Investigation Report

C1/2008M

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

Translation of the original Finnish report

SUMMARY

OOCL NEVSKIY, GROUNDING SOUTH OF HELSINKI PILOT STATION HARMAJA ON 27.2.2008

The M/S OOCL NEVSKIY started her voyage from Helsinki to Kotka at about 12.20 pm on 27 February 2008. The vessel was carrying 349 maritime containers. The pilot departed the vessel southwest of Helsinki Pilot Station Harmaja while she gave leeway by turning eastward in the prevailing southwesterly wind. Shortly after the pilot had departed the vessel, both the pilot and the VTS noticed that the vessel was heading towards the Uusimatala shoal. Warnings were issued and actions were taken to stop the vessel, but despite of these, the vessel ran aground at an approximate speed of seven knots.

The M/S OOCL NEVSKIY ran aground on the Uusimatala shallow. The bottom of the vessel was damaged, and there was a minor leakage in her ballast tanks. There was no oil leakage to the sea. The vessel was inspected by divers, and it was decided to delay the salvage operation until the oil recovery vessel HYLJE arrived at the scene.

The vessel was refloated from the shallow by tugs, and they assisted her back to West Harbour in Helsinki for a more thorough inspection and for reparation of the damages in the bottom of the vessel. The M/S OOCL NEVSKIY continued her voyage to Kotka the following evening.

The cause of the accident was human error in navigation.

THE ABBREVIATIONS USED

AIS	Automatic Identification System
BRM	Bridge Resource Management,
ECDIS	Electronic Chart Display and Information System
NFU	Non Follow Up
IMO	International Maritime Organization
Lpp	Length between perpendiculars
VDR	Voyage Data Recorder
VTS	Vessel Traffic Service

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Figure 1. The OOCL NEVSKIY aground, the tender vessel AV-005 next to her. (© Rajavartiolaitos / Vartiolentolaivue)

FOREWORD

The Accident Investigation Board appointed on 7 April 2008 an Investigation Commission to investigate the grounding of the OOCL NEVSKIY. Captain Juha **Sjölund** was appointed as the Chairman of the Commission and Master of Science (Technology) Mikko **Kallas** was appointed as its member.

An Accident Investigator visited the vessel in order to hear the Master's and the crew's views about what had happened. These visits took place after the vessel had returned to West Harbour in Helsinki on the evening of the day of the accident, and again the following day.

The investigators were given a video recording from the Helsinki VTS. The recording contained the vessel's track and the radio traffic between the vessel and the VTS. The pilot was heard at the Accident Investigation Board premises, and a written report on the course of the events was received from him.

The damage descriptions are based on the report given by the Master to the Finnish Maritime Administration and on the documents drawn by the classification society. The Finnish Maritime Administration relieved the Master from the obligation to give a maritime declaration since the accident investigation had been commenced (Maritime Act 18, section 15).

The final draft of the report was sent for possible statements to the Master of the vessel, to the shipping company and to the pilot on 3rd December 2008. The Accident Investigation Commission has finalised the Investigation Report on the basis of the statements, and reviewed it when this has been considered necessary. The Investigation Report has been translated into English by Minna **Bäckman**.

1 EVENTS AND INVESTIGATIONS

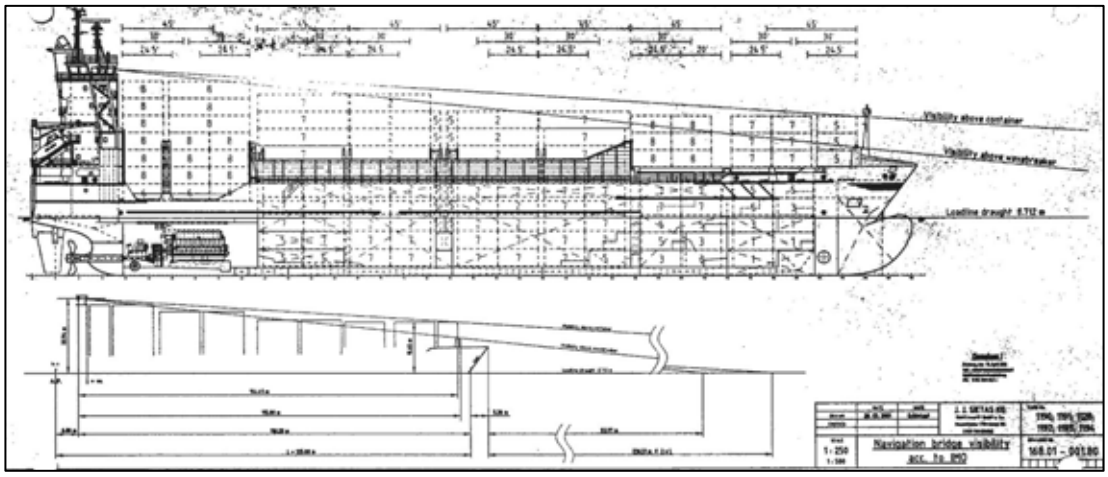

Figure 2. Navigation bridge visibility drawing.

