



Investigation Report

M2012-01

M/S BARENTSZDIEP (NLD), collision with the edge mark off Oulu on 10.1.2012

Translation of the original Finnish report

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SUMMARY

M/S BARENTSZDIEP was laden with timber when she departed Oulu at 4.00 on 10 January 2012. The voyage plan was not gone through prior to the voyage and the Pilot did not present his own plan to the Master. The Master took care of turning the vessel in the dock basin. After the vessel had been turned, the Pilot took over the manoeuvring. To start with, he used manual rudder and later on in the fairway he switched over to automatic steering. During the voyage the pilot boarding area was changed from a northerly location to a more southern location near Holma upon a request made by pilot. The VTS was not aware of this change.

The pilot boat came to the side of the vessel as early as 3 NM before the southern pilot boarding area, but it suffered from problems in staying there because of the west-south-westerly swell. The Pilot was down on the deck; however, he could not transfer to the pilot boat because of the abovementioned reasons. The Master was alone on the bridge and the vessel was on automatic steering, which can only be operated from the middle console of the bridge. At the time of the accident, the Master was mainly on the port bridge wing because of the departure of the Pilot. The Pilot asked the Master to turn the vessel on a more southerly course of 190°–180°. This change of heading did not provide enough lee for the pilot boat so the Pilot requested a turn on course 160°. After the vessel had turned on this course, the Pilot was able to board the pilot boat at approx. 7.30. The vessel continued turning after that and reached the heading of 152.8°.

The Master was fully concentrated on the safe departure of the Pilot, and he did not at that instant notice that the vessel had proceeded close to the Holma edge mark. The Pilot warned the Master about the proximity of the Holma edge mark from onboard the pilot boat as did the deckhands who were on the deck. It is worth noticing that the accident occurred when it was dark but that the edge mark was lit with a white flashlight and that there was no lookout on the bridge. The deck illumination used in connection of the departure of the Pilot reduced possibilities to make observations. The Master saw the edge mark on the port side approx. 20°–30° and 2–3 cables from the bow. The Master steered to starboard by using automatic steering when the speed was according to the S-VDR approx. 4.2 knots. As the vessel was fully laden, she did not turn as was hoped and collided with the edge mark port side first at 7.31.

So many duties had built up on the Master that he was not able to manage them alone. These duties encompassed the control of the vessel's motion state including speed control, use of autopilot, monitoring of the heading, outlook, monitoring of the radar and communication with the Pilot as well as observing what was happening on the deck. The modification of the voyage plan and manoeuvring in order to have lee for the pilot boat can be considered as contributing factors.

The bridge must always be appropriately manned to ensure the safe navigating of the vessel in all circumstances. Pilot boarding/disembarking must be realised in such a way that the vessel has enough berth to provide lee for the pilot boat and to return back on a safe course.

As a result of the investigation, the Safety Investigation Authority recommends to the Finnish Transport Agency and the Finnish Meteorological Institute that they let install such appliances to the safety equipment that it is possible for seafarers to access real time information on the state of sea on the pilot boarding area and in its immediate proximity. In addition, the Safety Investiga-



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tion Authority recommends to Finnpiilot Pilotage Ltd and the Finnish Transport Agency that they, after the collaboration meetings of all pilotage areas in the entire country have been held, compile a common operating instruction for the VTS centres and pilots.

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GLOSSARY OF ABBREVIATIONS AND ACRONYMS

Abbreviation/acronym	
AIS	Automatic Identification System
ARPA	Automatic Radar Plotting Aid
BRG	Bearing
CPA	Closest Point of Approach
EBL	Electronic Bearing Line
ECS	Electronic Chart Display
MMSI	Maritime Mobile Service Identity
LT	Local time
RPM	Revolutions per minute
SOLAS	International convention for the Safety of Life at Sea
STCW	Standards of Training, Certification and Watchkeeping
TCPA	Time to Closest Point of Approach
Trafi	The Finnish Transport Safety Agency
UTC	Universal Time Coordinated
VTS	Vessel Traffic Service

FOREWORD

The Safety Investigation Authority obtained information on the collision of the M/S BARENTSZDIEP with the Holma edge mark on 13 January 2012. The damages on the vessel were rather serious and she had to interrupt her voyage and return to Oulu in order to discharge her cargo.

The Finnish Transport Safety Agency provided preliminary information on the accident, the Pilot's report and the VTS recording. A decision was made to perform a preliminary investigation, on the basis of which a decision was later made to investigate the accident as a serious incident because the damages to the vessel were rather significant. Sea captain Juha **Sjölund** was appointed as the head of the investigation commission and sea captain Rainer **Dahlblom** was appointed as a member investigator. Chief Marine Accident Investigator Martti **Heikkilä** was appointed as investigator-in-charge.

The head of the investigation commission visited the vessel in the Tallinn dock on 19 January 2012 in order to study the vessel's damages and to hear the Master. The Master accounted for the course of events and gave the vessel's S-VDR recording to the investigation commission's disposal.

The Master gave a maritime declaration in Oulu District Court, and the member investigator was present in the occasion. The Pilot did not agree to be heard by the investigators.

The time used in the investigation report is UTC+3, LT (local time).

The objective on Safety Investigation Authority (hereafter referred to as the SIA) is to improve safety, and thus liability and damage issues are not considered. As to its contents and style, the Investigation Report has not been written in such a manner that it would be intended to be used in a trial. The conclusions and safety recommendations presented in the Investigation Report do not constitute any presumption of responsibility or liability for damages.

Statements concerning the Investigation Report. The final draft of the Investigation Report was sent for statements to the Finnish Transport Agency, to the Finnish Meteorological Institute, to the Finnpilot Pilotage Ltd., to the Netherlands Shipping Inspectorate, to the shipping company and to the Master. The statements received within the prescribed time have been taken into account in the final Investigation report and a summary of those has been described in the appendices. Statements given by private persons are not published.

The Investigation Report has been translated into English by Minna Bäckman.

The sources used in the investigation are filed at the SIA (Safety Investigation Authority Finland).

1 EVENTS AND INVESTIGATIONS

1.1 Vessel



Figure 1. M/S BARENTSZDIEP.

(© Feederlines)

1.1.1 General information

Owner	Beheersmaatschappij M/S "BARENTSZDIEP" B.V.
Operator	Feederlines BV
Year of construction	2010 in the Netherlands
Type	Multi-Purpose Dry Cargo Ship
Nationality	the Netherlands
Home port	Groningen
Call sign	PCFR
IMO No.	9507130
Length, max.	106.78 m
Breadth	15.2 m
Draught	5.25 m
Deadweight	5489 t
Gross tonnage	4102
Net weight	1851
Speed	12.5 knots
Main engine	MAK 6 M25 2010 kW
Bow thruster	300 kW

1.1.2 Manning

The vessel had a crew of eight. The Master was Dutch (born in 1949), the Chief Officer (born in 1966) and the Second Officer (born in 1985) were from Croatia. The Chief Engineer and the Second Engineer were from the Netherlands and the rest of the crew from the Philippines.

1.1.3 Navigating bridge and bridge equipment

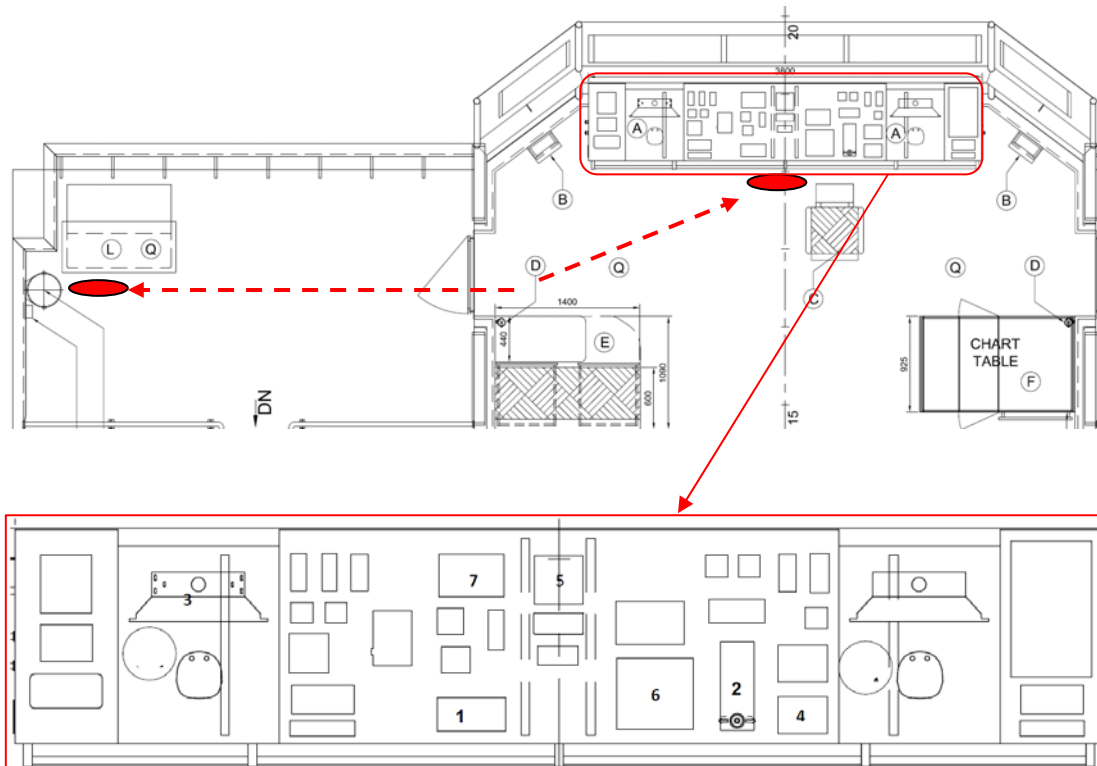


Figure 2. During the moments prior to the accident, the location of the Master varied between the red dots marked in the picture. He was alone on the bridge. Figure 2 numbering key can be seen in Table 1.

Table 1. Explanations for the numbers in Figure 2.

Number	Quantity of equipment	Description	Device information
1	1	Automatic steering	Anschutz Digital Autopilot Pilotstar D
2	1	Main console for the control devices	Control devices
3	1	Radar 2	X-Band Radarpilot 1102/ARPA 1A5X SAM Elec.t
4	1	Bow thruster control	
5	1	Sister indicator of gyro compass (repeater).	Anschutz Standard 22
6	1	Controllable pitch propeller (CPP)	Adjustment of controllable pitch propeller. BERG propulsion.
7	1	Log display	Speedlog ANTHEA, SAM Electronics



Figure 3. Photo taken from the starboard side of the bridge.

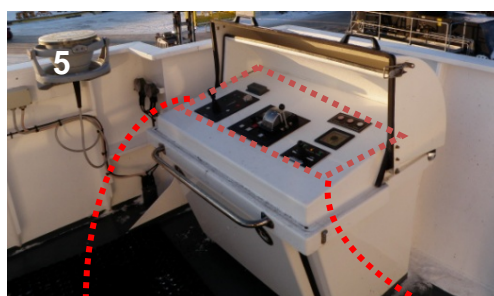


Figure 4. Bridge wing equipment: 1. Bow thruster control, 2. Controllable pitch propeller, 3. Rudder "Tiller", 4. Rudder angle indicator, 5. Sister (repeater) indicator of gyro compass (the upper figure).

1.1.4 Engines and the engine room

Not relevant concerning the accident.

1.1.5 Passengers and cargo

The vessel carried cellulose and timber 4770 tons in total. The destination of the cargo was Egypt. There was no deck cargo. There were not any passengers on the vessel. The loading of the vessel was completed at 21.00 on 9 January 2012, but the Master decided that the departure would not take place until 4.00 the following morning because the crew had to rest before the voyage was started.

1.2 Accident event

1.2.1 Weather conditions

According to the Finnish Meteorological Institute, a 1 m/s wind blew from the direction 107 degrees (Marjaniemi at 7.40) and there was a west-south-westerly swell of 0.5 m. It was dark and the visibility was good. The sun rose at 10.13. Water height was +55 cm.

According to the skipper of the pilot boat, there was a southerly wind 7 m/s 1.5 hours before the Pilot boarded the vessel. According to the maritime declaration given by the Master, there was a sea of 1–2 m.

