Investigation report

C2/2009M

M/T CRYSTAL PEARL, ramming of edge mark Lålättan on 26 January 2009

Translation of the original Finnish report

SUMMARY

Luxembourg flagged chemical tanker M/T CRYSTAL PEARL departed the port of Kotka for Rotterdam, Netherlands with a cargo of chemicals. She rammed of the edge mark Lålättan on the fairway of Orrengrund.

After departure the Master handed the steering to the Pilot who steered with the autopilot. He navigated with the help of visual observations and verified his remarks with the help of radar. The Pilot was well familiar with the vessel. The fairway layout included shortcuts, which were utilised by pilots on this fairway.

The vessel encountered one inbound vessel at the approximity of Kaunissaari. Besides that, there was no other traffic on the fairway. Shortly after passing Kaunissaari the Master left the bridge and the remaining bridge manning was the Watch Officer (OOW), the Watch Officer trainee and the Pilot. Finnish Chief Engineer stayed on the bridge since the departure. When the Master left the bridge, the Pilot continued chatting with the Chief Engineer.

CRYSTAL PEARL's all navigation equipments were operational. The Pilot used the 3 cm radar and it was set to six miles scale at the time of the accident. The Pilot steered the vessel during the whole accident trip with the autopilot.

The weather at the time of departure in Haapasaari was: wind from East 5 m/s, temperature around zero degrees centigrades and the visibility 7 km. During the accident trip the visibility was occasionally poor due to the snow showers, but the radar navigation was not impacted. According to the pilot the visibility varied after passing Bisagrund and it was about 0.5 miles as its worst.

CRYSTAL PEARL's route plan agreed with the official fairway lines. The route the Pilot used and his recollected piloting plan and its steering procedures were not known by the OOW and the plan was not negotiated before starting the piloting. The Pilot did not explain the progress of his planned piloting to the OOW and e.g. the shortcuts were not at all explained. Additionally the intensive conversation between the Pilot and Chief Engineer on other than piloting or steering matters prevented the communication between the OOW and the Pilot. Because the task sharing was not clearly defined it distracted the OOW's monitoring.

The ramming of the navigation mark caused a crack to the bow of vessel's port side between two alongside ballast tanks and the vessel got some damages on the gunnel plating above the waterline. The vessel returned to Kotka for damage checks and to unload the cargo. Later, the vessel got the permission to sail in ballast to Klaipeda for docking. The damages were repaired there.

The edge mark got damaged, but remained operational. The FMA estimated that the repairs would take place during the next open water season.

The investigation work included an analysis of both the VTS recording from FMA and the vessel's own VDR recording. This data helped to reconstruct the accident trip route including the steering events.

In general the utilised piloting method had a poor transparency of operation and thus weakened the common awareness of the situation especially when the communication between the Pilot and the OOW was weak.

The accident investigators have concluded that introducing the piloting route and the piloting method in advance and a comparison with the vessel's route plan improves the co-operation in bridge operations and improves the formation of the common piloting situation picture. The accident investigators recommend Finnpilot to compose a piloting plan for Kotka–Orrengrund fairway following the navigation chart's fairway.

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ABBREVIATIONS

AIB	Accident Investigation Board Finland
BRM	Bridge Resource Management
DSC	Digital Selective Call
DWT	Dead weight in metric tons
EBL	Electronic Bearing Line
EUREF	European co-ordinate system
FU	Follow-up
GMDSS	Global Maritime Distress and Safety System
GPS	Global Positioning System
DGPS	Differential GPS
IMO	International Maritime Organisation
ISM	International Safety Managament code
LOA	Length overall
LWL	Length waterline
FMA	Finnish Maritime Administration
MRSC	Maritime Rescue Sub-Center
NFU	Non Follow-up
nm	Nautical miles
OOW	Officer of the Watch
STCW	Standards of Training Certification and Watchkeeping
UTC	Universal Time Co-ordinated
VDR	Voyage Data Recorder
S-VDR	Simplified VDR
VRM	Variable Range Marker
VTS	Vessel Traffic Service

FOREWORD

Chemical tanker M/T CRYSTAL PEARL, flagged to Luxembourg, was on her way from the port of Kotka to Rotterdam when it rammed of (bumbed) the edge mark Lålättan mutka on 26 January 2009. On the Bridge there were the Pilot, the Watch Officer, the Cadet and the Finnish Chief Engineer.

The vessel got some cracks on her empty alongside ballast tank. The foundation of the edge mark was badly damaged.

The Accident Investigation Board of Finland made a preliminary site examination on the same day and later on 9th of June 2009 AIBF decided to start the investigations by naming the Investigation Commission (C2/2009M) to start thorough investigation on the ramming.

Marine Accident Investigator Risto **Repo** was appointed, after his own consent, as the Chairman of the Commission. The Investigators Kari **Larjo** and Hannu **Martikainen** were appointed as its member.

Statements and comments on the investigation report. The final draft of the Investigation Report was sent for a statement under section 24 § of the Decree on Accident Investigation to the Finnish Transport Safety Agency's Maritime Safety department and to the Finnish State Pilotage Enterprise. The addressees were requested to commit themselves on the safety recommendation made by the investigation Commission. The final draft was also sent for possible comments to the vessel company and Master, both to the pilot on the accident voyage and to his advocate and to the Administration of Technical Investigations, Luxembourg. The statements received are attached to the investigation report.

All times in this report are Finnish Standard Time (UTC+2).

The material used in the investigation is stored at the Accident Investigation Board's premises.

1 ACCIDENT AND INVESTIGATIONS

1.1 Vessel information

The accident vessel CRYSTAL PEARL was built in Belgium year 1994 as an oil / chemical tanker. It is owned by the Crystal Pool UK Ltd and managed by Crystal Pool Oy.

Picture 1. Picture taken in the port of Mussalo after the accident.

1.1.1 General information

General information is based on the Master's maritime declaration, certificate of registration, Pilot card and marine casualty report.

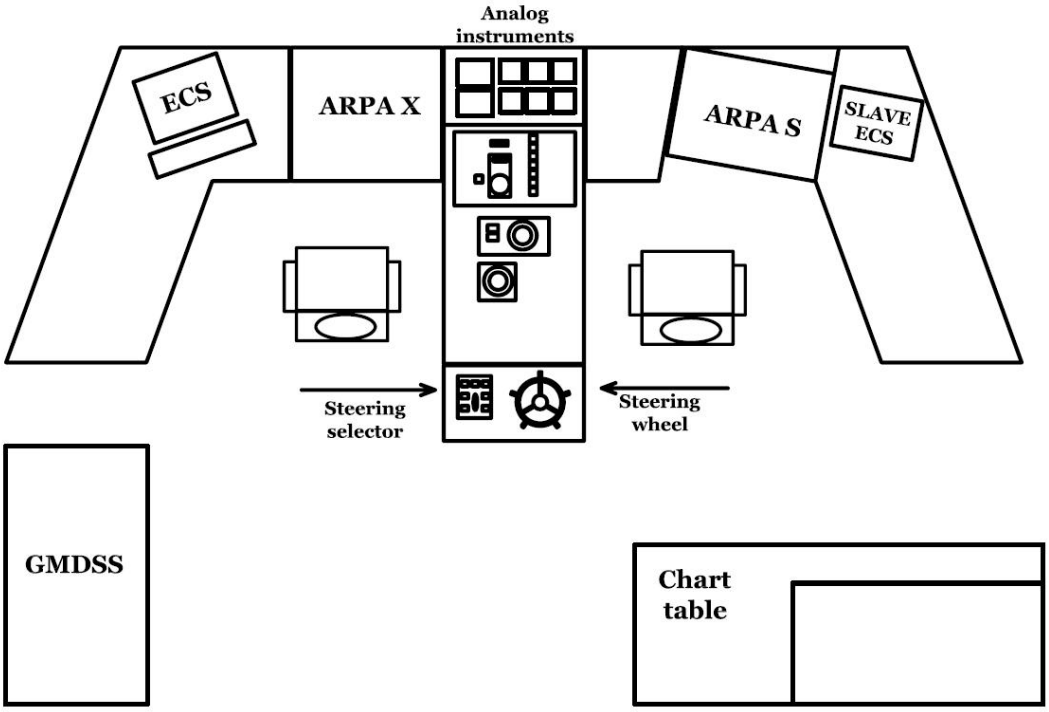
Name	M/T CRYSTAL PEARL
Home port & the place of registration	Luxembourg
Register number	4 279
IMO number	9016935
Call sign	LXCY
Company	Crystal Pool UK Ltd
Type of ship	Oil / Chemical tanker Multipurpose
LOA/ LPP	112.0 m/ 105.0 m
Breadth	18.2 m
Draugth	7.5 m
Gross tonnage/Net tonnage	5677/ 2678
DWT	8143
Engine power	4320 kW
Speed	10.5 knots
Propulsion	one variable pitch propeller, bow thruster 450 kW
Rudder	one + 35°/ - 35° ("Hard-Over" time 10 s)
Place and year of construction	Boelwerf N.V. Belgium, 1994
Classification society	Lloyds Register of shipping
Class/ ice class	LR +100 A1/ 1A (Swedish-Finnish)

1.1.2 Manning

At the time of departing port of Kotka the vessel had a multinational crew of 15 persons. The Master was Belgian, the Chief Engineer Finnish, the Chief Officer and the 2nd Mate were Latvians. The 3rd Mate was from Ukraine and the Cadet from U.K. Rest of the crew were Ukrainian, Polish and Filipino. The vessel's language was English.

1.1.3 The bridge and its equipment

The Wheelhouse's forefront consoles have two working positions (BB, SB). One position is for the steering and the other for monitoring purposes. Both positions have independent workstations for the radar and the electronic chart. Both positions share the middle part of the console equipped with the propulsion and steering controls.



Picture 2. Wheelhouse general arrangement.

The pilot sat at the port side working position from where he controlled and changed the course to steer using the autopilot control panel.

Picture 3. Working positions in the forward part of the wheelhouse.

The most important navigation instruments, gyro and magnetic compass repeaters, speed log, echo sounder, rudder angle indicator and RPM meters are installed in the instrument panel of the forefront consoles.

Picture 4. Displays and repeaters in the forefront console for navigation sensors, rudder angle and RPM's. On the top row from left are echo sounder, rudder angle, main engine RPM, shaft RPM. On the lower row from left; magnetic compass, gyro compass and speed log

1.1.4 Navigation and Communication equipment

The vessel has the following list of navigation and communication equipment. All equipment were operational.

• Radar S-band (10 cm)	Litton - Sperry	
• ARPA workstation	Bridgemaster E	
• Radar X-band (3 cm)	Litton - Sperry	
• ARPA workstation	Bridgemaster VT	(*
• Echo sounder	Skipper GDS 101	(*
• Gyro compass	Anschütz Standard 14	(*
• Autopilot	Anschütz Nautopilot D	
• GPS receiver (3 pcs)	Raytheon NAV 338	
	Leica AP Navigator Mk 10	
	SAAB R4	(*
• Speed log	Consilium	(*
• Electroric chart	Transas – Navisailor 3000	
• VHF+DSC	Skanti	(*
• AIS-transponder	FURUNO FA -100	(*
• other GMDSS		
• Portable VHF		

(* = connected to VDR

1.1.5 Steering system

The steering system of the vessel consists of the steering gear and one rudder, hydraulic system with two pumps, servo control system with amplifiers and the cabling.