1.1 The vessel

1.1.1 General information

The name of the vessel	M/S OOCL NEVSKIY
The shipping company	Reedereiverwaltung Rainer Drevin
Home port	Luxemburg
Place of registration	LU, Luxemburg
Register No.	0094895
IMO No.	9231834
Call sign	LXOY
Type	Container vessel
Number of crew	9 (Manning Certificate)
Classification society	GL, Germanischer Lloyd AG
Class	+ 100 A5 E3
Ice classification	IA
Year of construction	2001
Place of construction	J.J. Sietas Werft
Length	134.44 m
Lpp	124.41 m
Breadth	22.75 m
Draught	8.7 m
Gross tonnage	9,981
Deadweight	11,386
Engine power	8,400 kW
Engine.	MAK

1.1.2 Manning

The crew consisted of the Master, the chief officer, the officer, the chief engineer, the engineer, the boatswain, four able-bodied seamen, the motorman and the cook, i.e. 12 persons altogether. The crew members came from Germany, Romania, Turkey and the Philippines.

According to the Master of the vessel (born 1938), he had visited Helsinki several times during the last thirty years. The vessel visited Helsinki regularly, and according to the pilot, the vessel was already familiar to him.

1.1.3 The bridge and its equipment

Figure 3. The bridge on the OOCL NEVSKIY

There was a two-work-place bridge (Sietas Optimale Brücke) on the vessel, and it was fitted with modern bridge equipment. A Radarpilot Atlas 1000 radar display was located in front of the port place of work. At the starboard place of work there was a radar display similar to the one on the port side, as well as an Atlas Chartpilot ECDIS display, where the Microplot Mariner 7 programme was running.

Non Follow Up (NFU) control units for rudder were located on the middle console of the bridge in such a way that each place of work had its own control units. The thrusters at the bow and at the stern of the vessel were manoeuvred from the driving levers located in the middle of the middle console. The rudder manoeuvring buttons were located at the rear side of the console. There was a rudder angle display both in the ceiling and in the upper part of the middle console.

The engine order transmitter was located on the console to the right of the starboard place of work.

There was a NFU controller, levers for the manoeuvring propellers and an engine order transmitter on both bridge wings.

1.1.4 Cargo

The vessel was carrying 349 maritime containers. The cargo did not restrict the visibility significantly from the bridge. The cargo did not contain any dangerous substances.

When the accident occurred, there was 66.5 m^3 diesel oil and 550 m^3 heavy fuel oil on-board the vessel.

1.2 The accident event

The description of the events is based on the reports of the Master and the pilot and on VTS recordings.

1.2.1 Weather conditions

The visibility was good. Southwesterly wind, approximately 11 m/s with gusts of 14 m/s.

1.2.2 The accident voyage and preparations for it

The OOCL NEVSKIY was at the Melkki quay in the West Harbour in Helsinki, and the pilot arrival had been ordered for 12 o'clock. The vessel had written standard route plans for the voyages betweens its ports of call. The standard route plans had been drawn from one pilot boarding place to the following one due to the several route possibilities when manoeuvring into ports.

The pilot arrived to the vessel at 11.15 when the loading operations were still underway. While waiting for the crew to arrive to the bridge, the pilot switched on the radio telephones on channels 71 (VTS) and 12 (port) and made sure that the gyrocompass of the vessel showed correct readings. As to radio traffic, the pilot received the information that the wind direction was 220° and speed 10–12 m/s. Because the wind had mainly been from south already the previous day, the pilot decided that the vessel would depart west of Harmaja so that the pilot could depart the vessel off Helsinki Pilot Station Harmaja.

The Master and the chief officer arrived to the bridge at about 12.20, and the pilot gave the vessel departure notice by radio to the VTS and the port. After this he moved to the port wing of the vessel, told the Master about the prevailing weather and agreed with him on how to manoeuvre the vessel out from the quay.

The Master manoeuvred the vessel from the quay and the pilot took the vessel to manual steering as its bow pointed towards Pihlajasaari. At this stage the pilot sat at the vessel’s port manoeuvring place, and the Master went next to him to the starboard manoeuvring place to use the engine. At Pihlajasaari the pilot told the Master that due to the prevailing sea, the vessel would be outbound west of Harmaja; the vessel would be turned off Harmaja to make lee to the pilot vessel and the pilot would depart the vessel. The Master acknowledged this by saying: ”OK, no problem.”