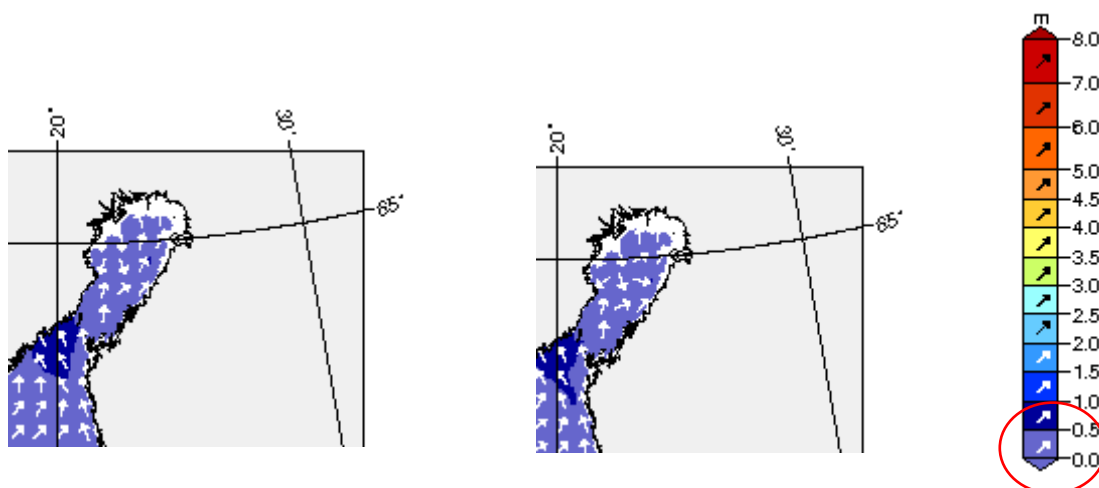


Figure 5. The direction of the waves at 5.00-8.00.LT
(© Finnish Meteorological Institute)

1.2.2 Preparations for the accident voyage and its first leg

Normal departure procedures and controls according to the vessel-specific check-list were carried out. The Pilot arrived to the vessel at 3.45 on 10 January 2012. Departure draught forward was 4.9 m and aft 5.3 m. The voyage plan was not gone through prior to the voyage and the Pilot did not present his own plan to the Master.

The vessel was let go from the quay at 4.00. The Master took care of turning the vessel in the dock basin. After this the Pilot took over the manoeuvring of the vessel. To start with, he used manual rudder and later on in the fairway he switched over to automatic steering.

1.2.3 Scene of the accident

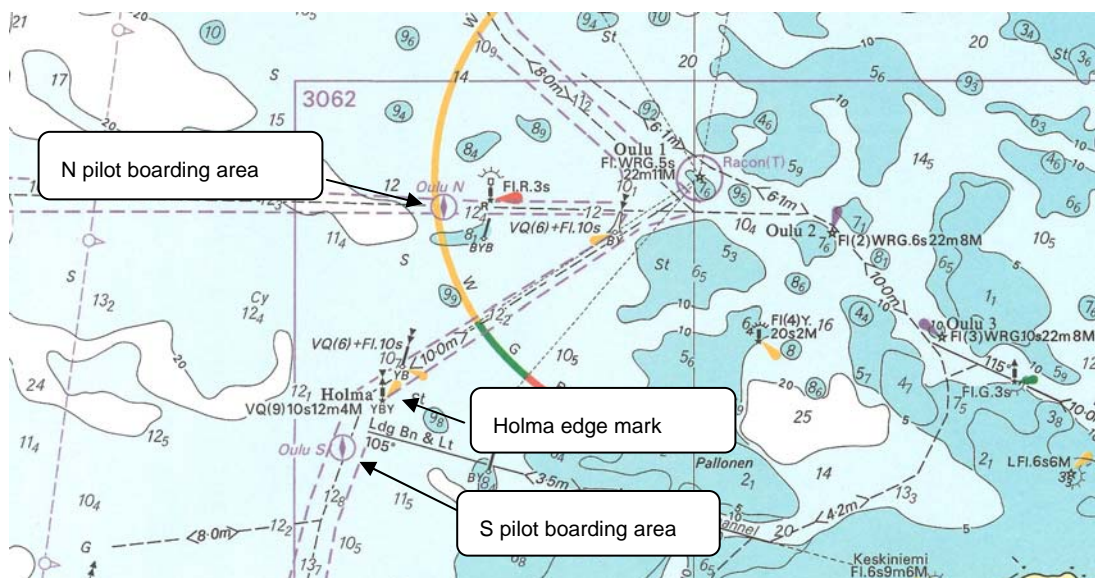


Figure 6. The scene of the accident is located west of Hailuoto. (© The Finnish Transport Agency)

The pilot boarding areas for the pilot boarding and disembarkation have been marked on the chart in a clear manner. The Pilot disembarked the vessel approx. 3 NM before the southern pilot boarding area marked on the chart. Around this area there is enough open sea area so that the disembarkation of the Pilot can be arranged in a safe manner.

1.2.4 Accident

In the course of the voyage, the Pilot asked the Master whether he could disembark the vessel on the southern pilot boarding area instead of the northern one. The Master was fine with this, even though he had originally planned to leave the Pilot at the northern pilot boarding area. Bothnia VTS was not informed about the change.

After Oulu 1 lighthouse the vessel was turned to southwest, on the heading of approx. 225°. After a while the speed of the vessel was reduced to approx. 7 knots. The pilot boat arrived to the port side of the vessel approx. 3 NM prior to the southern pilot boarding area. She experienced some difficulties in staying at the side of the vessel because of a west-south-westerly swell, and the Pilot could not therefore transfer to the pilot boat.

The Master was alone on the bridge and the vessel was in automatic steering. There was no lookout on the bridge. The automatic steering can only be operated from the middle console of the bridge. According to the Master, the settings used at open sea

were set in the automatic steering¹. The vessel's maximum rudder angle was 40 degrees, but a restriction to 20 degrees was applied. The bridge wing offers possibility to use manual rudder and the repeater indicator of the gyro compass, but the Master did not make use of these.

When the vessel was approaching the wheel over point north of Holma edge mark (Figure 7), the Pilot asked the Master from the deck level to turn the vessel on a more southern course of 190°–180°. This change of heading did not provide enough lee for the pilot boat so the Pilot requested a turn on course 160°. After the vessel had turned on this course, the Pilot could finally transfer to the pilot boat at approx. 7.30. According to the S-VDR recording the vessel was briefly on a heading of 152.8 degrees, which means that the heading given by the Pilot was exceeded by 7.2 degrees to port closer to the Holma edge mark. When providing lee for the pilot boat, the vessel had turned altogether 73 degrees port from the direction of the fairway. The positions of the vessel and the pilot boat at the different stages of the disembarkation of the Pilot on the basis of the VTS recording have been presented in Figure 8.

It was dark and the deck illumination used in connection of the disembarkation of the Pilot reduced possibilities to make observations. The edge mark was lit with a white flash light². There are 9 quick flashes in each 10-second-period, and during the period the light is dark for approx. 5 seconds. The bearing to the edge mark changed all the time as the vessel was turning. There is no facade light in the edge mark.

The Master did not observe the radar image and edge mark when he was on the port bridge wing and moving around between the manoeuvring consoles of the bridge wing and the bridge. He was concentrating on the safe departure of the Pilot, and he did not at that instant notice that the vessel had proceeded close to the Holma edge mark. The Pilot onboard the pilot boat warned the Master about the proximity of the edge mark as did the deckhands who were on the deck.

The Master saw the edge mark approx. 20°–30° on the port side of and 2–3 cables from the bow. He turned the vessel starboard by using automatic steering. According to the S-VDR the speed was 4.2 knots. As the vessel was fully laden, she did not turn as was hoped and collided port side first with the edge mark at 7.31.

¹ According to the Master, the automatic steering settings were Yawing 1, Rate of turn 40°/min and Rudder limit 20°.

² The light character of the Holma edge mark is VQ(9)10s12m4M, which means 9 ultra-quick flashes in the sequence of 10 seconds and that the light is in the height of 12 metres and it can be seen from the distance of 4 NM.

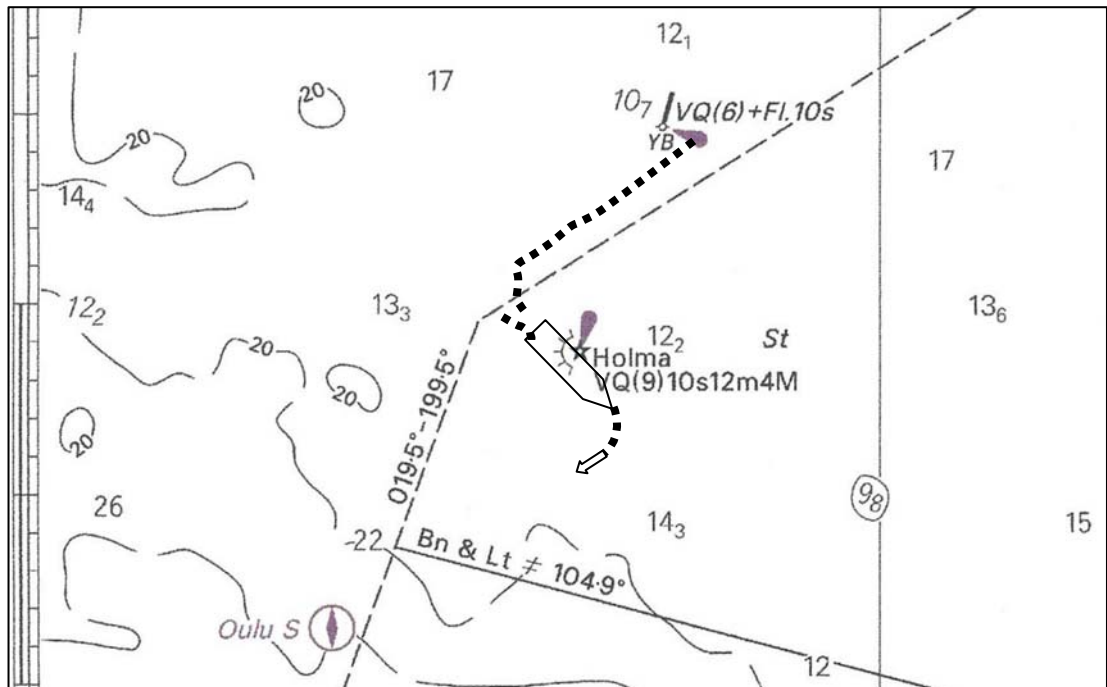


Figure 7. A Figure drawn on the basis of the Master's sketch describing the vessel's movements as she collided with the Holma edge mark.