The steering has a manual and an automatic operating modes. The selection of the steering mode and control position is performed by the steering selector[1] switch installed in the steering stand.

[1] Steering selector enlarged in the picture 5.

Picture 5. Steering stand for Follow-up mode in hand steering. Selector for steering post and mode enlarged on right; switch in FU hand steering position. Right top position = Autopilot selected, Left top = Desk panel NFU selected. Two lower positions on left = selections for NFU steering at the Bridge Wings.

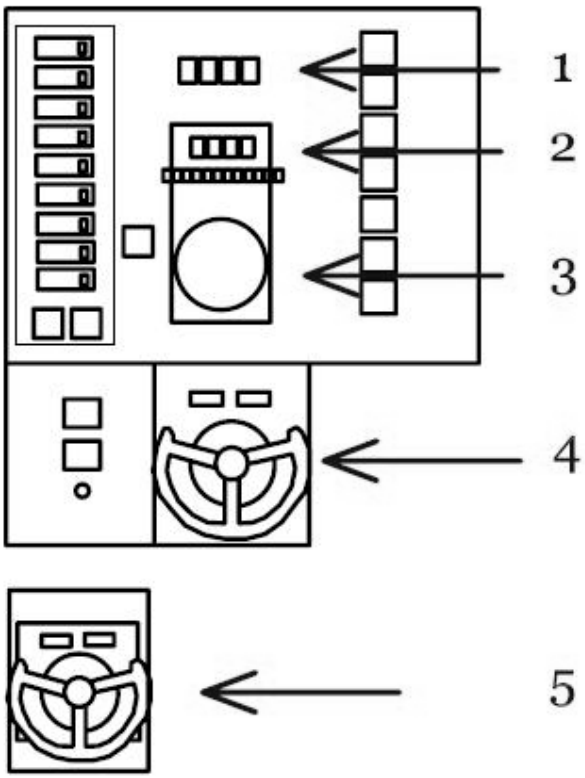
Automatic steering

The autopilot has a Course control mode. All steering orders and pre-settings are set by the Desk panel which is installed in the middle of the forefront consoles. When switching from hand steering to automatic steering the compass course remains as SET COURSE (**2**) and the autopilot tries to maintain the selected HEADING (**1**). The new course setting and other corrections can be done either by the keyboard or by the hand wheel (**3**) on the control panel. The latter method, used by the pilots, is done by pushing and rotating the wheel. The maximum rudder angle is preset by Rudder Limit selection. Rudder Limit value used on accident voyage is unknown for the investigators.

The heading and velocity references are connected to the autopilot from gyro compass[2] and speed log.

Next to the desk panel there are two NFU tillers. The one above (**4**) is activated when the selector is switched to ”DESK” position and the one below (**5**) is used for emergency[3] steering.

[2] In the case of a gyro failure the signal is received from the magnetic compass
[3] Override



Picture 6. AutoPilot control panel, NFU tiller and Override tiller installed in the middle of the forefront console.

Hand steering

The Follow-up steering mode control is placed in the steering stand at the aft end of the middle console. This wheel control governs the magnetic valve of the hydraulic steering gear. The valve adjusts the rudder via the servo unit for desired direction and angle. The rudder position is continuously compared with hand wheel position as closed-loop servo signal. When the error signal between the angle demand and the actual angle[4] becomes zero the rudder gear halts and the desired rudder angle remains. When the wheel is returned to midships the rudder returns to zero angle.

The three other hand steering posts are by the desk panel on the middle console as well as on both BB and SB bridge wings. The selection is made with the selector switch in the steering stand. All posts allow the Non-Follow-Up steering mode, which directly controls the magnetic valve of the steering gear. The hydraulic moves the rudder to the requested direction without feedback.

[4] Order angle vs. Feedback angle

NFU tiller turns the rudder either to port or to starboard. When releasing the tiller into its middle position the rudder gear stops and remains in the angle where it was by the time of release, unless it already was in its outmost position. When using this steering mode it is very important to continuously monitor the rudder angle and follow the vessel's turning on gyro repeater.

The emergency steering with override tiller[5] overrides the activated autopilot. When the override tiller is released the steering control returns back to the autopilot if it was activated.

1.1.6 Propulsion controls

The control panels for the machinery, propulsion and the bow thruster are installed in the middle of the forefront consoles so that they are within the reach from both working positions.

Picture 7. The control panel for the bow thruster on the left, the controls for the propeller pitch and RPM on the right.

1.1.7 Other systems

Parts introducing navigation and bridge routines in *Ship specific manual*, among the vessel's ISM documentation, were thoroughly studied during the investigation.

[5] Uses NFU principle

1.1.8 Passengers and cargo

There were no passengers on-board.

The cargo consisted of :

- ~ 600 metric tons Nonylphenol Ethoxylate (NPE 9),
- 1000 metric tons N paraffin and
- 4750 metric tons Paraxylene.

Possible cargo leakage to the sea and the consequences are handled in the ANALYSIS chapter.

1.2 The Accident

The investigation work is based on the Master's maritime declaration, the Pilot's declaration, the vessel's VDR recording, the VTS recording and additionally requested information like MRSC action report, the weather report and forecast. The investigators have later visited the vessel in order to familiarise themselves and to document the general arrangements and equipment on the Navigation Bridge (Wheelhouse).

The company has supplied the documents concerning the vessel as well as other requested information. The Pilot has been heard by the investigators.

1.2.1 The Weather

The weather forecast given for Eastern Gulf of Finland[6] for the accident day was predicting moderate winds between 3 and 8 m/s from East. The report also forecasted some mist or fog and temporarily snow fall. From the evening of 26th onwards winds between East and South East 1 to 6 m/s was expected.

Weather report from Haapasaari[7]: *Wind direction 082°, force 5,1 m/s. No rain, visibility 7410 meters.*

In his interview the Pilot told that the visibility varied after passing the Bisagrund. In his opinion it was, as its worst, only about 0,5 nautical miles.

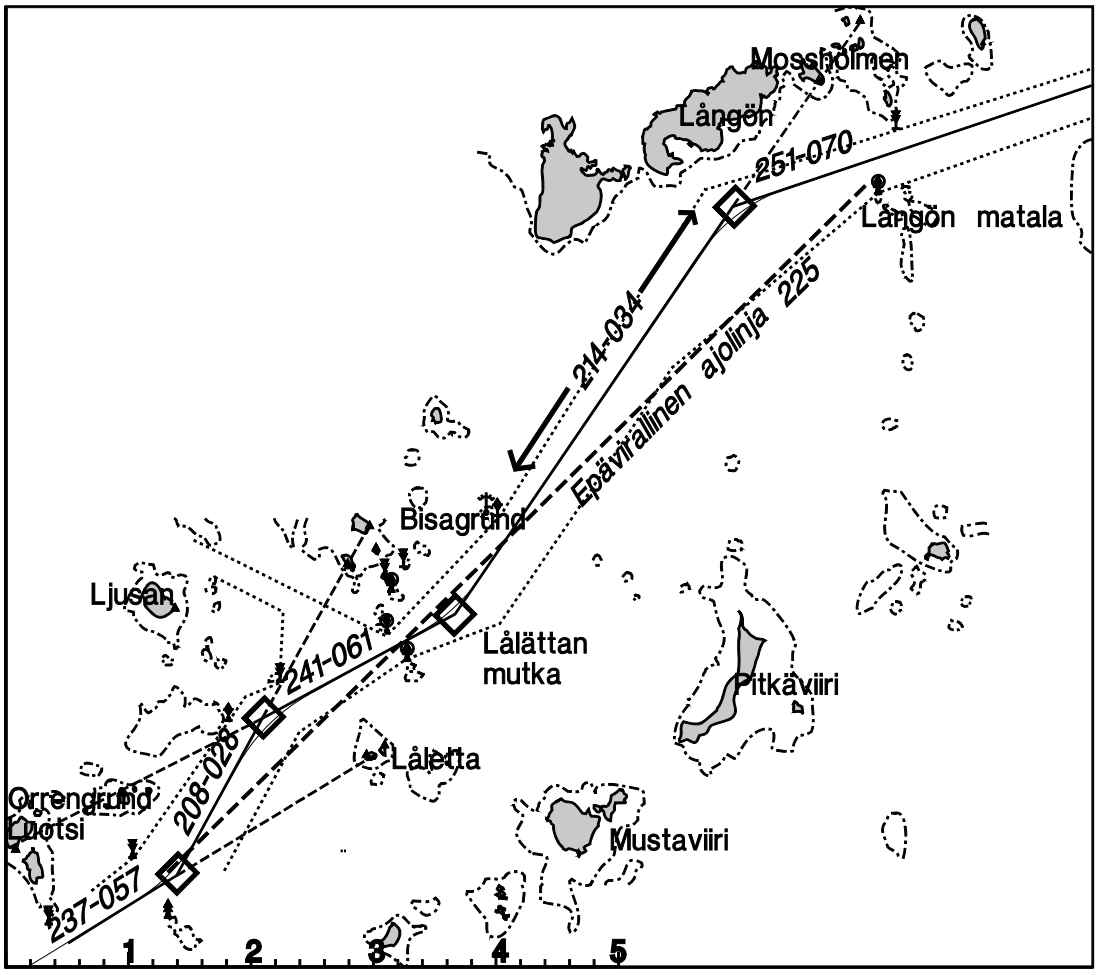
6 Weather for seafarers on 26th of January 2009 at 05.50 UTC.
7 Location 19 nm East from Bisagrund; same day at 06.00 UTC.

1.2.2 Preparing the Accident Voyage

The vessel's route plan was drawn on the chart and it agreed with the fairway lines. IMO has required the route plan based on STCW conventions in years 1978 and 1995. IMO has not specified the detailed format of the route plan. On CRYSTAL PEARL the plan was drawn on the nautical chart.

The Master said in his maritime declaration, that he also knew the fairway and area well. In his opinion there was no need to go through the plan with the pilot.

The piloting plan was based on the pilot's experience and memory. The plan was not gone through with the deck officers and the pilot did not introduce his plan to them. The pilot said he believed that the Master knew the prevailing way of (piloting) steering.



Picture 8. Vessel's route plan, which followed the fairway lines. Courses to steer were marked on top of the lines. Pilot used his recollection of the plan to steer; marked as unofficial dotted line with course 225 degrees.

1.2.3 The Accident site

The edge mark Lålättan mutka is yellow-black in colour, equipped with a light and a radar reflector. Position Lat 60°18.1537' N Lon 26° 33,1205' E[8]. Located 50 meters from the fairway edge of Southern Finland's winter fairway.

Picture 9. Damaged edge mark Lålättan.

The same edge mark was damaged previously on 2 September, 1999, when M/S AMSTELDIEP rammed (dumped) it.

1.2.4 The Accident

The vessel left the port of Mussalo, steered by the Master, at 06.20 hours local time. He handed out the steering to the pilot after the departure. The piloting to Orrengrund began. On the way one vessel inbound Kotka was encountered.