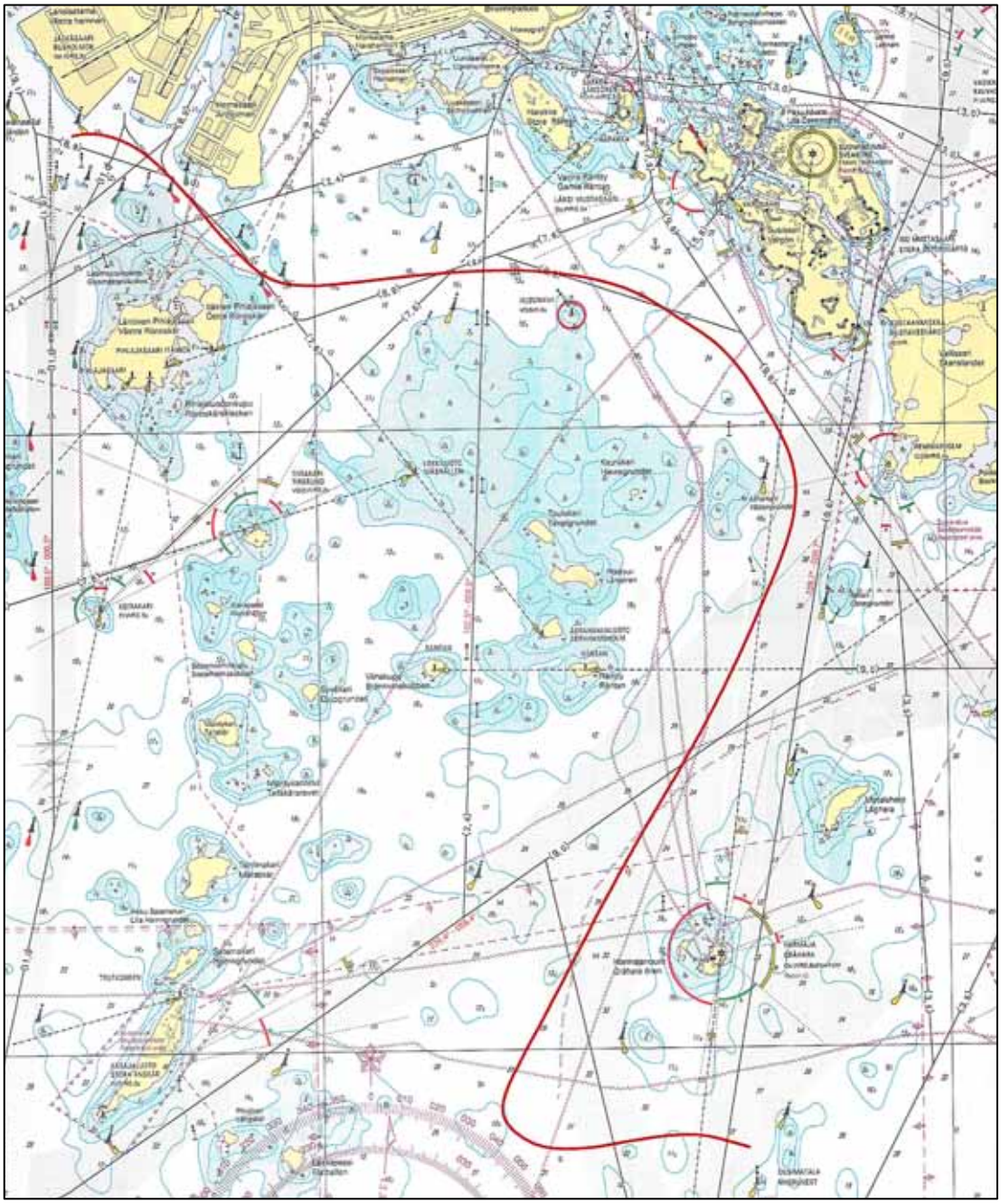

Figure 4. The OOCL NEVSKIY's route from West Harbour to Uusimatala.

When the vessel was passing Harmaja at 13.05 the pilot informed the VTS that he would depart the vessel and that the vessel would continue eastwards, towards Kotka, from the Helsinki lighthouse. The pilot provided the Master with the VTS information that there was no oncoming traffic and repeated the facts about the pilot departing the vessel. At the same time the pilot showed the locations of the Flathällgrund and Uusimatala border marks both from the window and on the radar which was located in front of the Master, and gave instructions on how to proceed after he had departed the vessel. After this the pilot made sure that everything was clear – the Master's answer was affirmative – and switched the vessel to automatic steering on course 090°. The Master however

reported that he would take the vessel into manual steering. The pilot departed the vessel at about 13.15, and nothing remarkable happened during the procedure. The Master and the officer remained on the bridge.

The pilot followed how the vessel proceeded from the pilot vessel's AIS display and by looking back towards the vessel every now and then. After a couple of minutes he noticed that the AIS display indicated that the course of the vessel was 075° and the speed 10 knots. In the pilot's opinion this led the vessel too much towards east, and he asked the VTS to inform the vessel about this. The VTS had also discovered that the vessel was drifting toward the Uusimatala shoals, so it called the vessel. After the call had been made twice, the vessel answered, and the VTS then asked "*could you take astern please… right away*" and gave the warning "*You are heading for shallow waters*". Almost immediately after this the VTS repeated the advice "*full astern please*", and the vessel complied with this. However, the manoeuvre did not prevent the OOCL NEVSKIY from grounding at a speed of approximately seven knots. According to the VTS recording, the vessel first touched the ground at 13:18:40 and then slid to the shoal.