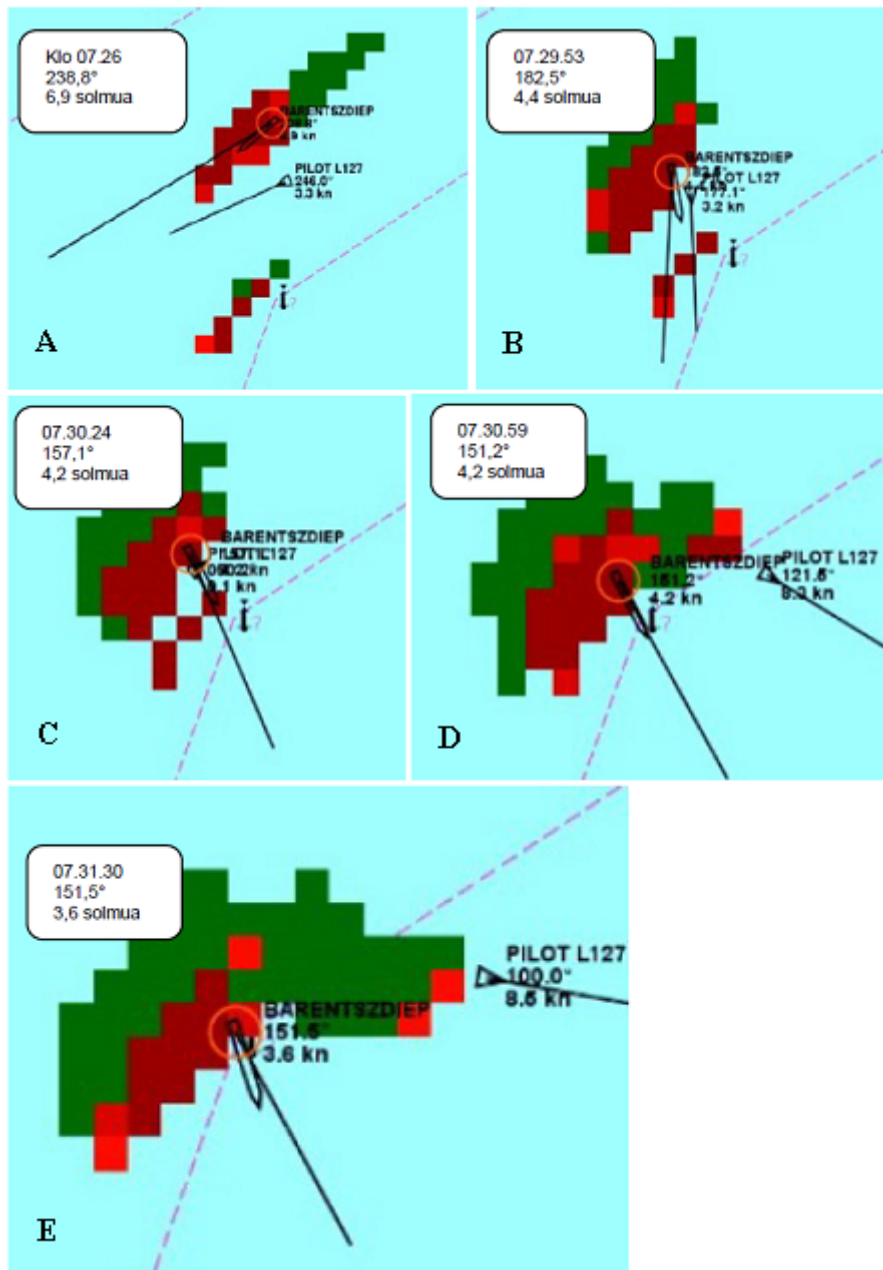


Figure 8. The accident according to the VTS recording (the vessel's radar echo and AIS information). The time, heading and speed are marked in the rectangles.

- A The pilot boat is approaching the vessel.
- B The vessel has turned on course 182.5° and the pilot boat is next to the vessel.
- C The Pilot disembarks the vessel.
- D The Pilot has disembarked the vessel, but the vessel has not yet started to turn to starboard.
- E Collision with the Holma edge mark.

1.2.5 Bridge cooperation and communication

The Pilot carried out the pilotage without communicating about the course changes with the Master during the voyage. There was no Bridge Resource Management (BRM³) in practise.

In the course of the voyage it was decided, upon the Pilot's suggestion, that he could disembark the vessel at the southern pilot boarding area instead of the northern one. The Pilot did not give motivation for the change of the pilot boarding area. The VTS was not informed beforehand. The Master had not taken the change into consideration in his voyage plan. The disembarkation of the Pilot started approx. 3 NM before the southern pilot boarding area. After going to the deck, the Pilot gave manoeuvring requests from the deck level in order to provide lee for the pilot boat.

1.2.6 Measures after the accident

After the collision, the vessel listed immediately 10° to port. The personnel first checked that there was no oil spillage to the water. Ballast tanks were sounded and it was concluded that there was water in the port side tank number 5 and in the bottom tank number 6. The Chief Officer checked that the vessel's stability was adequate. After this, water was pumped to the starboard side tank number 5. When it was filled, the list had decreased to four degrees. Water was also pumped to the starboard side tank number 3 till the vessel was straight. Information about these measures as they progressed was conveyed to Bothnia VTS and MRCC Turku.

A preliminary investigation on the damages to the vessel was carried out in the proximity of the scene of accident. This was mainly done by sounding the tanks and by making sure that the vessel did not spill oil. On the basis of this inspection, the Finnish Transport Safety Agency granted the vessel permission to return to Oulu, where the cargo was discharged.

After the discharging of the cargo, a more detailed inspection was carried out in Oulu. On the basis of the inspections and the conditions set by the classification society, the vessel was granted permission to sail to Tallinn dock in favourable weather conditions.

1.2.7 Injuries to persons

There were no injuries to persons.

³ Bridge Resource Management (BRM) stands for managing resources on the navigating bridges of vessels. These resources include navigational equipment, voyage plan, communication, bridge personnel, pilot with local knowledge and external circumstances e.g. wind. The objective of BRM is that all persons working on the bridge have a common vision on how the voyage in question is realised.

TRAFI/6798/03.04.01.00/2011, Shipping / 2.2.3 Bridge resource management skills

1.2.8 Damages to the vessel

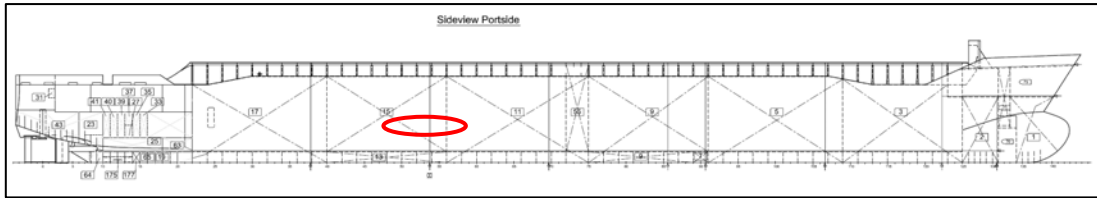


Figure 9. The red ellipse describes the location of the damages on one side of the vessel.



Figure 10. Damages on the port side.

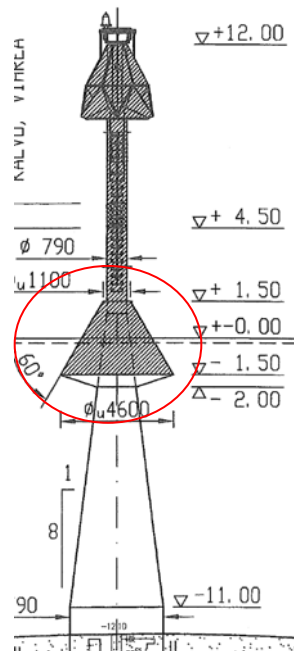


Figure 11. HOLMA edge mark. The vessel collided with the ice cone on the side of it with its side first. The edge mark did not suffer damages in the collision.

After the collision, the vessel listed immediately 10° to port. The ice cone of the edge mark cut a 5–6 m long, up to 0.8 m deep slash to the side of the BARENTSZDIEP 2.5 m

below the waterline. The damages were limited to the port side tank number 5 and the bottom tank number 6, which had leakages. Figure 9 describes the location of the damage on the port side, and a photo of the point of damage taken in connection of the docking can be seen in Figure 10. Vessels have also before suffered from severe damages because of colliding with edge marks equipped with ice cones⁴.

1.2.9 Registration equipment

S-VDR records radar image (and information contained in the radar image) and bridge sounds. The Master of the vessel provided the Investigation Commission with the information registered by the vessel's S-VDR. Recorded conversations on the bridge and VHF traffic as well as radar images have been used in order to reconstruct the various stages of the incident. Analysis of the radar images and sound recording of the registration can be found in Appendix 1.

1.2.10 Operation of the VTS and supervision systems

Vessels are given notifications when needed, when the vessel reports or when the vessel requests for information. These notifications include information which has an effect on the vessel's safe navigation and smooth operation, e.g. information on the traffic on the VTS area, circumstantial information and information on the condition of fairway equipment and channels. VTS monitors the passage of vessels and when necessary, warns vessels about dangerous situations threatening the vessels.

Vessel traffic is organised in order to improve traffic flow and safety. The objective is to prevent dangerous meetings and overtakings of vessels as well as backing up of vessel traffic. The VTS can stagger traffic according to traffic situation and circumstances in such a way that vessels meet in safe areas.

VTS recorded the information related to the time of the accident. The investigation has had this recording at its disposal.

1.2.11 Fairway equipment

The structure of the HOLMA edge mark can be seen in Figure 11 and it is described in further detail in Appendix 2. The edge marked was firmly fastened to the bottom of the sea at the depth of approx. 11 metres and it had been designed to withstand/break moving pack ice with the help of the cone installed at the waterline of the cylindrical trunk. It did not suffer damages as the result of the collision.

The light character of the Holma edge mark is VQ(9)10s12m4M, which means 9 ultra-quick flashes of light in the sequence of 10 seconds and that the light is in the height of 12 metres and it can be seen from the distance of 4 NM. The light character is used in west cardinal marks.

⁴ The German cargo vessel ms JANRA suffered from a similar damage caused by an ice cone when she collided with the Tröskeln Östra edge mark south of the Åland Islands on 23 December 2000. As a result the vessel capsized quickly but did not sink. See investigation report B5/2000M *MV JANRA, Capsizing in Northern Baltic* 23.10.2000

1.3 Rescue activities

1.3.1 Alerting activities

At 7.40 LT the pilot boat informed the VTS that the BARENTSZDIEP had collided with the Holma edge mark and suffered damage in the ballast tank and that the pilot boat would stay at the scene to observe the situation.

At 7.42 the VTS informed the MRCC Turku about what had happened.

At 7.52 the MRCC informed the VTS that a maritime inspector had ordered the vessel to return to port. The VTS passed the information to the pilot boat. The MRCC also contacted the vessel and inquired whether they required assistance. At 9.35 the Master had contact with the MRCC Turku, from which it was informed that the vessel had to be taken to a maritime inspection either to Oulu or to Raahe. The location was later confirmed as Oulu.

1.3.2 Initialising rescue activities

The vessel's personnel surveyed the vessel and concluded that she was not in the danger of sinking or capsizing.

1.3.3 Salvaging the vessel

The vessel's list was straightened with the help of ballast and the vessel was able to return to Oulu.

1.4 Special investigations

1.4.1 Investigations on the vessel and at the scene of the accident

The Finnish Transport Safety Agency carried out a Port State Control⁵ on the vessel on 11 January 2012. The only detected defect was the reduced seaworthiness of the vessel caused by the damages. The vessel was granted permission, with the consent of the classification society, to sail a one-way voyage to dockyard in Tallinn in favourable weather conditions.

The head of the investigation commission visited Tallinn on 19 January 2012 in order to examine the damages to the vessel and study the bridge and the Safety Management System (SMS) of the vessel as well as to hear the Master and fetch the S-VDR recording.

The Holma edge mark was inspected visually on the day of the accident by the Oulu channel group. No damages to the edge mark were detected in the inspection.

⁵ Port State Control (PSC inspection) is a port state inspection made on the vessels. These inspections constitute an international supervision system, which pertains to foreign vessels visiting ports or anchorages of the member states.

There were not any defects in the vessel's equipment or in the Holma edge mark that would have contributed to the accident. The technical investigations mainly concentrated on the examination of the VTS and S-VDR recordings. The investigation concentrated on the persons' actions which were analysed in relation to e.g. the Safety Management System of the shipping company.

1.4.2 Organization and management

The master of the vessel is responsible for the safe usage of the vessel. The flag state authority is the primary organ supervising the vessel and its operations. It is the responsibility of the shipping company to define safe procedures concerning the usage of the vessel and to make sure that these procedures are observed.

Finnpilot Pilotage Ltd is a dedicated state company operational in the administrative sector of the Ministry of Transport and Communications. The state of Finland holds the entire share capital of the company. The operations are governed in accordance with the Limited Liability Companies Act and controlled by the Pilotage Act. The duty of Finnpiilot Pilotage Ltd is to support and develop the safety and operational conditions of waterborne traffic primarily through pilotage services and through other services and products related to these services.

According to the Pilotage Act, the pilot acts as an advisor to the master of the vessel and having pilot onboard does not free the vessel's master/officers from the responsibility to see to the safe navigation of the vessel.

1.5 Rules and regulations guiding the operations

1.5.1 National legislation

Pilotage. Compulsory pilotage and the pilot's responsibilities and duties in Finland are stipulated in the Pilotage Act of 23.11.2003/940 (the latest amendment 1050/2010 which came into force 1.1.2011). The Act defines how a pilot should act and also where a pilot should board or disembark a vessel. Appendix 3 covers statutes and regulations on pilotage, vessel traffic service and watchkeeping.