The Master left the bridge at about 06.50 hours[9]. The Pilot, Chief Engineer, Watch officer and Cadet stayed on the bridge. At 07.03 hours *Långön matala* was passed. In

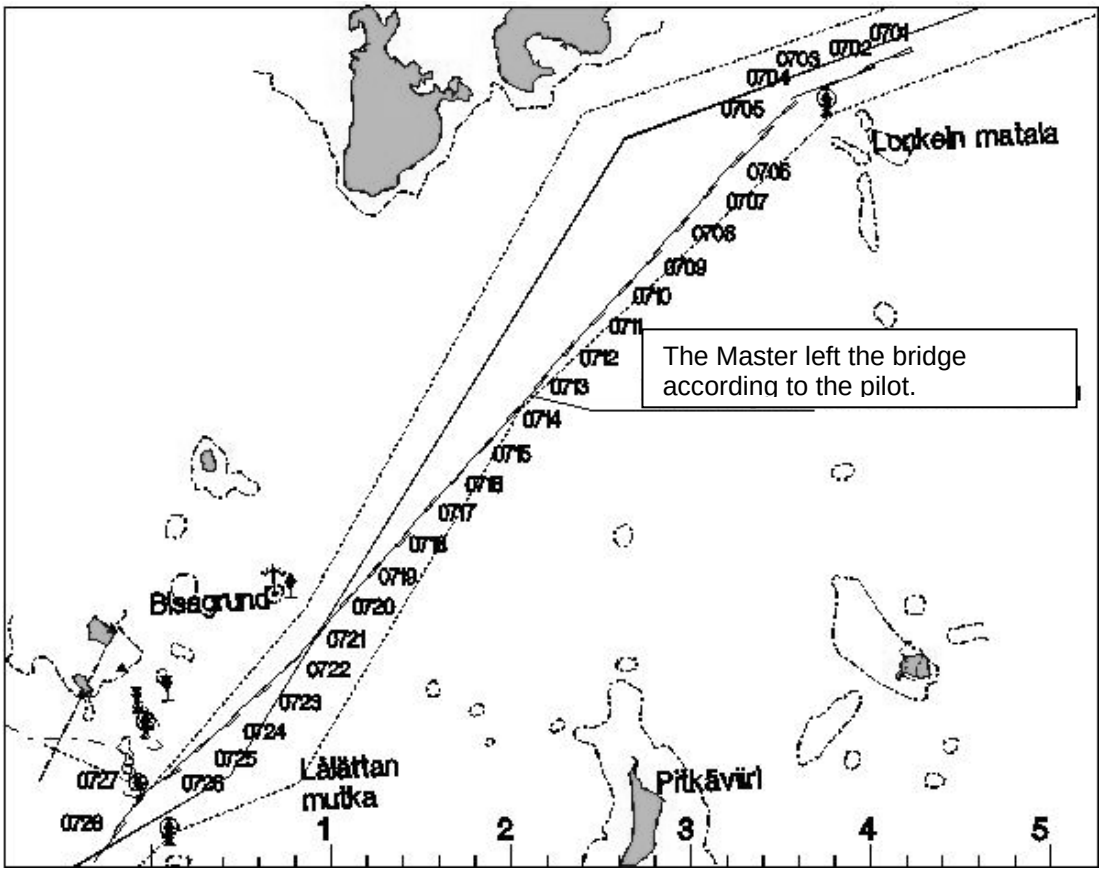
8 EUREF-FIN, Finnish horizontal coordinate systems, source FMA Sea mark register
9 Master's declaration.

pilot's opinion the Master left the bridge at about 07.13–07.14 ("3 miles before Lålättan edge mark")[10].

The pilot was sitting on the port side workstation and steered the vessel with the autopilot shortcutting the fairway waypoints (turns).

The Master, Pilot and Chief Engineer had a common conversation on actual matters ("Small talk") right after the departure. After the Master left the bridge the Pilot and the Chief Engineer continued their chat in Finnish until the crash. Their chat was very intensive and was not associated with the steering of the vessel.

After *Långön matala*[11] buoy the vessel turned to 224° course towards the Gate between *Lålättan* edge mark and spar buoy north. *Bisagrund* was passed at 07.21 hours. Pilot said he checked the passing distance to Bisagrundin with the radar VRM. The distance was 0,5 nm (Nautical miles). According to the VDR recorded track the distance was 0,25 nm. The vessel was on the middle of the fairway.



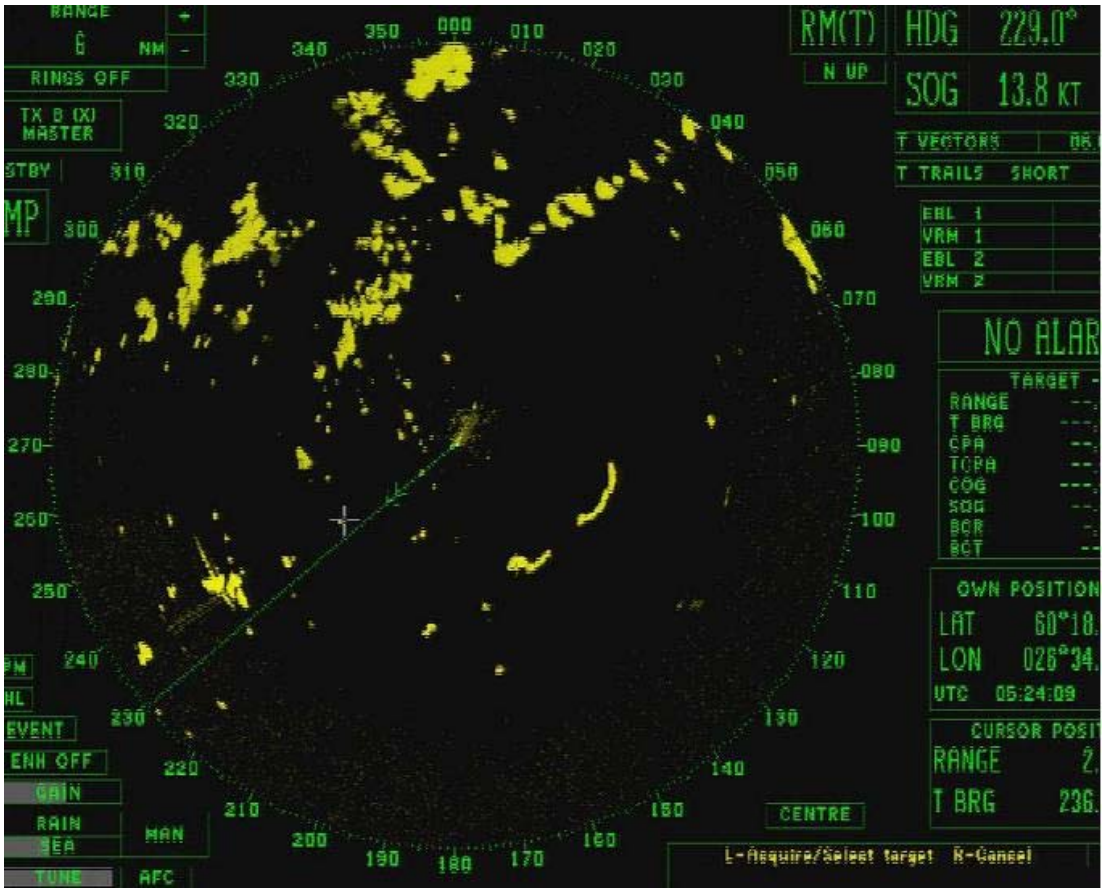
Picture 10. Pilot's steering followed a non-published and an unofficial route to steer, widely used by the Pilots.

10 Pilot's declaration in the cord.

11 Chart name Lonkeinmatala is printed in latest revision of FMA chart. Seafarers still use name Långön matala.

According to the VDR recording the average speed of the vessel on the accident voyage was 13.8 knots.

The radar's display mode used by the pilot was a compass stabilised North-up mode. The selected range was first after departure until 06:28:32 o'clock 3 nm. From that onwards the scale was permanently kept on 6 nm scale.



Picture 11. Radar picture in VDR storage at 07:24:09, range scale 6 nautical miles.

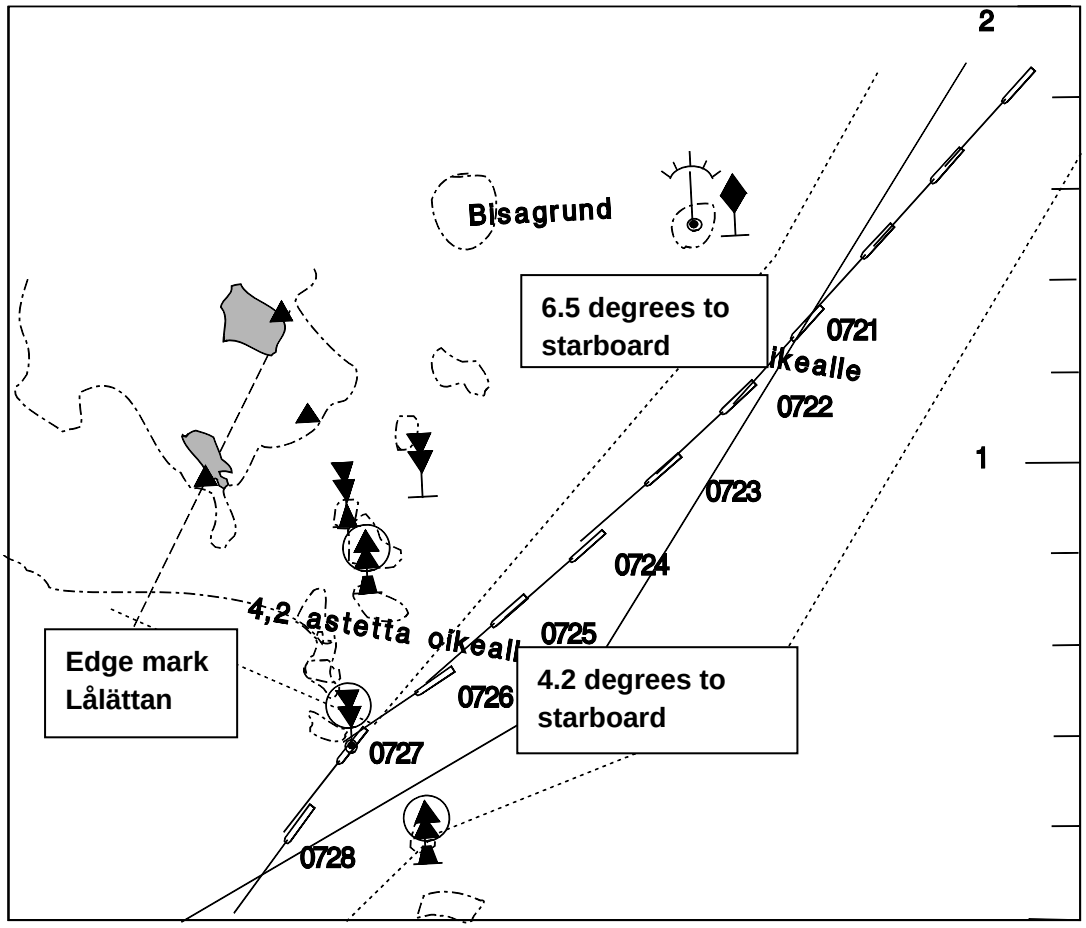
The tuning, adjustments or other actions with the radar and mentioned in the pilot's declaration could not be verified from the VDR recordings. For example the position check with the help of VRM (0,5 nm), mentioned by the pilot, when passing on Bisagrund cannot be observed from the recording. After the crash the range was switched to 3 nautical miles at 07.41 hours.