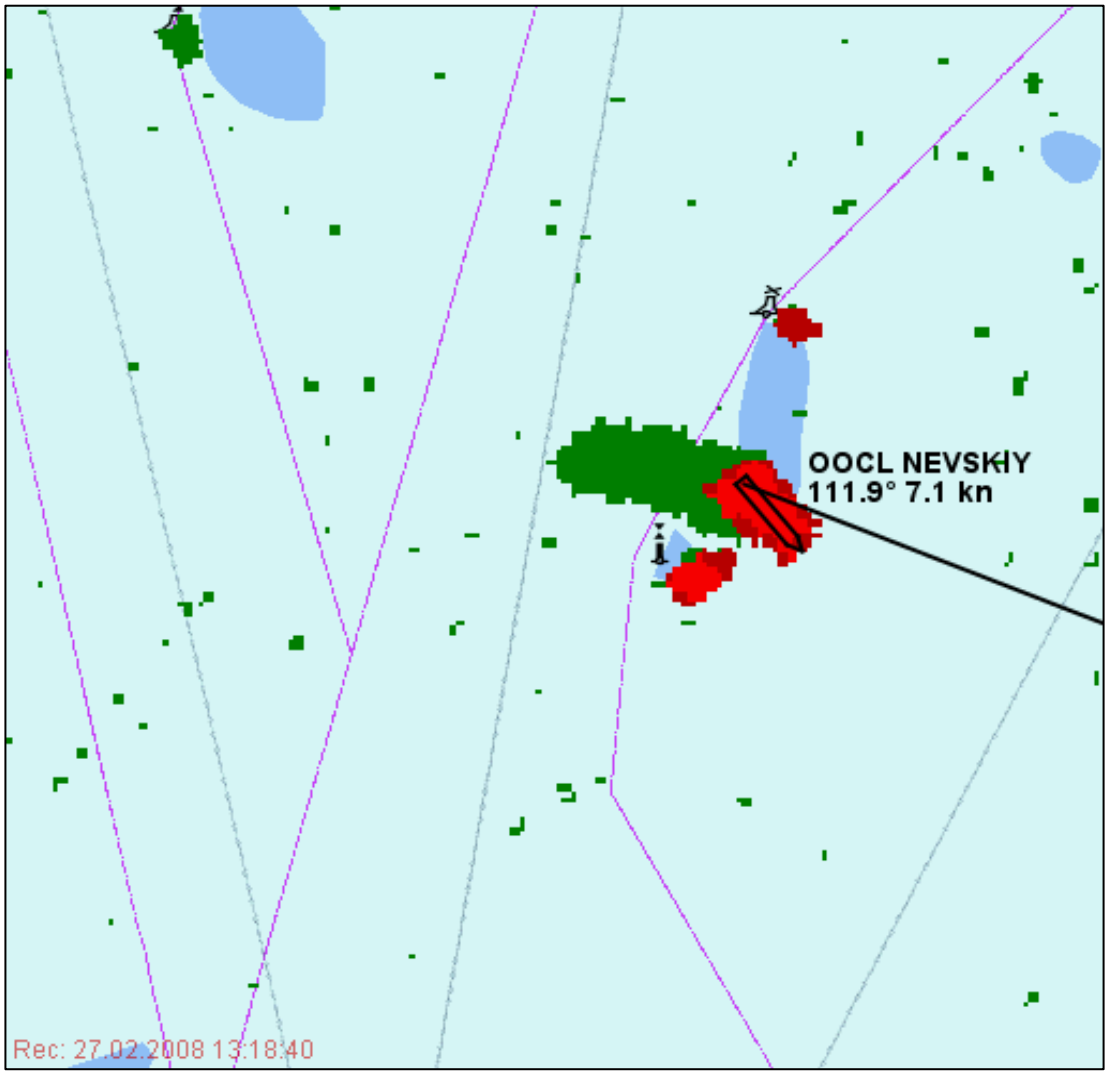

Figure 5. A picture of the VTS recording at the time of the grounding.

1.2.3 Measures after the accident event

The vessel stayed aground and there were no attempts to move it before divers had checked it for possible leakages and damages. After these inspections the vessel was refloated with the help of two tugs. The vessel then proceeded to Hernesaari Quay for closer inspections by using its own engine power.

1.2.4 Damages to the vessel

When the vessel was aground, divers checked the bottom of the vessel and discovered that the vessel did not leak oil to the sea and that there were no serious damages.

At Hernesaari Quay the divers inspected the hull of the vessel more thoroughly. Damages were detected in the bottom in an area which was limited between the frames 40-125 on the port side of the middle line. The damages consisted of several 30 cm dents and of tears, which were as large as 20 x 2 cm. Some of the tears were so deep that they reached through the bottom to the vessel's ballast tanks, and seawater was leaking into them.