The Ministry of Transport and Communications is in charge of the general instruction and development complying with the Pilotage Act. The Finnish Transport Safety Agency supervises that the Pilotage Act and rules and regulations issued under it are observed. The Finnish Transport Safety Agency takes care of those duties related to pilotage which according to the Act do not fall to Finnpiilot Pilotage Ltd.

The Government Decree 246/2011 and the Finnish Transport Safety Agency instructions 15.6.2011 6703/03.04.01.00 / 2011 "The fairways and the pilot positions" ["Piloted fairways and pilot boarding areas"] define the pilot boarding area where a pilot shall board and disembark a vessel. See Appendix no.3.

Where a pilot boarding area should be located is a matter which is negotiated locally (authorities under the Ministry of Transport, pilots and possibly users of the port) and a

proposal is made to the Finnish Transport Safety Agency which makes the official decision on the coordinates of the pilot boarding area. This location information is published in the form of a maritime safety regulation by Finnish Transport Safety Agency.

Vessel traffic services⁶ are maintained by the Finnish Transport Agency in its role as the VTS authority. The sea areas along the Finnish coast are divided into six VTS areas, of which the Bothnia VTS sector guides the Oulu area. Vessels with the maximum length of at least 24 metres are obliged to participate in vessel traffic services by reporting to Bothnia VTS, by listening to VHF channel 67 and by complying with the regulations on operating on the VTS area. The Master of the vessel has to notify the VTS authority on non-conformities in the VTS area or its proximity including e.g. the change of navigation status.

1.5.2 Shipping company regulations

The procedural instructions (SMS) of the shipping company require that the bridge be manned in such a way when boarding/disembarking a pilot that the task can be carried out in a safe manner. The shipping company recommends in its Safety Management System that an officer is present on the deck, next to the pilot ladder, and he/she supervises the boarding/disembarkation of the pilot. The master is responsible for the implementation of the vessel's Safety Management System.

1.5.3 Pilotage Instruction of the Finnpilot Pilotage Ltd. 4.10.2011

The instruction gives guidelines as to when pilotage starts, on how the pilot boarding position is agreed on with the vessel, on cooperation between the pilot and officers during pilotage, on the use of manoeuvring and navigation equipment and on how manoeuvring and engine orders are realised. See Appendix 2.

1.5.4 International agreements and recommendations

The ISM Code⁷ requires that the shipping company compiles safe procedures for the use of the vessel.

In Regulation 24 in Chapter V in the SOLAS there is a provision on the use of automatic steering which defines that when using automatic steering, **a qualified helmsman must be prepared to take over manual steering in certain circumstances.**

The international Rules of the Road at Sea 1972 (i.e. Collision Regulations) also deal with appropriate lookout in Part B - Steering and Sailing, Rule 5, according to which a proper lookout shall be maintained **at all times.**

⁶ Vessel traffic services are regulated by the Vessel Traffic Service Act 623/2005 and by the Government Decree on Vessel Traffic Service 763/2005 and 1798/2009 and by decision to establish a VTS, Ministry of Transport and Communication 26.4.2011.

⁷ The International Safety Management Code (ISM) equals with international safety management regulations the purpose of which is to enhance the safe operations of vessels and prevent environmental damage.

The international agreement on the Standards of Training, Certification and Watchkeeping (STCW), Section B-VIII/2, defines that **the person carrying out navigational watch should not be overburdened with other duties.**

Appendix 3 includes references to national and international agreements and sections relevant with reference to this case.

2 ANALYSIS

There were no defects on the vessel and the Holma edge mark was in working order so the investigation has concentrated on the actions of persons. These actions have been analysed in relation to the Safety Management System and pertinent regulations and legislation.

The analysis consists of the following parts: bridge operations, problems related to the disembarkation of the Pilot and assessment of rescue activities.

2.1 Bridge operations

Bridge manning. The procedural guidelines presented in the vessel's Safety Management System (SMS) for the situation in question are clear, but their implementation on the practical level hobbles. The shipping company should ensure the proper implementation of the Safety Management System, but it is clear that it is difficult for the shipping company to supervise the observation of instructions when the vessel is at sea. Thus the Master carries this responsibility.

The SMS of the BARENTSZDIEP's shipping company requires that the bridge be manned in such a way that the disembarkation of the pilot can be carried out in a safe manner.

The commitment of the top-level management, i.e. in this case the Master, is important. The Master must act as an example to others and motivate the vessel's personnel to maintain safe operations. In this case the situational control would have been significantly more effective if the shipping company instructions had been complied with. The small number of personnel onboard the vessel had, however, an effect on the situation. It is clear that the SMS cannot be realised with the current number of crew.

According to the investigators' view the bridge should have been manned in this pilot disembarkation situation carried out in dark in such a way that there would have a look-out and/or officer on the bridge while the Master employed manual steering on the bridge wing. With this kind of bridge manning and procedure the person engaged in watchkeeping could have concentrated on the safe disembarkation of the Pilot while the other person would have taken care of the safe navigation of the vessel.

Communication. The Pilot performed the pilotage without active navigational communicating with the Master during the voyage. It was agreed during the voyage that the Pilot would disembark the vessel on the southern pilot boarding area instead of the northern one because it was obvious that the northern pilot place is used in this time of year. The VTS was not informed beforehand. Because the direction of the swell was surprising, the Pilot gave manoeuvring orders on providing lee to the pilot boat from the deck level before leaving the vessel.

The communication prior to the disembarkation of the Pilot concentrated on how the Pilot can disembark in a safe manner. Before leaving the bridge the pilot had told to Mas-

ter the position of the Holma edge mark and safe continuation of the voyage after the pilot's disembarkation.

Communication between all parties involved in a situation enables generation of a common situational awareness, discussion about changes contributing to the improvement of safety and implementation of these changes before the situation becomes dangerous. If the disembarkation of the pilot does not succeed as had been originally planned, it is of foremost importance that all parties involved discuss the changing of the situation in an effective manner.

The Master's situational awareness and the manoeuvring of the vessel. The change of the pilot boarding area was changed from the northern to the southern area and the disembarkation of the pilot took place approximately 3 NM prior to the marked pilot boarding area. The surprisingly large port turn which had not been planned beforehand was a surprise for the Master. While the Pilot and the Master solely concentrated on the disembarkation of the Pilot, the monitoring of the vessel's position got less attention.

When the Pilot moved to the deck, the burden of bridge duties was solely directed on the Master. His duties comprised of the control of the vessel's motion state including speed control, use of autopilot, monitoring of the heading, lookout, monitoring of the radar and communication with the Pilot as well as observing what was happening on the deck. According to what the Master has told, he solely concentrated on the safe disembarkation of the Pilot.

The Master told that he had decreased the burdening of the duties by using automatic steering. His ability to observe the surrounding was, however, reduced by the fact that he had to move from one place to another and to keep lookout to the deck. The duty was burdening concerning visual observation and attention as deck illumination prevented observing the flash of the edge mark, and this exposed to human error.

The location for the disembarkation of the Pilot at the Holma edge mark had been chosen in such a way that this resulted in the safe margin for the manoeuvring of the vessel becoming significantly narrower as the manoeuvre made in the direction of the edge mark protracted and as the turn was directed towards the edge mark. The last heading of 160° given by the Pilot from the main deck was surpassed by 7.2 degrees to the heading of 152.8°.

Reducing the rudder angle of automatic steering to 20 degrees in navigation in archipelago reduces operational preparedness in problematic situations if manual steering is not switched on. However, a last-minute swerve of the collision by using manual rudder would have been a demanding manoeuvre because the edge mark was not clearly visible in the dark. In a sharper turn the collision might have lead to more severe damages in case the hit was directed to the engine room. (Figure 12).

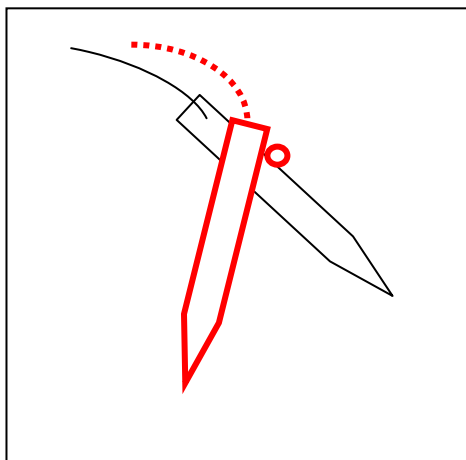


Figure 12. A sharper turn (red symbol) might have resulted in the collision with the edge mark being directed to the place where the engine room is situated.

The technical resources on the bridge were not employed to their full extent. The manoeuvring of the vessel in this kind of a situation can be handled solely from the bridge wing by using the equipment available there if the visibility is good. The Holma edge mark is equipped with a flash light but the trunk had not been lit. When giving the maritime declaration, the Master forgot that there is a repeater indicator of gyro compass on the bridge wing.

The Pilot's situational awareness. The Pilot was aware of the vessel's position, heading and speed before leaving the bridge. When the disembarkation from the vessel it was delayed and it was not possible to transfer to the pilot boat despite several attempts, the Pilot's situational awareness with reference to the position of the vessel grew weaker as time passed. The Pilot's location on the deck next to the pilot ladder or hanging on the ladder further reduced his situational awareness. When onboard the pilot boat, the Pilot observed the severity of the situation and warned the Master on VHF channel 13 without getting any reply, but this was done too late.

If the Pilot had had better information on the weather conditions at the pilot boarding area beforehand, there would have been better prerequisites for a successful disembarkation of the Pilot. The VTS has direct contact to Marjaniemi weather information and the pilot boat has even more precise information on e.g. the waves. The weather conditions were, however, suitable for the disembarkation of the pilot but the place was incorrectly chosen. According to the investigators point of view there was no ground to change the disembarkation position.

2.2 Problems related to the disembarkation of the Pilot

The disembarkation of the Pilot of the BARENTSZDIEP was commenced approx. 3 NM before the official southern pilot boarding area while the heading was 236 degrees. *The direction of the waves was a surprise for the Pilot* as he presumed it would have been more from the west. If this had been the case, the disembarkation of the Pilot would have succeeded according to the Pilot's plan.

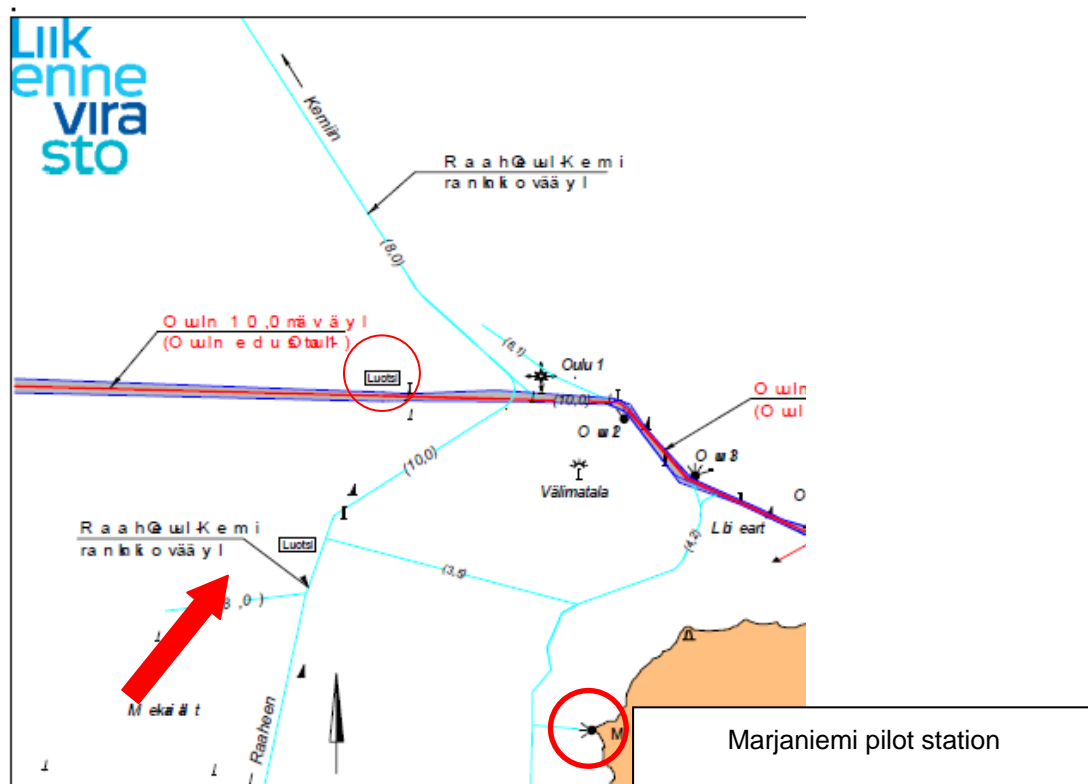


Figure 13. Excerpt from the Oulu track chart. The red arrow indicates the direction of the waves at the time of the accident. At both disembarkation positions, it would have been practical for the Pilot to disembark the vessel from the starboard side as the bow of the vessel pointed towards west. (© The Finnish Transport Agency)

The swell was from south-west, and because of this the vessel had to be turned more to port as the ladders were rigged on the port side. After the Holma edge mark, the collision risk would have been avoided in an area where it would have been possible to realise the changes in the course of the vessel in a safe manner or to turn the vessel to west as the pilot ladder was on the starboard side.