The events which led to the ramming of the edge mark began right after passing the Bisagrund sea mark (radar reflector) and spar buoy east.

Table 1. Change of the heading before and after the accident.

Time	**HDG $_{True}$**	**Remarks**
7:21:00	222.1	Until 07:21:00 the vessel had a stable heading 222° as per the pilot's own plan, straight to the gate between Lålättan mutka two navigational marks.
7:21:10	222.6	Between 07:21:00 and 07:22:10 the heading shifts **6.5° to starboard.** After this change the heading line still safely points to the southern side of the edge mark.
7:22:10	228.6	
7:22:20	229.1	Between 07:22:10 and 07:25:00 the heading is stable 229.1°.
7:25:00	229.1	
7:25:10	231.0	Between 07:25:10 and 07:26:40 **the vessel turns 4.2° to starboard.**
7:26:30	**233.3**	
7:26:40	224.3	At 07:26:30 with the heading of 233.3° a steep turn to port initiates.
7:26:50	218.1	
7:27:00	218.5	Between 07:27:00 and 07:27:10 **the vessel rams of the edge mark,** the heading changes from 218.5° to 216.1°.
7:27:10	216.1	
7:27:20	214.1	The turn continues ten seconds to port between 07:27:10 and 07:27:20 and stops on heading 214.1°.
7:27:30	214.5	Between 07:27:20 and 07:29:00 the vessel turns to starboard to the heading 232.5°.
7:29:00	232.5	
7:29:10	230.1	Between 07:29:00 and 07:30:00 the vessel turns to port.
7:30:00	218.6	

The recordings used in the investigations indicate a course change first towards the edge mark and later to its right (northern) side. In the Master's declaration it was noted, as told by the OOW, that the starboard turn initiated when the pilot was steering with the autopilot.



Picture 12. CRYSTAL PEARL's two course corrections to starboard prior to the ramming.

1.2.5 Actions taken after the accident

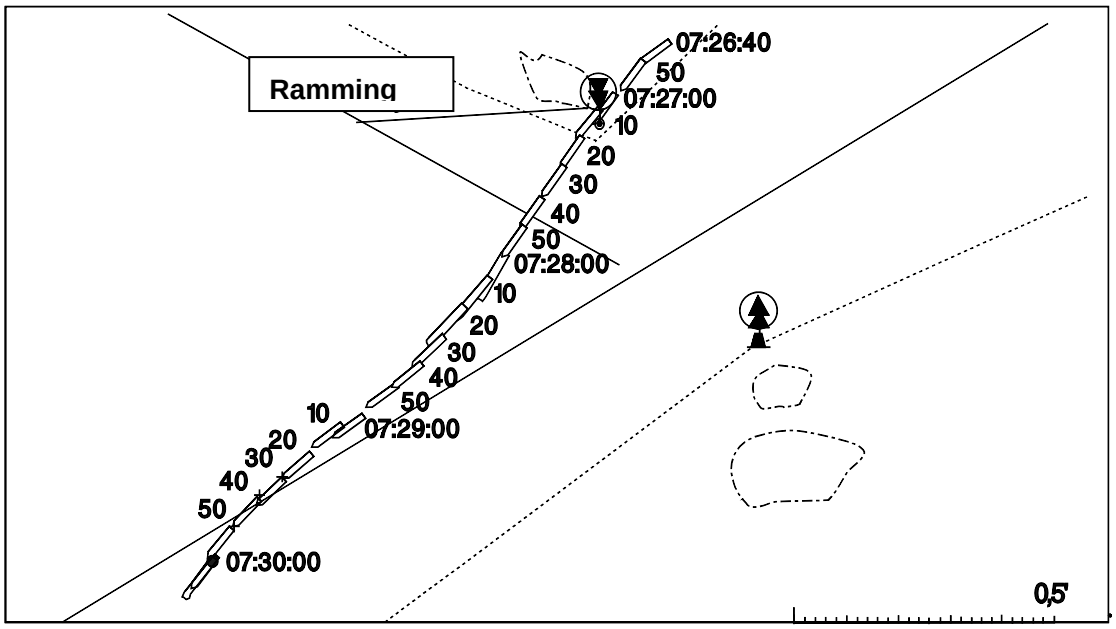
The OOW called the Master to come to the bridge. The pilot continued steering towards the pilot boarding place at Orrengrund. The speed of the vessel remained steady. The pilot told the Master that the vessel rammed the edge mark. The Master ordered the Chief Officer to begin and manage the damage checks. The Chief Engineer ordered the engine room team to check the tanks.

The pilot made a phone call (cellular) and reported the event to the pilot station at 07.30.

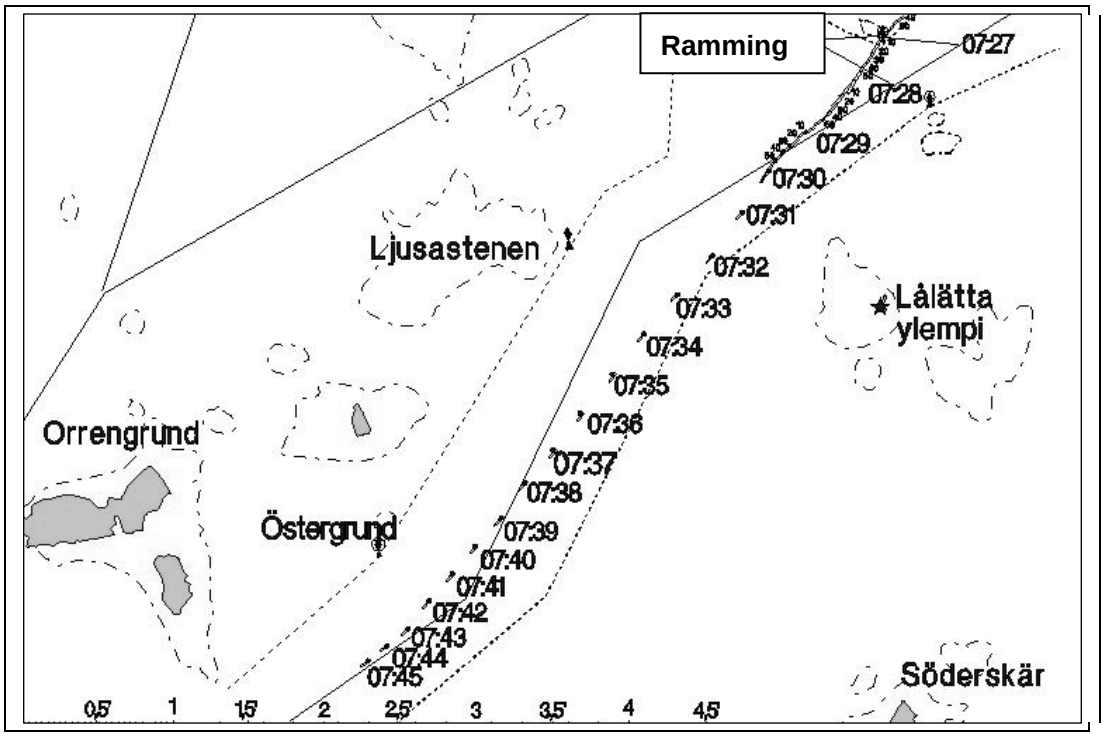
The pilot station reported the event to the Helsinki VTS.

The Helsinki VTS reported the ramming to the MRSC Helsinki at 07.45.

The MRSC alerted an aircraft to check the situation on site and to observe possible environmental damages.



Picture 13. Ramming the edge mark and movement of the vessel after the ramming; interval 10 seconds.



Picture 14. 10 minutes after the accident the speed of the vessel was 11 knots.

The vessel was stopped at 07.52 as the pilot boat arrived. The Chief Officer embarked the pilot boat and checked around the vessel in order to observe the damages. The CO took photographs and showed them to the Master. After seen the photographs the Master decided to turn back to Kotka for the thorough investigation of the damages.

The vessel returned back to port of Mussalo at low speed.

1.2.6 Injuries

There were no physical injuries to any of the persons aboard.

1.2.7 Damages

The vessel got cracks at side plating, outer side of the ballast tanks # 1 Port and # 2 Center Port, between the frames 119–126. The plating was damaged between the frames 108–125, about 5 to 8 meters below the main deck level. The gunnel was bent between the frames 122–135.

The vessel was ordered to unload her cargo prior to the permission to sail out to the repair yard on ballast.

Picture 15. The arrow points the crack area on port alongside of the ship.

1.2.8 Other losses

The foundation of the edge mark needs to be repaired. The Finnish Maritime Administration (FMA) estimated the costs to be around 500.000 €.

1.2.9 Registration devices

The vessel had a S-VDR[12] (Furuno) installed and in operation. Navigation and communication equipment, listed in 1.1.4, were together with 3 pieces of microphones in the wheelhouse connected to the S-VDR. The recordings have been used by the investigators.

1.2.10 Operation of the vessel traffic and other services

The investigation commission has received the VTS recording including the tracks and plots of the accident voyage. VTS recording was very useful and helped to follow the traffic situation.

12 Simplified Voyage Data Recorder

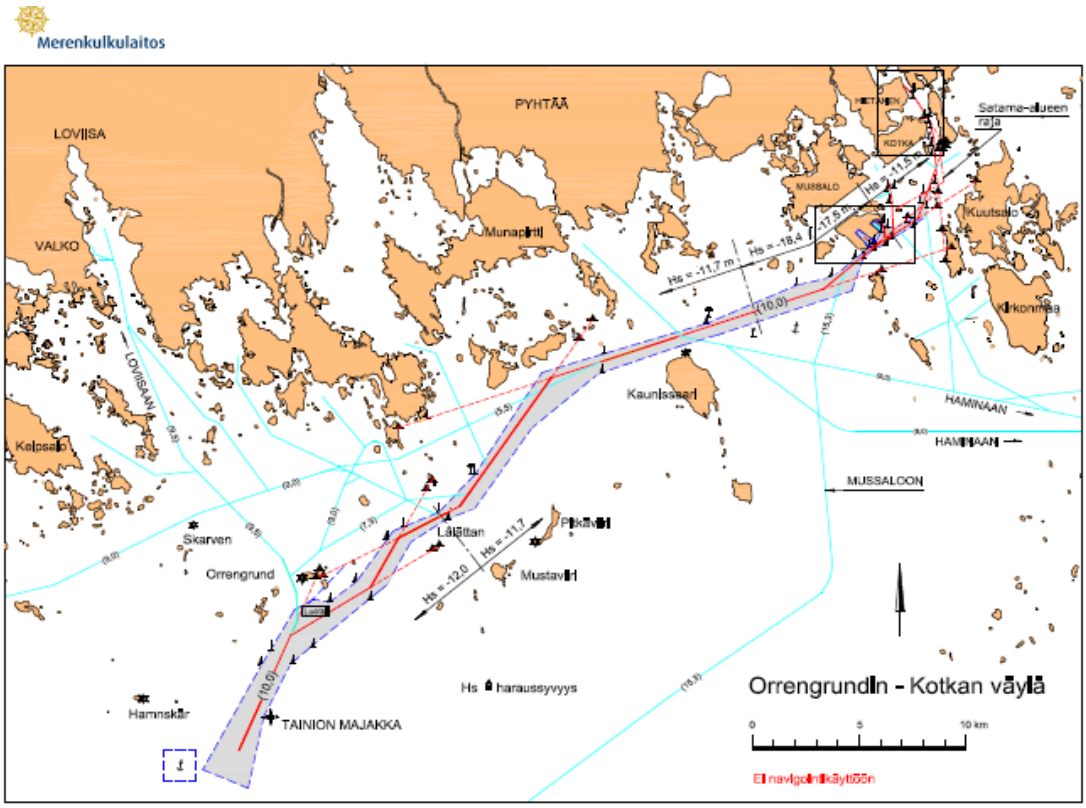
1.2.11 Port and Fairway appliances

Port

Neither the port nor its equipment had an influence to the accident.