The vessel’s cargo did not get damaged in connection with the grounding, and there were no leakages of fuel to the environment.

1.2.5 Registration equipment

The ECDIS system of the vessel probably recorded information about how the route had proceeded, but the crew onboard the vessel could not say where the information was registered and how it would be possible to recover it from the system.

There was no VDR on the vessel yet as the transition time to its obligatory use on vessels of this size is still uncompleted. According to the plans made by the shipping company, a VDR was supposed to be installed in connection with the following docking in April 2008.

1.2.6 The operation of the VTS and the supervision systems

The VTS followed how the vessel proceeded and the pilot informed in advance both about the departure from the port and about his plans to depart the vessel as well as about the vessel's subsequent route after he had departed the vessel. The communication between the VTS and the pilot took place in Finnish. After the pilot had departed the vessel, the VTS communicated with the vessel in English.

1.3 Rescue activities

1.3.1 Alerting activities

The VTS informed the Gulf of Finland Coast Guard about the accident, and they alarmed the patrol vessel MERIKARHU, a tender vessel from the Gulf of Finland Coast Guard Station and an Air Patrol Squadron helicopter. The Coast Guard also informed the Finnish Environment Institute, the Accident Investigation Board and a maritime inspector about the incident. The Finnish Environment Institute alarmed the oil recovery vessel HYLJE to the scene to ensure that a possible oil leakage would be gathered.

1.3.2 Commencing rescue activities and salvaging the vessel

Coast Guard divers checked the bottom of the vessel while she was aground. The vessel was aground midships on a shallow, which lay seven meters deep. No major damages were detected in the inspection so the shipping company concluded a salvage agreement with a towage company.

Measures to refloat the vessel were commenced when the oil recovery vessel had arrived at the scene at about 18.35. The maritime inspector and the Finnish Environment Institute duty officer gave their permission, and tugs refloated the vessel at 20.00. After the vessel was refloated, it proceeded to Hernesaari Quay in West Harbour using her own engines while the tugs followed to secure the transfer. Tender vessel AV-005 from Suomenlinna followed the operation and checked at the quay that there were no leakages from the vessel.

1.4 Completed special investigations

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

An Accident Investigator visited the vessel after the vessel had returned to West Harbour on the evening of the day of the accident and again the following day to hear the Master and the crew.

1.4.2 Actions taken by the crew

An alarm was raised on the vessel after the vessel had run aground, and the crew members assembled at stations corresponding to the muster list. The vessel was checked for leakages, but no leakages into the vessel were detected. No problems were detected in the vessel’s technical systems.

According to the chief officer, who acted as the ship safety officer, the actions taken in the alarm situation went well because a drill had been carried out on the vessel a bit earlier. The initial situation then had been a grounding followed by a leakage in the vessel's hull.

1.5 Rules and regulations guiding the operations

1.5.1 National legislation

The regulations on pilotage are stated in the Pilotage Act (940/2003).

VTS operations are governed by the Vessel Traffic Service Act (623/2005) and by the Government Decree on Vessel Traffic Service (763/2005). The vessel traffic services defined in the Vessel Traffic Service Act include giving information, navigational assistance and vessel traffic management. The Act comprises e.g. the regulations stating the vessel's responsibility to participate in vessel traffic services. In addition to this, the Act comprises regulations on the Master's responsibilities and his/her obligation to give notices about dangerous situations and accidents at sea.

The Government Decree on Vessel Traffic Service lays down the competencies of the vessel traffic service personnel and the VTS authorities' obligation to make notifications as well as the contents of the notifications on dangerous situations and accidents at sea.

1.5.2 Regulatory decisions and instructions

The Master's Guide of the Gulf of Finland VTS Centre[1] describes the activities of the VTS centres e.g. in the following way:

Notifications

In notifications to vessels the VTS authority issues information about:

1. Other vessels in the area
2. Matters related to changes in the VTS area and traffic operations
3. Weather and ice situation and water level
4. Pilot and ice-breaker operations
5. The condition and useability of the fairways and safety equipment
6. A dangerous situation threatening the vessel
7. Other matters affecting the safe navigation of the vessel

Navigational assistance

As navigational assistance the VTS authority issues:

1. Information about the vessel's course and speed
2. information about the vessel's position in relation to the navigation line or the turning point corresponding with the VTS route plan
3. information about the position, identification information and intentions of the vessels in proximity; and
4. a warning to a certain vessel

[1] http://www.fma.fi/toiminnot/meriliikenteenohjaus/master/MASTERS%20GUIDE_Suomenlahti_VTS.pdf

2 ANALYSIS

2.1 Pilotage

Extract from the Pilotage Act 940/2003, Section 9:

> *The pilot can, by agreement with the Master of the vessel, board the ship or leave the ship outside the pilot boarding point of the fairway if required by the weather or ice conditions. The Vessel Traffic Service must be notified of this.*

The present instructions and regulations on the pilot departing a vessel give the pilots the possibility to decide where and how they depart the vessel on a case by case basis while taking the safety of both the vessel and their own pilot vessel into consideration. There are no official criteria defined as to choosing the place where the pilot departs the vessel in various conditions. For example the weather, the vessel's drift, wind surface and the width of the berth in the area in question are used as criteria. Taking into account the situational factors permitted in the instructions is a precondition for the vessel traffic running smoothly also in more demanding conditions. The fact that the criteria and minimum limits are not defined can nevertheless result in guaranteeing the fluency of vessel traffic at the cost of reducing the safety margins.