The pilot ladder was first thought to be placed on the starboard side of the vessel, but then a decision was made prior to the disembarkation of the Pilot to place it on the port side which indicates that the Pilot did not perhaps have exact information on the direction of the waves. As a matter of fact, the starboard side of the vessel would have been a good option for the disembarkation of the Pilot if the vessel had been turned towards west.

The northern pilot boarding area of Oulu is a natural and in all respects safe choice in these circumstances and in the circumstances prevailing in this case when the sea is from south-west. There would not have been any need to turn the vessel in order to provide lee for the pilot boat.

Disembarkation of the Pilot and pilot boarding area. Many factors have an effect on the safety of the disembarkation of a pilot. It has been commonly noted that when there

is heavy sea, pilot boarding and disembarkation are safer if both the vessel and the pilot boat are moving. The manoeuvring of the pilot boat can in such cases be used in order to ensure that it presses more tightly against the side of the vessel. Speed must be determined on the basis of the situation and this must not put the pilot's or the vessel's safety in danger. Enough time and space must be reserved for the realisation of the action. The disembarkation of a pilot tends to stretch in bad conditions, which means ***there has to be enough time and distance.***

When the disembarkation of the pilot takes place before the pilot boarding area, the pilot should inform the VTS about the plans agreed with the vessel and also provide the master with adequate instructions on how the vessel can safely return to the channel after the disembarkation. Before the disembarkation the pilot did show to the Master all the relevant seafaring safety devices and told that there is enough depth. The observation of the Holma edge mark got dimmer during the big course changes and there was no assistance in the bridge in order to maintain sufficient situational awareness and retain the capability of function.

When determining pilot boarding areas, the authorities and pilots have considered the matter from the perspective of vessel safety in such a way that the boarding or disembarkation of the pilot can be realised in safe manner in various weather conditions when the vessel is turned in order to provide lee. The pilot boarding areas marked on the chart are mainly located at the open sea. Therefore pilot boarding and disembarkation near the pilot boarding area is dangerous in bad weather due to heavy sea as well because of a difficult ice situation during the winter. In these cases legislation grants possibility to bring forward the embarkation of the pilot or delay the boarding of the vessel. This exceptional practice has caused several situations in which the crew of a vessel have had to navigate themselves part of the voyage intended to be piloted. It has to be taken into account, that if the pilot cannot disembark safely he can travel onboard to the next harbour or to a place where the disembarkation can be carried out safely.

Summary on the factors which led to the BARENTSZDIEP accident. When the pilot disembarks the vessel, his/her safety and the safety of the pilot boat and the vessel have to be assured. This can be achieved through cooperation between the pilot, the master of the vessel and the VTS Centre. When choosing his/her disembarkation position and the manoeuvre required in connection with it, the pilot must make sure, by discussing this with the master and/or the officer of the watch, that there is a safe space for the manoeuvre considering the fact that the situation may, due to circumstances, take longer than expected. The safe continuation of the voyage can be ensured if the pilot gives instructions to the master on how to return to the channel in a safe manner. By letting the VTS know about the pilot's disembarkation position and the manoeuvre to be completed there, the VTS is included in the securing of the situation.

Previous accidents. In Appendix 4 there is a summary on the accidents which have occurred in connection with pilotage / pilot disembarkation. About the previous accidents: The OOCL NEVSKIY was also an accident in which the vessel's personnel did not have control of the situation after the pilot had disembarked. It has to be taken into

account that the piloting are generally carried out safely. In spite of that, there is always chance to improve the safety.

The investigation report M2012-02 PHOENIX J. PHOENIX J: The situational awareness after the pilot has disembarked and the significance of the instructions and practices in organizations.

2.3 Assessment of rescue activities

The internal rescue activities on the vessel were carried out quickly and efficiently. In addition, the safety of the vessel and the state of the marine environment were established widely enough. The personnel of the BARENTSZDIEP quickly found out the compartments which suffered from leakages. In addition, other possible targets which could have suffered damages in the collision were checked, e.g. fuel tanks. The Chief Officer checked that the vessel's stability was adequate. It was possible to straighten the vessel quickly by pumping water to the tanks on the opposite side. During the situation it was made sure that there were no oil leakages from the vessel to the sea.

During the internal rescue activities the crew had contact with the Turku MRCC and Bothnia VTS. Thus the rescue organization ashore was kept up-to-date on what was happening.

The pilot boat remained at the accident scene to cover the situation.

3 CONCLUSIONS

3.1 Findings

1. The voyage was started without the pilot and the master together familiarising themselves with each other's voyage plans.
2. The vessel had readiness to use electronic charts but the shipping company had not acquired charts suitable for navigation in the archipelago.
3. There was lack of navigation related communication between the pilot and the master which should increase safety of the navigation.
4. An alteration was made in the voyage plan without forcing grounds at the final stage of pilotage upon the pilot's request. Due to this alteration the master had to prepare pilot's disembarkation in the southern pilot boarding area instead of the northern one. The VTS was not informed about this change.
5. To begin with, the pilot did not have exact knowledge of the direction of the waves, and the disembarkation of the pilot was completed from the port side of the vessel, and therefore the vessel was turned to port towards the Holma edge mark.
6. The Safety Management System (SMS) of the shipping company states that the bridge must be manned in such a way that the disembarkation of the pilot can be carried out in a safe manner. The manning on the bridge did not comply with this.
7. After leaving the bridge the pilot requested course changes from the main deck level when his preconditions for the evaluation of the overall situation had been weakened. As a consequence the vessel turned totally 73 degrees port from the direction of the fairway toward the edge mark Holma when providing lee to the pilot boat.
8. The VTS did not react to the situation as they had not been informed about the disembarkation of the pilot.
9. The warnings given by the deck crew and the pilot then onboard the pilot boat about the proximity of the edge mark came too late.
10. The Master who was alone on the bridge was overloaded.
11. The vessel's personnel quickly examined the consequences of the accident and had good control of the actions thereafter.

3.2 Factors contributing to the accident

When marking pilot boarding areas on the chart, it has been taken into account that there is enough space to turn the vessel if needed. In this case the northern pilot boarding area, which was more suitable as to the situation and prevailing circumstances, was changed into the southern pilot boarding area without any justified reason. The disembarkation of the pilot was started at a point where the Holma edge mark had not yet been passed. The disembarkation of the pilot took longer than expected because there was not adequately precise data on the weather conditions (wave direction). The pilot did not have real time information on weather conditions at the pilot boarding area at his/her disposal.

The appropriate manning of the bridge is one of the important elements in a Safety Management System. So many duties had built up on the master that he was not able to manage them alone. It is clear that the Safety Management System cannot be realised with the current number of crew.

When the pilot disembarks the vessel, his/her safety and the safety of the pilot boat and the vessel have to be assured. This can be achieved through co-operation between the pilot, the master of the vessel and the VTS Centre. The following can be considered as contributing factors: change in the master's voyage plan due to the pilot's request, changing the area for the pilot's disembarkation, the fact that the disembarkation took longer than expected, and concentrating on the safe embarkation of the pilot, which is important, without being able to ensure the safety of the vessel at the same time.

In the light of the factors which have surfaced in the investigation of the accident, it is clear that the Safety Management System has not been implemented properly because the level of bridge manning did not comply with the safe manning described in the system. The Netherlands Shipping Inspectorate and the vessel's shipping company Feederlines are parties which can confirm the practical level functionality of the Safety Management System of the shipping company with the current number of crew.

4 IMPLEMENTED MEASURES

Cooperation between Finnpilot Pilotage Ltd and VTS

Finnpilot and the Finnish Transport Safety Agency have launched a joint project in order to establish common practices. The Management Boards of both parties have had their first co-operation meeting in April 2011. It was preceded by an operative meeting held by the operational levels. In the future, the objective is to arrange two-level meetings with regular intervals. The operative working group¹⁸ aims at finding such measures which have proved to be efficient in improving safety and looks for a considerable improvement in the communication between VTS centres and pilots. To the Sea of Bothnia area Finnpilot Pilotage Ltd and VTS have together prepared the cooperation instructions in which a stand is taken how the flow of information is changed between the organisations.

The piloting instruction has been updated for the pilot's embarking situations and leaving situations 1.10.2013. Pilots will be equipped with mini-computers with the possibility to monitor weather forecasts from different sources during the years 2013–2014.

In the Finnish Meteorology Institution FMI there are under development several projects with which it intensifies 24/7 operative co-operation with Finnish Traffic Agency. Projects are financed by the ESA. FMI also participates "Intelligent Buoy" project drawn by Finnish Meritaito Ltd in order to verify the exactness and reliability of measuring devices that have been installed to buoys to measure the height of water level and the height of waves.

¹⁸ The supervisor of VTS, shift foremen, district chief pilot and pilots.

5 SAFETY RECOMMENDATIONS

C1/2010M M/S STADIONGRACHT investigation report includes comprehensive recommendations on how to develop pilotage and VTS operations.

In the light of the previous cases it can be concluded that pilot boarding or disembarkations tends to take longer in adverse weather conditions and therefore vessels have encountered situations which they have not been able to manage. Boarding or disembarking the pilot has been commenced in a place where there has not been enough space or the pilot has not had real time information about the circumstances at the pilot boarding area at his/her disposal. Real time information on the circumstances would have a safety enhancing effect on the planning of the disembarkation or boarding of pilot.

The Safety Investigation Authority recommends that:

1. *the Finnish Transport Agency together with the Finnish Meteorological Institute let install such appliances to the safety equipment that it is possible for seafarers to access real time information on the state of sea on the pilot boarding area and in it's immediate vicinity.*

If the pilot agreed with the master prior to the voyage or in good time during the voyage on the change in the voyage plan and the vessel's approximate position and course when the pilot disembarks, the master could anticipate coming navigational measures.

The Safety Investigation Authority repeats the recommendation issued in the Phoenix J investigation report M2012-02 that:

2. *FINNPILOT specify it's pilotage instruction in such a way that the pilot, if the pilotage ends before the pilot boarding area, understands to indicate clearly to the master the position of the vessel and the route out past the pilot boarding area and makes sure that the master has understood the aforementioned. The pilot has to notify the VTS about disembarking the vessel.*

In the course of the pilotage the master of the vessel may leave the control of the vessel entirely to the pilot and does not adequately monitor the passage of the vessel. Thus the exact position of the vessel may not be clear to him/her when the pilot disembarks the vessel. In addition, he/she has to monitor the transfer of the pilot to the pilot boat.

Netherlands Shipping Inspectorate could in it's role as a safety authority ensure with it's instructions that the master and the officer of the watch check with the pilot the vessel's position and her continued route before the pilot leaves the bridge. The voyage plan must also be entered into the electronic chart before the voyage begins.



M2012-01

M/S BARENTSZDIEP (NLD), collision with the edge mark off Oulu on 10.1.2012

Helsinki, xx October 2013

Juha Sjölund

Rainer Dahlblom

SUMMARY OF THE RECEIVED STATEMENTS:

The Transportation Safety Agency had nothing to state from the case.