Fairway

The Orrengrund-Kotka fairway was completed year 1954. The general planning criterion of the fairway layout was made for optical navigation. The fairway legs were short and equipped with leading lights near to wheel over points causing the fairway to become very curvy. Thus the fairway allowed a better optical navigation environment even on reduced visibility conditions. Before radar assisted navigation the piloting service used a different set of navigational marks for daylight and for darkness. Later, the more common use of radars for navigation and position definition made it possible to use the same piloting method both on day and night time. The use of radar made it possible to cut across the turns and provided, together with very general piloting instructions, a favourable selection of the navigation lines to the pilots when planning their piloting.



Picture 16. The fairway description. [13]

13 From Finnish Maritime Administration Fairway card dated 19.5.2008

Lining and marking

The Orrengrund–Kotka -fairway begins from South of Tainio lighthouse and continues 10.0 meters deep South of Orrengrund and North of Kaunissaari to the port of Kotka. The stretch Lålättan–Kaunissaari is part of the Gulf of Finland Winter Route. In the vicinity of the island Mussalo, the channel follows the alignment of the 15.3 m deep Mussalo channel. From there it continues to the inner parts of the port of Kotka.

The fairway has the total length of 38.8 km/21.0 nm having 7 navigation lines marked by boards and sector lights. There are Cardinal marks in the approach and lateral marks in the entrance.

Dimensions

Authorised draught 10.0 m. Safe clearance depth -12.0 m between Tainio and Lålättan, between Lålättan and the Eastern part of Kaunissaari- 11.7 m, in the fairway area of the Mussalo channel -17.5 m.. -18.4 m and from there on -11.5 m. Minimum width 200 m.

Navigability/Navigational conditions

The whole fairway from the approach to the entrance of Mussalo Harbour is unsheltered in Southerly winds. Strong winds and sea state may interfere the navigation. The approach is at its narrowest 480 meters wide at North of Lålättan. In the roadstead the width is 200 m.

Reorderations (fairway)

Speed: Ships sailing at their maximum authorised draught should take into account the squat effect; design speed in the Lålättan narrows is 13.0 knots (Sc -11.7 m).

1.3 Rescue activities

1.3.1 Alerting

After the ramming the Pilot asked OOW to call the Master to the bridge. The Pilot made a call using his mobile phone and announced the ramming to the Orrengrund Pilot station. Based on the investigated recordings no traffic announcement was given from the vessel to the VTS station or other authorities. “ALL SHIPS” announcement, specified by the Radio Regulations[14], was not used. The radio traffic was always addressed to some station; so it was assumed to be confidential.

1.3.2 Rescue actions

The Master arrived to the bridge and asked the Chief Officer to perform damage checks and to measure the tanks. The preliminary results of damage checks did not require any rescue actions.

[14] PAN-PAN message

1.3.3 Evacuation of the passengers

There were no passengers onboard and no need to evacuate the crew.

1.3.4 Salvage of the vessel

The vessel returned to Kotka for unloading the cargo. After unloading the vessel sailed to Klaipeda in Lithuania for docking.

1.4 The special investigations

1.4.1 Investigations onboard and at the site

The investigator from AIB was present in the city of Kotka at the time of the accident, where he received the information of the happened. After the berthing he visited the vessel together with members of other authorities. The navigation bridge and its equipment were photographed and bridge documents were copied by the investigator. He also verified that the VDR recording back-up was secured by the vessel.

The Chairman of the Investigation Commission was present at the Masters declaration in the Maritime Court. All declaration documents have been available for the investigation commission.

The ship company has been very willing to co-operate with the investigators. The investigators visited the vessel during her stay in the port of Hamina in summer 2009. The company has provided the ISM code documents for the commission.

City of Kotka Police has started, after the Maritime Court's recommendation, the examination on the matter.

The investigation commission conducted discussions and case handling with the Pilot.

1.4.2 Technical investigations

The sensor data and audio recordings were analysed from the vessel's VDR-recording. With the help of these analyses the investigation report's tables and chart models has been created in order to reconstruct accident route. The track plot and the motion data of the vessel from FMA's VTS recording provided good reference info for VDR data and helped to recreate the traffic situation picture.

1.4.3 Actions of the crew

The crew of the accident vessel cleared well after the ramming. Since there was no observed leakage the vessel sailed back to the departure port without external assistance.

1.4.4 The organisation and management

The Ship Specific Manual for CRYSTAL PEARL given by the company describes the bridge tasks according to the ISM code. This manual includes chapters for Voyage Planning, Bridge Procedures, Changing Over Watch, Masters Standing Orders etc.

The vessel had a multinational crew with traditional hierarchical job descriptions. The hierarchy prevents a person in lower grade to intervene somebody's doings on higher hierarchy level.

The embarkation/disembarkation of Pilot is instructed by the Company Forms Manual. The manual states that the exchange of information between the Master and the Pilot is fulfilled with the Pilot Card where it's also stated that the Master is responsible for the navigation and the Pilot is acting as an instructor. This instruction is a direct quotation from the legislation.

1.4.5 Other investigations

The Master gave his Maritime declaration in Maritime Court in Kotka on 6 March 2009.

The foundation of the Lålättan edge mark has been redesigned and will be rebuilt in summer 2010.

The procecutor has asked the Police to make a pre-investigation on the matter. This investigation is not completed by the time of this report's publication.

1.5 Legislation and managing instructions

The accident of CRYSTAL PEARL is closely related to piloting and voyage planning legislation and instructions. There are both international and domestic legislation and instructions. The international ISM code requires the ship companies and/or operators to instruct the bridge operations onboard.

1.5.1 International conventions and recommendations

The STCW convention 1978 requires that each voyage has always to be planned from port to port. The same requirement was repeated, yet better defined and explained in year 1995[15].

IMO has required that the Pilots need to be qualified and get the professional training needed for their profession. IMO does not instruct the piloting work, but determines the information exchange between the Master and the Pilot prior to actual piloting.

IMO determined in year 1987[16] the Master to interchange information with the Pilot before the piloted voyage. The information to be given to the Pilot includes the radar and

15 IMOn res. A.285 required the Master to make route plan also for the piloted part of the voyage. This resolution became rule in IMO's STCW convention year 1978. STCW was renewed 1995.

16 IMO res. A.601 (15) 1987, Annex 1; PILOT CARD, Appendix 2, WHEELHOUSE POSTER.

its band info, the measuring principle of the speed log, deviation error of the speed log, operation of the engine telegraphs, number of steering gear units/pumps, rudder angle indicators, RPM indicator and possible ROT indicator. Also the deviation and other angular error in compass system has to be informed.

1.5.2 National legislation

In Finland the voyage planning requirement is part of the manning regulation. The regulation does not instruct the planning in details.

Present Piloting law and regulation neither govern the route planning nor the actual piloting work. The route planning and the bridge work co-operation are not required by authorities. Bridge work co-operation is only seen as a recommendation by the IMO.

The flag state for CRYSRTAL PEARL is Luxembourg. The investigation commission has asked if the flag state has given out rules and regulations or orders for bridge operation work. Based on received answer the situation is similar to Finland; Luxembourg only follows the guidelines of IMO.

1.5.3 Authorities' regulations and instructions

In Finland the FMA gave instructions for route planning in year 1995, but these instructions were cancelled from the list of regulating decisions in year 1998. New, substituting instruction has not been given.

The Guideline for piloting was given in year 1988[17] and renewed in year 2000[18]. In the renewed guideline the bridge work co-operation was handled and mentioned for the first time ever. This guideline required the Pilot to carry navigation chart extracts with marked notes for radar assisted navigation. This guideline was cancelled from the list of regulating decisions around the year shift 2003–2004.

The Finnish maritime authority's opinion about the co-operation is published in HERAKLES-BULK investigation report's statement[19]. The FMA is stating, that the safety recommendation given in mentioned investigation report which refers to IMO's STCW-95 convention describing bridge work co-operation is only a recommendation by the IMO; it does not require Finnish flag authority's actions.

1.5.4 Operator's regulations

According to the ISM code, the responsibility of the regulation work for route planning and piloting work has fallen on the ship companies or operators. The investigation commission has received a copy of instructions given by the ship company.

17 FMA Notices to Mariners # 6/1988.
18 FMA Notices to Mariners # 10/2000.
19 Investigation report Pusher-Parge HERAKLES-BULK sinking 2-3.3.2004. ISBN 951-836-185-1. FMA's statement 5.7.2006.

CRYSTAL PEARL's company forms manual gives the ship company's instructions for Bridge procedures and includes required forms for the co-operation.

The company underlines, that the Master of the vessel gives his own instructions as "Master's standing orders". The company gives the guidelines, which are very detailed, but in the end of the day the instructions for the route planning remains in practice as the Master's task.

1.5.5 Quality system

The accident vessel did not have a quality manual in use, but on the ship company's homepages are described the safety values. Below are some extracts from the company's goals, which can be referred as similar part of the quality system:

"We are collectively committed to the following:

We rank safety, health, protection of environment and quality as top-priority matters in all our activities on all levels of the organization, in order to prevent human injury, pollution and loss of property.

We take responsibility for our actions in respect of the environment and aim at minimizing pollution, air emissions and waste.

Risk assessment and incident investigation are recognized tools to achieve zero level accidents. Accident, incident, near miss records are reviewed annually *(text bolded by the AIB).*

We minimize failures due to technical reasons by planned maintenance of ships.

We measure our success in safety, environmental and quality matters with respect to criteria defined by the management."

2 THE ANALYSIS

The analysis is based on the information transcribed from the VDR, Maritime declaration material and parts of the ship company's manuals given for bridge operations.

The analysis is built from the Crew members' and the Pilot's points of view.

2.1 Crew members' actions seen from their viewpoints

The leg from Långö buoy to Bisagrund was straightforward. The Pilot and the vessel's Finnish Chief Engineer, who stayed on the bridge, were chatting in Finnish. The subjects of their discussions on the bridge were within the range of seamanship, but outside of actual steering or navigation.