2.1.1 Pilot departing practices

Pilots have to decide where and how to depart a vessel on the basis of weather conditions without having standards to support them in their decision-making. Amongst themselves pilots have, however, tried to create standards and to standardize their practices. The investigation knows about five alternative pilot boarding and departing places in Helsinki (Figure 6). The official pilot boarding place defined by the Finnish Maritime Administration is two nautical miles south of Harmaja (Figure 6, area E). The pilot departing place situated north of Harmaja (Figure 6, area A) is used in strong southerly winds. The pilot departing place situated west of Harmaja (Figure 6, area B) is also used when there are strong southerly winds. The pilot departing place east of Harmaja (Figure 6, area C) is commonly used when the weather is fine. It is the most used pilot departing place. The pilot departing place D is also commonly used when there are strong winds blowing from south[2]. When needed, this place is used when the area outside the fairway in utilised. In addition to this, the pilot can also follow the vessel to the next port if there are no preconditions for departing the vessel in a safe manner.

[2] For example the M/S AURORA left the pilot at the same place as the OOCL NEVSKIY and run on the same ground 6.3.2000. Investigation Report 2/2000 M, published in a marine safety study 2/2004 M. The reason for the grounding was different than in this investigation.

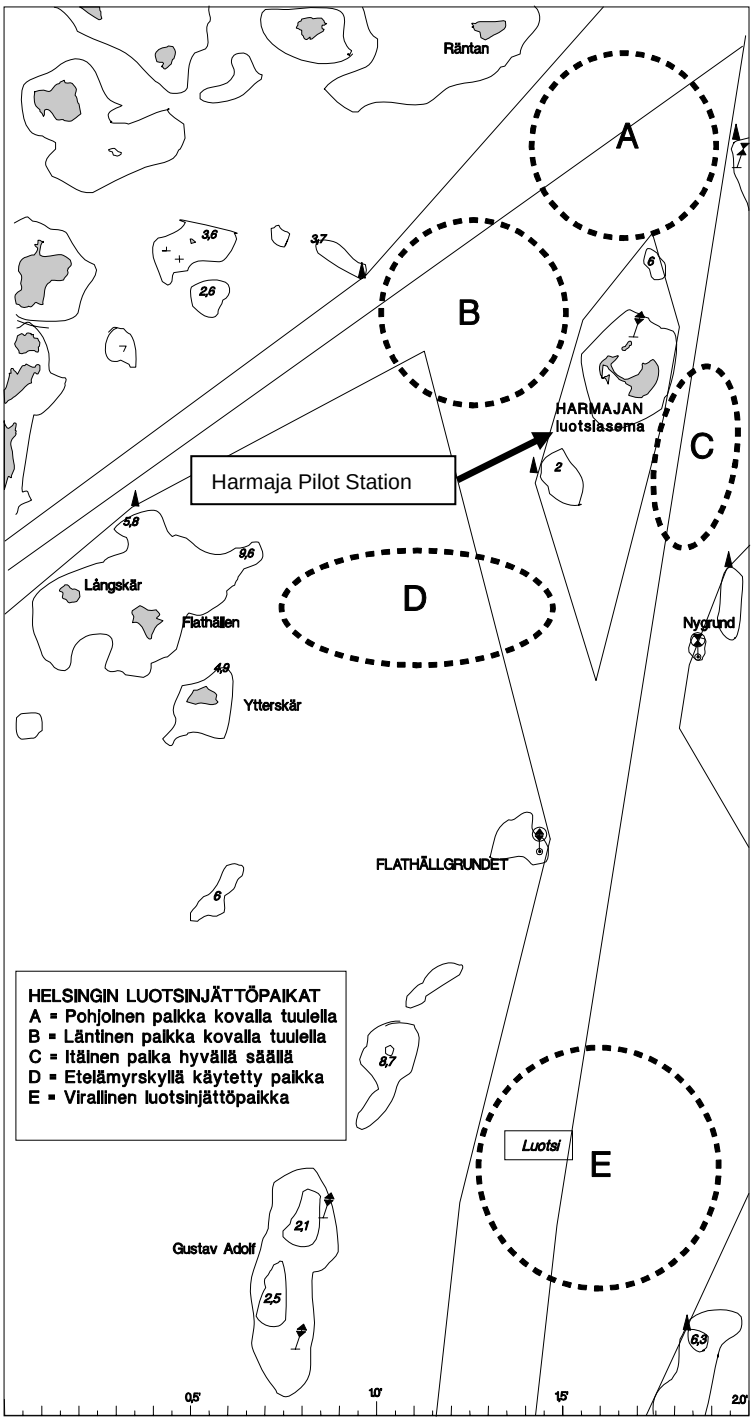

Figure 6. Pilot departing places in Helsinki. (Figure 3 from the AURORA Investigation Report)