The Finnpiilot Pilotage Ltd has, in its statement, brought out executed measures which have been described in chapter 4. Furthermore, Finnpiilot Ltd brought out it's concern about the meaning of the terminology related to the piloting. Finnpiilot considered recommendation one worth supporting and already has taken in connection with recommendation two the action. According to the view of Finnpiilot Ltd the accident happened because the master was not able alone to manoeuver the ship and at the same time safely disembark the pilot.

According to **The Finnish Meteorological Institute (FMI)** it is worth for investing in the prognosis models and in the local forecasts. However, the conditions of our sea area make it very challenging. The projects going on have been described in chapter 4.

Excerpts from S-VDR recordings

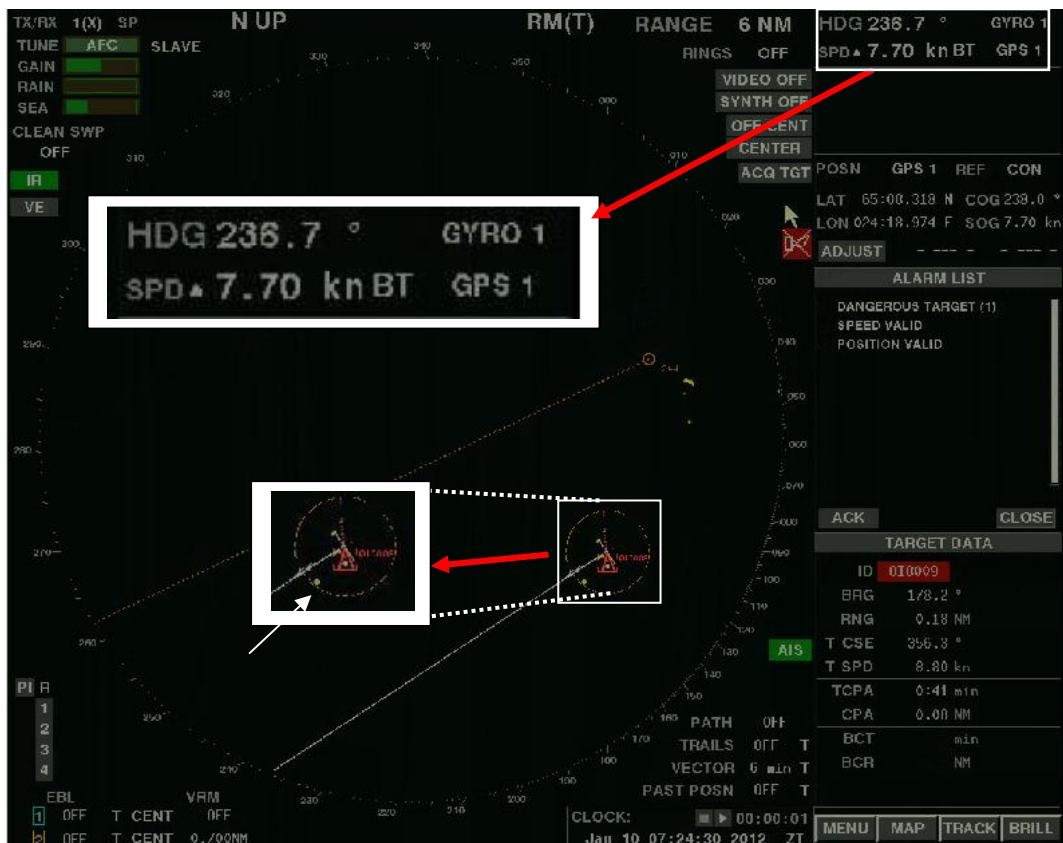


Figure 1. The Pilot leaves the bridge at 7:24:30.

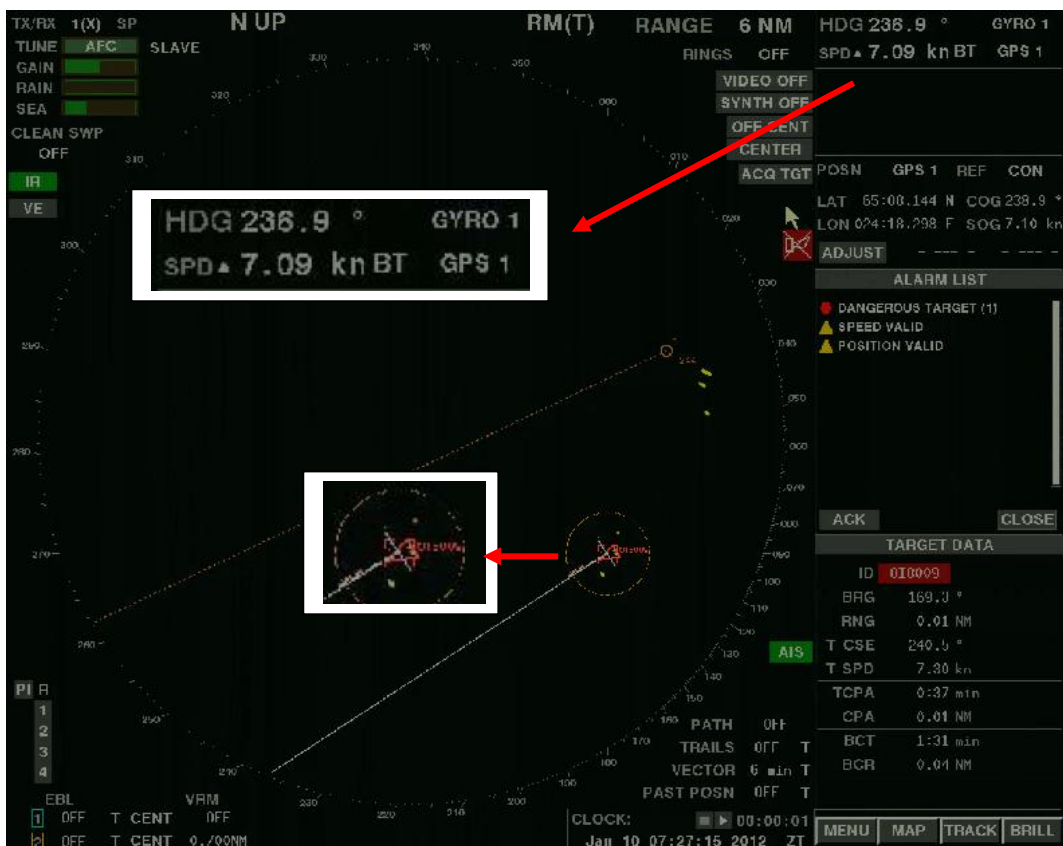


Figure 2. At 7:27:15 the Pilot makes the request "more to port" from the deck.

Appendix 2/2 (5)



Figure 3. At 7:28:00 the Master changes the course to heading 180° upon the Pilot's request.



Figure 4. At 7:28:45 the Master changes the course to heading 160° upon the Pilot's request.



Figure 5. At 7:30:04 a comment on the buoy can be heard on the radio.



Figure 6. At 7:30:30 the Master answers that he will try to avoid hitting the buoy.

Appendix 2/4 (5)



Figure 7. At 7:31:15 an outburst by the Master and a slamming noise.



Figure 8. At 7:31:45 it is told from the deck that the vessel hit the buoy.

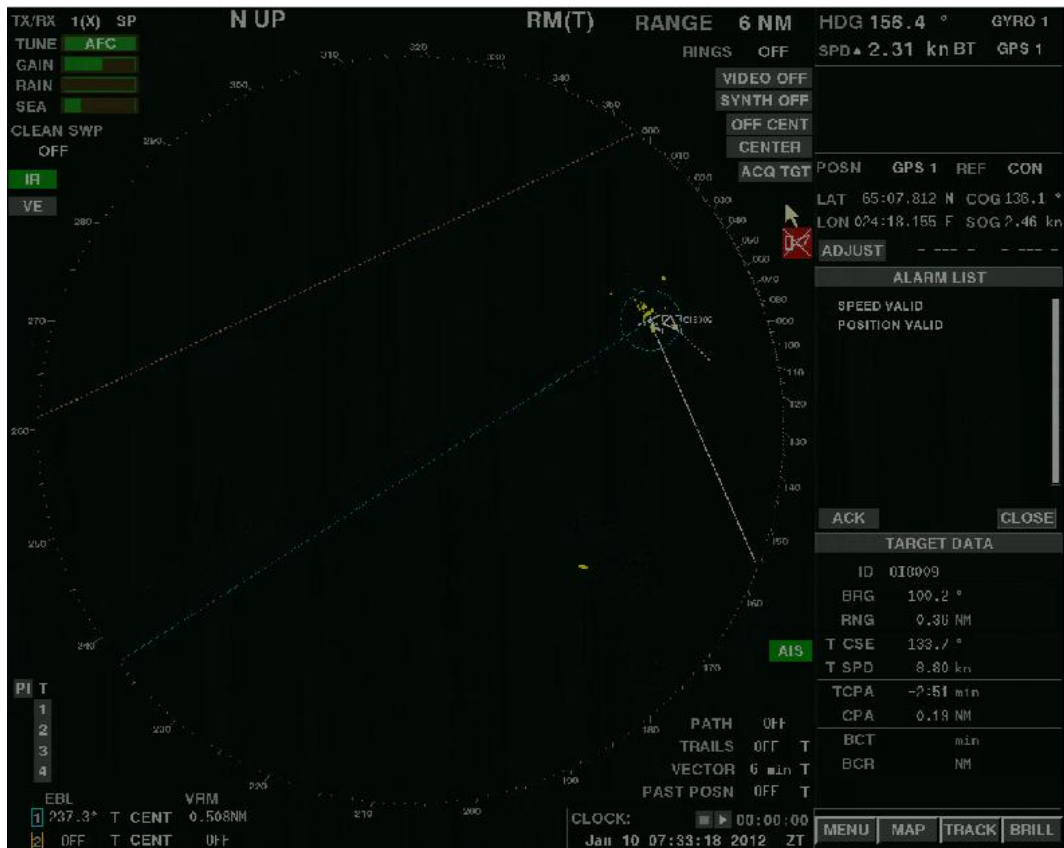
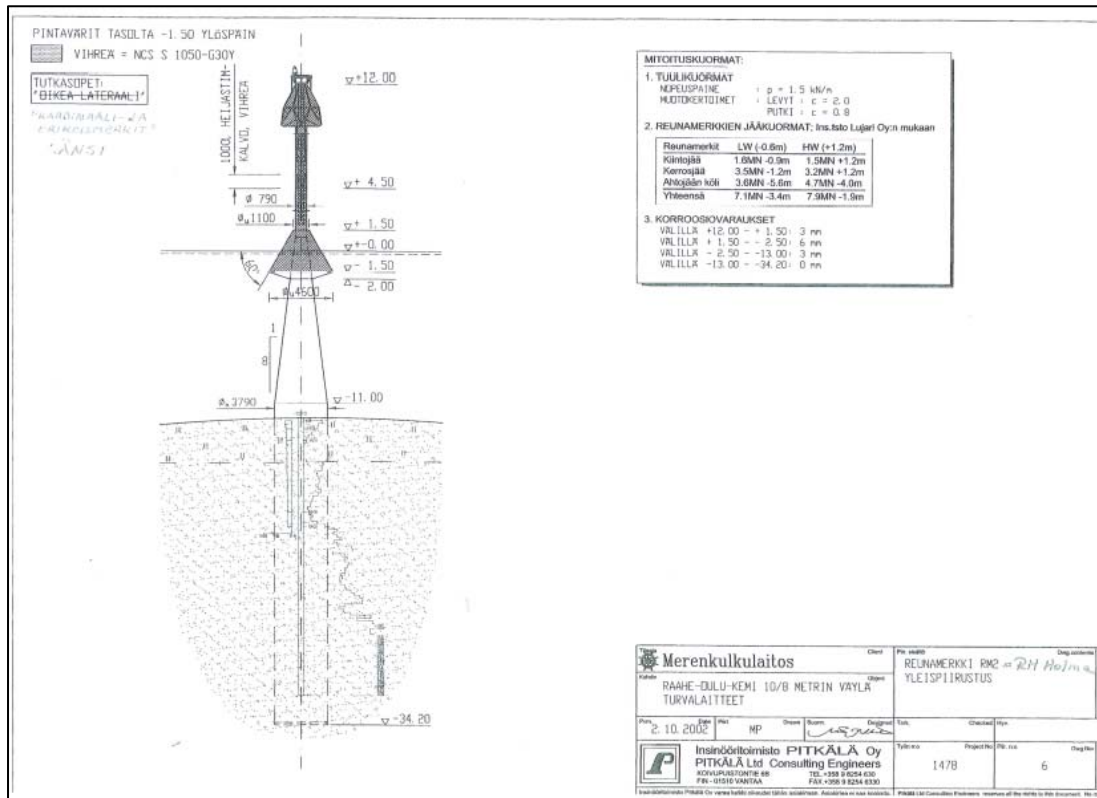


Figure 9. At 7:33:18 the Master uses the radio and asks that damages be checked.