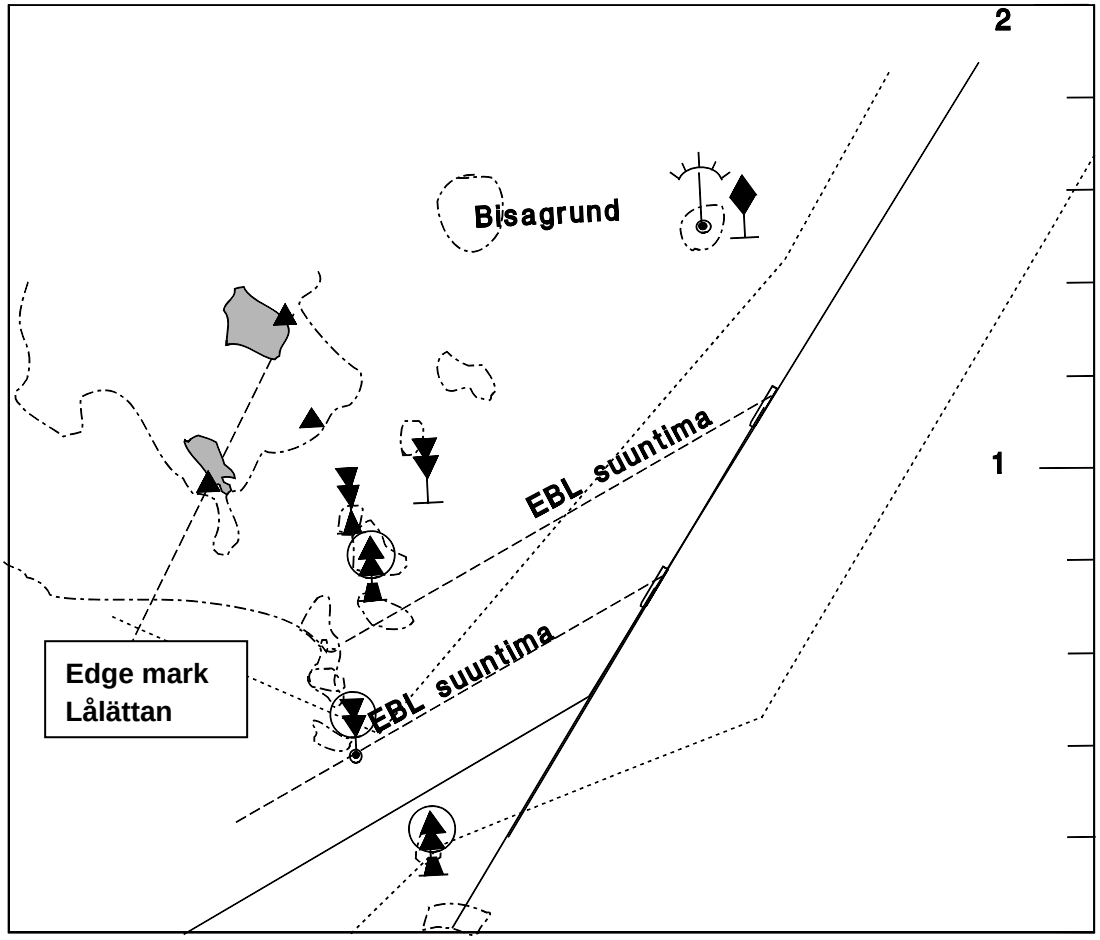
The vessel began the shortcut after passing Långö at 07:04 o'clock. The Pilot kept the course to steer at 221° until 07:21 when the ship passed the fairway leading line on Bisagrund level.

Ships course after Långö would have led directly and safely between the Lålättan edge mark and the buoy south from it. Instead, two course corrections to starboard were made (see picture 12). The first correction of 6.5° occurred between 07:21–07:22 o'clock meaning that the Pilot's intention was to steer close to the edge mark with the heading of 227°. This would have taken the vessel near the edge mark, but obviously required a small correction before the passage.

The conversation between the Pilot and the Chief Engineer continued very intensive during the whole trip. The second correction between 07:25–07:26 o'clock should obviously not been needed but the Pilot wasn't concentrating at this critical moment. In the middle of the most intensive conversation the Pilot corrected the course to steer 4° to starboard, which lead the course directly towards the edge mark.

The Master mentioned in his declaration that pilots are used to go near the navigational marks when using the shortcutting steering method. This did not surprise him or the OOW.

Both the Pilot and the OOW had different style voyage plans. The vessel's plan followed the fairway layout while the Pilot's plan was shortcutting. If the piloting plan was made to follow the chart's navigation lines the course to steer would had been 214° and the Pilot would had been forced to concentrate more to the next turn to 241°.



Picture 17. According to the chart's fairway lines the operator would set the next course to steer by radar's EBL 241° prior to next turn. The turn begins when the EBL points to the Lålättan edge mark.

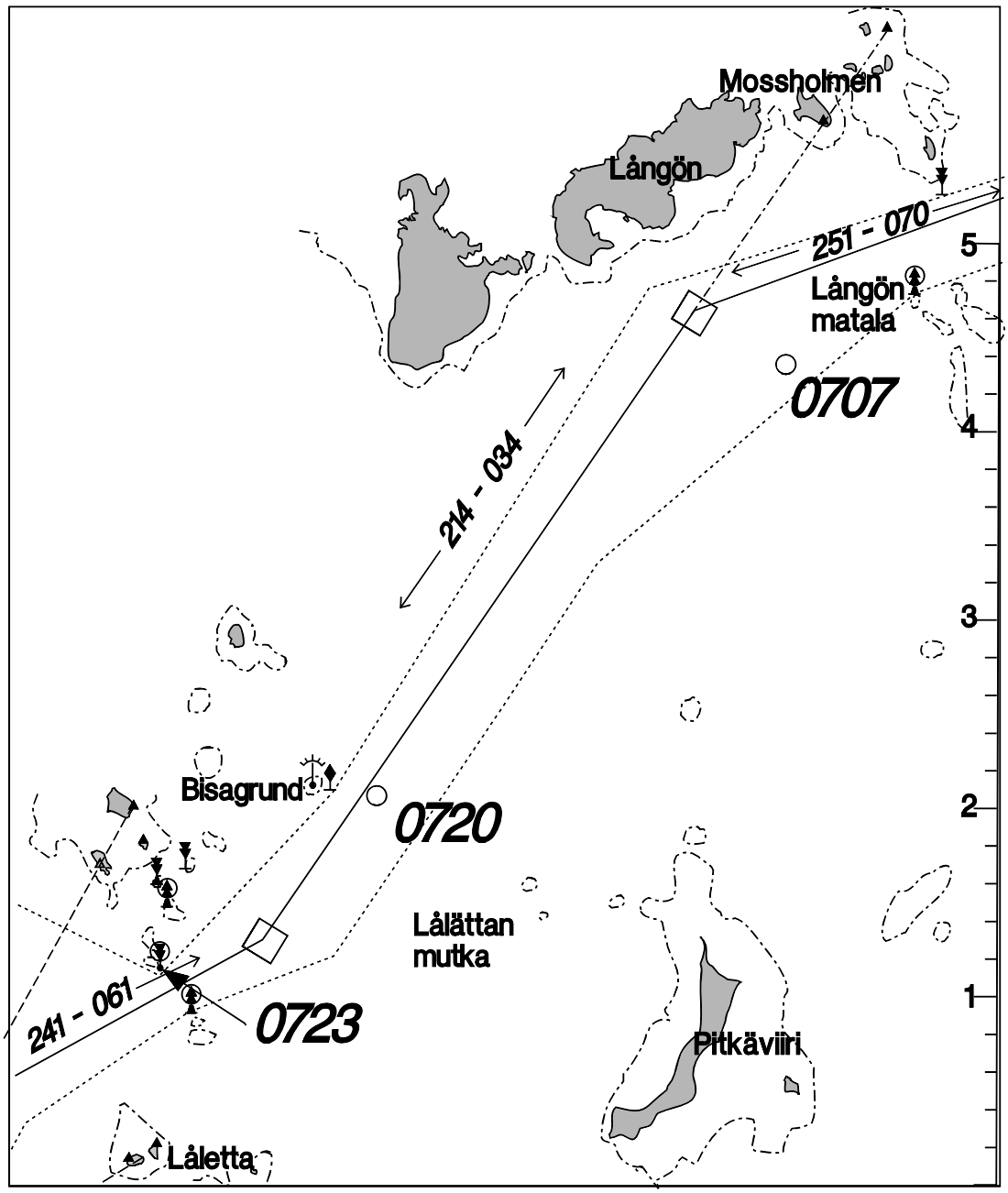
If the pilots follow the fairway navigation lines, the deck officers are not surprised. The Pilot was reckless of the fairway navlines and thus made it impossible for the OOW to monitor the piloting.

Passing near the navigational marks was not a surprise for the deck officers. The second course correction towards the edge mark, 1.5 minutes before the ramming, wasn't a normal steering act. This course change obviously surprised the OOW and he did not have the time to react.

The following four paragraphs describe the situation on the bridge as seen from each person's viewpoint.

2.1.1 The Watch officer trainee (Cadet)

The Cadet logged the ship's position three times after passing the Långö buoy, when passing the Långö buoy at 07:07, when passing the Bisagrund at 07:20 and immediately after the ramming at 07:23. On the way back to Kotka the position was logged nine times on the same leg, I.e. three times as frequent as on the way out.



Picture 18. The Cadet's position logging after passing the Långö buoy.

The presence of the Chief Engineer on the SB side working position hindered the Cadet's position logging from the radar display. GPS navigators are installed into the chart desk at the rear of the navigation bridge. There are instruction stickers in the chart desk front panel reminding the navigator to define the position on coastal waters and to cross check the result between the radar and the DGPS. It is time consuming to convert the positions and plot them to the paper chart. This task also includes a risk for errors.

The Cadet told that he defined the positions by looking at the radar screen, the electronic chart and the lights on navigational marks along the fairway. He had defined and recorded the positions well even when he could not use the radar's EBL and VRM.

The position logging was obviously one part of the Cadet's training subjects. Vessel's position was logged on the paper chart for registration's sake so that the vessel's track could be examined afterwards in order to clarify possible dangerous situations. This action was useless, because the vessel's VDR records sensor data automatically and accurately. If the meaning was to teach the Cadet to define ships position, one can say he knew that task well enough. So the position logging was useless work. It would have been more efficient to teach him to understand the actual piloting practice.

The Cadet had no duty in relation with the piloting. He worked for the OOW performing on the lowest level in the "Bridge hierarchy". He could not order anyone, but he could have said out loud his opinion on the Pilots steering course straight towards the edge mark.

In practise the difference in the hierarchy level between a pilot and a cadet is huge and. It was observed also in this accident. The Cadet made his duties as taught. This was a common manner. The Master defined the trainee's position in the hierarchy to be only on lookout level. The Cadet did not keep himself granted to criticise or ask the Pilot the meaning on the course changes. One can find "territorial barriers" on the navigation bridges and the Cadet acted like the vessel' s common manner required.

During the piloting the definition and knowledge of ships present position is not relevant, but concentration on predicted, future position. This means that the Pilot figures the future position in a half a minute intervals ahead. The Pilot predicts ships position with the help of the present course and rudder angle with observed rate of turn information. It would have been more beneficial to teach the Cadet this way of thinking and working "ahead in time" and at the same time monitor the Pilots practices and methods in turns and course changes e.g. visual signs, used rudder angles and orders for a new course. This would have required this training situation to be explained to the Pilot and the need for continuous communication between the Pilot, the OOW and the Cadet.

2.1.2 The watch officer[20]

The 3rd Officer acting as the OOW had most probably got the same kind on on-job training like the Cadet. There was no discussion with the Pilot about the vessel's own route plan. It was not monitored, because it was not followed. The OOW could not monitor the Pilots plan because it was, as traditionally, based on recollection. The OOW had only a slight recollection from his previous trips to Kotka. It may also have been difficult for him to discuss about the matter since the Pilot had an intensive conversation with the Chief Engineer. This indicates that he felt his hierarchy level to be much lower than the Pilot's and he did not dare to disturb the Pilot. The monitoring was weak due to too much of politeness and submission to those "territorial barriers".