According to the pilot, manoeuvring the vessel outward west of Harmaja has over the course of the years become an established practice when the winds blow from between south and west. Depending on the wind direction and speed and the seas, the vessel is manoeuvred to such a point (Figure 6, area D), where it is possible for the pilot to depart the vessel safely when taking into consideration his/her safety, and the safety of the pilot

vessel and the piloted vessel. According to the pilot, due to the topography of the area south of Harmaja the practice can be said to be such that even when the wind blows from southwest, the swell of the sea comes directly from south. Because of this it is almost imperative to turn the course of the vessel directly towards east before the pilot departs the vessel. If there is oncoming traffic between Harmaja and the Helsinki lighthouse, the vessels meet almost without exception port to port, which complies with the Collision Regulations. Also because of this, the western route of Harmaja is the only option when it is necessary to provide enough shelter, i.e. make enough lee, to the pilot vessel before the pilot departs.

According to the pilot, a pilot typically departs a vessel southwest of Harmaja (area D) when the wind blows from between south and west. This is because at the official pilot boarding place the roll of the sea is usually heavier and the swell of the sea follows the direction of the wind. According to the pilot, it is risky for the vessel to use the official pilot boarding place, because there is not very much space to make enough lee for the pilot vessel due to the narrowness of the fairway. Without enough lee the pilot vessel cannot stay safely alongside the vessel and it is almost impossible for the pilot to board the pilot vessel. In winter the pilot vessel is also at risk of freezing because of water splashes.

When studying the chart, it appears that there is plenty of space to make lee for the pilot vessel. However, it is possible that the area is felt to be narrow because the necessary lee cannot be made on the west side of the fairway, but the vessel has to be turned in the middle of the fairway and it drifts over the fairway to the “wrong side”. The return back to the fairway also becomes more demanding than in area D, where making lee and returning towards the fairway happens more naturally.

2.1.2 Preparations for pilotage and the pilotage

The pilot and the Master did not go through the route plan before the pilotage was commenced, and neither did they agree on where the pilot would depart the vessel. The Master first manoeuvred the vessel from the quay after which the pilot manoeuvred the vessel using manual steering. At Pihlajasaari the pilot presented the Master with a plan for departing the vessel. The plan was approved by the Master. The pilot was aware of the fact that the Master was experienced but fairly advanced in years to be working onboard. The pilot said that he had noticed that there were uncertainties in the way the Master handled the vessel, so the pilot explained the pilot departing procedure and the measures which followed it to the Master as accurately as possible. At Harmaja the pilot told the VTS about his plans with reference to departing the vessel. 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 vessel'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. The VTS called the vessel twice before it answered which consequently resulted in the loss of valuable seconds.

Table 1. The course of events and the radio traffic after the pilot had departed the vessel, based on the VTS recording.

Time	
13.14.23	The pilot vessel sets off from alongside the vessel, the course of the vessel 100°
13.17.01	The pilot contacts the VTS and asks whether the vessel has started to turn and mentions that the Master of the vessel is advanced in years. The course of the vessel is 79° and its speed approximately 11 knots.
13.17.13	The VTS calls the vessel.
13.17.22	The VTS calls the vessel again and receives an answer.
13.17.33	The VTS asks the vessel to back ("Could you take full astern… right away") and receives an unclear answer. The VTS mentions that the vessel is drifting to shallow water.
13.17.49	The VTS advises the vessel to put the engines "full astern"; the vessel immediately answers "full astern"
13.18.33	The VTS inquires the vessel about its speed and receives "Six knots and full astern" as the answer.
13.18.40	The VTS inquires about the situation onboard the vessel. The vessel reports that it has touched ground.

2.1.3 Measures after the pilot had departed the vessel

After the pilot had departed vessel, the Master changed the automatic steering into manual steering and the vessel turned as far towards port as to the course 075°.

After the pilot had departed, the vessel was presumably navigated on the basis of erroneous optical observations. The available compass, radar and electronic chart were probably not utilised. The Master said that the pilot had pointed out a navigation mark which was supposed to be left on the starboard side of the vessel. However, turning the vessel across the fairway made the situation unclear and most likely led to a situation where the wrong navigation marks were followed. The Uusimatala and Flathällgrund

border marks might have been mixed because the vessel had turned more to port than was intended in connection with the pilot departing it.

2.1.4 The route plans for the piloted sections

The STCW Code requires from the Master that the vessel has a route plan[3]. The matters which have to be taken into account in it are explained in the STCW Code section which deals with the training requirements of the masters and officers[4]. The Solas Chapter V, Regulation 34 requires that the vessel has a route plan for the whole voyage, and the IMO has given instructions upon route plans in its Resolution A 893(21) ”Guidelines for Voyage Planning”.