The structure of the Holma edge mark



The light character of the Holma edge mark is VQ(9)10s12m4M, which means 9 ultra-quick flashes in the sequence of 10 seconds and that the light is in the height of 12 metres and it can be seen from the distance of 4 NM. There is no facade light on the Holma edge mark.

Statutes and regulations on pilotage, vessel traffic service and watchkeeping

1. National legislation

In Finland the authority responsible for pilotage is the Pilotage Authority at the Finnish Transport Safety Agency. Pilotage and the operation of Finnpilot are regulated in *the Pilotage Act (938/2003) and its amendments and in the Pilotage Decree (10.3.2011/256)*. Compulsory pilotage is maintained in channels for which the Finnish Transport Safety Agency has imposed compulsory pilotage. The pilot acts as an advisor to the vessel's officers, and this does not free the vessel's master/officers from the responsibility to see to the safe navigation of the vessel.

A comprehensive description on pilotage is available in a study called Effectiveness of Pilotages⁸ and in safety study S1/2004b, Safety Investigation Authority, 18.5.2010. Below the topic is discussed in the scale required by this investigation.

A new Pilotage Act came into force on 2.8.2010/1050. This section deals with the pilot's responsibilities and duties. Section 8 (1):

The pilot is responsible for the pilotage operation. The pilot shall present the master of the piloted vessel with a passage plan based on up-to-date charts and any other information and instruction necessary for the safe passage of the vessel, and the pilot shall supervise any measures related to the steering and handling of the vessel that are of significance for the safety of vessel traffic and environmental protection.

Section 9. Start and end of pilotage

Pilotage commences when the vessel leaves a berth or anchorage and ends at the vessel's arrival in port when the vessel has been anchored or moored.

Otherwise, pilotage commences when the pilot has boarded the vessel and started the pilotage and ends when the pilot hands pilotage over to another pilot or has completed the pilotage.

The pilot can, by agreement with the master, board the ship or disembark outside the pilot boarding area if necessitated by weather or ice conditions. The Vessel Traffic Service must be notified of this.

Government Decree 10.3.2011/246. Section 2, Definitions: In this Decree stipulates that:

10) Pilot boarding area stands for a place marked on the chart, in the proximity of which pilot shall board/disembark vessel, if allowed by weather or ice conditions.

⁸ University of Turku, Centre for Maritime Studies, 2nd edition. Foreword Finnpilot Pilotage Ltd., 19.6.2012. The objective of the Effectiveness of Pilotage is to give a process description to pilotage, to plan a measurement on the follow-up of the effectiveness of pilotage for the use of Finnpilot as well as to draw a preliminary plan for the implementation of the measurements in the Finnpilot organization.

Appendix 4/2 (6)

2. Regulatory decisions and instructions

Pilotage

The Finnish Transport Safety Agency supervises that the Pilotage Act and rules and regulations issued under it are followed. It has also published regulations on piloted channels and pilot boarding areas.

The Finnish Transport Safety Agency regulation 15.6.2011 6703/03.04.01.00 / 2011, Piloted channels and pilot boarding areas, section 2, Pilot boarding areas⁹: In these regulations a pilot boarding area stands for a place marked on the chart, in the proximity of which pilot shall board/disembark vessel, if allowed by weather or ice conditions.

Traffic management (VTS)

The Traffic Management Department at the Finnish Transport Agency issues rules and regulations concerning vessel traffic services and supervises the compliance with the Vessel Traffic Service Act and the orders and regulations issued under it.

The sea areas along the coast of Finland have been divided into six VTS areas, of which Bothnia VTS controls Oulu area.

The party responsible for pilotage operations in Finland, Finnpiilot, has compiled pilotage instructions (Helsinki 4.10.2011) which were in force when the accident occurred. These instructions have sections which correspond with the Pilotage Act and Pilotage Decree:

Finnpiilot Pilotage Ltd is a dedicated company having special duties operational in the administrative sector of the Ministry of Transport and Communications. The state of Finland holds the entire share capital of the company¹⁰. The operations are governed in accordance with the Limited Liability Companies Act and controlled with the Pilotage Act. Finnpiilot has exclusive right to perform pilotage. The duty of Finnpiilot Pilotage is to support and develop the safety and operational conditions of waterborne traffic primarily through pilotage services and through other services and products related to these services.

The operational duty of Finnpiilot is to provide pilotage service, which is realised by the pilots and pilot boat skippers. The pilots provide pilotage and pilot boat skippers take care of transportation by boat and by car as well as of the maintenance of the equipment and properties.

Pilotage Instructions of the Finnpiilot Pilotage Ltd. 4.10.2011

Ending of pilotage

Pilotage ends when the vessel is anchored or moored or when she is at the pilot boarding area. The pilot is not allowed to leave the bridge before the pilotage has ended or another pilot has replaced him/her.

⁹ Pilot boarding position number 15, position 61 07.60' N/21 10.06' E, Rihtniemi, Sea of Bothnia.

¹⁰ Founded by act on the changing of the Public Pilotage Enterprise into a limited company, 26.11.2010/1008

Agreeing upon the pilot boarding area

It the pilot, due to special circumstances (weather or ice conditions), boards or disembarks the vessel at another point of the fairway than at the pilot boarding area, he/she must agree upon this with the master of the vessel and notify the VTS on VHF.

Cooperation between the pilot and the vessels' officers during pilotage

In the course of pilotage, the pilot must together with vessel's master and/or OOW carefully monitor the vessel's passage and position.

The pilot must tell the master or the OOW about the contents of the discussions which he/she has had with third parties and which have substantial effect on the passage of the vessel.

The pilot must agree on the use and adjustments of manoeuvring and navigation appliances with the master or the OOW.

When giving manoeuvring or engine orders, the pilot must make sure that the given order has been understood correctly and that it is executed in the manner it was supposed to be executed.

International agreements and recommendations

The ISM Code¹¹ requires that the shipping company compiles safe procedures for the operating of a vessel.

Shipping company regulations

The procedural instructions (SMS) of the shipping company (Feederlines) require that the bridge is manned in such a way when boarding/disembarking a pilot that the measure can be carried out in a safe manner. The shipping company recommends in its Safety Management System (SMS) that an officer is present on the deck, next to the pilot ladder, and he/she supervises the boarding/disembarkation of the pilot. The master is responsible for the implementation of the vessel's Safety Management System.

Regulation on the use of automatic steering

Solas Chapter V Regulation 24

1. In areas of high traffic density, in conditions of restricted visibility and in all other hazardous navigational situations where heading and/or track control systems are in use, it shall be possible to establish manual control of the ship's steering immediately.

2. In circumstances as above, the officer in charge of the navigational watch shall have available without delay the services of a qualified helmsperson who shall be ready at all times to take over steering control.

¹¹ The International Safety Management Code (ISM) equals with international safety management regulations the purpose of which is to enhance the safe operations of vessels and prevent environmental damage.

Appendix 4/4 (6)

The international Rules of the Road at Sea 1972 (Collision Regulations)

Part B - Steering and sailing rules

Rule 5 Lookout

Every vessel shall at all times maintain a proper look-out by sight and hearing as well as by all available means appropriate in the prevailing circumstances and conditions so as to make a full appraisal of the situation and of the risk of collision.

Standards of Training, Certification and Watchkeeping

Section B-VIII/2

No member of the navigational watch should be assigned more duties or more difficult tasks than can be performed effectively.

3. Previous national pilotage legislation and comments on it

Pilotage Decree number 393 from 1957, section 37 (2)

Pilotage is considered to have ended when piloting a vessel to sea when the outermost shoals have been passed, and else at the nearest pilot station or post, subject to other instructions by the Maritime Authority.

The maker of the Decree has wanted to bring clearly forth the fact that pilotage must be completed to its end in such a way that the vessel has passed the outermost shoals and reached safe waters.

In 1972 the National Board of Navigation gave instructions on the pilot boarding positions in a circular. The instruction was published in the National Board of Navigation bulletin¹²:

“The pilot boarding the vessel and disembarking it.

On the basis of what has become known, the ~~National Board of Navigation~~ Maritime Administration reminds pilots on the fact the position marked as "Pilot" off the blue water pilot stations indicates the position in which the pilot presumes responsibility for the duty of pilotage when the vessel is arriving from the sea. The pilot disembarks an outbound vessel at the same position.”

The wording of the circular is strict and clear.

The tanker ANTONIO GRAMSCI ran aground at the opening of the Emäsalo channel on 6 February 1987. The instruction on the pilot boarding area could not be observed as the ice situation made the navigating of the pilot boat difficult. This led to a misunderstanding as to the position of the pilot boarding area which then resulted in the grounding. The matter caused an extensive public debate. The director general of the National Board of Navigation demanded that the pilot boarding and disembarkation positions be checked. The National Board of Navigation issued new orders on moving the pilot

¹² Maritime Administration Bulletin number 9/72, 2.4.1972.

boarding areas outside shallows to where channels begin¹³. When compared with the previous instruction, an exception was made on complying with the pilot boarding area:

“For weather, ice or other reasons pilots can board or disembark the vessel also in other positions than in the channel.”

The new instruction revoked the principle of the previous instruction, and changed the factual content in such a way that it corresponded with the prevailing practice. What was new in the instruction was the fact that the pilot had to agree with the master if the position marked on the chart was to be deviated from.

The Chancellor of Justice criticized the new instruction by stating that a vessel carrying dangerous cargo might proceed far into the archipelago without pilot assistance. He also criticized the new instructions because these “*special circumstances*” were not specifically defined¹⁴. The Chancellor of Justice’s message was clear. Such situation could not arise in which a foreign vessel would not get pilot assistance in time.

On the basis of the comment made by the Chancellor of Justice, the pilotage instructions were revised and the *first Finnish pilotage instruction*¹⁵ was issued on 8 February 1988, but the principle criticized by the Chancellor of Justice was still effective. The section in the instructions dealing with the disembarkation of the pilot stated as follows:

“Pilot boarding and disembarkation areas have been marked on charts, and piloted tracks are presented in lists confirmed by the National Board of Navigation. Due to special circumstances the pilot can on the discretion of the pilot station duty officer or on his/her own discretion and in understanding with the master of the vessel board or disembark the vessel in other points of the channel and also at open sea, if there is a justified and acceptable reason for this.”

Twelve years later, in 2000, the Maritime Administration issued a new pilotage instruction: Sections 5 and 6 in this instruction state the following:

5. Ending of pilotage

“Pilotage ends when the vessel is anchored or moored or when she is at the pilot boarding area. The pilot is not allowed to leave the bridge before the pilotage has ended or another pilot has replaced him/her.”

6. Agreeing upon the pilot boarding area

“If the pilot, due to special circumstances, boards or disembarks the vessel elsewhere in the channel than at the pilot boarding area, he/she has to agree on this with the master of the vessel and the pilot duty officer or the VTS centre.”¹⁶

The Finnish Maritime Administration withdrew the pilotage instruction from the list on effective instructions between December 2003 and February 2004. The situation with reference to pilot boarding areas had thus gone back what it was prior to 1972. The situation has further deteriorated because pilotage duty was transferred from VTS centres to the Public Pilotage Enterprise in connection with an organizational change. VTS operators criticized the fact that they do not any more know in all situations in what position in the channel the pilot boards the vessel.

¹³ Maritime Administration Bulletin number 7/87, 10.4.1987.