The OOW did monitor the Pilot's steering and noticed his shortcutting in the previous turn as well as keeping the course to steer straight through the passage between Lålättan edge mark and the buoy south of it while the Pilot was chatting with the Chief Engineer. The OOW could not verify the passing distance to the edge mark with the

[20] Officer of the Watch; OOW

radar, because both of the radar workstations were occupied by the Pilot on SB and the Chief Engineer on BP side.

The range on radar was the whole time 6 nm, which in a close up situation is too large. The OOW noticed that the steering lines lay much alike the other pilots' from Kotka use to have; shortcutting in the turns and sailing near the nav marks.

He mentioned that when passing the Bisagrund, the course to steer was changed almost straight towards the edge mark. According to him the Pilot was calm. The pilots are using shortcuts and sail near to the nav marks. The OOW trusted the Pilot, because the navigation lines agreed with his previous experience about pilots track layouts.

Some 0.3 to 0.4 nm before the edge mark the OOW observed that the Pilot became somewhat uncertain. The Pilot ordered the OOW to activate hand steering by ordering "Hand steering - Hard Port". According to IMO technical standard the switching from the automatic steering to hand steering may take 3 seconds maximum and is to be performed by one manual switching[21]. Based on the VDR recording the time from the Pilot's order to OOW's switching and acknowledgement took 8 seconds. It was only then when the OOW noticed the edge mark.

The OOW followed his normal working routine and felt the situation neither alerting nor surprising even though the course to steer led near to the edge mark. That was a common practise. When the Pilot observed the danger and ordered the hand steering it was already too late to correct the situation.

2.1.3 The Master

The Master checked and signed the Pilot Card prior to departure and handed it to the Pilot who signed the receipt of it. Also the information exchange between the Master and the Pilot was done using the Pilot Card[22], which includes check lists for navigation and communication equipment and their working condition. In the Maritime Court's hearing the Master told that it was only the Pilot who was responsible for the vessel's movement and the OOW had nothing to do with the steering. In his opinion it is a common practice. The Master also knew that the Pilot doesn't follow the chart's official navigation fairway lines. He knew the Pilot's way of shortcutting the turns in a way that the vessel sails closer to the nav marks than they should. In Master's opinion there was no need for the OOW "to get a panic" because of this practise. He also said that there was nothing strange in the piloting during the accident trip except the very last course changes, which were wrong.

The Master said the navigation bridge was well manned so he could leave the bridge in order to reboot his email application which was frozen on the satellite communication system. The Cadet took care of the lookout. In Master's opinion the OOW needed to use the radar and make the needed markings. The OOW doesn't have any reserved sitting place and he doesn't have time to intervene the piloting, said the Master. In his opinion

21 IMO Resolution MSC.64(67) 4.12.1996. Adoption of New and amended Performance Standards, Paragraph 4.1: Change over from automatic to manual steering and vice versa should be possible at any position of the rudder and should be effected by one manual control within 3 sec.

22 Bridge Procedures, Master-Pilot Information Exchange

the Pilot alone answered for the steering of the vessel. This, in Master's opinion, was a common practise. It is true especially in Kotka area, where the pilots use and follow steering lines which shortcut the fairway turns. In his own Maritime declaration, the Master has clarified been acting according to the instructions.

2.1.4 The Pilot

After the departure the Pilot received the steering from the Master and began the piloting. He agreed with the Master to use the automatic steering. The Pilot did not tell anyone about the steering mode or the orders he used with the autopilot. In the Maritime Court's hearing the Pilot told that it was him alone who considered where and how to perform the turns and course changes. His steering was based on both visual and radar observations. The Pilot considered the electronic chart to be unreliable even there was a DGPG connected giving an accuracy of 2 to 3 meters. He trusted the radar, which had the range set to 6 nm. This scale is too large when approaching the Lålättan passage. The edge mark was on the headline on the radar screen and the buoy south of it.

The Pilot shared the Master's opinion, that local pilots have their own methods of steering along the Orrengrund fairway. The Pilot said that the Masters normally approve this as an individual task. As long as the piloting is performed as an individual task, possible errors in it cannot be monitored.

According to the Pilot's opinion his conversation with the Chief Engineer was disturbing his piloting work, but he did not intervene with the Chief Engineer's presence on the bridge. In his opinion the Master or the OOW should manage it.

In practice the bridge operation cannot strictly follow the regulations, because the regulations do not include instructions. The regulations only describe the responsibilities and the goals. The authorities have left the draw up work for bridge operation instructions to the ship companies by the ISM code. The responsibility of the bridge operations has traditionally been on the Master. The instructions given by the authorities or ship companies do not specify the piloting work, because it has traditionally been the Pilot's task.

2.2 The ship company's instructions

The IMO as well as national authorities have left the bridge operation bound to ISM code. The ISM code says that ship companies need to instruct the bridge operations and routines, including the piloting. This is an important issue, because at least in Finland the authorities have cancelled their instructions for route planning and piloting.

CRYSTAL POOL LTD had given their instructions for bridge operations and routines. The investigation commission received *Bridge Procedures* and *Master's standing orders* parts. The committee also received copies of the most used forms like; *Navigation, Embarkation / Disembarkation of Pilot, Master / Pilot Information Change, Changing over the Watch, Navigation in coastal waters, Voyage Planning*.

The Instructions for piloting are missing from the ship company's instructions and it remains as Master's instruction task. In other company's instructions there are some

parts that refer to piloting, but concrete courses of action have not been written in these documents.

The route planning is the 2nd Officer's responsibility. There are no company's instructions for planning the turns even though the instruction requires the plan to be done from the departure port to the arrival port. That is why the vessel's route plan did not include the turns for Orrengrund fairway.

The pilotage monitoring is determined as Master's responsibility. He may delegate this task to the OOW. During the piloting the bridge manning requires the presence of the Master, OOW and one seaman. If there is a Cadet in a.m. manning the Master may leave the bridge. This means that during the accident voyage the bridge manning on CRYSTAL PEARL's bridge was in accordance with the company's instruction.

The company's instructions define the Pilot as an instructor. This wording is more for filling the legal aspect. The legal description of the piloting work differs from the practical work.

The company's instructions clearly define the presence of outsiders on the navigation bridge and prohibit their presence during the piloting. The Chief Engineer is hardly considered as an outsider.

In the ship company's instructions there are a lot of instructions and restrictions, but less information about how to manage the operations. This can be seen by the lack of a chapter handling instructions during the piloting.

2.3 Crystal Pool's Safety management

On their homepage the ship company clearly states its respects and goals for their customers and the society. The goals are taking into account the safety and environmental issues. These goals show the willingness to comply with the safety course actions.

In the transportation chain of chemicals the co-operation and mutual understanding between the customers and operators is based on continuous checks of operation and functions. These checks are called Vettings, which are considered to be tools for searching the possible deviations in the security. It is obviously true in most of the cargo handling operations.

It seems that there is not enough everyday control for vessel's safety transportation rules.

The basic piloting routines on the bridge, as observed in this investigation, are well known by the company, the Master and other parties involved. More often the Pilot is acting as an independent, solitare operator steering the vessel. In practice the Masters do not consider the Pilot to be an instructor only, but Masters also expect to be served in the practical steering operation.

All operators within the maritime business are familiar with the above described situation as well as the contradiction between everyday business and the regulations and rules.

3 CONCLUSIONS

The conversation between the Pilot and the Chief Engineer disturbed the Pilot's concentration into his work on a critical moment. The Chief Engineer cannot be seen as an outsider on the bridge. Therefore his presence was not violating the company instruction. Still, the conversation had an effect in the accident event. The accident event exposed the bridge routines to be very sensitive for the disturbances. In addition to the Pilot and the Chief Engineer there were the OOW and the Cadet on the bridge. They were performing their jobs according to the instructions. When the seamen operate following the customary manners the actions themselves are already approved in advance. By their own experience the crew members felt so too. Regulations and the company instructions on a too general level have developed the existing operation methods, which ignore the actual piloting work.

An undefined working method is accepted and it provides two different steering methods for the fairway in Kotka area. The deck officers' plans are based on the navigation chart fairway lines while the pilots' plan for piloting routines are based on their recollection, which includes shortcutting the turns. The authority controlling the piloting work allows these various methods on the same fairway. There is no uniform, common practice present.

The shortcoming could be avoided by a better co-operation between the pilots and the deck officers on vessels. This has not been successful. The Finnish maritime authority's opinion is that the BRM co-operation defined by the IMO STCW sub-committee cannot be demanded since it is only a recommendation[23].

BRM should be uplifted from recommendation to regulation into STCW convention. The bridge operations and routines as well as the Piloting work has been ignored and left on hands of the "Seamanship" and "Good Seamanship" specified by the Maritime law and Navigational Code.

Ignoring attitude has led to a situation where the concrete co-operation during the piloting cannot be agreed on bridges. This co-operation has been bound up with the companies' instructions where again the authorities' format of the legislation text is repeated without a clear definition. This was also seen in the CRYSTAL PEARL's company instructions where the piloting instructions were missing.

The Master interpreted that the Pilot has the authority over the Orrengrund fairway, because he did not follow the official lines of the fairway. This most probably has also been the method accepted by the controlling authority i.e. the method to be accepted also by the Masters even though it is not confirmed by the authority. The Pilot said that even when the fairway line is not followed, one always knows where the vessel lies.

[23] Investigation report B2/2004M. Pusher-Barge HERAKLES-BULK sinking 2.–3.3.2004. In statement 1384/330/2006 FMA announces that it's needed to clarify and deepen the co-operation on bridge, but the referred STCW BVII / 2 rule is not applicable since it is only a recommendation without legal effect.

If the piloting becomes disturbed by an inappropriate conversation then this kind of piloting method is vulnerable. The Pilot executed the piloting method which had been created by his own organisation, so he did not feel doing anything wrong. Sailing outside the fairway navigation lines may not be an acceptable method, unless it is used for the safe passage of the vessel.

Pilot's work has always been considered as a special task which he carries out alone. For the CRYSTAL PEARL's Master it was good enough that the bridge manning fulfilled the company's requirements. The Master assumed that the Pilot was performing the steering alone. This can be seen by the vessel's inadequate route plan drawn on the chart without initial points of turns, rudder angles and passing distances. The piloting could not have been done by the vessel's plan, but obviously the plan fulfilled the company's requirements. According to the Master's experience the piloting was under control. In this way it had been done before. The routine indicates apparent confidence, but in the reality it is vulnerable.

4 ACTIONS TAKEN AFTER THE ACCIDENT

An inquiry about revising the instructions and acts, possibly done after the accident, was emailed to Finnish State Pilotage Enterprise and Crystal Pool Ltd.

The next day following the accident Crystal Pool gave a standing order stipulating that only the persons whose presence is related to the safe manoeuvring are allowed to stay on the bridge during the pilotage.

The same letter highlighted both the importance of Master's presence on the bridge and the monitoring of piloting during the pilotage. The Master's absence during the pilotage has to be as short as possible.

In January 2009 the general manager of the ship company sent a letter to the managing director of the Finnish State Pilotage Enterprise, in which he referred i.a. to the CRYSTAL PEARL's accident.

In the letter it was required, that a pilot, whenever piloting Crystal Pool's vessel, must comply strictly with the navigating practices, where a vessel is navigated using fairway lines. Deviating from these lines is not allowed.

The Finnish State Pilotage Enterprise states in their answer on 14.5.2009 to the shipping company that the supervisors on the pilot stations are informed to advice the pilots not to put fairway curves too straight and to point out the importance of staying in the fairway area.

5 SAFETY RECOMMENDATIONS

The bridge operations might become disturbed by several reasons. For example idle and inappropriate conversation is only one reason. Forbidding the conversation does not remove the risk of accident.

Until now, the edge mark Lålättan has been rammed two times, both times under piloting the vessel outbound towards Orrengrund. When the track lines are shortcutting the fairway and the ship is sailing near the navigational marks even a small track deviation can cause an accident. In addition this type of steering method cannot be monitored, because it is not documented. Ship's route plan and piloting plan should be comparable with the navigation chart's fairway lines.

The accident investigation commission recommends that:

Finnpilot composes such a piloting plan, which follows the navigation chart's fairway lines between Kotka and Orrengrund. The maritime authority responsible for enforcing the piloting should approve the plan.

Helsinki, on 21 March 2011

Risto Repo Kari Larjo

Hannu Martikainen

LAUSUNNOT / STATEMENTS

Lausunto / Statement 1	Liikenteen turvallisuusvirasto TraFin lausunto Finnish Transport Safety Agency TraFi's statement (in Finnish)
Lausunto / Statement 2	Finnpilotin lausunto Finnpilot's statement (in Finnish)
Lausunto / Statement 3	Luxemburgin onnettomuustutkintaviranomaisen kommentit Comments from the accident investigation authority of Luxembourg (Administration of Technical Investigations, Luxembourg)

SAAPUNUT
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TraFi

Lausunto

Päiväys/Datum/Date 7.3.2011

Dnro/Dnr/Ind.No. TRAFI/25459/07.01.00/2010

Viite/Referens/Ref Lausuntopyyntönne 18.8.2010 koskien tutkintaselostuksen C2/2009M lopullista luonnosta

Onnettomuustutkintakeskus
Martti Heikkilä
Sörnäisten rantatie 33 C
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Mt Crystal Pearl, törmääminen Lålättan Mutka reunamerkkiin 26.1.2009

Tutkintaselostuksessa Onnettomuustutkintalautakunta suosittelee, että Luotsausliikelaitos laatii Kotkan ja Orrengrundin välille sellaisen luotsaussuunnitelman, joka noudattaa merikartan väylälinjausta. Luotsausta valvovan viranomaisen tulisi hyväksyä suunnitelma.

Onnettomuuden tapahtumahetkellä voimassa olleen luotsauslain (940/2003) 8 §:n mukaan luotsi on vastuussa luotsauksesta. Luotsin on annettava luotsattavan aluksen päällikölle aluksen turvallisen kulun kannalta tarpeelliset tiedot ja ohjeet sekä valvottava niitä aluksen ohjailuun ja käsittelyyn liittyviä toimenpiteitä, joilla on merkitystä alusliikenteen turvallisuudelle ja ympäristönsuojelulle.

Laki luotsauslain muuttamisesta (645/2010) tuli voimaan 2.8.2010. Lakimuutoksen seurauksena luotsille säädettiin velvollisuus esittää luotsattavan aluksen päällikölle ajantasaiseen kartta-aineistoon perustuva reittisuunnitelma sekä muut aluksen turvallisen kulun kannalta tarpeelliset tiedot ja ohjeet.

Valtioneuvoston luotsauksesta antamalla uudella asetuksella ja Liikenteen turvallisuusviraston (Trafi) luotsaustoimintaa koskevalla määräyksellä muutetaan luotsin ohjauskirjan myöntämisedellytyksiä 1.7.2011 alkaen. Ohjauskirjan myöntämisen edellytyksenä on, että hakija suorittaa laivasimulaattorissa tutkinnon. Tutkintoon kuuluu mm. reittisuunnitelman teko ja sen toteuttaminen simulaattorissa vaihtelevissa olosuhteissa. Tämä tutkinto tulee uusia viiden vuoden välein. Luotsin reittisuunnitelma tarkastetaan tutkinnon yhteydessä.

Suomessa ei ole voimassa olevaa määräystä reittisuunnitelmien laatimisesta. Trafi antaa asiasta IMO:n suositukseen Guidelines for Voyage Planning (IMO Resolution A.893(21) perustuvan määräyksen syksyn 2011 aikana. Määräystä tullaan soveltamaan myös luotsaukseen.

Trafin vahdinpitomääräys velvoittaa aluksen päällikköä huolehtimaan ennen jokaista matkaa, että aiottu reitti lähtösatamasta ensimmäiseen käyntisatamaan on suunniteltu sopivien ja asianmukaisten merikarttojen ja muiden merenkulkujulkaisujen avulla. Trafi pitää tärkeänä, että aluksen reittisuunnitelma on riittävällä tarkkuudella VTS-keskuksen tiedossa ja että reittisuunnitelmasta poikkeamisesta informoidaan VTS-keskusta.

Onnettomuustapaus on tuonut esiin toimintatapoja, joita selkeyttämällä voitaisiin parantaa meriturvallisuutta ja ehkäistä vastaavia onnettomuuksia. Trafi ottaa huomioon esiin tulleet kehityskohteet laatiessaan luotsaukseen liittyviä määräyksiä.

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Onnettomuustutkintakeskus
Sörnäisten rantatie 33 C
00500 Helsinki

LUOTSAUSLIIKELAITOKSEN LAUSUNTO KOSKIEN ONNETTOMUUSTUTKINTAKESKUKSEN TUTKINTASELOSTUSTA C2/2009M MT CRYSTAL PEARL, törmäys Lålättanin reunamerkkiin 26.1.2009

Onnettomuustutkintakeskus on selvittänyt MT Crystal Pearlin törmäämistä Lålättanin reunamerkkiin 26.1.2009 ja pyytänyt tehdystä tutkintaselostuksesta lausuntoa Luotsausliikelaitokselta. Lausuntonaan Luotsausliikelaitos toteaa seuraavaa.

Tutkintaselostuksen sivulla yhdeksän Crystal Pearlin päällikkö toteaa, että hänen mielestään ei ollut tarpeellista käydä reittisuunnitelmaa luotsin kanssa läpi. Toisaalta tutkintaselostuksessa todetaan useaan otteeseen, että luotsin reittisuunnitelma oli muistinvarainen. Päällikön halutessa olisi luotsi osoittanut kartalta reittisuunnitelmansa, mutta tämä edellyttää, että aluksen henkilökunta on halukas käymään reittisuunnitelmaa läpi.

Luotsin reittisuunnitelman muistinvaraisuus ei ole nykyisten säädösten vallitessa mitenkään säädösten vastainen, koska luotsausta valvova viranomainen ei ole ohjeistanut miten reittisuunnitelma tulisi laatia. Käytännössä Finnpilot edellyttää luotseiltaan reittisuunnitelmaa, mutta sen dokumentoinnin ulkomuoto vaihtelee lähinnä siksi, että viranomaisen halusta ko. asian suhteen ei ole mitään konkreettista näkemystä. Dokumentoinnin ulkomuoto ei vaikuta siihen, että jokainen Finnpilotin luotsi kykenee esittämään reittisuunnitelmansa aluksen päällystölle, jos sitä aluksella halutaan.

Päällikön todetaan tunteneen luotsauskäytännön alueella (s.30), jos hän olisi halunnut ajaa jotenkin toisin, olisi hän varmaankin puuttunut käytössä olevaan luotsauskäytäntöön. Päällikönkin voidaan siis katsoa hyväksyneen vallitsevan käytännön ja tämä hyväksymisensä hänen olisi tullut ilmoittaa vahdista vastuussa olevalle perämiehelle, jolloin perämiehellä olisi ollut paremmat mahdollisuudet monitoroida reittisuunnitelman toteutumista.

FINNPILOT

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Johtopäätöksissä sivulla 33 todetaan, ettei konepäällikkö olisi ollut sivullinen komentosillalla. Konepäällikkö oli tutkintaselostuksen mukaan keskustellut koko matkan luotsin kanssa joten hän ei ollut siellä suorittamassa mitään ammattiinsa liittyvää tehtävää vaan viettämässä vapaa-aikaa. Vakavampaa konepäällikön komentosillalla olossa on se, että hän käytännössä vei tutkapaikan vahtipäälliköltä ja siten vahdista vastuussa oleva henkilö ei voinut toteuttaa päätehtäväänsä eli valvoa aluksen turvallista kulkua. Konepäällikön toiminta ja vahtipäällikön voimattomuus poistaa asiattomat henkilöt komentosillalta viittaavat siihen, että aluksen johtamisessa on kyseenalaistettavaa.

Onnettomuustutkintakeskus suosittaa sivulla 37 Luotsausliikelaitosta laatimaan "luotsaussuunnitelman" Kotkan ja Orrengrundin, joka noudattaisi merikartan väylälinjausta. Ottamatta kantaa siihen mitä "luotsaussuunnitelmalla" tarkoitetaan (vrt. reittisuunnitelma) Finnpilot toteaa, että vastuuviranomaisten (Trafi ja Liikennevirasto) kanssa etsitään parhaillaan väyläratkaisua, joka noudattaisi nyt käytössä olevaa luotsaustapaa, koska tämä tapa on koettu käytännössä turvallisemmaksi mm. siksi, että käännösten määrä on minimoitu. Asian selvittäminen on kesken ja nyt odotetaan Liikenneviraston näkemystä siitä voidaanko väylä oikaista ilman suuria rakennuskustannuksia. Asian ollessa kesken ei Finnpilot näe tarpeelliseksi ohjeistaa mitenkään nykykäytännöstä poikkeavasti luotsejaan.

Lopuksi Finnpilot esittää käsityksenään, että tämä onnettomuus olisi voitu välttää, jos alusta olisi johdettu jämäkämmin. Päällikön tulee luoda alukseensa kulttuuri, jossa ylimääräiset häiriötekijät suljetaan pois ja alusta ajetaan niitä reittejä pitkin, joita päällikkö on suunnitellut. Tällaisiakin hyviä kulttuureja on aluksilla, jotka ajavat Suomen satamiin Finnpilotin luotsien avustamana. Finnpilotin luotsit ovat kykeneviä mukautumaan aluksen haluamiin reittisuunnitelmiin, jos niillä ei vaaranneta aluksen turvallisuutta, mutta ilman mitään signaalia päällikön halusta poiketa normaalista käytännöstä, ei luotsilla ole mitään syytä muuttaa alkuperäistä reittisuunnitelmaansa.

Helsingissä 30.9.2010

Luotsausjohtaja Kari Kosonen

Dear Sir,

Thank you very much for the subject final draft report.

Please find hereafter my comments:
Other then a few minor orthographical errors and a missing arrow in Picture 15 where it states "the arrow points the crack area...."; the draft report is well done and is acceptable.

Note: It is somehow regrettable that during the investigation, the Flag State Administration did not receive any copies of the correspondence exchange done by the Finnish authority.

Meanwhile the management (ISM) is not in Finland anymore, but in Italy and the question remains how the safety recommendation and corrective actions will be accounted for.

Jointly, our Flag State Administration and I, we will follow up on the recommendation and remind the ship masters their responsibilities when a pilot is present on board.

I would appreciate receiving a copy of your Final report.

Best regards

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