¹⁴ Helsingin Sanomat 10.12.1987.

¹⁵ Maritime Administration Bulletin number 6/88, 8.2.1988.

¹⁶ Maritime Administration Bulletin number 10/20.6.2000.

Appendix 4/6 (6)

The 1988 pilotage instruction had listed the following requirements on performing pilotage:

- When pilotage commences, the pilot must present to the master the rules pertaining to the pilotage and he/she must find out the information affecting the passage and manoeuvring of the vessel and especially the condition of navigational equipment.
- The pilot must have *“in chart excerpts required markings for radar navigation, e.g. required headings, tracks and distances.”*
- The instruction concludes that a major part of accidents occurs when the vessel is turning. An entire paragraph deals with the control of speed, determining the turning point and assessing the proceeding of the turn by using manoeuvring signals.
- The instruction emphasized practising radar navigation in clear weather.
- The instruction granted the pilot permission to interrupt pilotage if he/she deems that the safety of the vessel requires such measure to be taken.

Ten years later the obligations placed in this instruction on the pilot were removed from the new Decree¹⁷. They were issued in a separate pilotage instruction in 2000. The instruction was effective only for a couple of years.

Section 6. Agreeing upon the pilot boarding area: *“If the pilot, due to special circumstances (weather or ice conditions), boards or disembarks the vessel elsewhere in the channel than at the pilot boarding area, he/she has to agree on this with the master of the vessel and the pilot duty officer or the VTS centre with VHF.”*

¹⁷ A.92/1998.

Accidents related to the boarding or disembarkation of the pilot

C2/2000M Ms AURORA (NOR), Dangerous Incident and Grounding South of Helsinki Pilot Station Harmaja on 6.3.2000

The disembarkation of the pilot took place before the official pilot boarding area south of Harmaja. The motivation for the disembarkation position was a southerly storm 18–23 m/s and sleet falling down. After the Pilot had transferred to the pilot boat, the pilot boat got stuck on the side of the vessel because the vessel had started a turn before the pilot boat had departed from the side of the vessel. The vessel had to make a new turn to port in order to get the pilot boat loose. Due to this manoeuvre the vessel drifted too much to east and got a ground touching at Uusimatala.

B1/2008M M/S TALI (FIN), grounding in Jössingfjord, Norway, on 29.1.2008

After the vessel had left the fiord, the Pilot asked to disembark the vessel and embark the pilot boat before the usual pilot boarding area. The Master of M/S TALI agreed to this. Due to heavy seas, the Pilot was not able to disembark in spite of several attempts. The Master had manoeuvred the vessel to starboard towards the shore in order to provide better lee for the pilot boat. During the manoeuvre, the vessel had proceeded so close to the shore that the Pilot had told the Master to turn the vessel to port and returned to the bridge. Before this the Master had already ordered the vessel to turn to port and started the bow thruster to assist in the turn. Due to the inertia of the vessel and the wind and the waves, M/S TALI drifted during the turn so close to the shore that the stern of the vessel hit a rock.

C1/2008M M/S OOCL NEVSKIY, grounding south of Helsinki Pilot Station Harmaja on 27.2.2008

The Pilot explained the disembarkation and consequent procedures to the Master as accurately as possible. At Harmaja the pilot informed the VTS about his disembarkation plan. The disembarkation had been planned to happen before the official pilot boarding area. The vessel was turned towards west after Harmaja, outside the dragged fairway area, so that there would be as much distance as possible for the pilot to depart when the vessel was proceeding on course 090°. The Pilot set the vessel to turn to course 090° on automatic steering before he left the bridge. The Master however wanted to change into manual steering. Before departing, the Pilot checked again with the Master that everything was clear. The Master's answer was affirmative. After this the Pilot asked the Master to turn the vessel to course 090°.

When the Pilot left the bridge, the Master and the officer remained there. When the Pilot reached the pilot ladder, the vessel was already close to the eastern course, so up to this point all measures complied with the Pilot's instructions. According to the VTS recording the vessel still continued its turn and for a moment it was on course 075°. The Pilot noticed from the pilot boat's AIS display that the vessel continued to proceed eastwards. He reported this to the VTS Centre and asked them to inform the vessel that it had drifted out from the fairway. The VTS had also noticed this and asked the vessel to back and after that to put the engines "full astern", but these measures were taken too late on the vessel and it drifted to the Uusimatala shoal.

Appendix 5/2 (4)

C3/2008M M/S ANNE SIBUM (CYP), grounding near Tainio Lighthouse on 2 April 2008

The Pilot disembarked ANNE SIBUM south of Orregrund at 13.53 on 2 April 2008. After the disembarkation of the Pilot, the Master handed over the con of the ship to the Officer of the Watch. The vessel continued on the course 237.5°. However, after the next turn it passed over a shoal at 60°14.255'N, 026°24.160'E and, at 13:58, ran aground. The vessel reduced speed, turned back to the fairway and continued its voyage as the crew began to assess the damage. No leaks were detected and because, in spite of the damage, the manoeuvring equipment and the thrusters worked well enough, the Master decided to continue the voyage. He notified the shipping company of the event. However, he failed to inform the Finnish authorities. While the location of the grounding is within the area of Kotka VTS, they did not notice the fact that the vessel had been outside the fairway.

Other accidents which have occurred in connection with the boarding of the pilot or immediately after:

C1/2000M ms OCEAN PRIDE, grounding at Orregrund 6.3.2000

A southerly storm was prevailing in the Orregrund area with gusts up to 24 m/s. Visibility was poor. The Master got the advice to proceed to an unofficial pilot boarding area at the western tip of the Orregrund island. The Master regarded this as an order and followed it. When the officer left the bridge to pick up the Pilot, the Master was left alone on the bridge.

Slightly before the official pilot boarding area, the Master turned to port with the autopilot to heading 000 towards the western tip of the Orregrund Island. Next, he tried to turn with the autopilot further to port to heading 340 with the intention to round the west shore of the Orregrund island, but the steering gear did not react. He switched to manual but the steering gear did not obey his orders. He tried the autopilot again and manual steering the second time in vain. The steering gear did not respond. The Master's next move was to turn the emergency steering wheel to port. The steering gear responded but slowly. The vessel was already too close to the shore and stranding could not be avoided. The Master's last operational measures aimed to limit the consequences of the grounding. The imminent causes of the accident were the storm, bad visibility, steering gear failure and poor manual steering system.

The investigation found several hidden latent factors with regard to the vessel. The Master did not know the procedures related to the unofficial pilot boarding area nor did he know that the VTS centre does not issue manoeuvring orders.

C5/2009M M/V EMSRUNNER, grounding off Kalajoki on 11 December 2009

The ship was at her final waypoint at the pilot boarding place at the agreed time of 8.00 a.m. and continued with a course of 075 degrees at 7 knots speed. After ten minutes, the Pilot boarded the ship approximately 8 cable lengths east-northeast from the pilot boarding area on the map. As the Pilot arrived on the bridge, the ship's heading was 075 degrees and speed 5 knots. The Pilot confirmed the location of the ship in relation to the radar target on the left from the radar, and confirmed full speed to the Master as well as the heading along the fairway, 080 degrees.

During the following five minutes, the Pilot and the Master discussed issues related to the harbour, docking, and manoeuvring the ship.

At 8.17 a.m., the Pilot received a phone call. One of the Pilot's colleagues was following the ship's progress in the AIS service and had noted that the ship was not on the fairway and she was heading towards Vällimatala. The colleague announced his discovery to the ship in the call. The Pilot doubted this and began to inspect the location of the ship on the radar. After a couple of minutes he called the pilot boat skipper and requested confirmation of the ship's location on the pilot boat's radar.

Within approximately one minute, the Pilot received confirmation that the EMSRUNNER was in danger of steaming onto the Vällimatala shoal. The pilot boat skipper told the Pilot to turn the vessel directly to south. After the call, the Pilot requested the speed to be reduced to half for some time, and set the new heading on the autopilot to 120 degrees. The Master carried out the requested engine command. The ship's first ground touchings took place almost immediately after this, at 8.22.02

C1/2011M M/V STADIONGRACHT (NLD), Grounding off Rauma in the Gulf of Bothnia on 29 December 2010

The Dutch-flagged M/V STADIONGRACHT ran aground in the 10.0 metre-deep southern channel to Rauma at 0.15 on 29th December 2010. The grounding occurred in a position which is approximately 2.7 miles (5 kilometres) from the pilot boarding position in the direction to the port. A nine-metre shoal indicated by a lateral spar buoy is located in the area.

The STADIONGRACHT was just about to finish her voyage from Kotka to Rauma. She was carrying kaolin. After passing the pilot boarding position south of the Rauma lighthouse, the vessel proceeded towards the beginning of the 10.0 metre navigation line so that the Pilot could embark her. The Pilot was onboard VECHTDIEP and was coming to meet the STADIONGRACHT. A pilot cutter was waiting in the fairway in order to transfer the pilot from one vessel to the other.

The operator of the West Coast VTS had informed the STADIONGRACHT that the Pilot was coming to meet her and further that the pilot cutter was on her way. The STADIONGRACHT passed the pilot cutter and the outpiloted vessel and proceeded without stopping towards the tapering part of the channel. The Pilot saw the situation from the VECHTDIEP and contacted the VTS-operator by his mobile phone. The VTS-operator immediately called the STADIONGRACHT on a radio telephone and recommended that the vessel turn and wait for the pilot. The message was acknowledged by the STADIONGRACHT and she started a turn via port. During the turn the vessel ran aground and stopped.

The bottom of the STADIONGRACHT was seriously damaged, especially where the ballast tanks were located. There were no damages to persons or the environment.

It was found out in the investigation that the turn was made via port because the Master had various reasons to consider this direction better. The VTS-operator did not intervene with the turning of the vessel.

Appendix 5/4 (4)

The STADIONGRACHT was manoeuvred past the pilot boarding position because the communication and the observation of the pilot cutter had led to the misconception that the Pilot was waiting onboard the pilot cutter and was going to board the vessel later, after the pilot boarding position. It was found out in the investigation that the practice with reference to the pilot boarding positions is wide-ranging: passing the pilot boarding position and boarding the vessel later is not that unusual. The communication preceding the course of events between the VTS, the vessel and the Pilot was scarce and made misinterpretations possible.

The VTS has a high threshold to intervene with the navigating of vessels even in unusual circumstance

M2012-02 M/S PHOENIX J (ATG), grounding off Rauma on 18 April 2012

M/S PHOENIX J, sailing under the flag of Antigua and Barbuda, had arrived to Rauma on 17 April 2012. The vessel discharged and loaded containers and departed for Gävle, Sweden, at 12.06 on 18 April. The vessel was manoeuvred by a Pilot. The vessel ran aground at 12.58 and remained on a shoal.

On the accident voyage the Pilot disembarked the vessel before the actual pilot boarding area after agreeing on this with the Master. The disembarkation took place somewhat north of the channel area and in this way the Pilot could transfer to the pilot boat in the lee of the wind. An inbound vessel, M/S HARBOUR FOUNTAIN, which the Pilot was to board next, had proceeded past the pilot boarding area and the Pilot decided to bring forward the transfer more than usual. The Master of the PHOENIX J lost his perception of the vessel's exact position possibly because of the manoeuvring required by the Pilot's disembarkation, in connection of which the vessel provided lee for the pilot boat by performing a sharp turn to north. Immediately after this the Master changed the vessel's course to 257 degrees towards Gävle, but this was done too early. This heading led the vessel towards a shoal. The Chief Officer had recommended that a course of 270 degrees should be used.

At the same time the VTS operator monitored the Pilot boarding the inbound vessel, which had already proceeded far and close to the southern border of the channel, where the channel starts to narrow. Due to this monitoring and the temporary disturbance in his display unit, the VTS operator noticed that the PHOENIX J was proceeding towards a shoal so late that the grounding could not, in spite of a warning, be avoided.

After the accident the Finnish Transport Agency in its role as authority responsible for VTS operations and FINNPILOT agreed on 7 May 2012 on common practices in order to improve cooperation in the Sea of Bothnia pilot boarding area. These practices make the operations clearer and thus improve the safety of vessel traffic. The objective is to improve the mutual communication and reciprocal situational awareness between the VTS and pilots.