It is essential for the safe navigation of the vessel that a route plan is drawn also for the most demanding parts of the route, i.e. for coastal fairways. It is customary not to draw route plans for those parts of the fairway which are piloted if there are several route options between the pilot boarding place and the port. When drawing route plans for the piloted sections, it is customary to depend on the pilot having plans for the sections which they pilot.

The IMO has also paid attention to the fact that some of the vessels do not have route plans for those parts of the fairway which are piloted.[5] In the case which is now investigated, the vessel had route plans only for the sections between the pilot boarding places of its ports of call.

2.2 Bridge operations

2.2.1 The Master’s experience and qualifications

The Master was experienced and rather advanced in years to be working onboard (born in 1938). The Master did not have that much recent experience, only 3–4 voyages per year during the last couple of years. According to what the Master said, he had called Helsinki ”*since 1986 about 300 times*”. The previous visit to Helsinki had been a couple of months earlier.

There are no age limits when it comes to working onboard, so officially it is enough for a Master to hold a valid medical certificate and a Certificate of Competency. It is known that senses and reactions deteriorate when a person grows older. When a person is advanced in years, these matters should be carefully checked in a medical examination.

[3] International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, STCW CODE -95, Chapter VIII, Section A-VII/2, Part 2 – VOYAGE PLANNING
[4] STCW CODE -95, Chapter II, Section A-II/2, Table A-II/2
[5] For example FSI 16/6, Annex 2, 29 February 2008, Casualty Statistics and Investigations

2.2.2 Authority gradient and bridge cooperation

The officer said that he did not exactly participate in navigation, because the Master was on the bridge. Authority gradient[6] equals with the involved persons' reciprocal decision-making and authority relationship. A steep authority gradient equals a situation, where the authority of the person making the decisions is so strong that none of the subordinates dares to put forth his/her own opinions. A descending or even negative authority gradient dominates in situations, in which a nominally responsible person makes the decisions purely based on what the others say. The optimal gradient with reference to functional and effective co-operation lies between these two extremes. It must be possible to question the validity of orders and actions which are felt to be faulty or wrong, but the authority relationship must still remain clear enough. For example the various parties' cultural background and conceptions of their own and the others' experience, manner and official rank or other position have an effect on the authority gradient.

In the accident now under investigation, the authority gradient might have been too steep with reference to safe operations. It might have become steeper due to the fact that the person who acted as the Master held an important position in the shipping company. Thus it might have been difficult for the vessel's crew to interfere in his actions. The threshold to interfere might also have been higher because of the Master's many years' experience compared to watch officer (age difference about 40 years) in working at sea and the fact that the Master in question does not normally sail with this vessel's crew.

BRM courses which have been developed to improve bridge cooperation concentrate to team work, team establishment, bridge communication, decision making and resource control. BRM focuses on the attitude to various stressful situations and risk management.

2.3 Assessing the rescue activities

The VTS quickly took care of alarming the coast guard, who then started to alarm other parties and necessary rescue equipment to the scene of the accident. The duty helicopter of Air Patrol Squadron, patrol vessel MERIKARHU and the tender vessel AV-005 from Suomenlinna were summoned to the scene. Information about the accident was quickly conveyed also to the Finnish Environment Institute, to the Accident Investigation Board and to a maritime inspector. The MRSC alarmed divers to check the bottom of the OOCL NEVSKIY for possible leakages, and the Finnish Environment Institute alarmed the oil recovery vessel HYLJE to perform possible oil recovery operations. There was 66.5 m^3 diesel oil and 550 m^3 heavy fuel oil on the vessel so the grounding constituted an environmental risk.

The patrol vessel MERIKARHU arrived at the scene approximately 40 minutes after the grounding, so possible oil recovery measures could have been commenced fairly quickly had there been leakages from the vessel to the sea. The heavy fuel oil which was on the

[6] Human Performance & Limitations, Vapaavuori & Sorsa.

vessel was moved from the tanks midships to other tanks to reduce possible leakage quantities. The shipping company made a salvage agreement and the tugs ISO-PUKKI, KRAFT and HELIOS soon arrived at the scene. It took the oil recovery vessel HYLJE somewhat over five hours to arrive at the scene.

2.3.1 Rescuing the vessel

Coast Guard divers checked the bottom of the vessel while it was aground. No major damages were detected in the inspection so the shipping company concluded a salvage agreement. Measures to refloat the vessel were commenced when the maritime inspector and the Finnish Environment Institute duty officer had given their permission, and when the oil recovery vessel HYLJE had arrived at the scene at 18.35. The vessel was refloated at about 20.00, and proceeded to Hernesaari Quay in West Harbour using its own engines while the tugs followed to secure the transfer. The tender vessel AV-005 from Suomenlinna followed the operation and checked at the quay that there were no leakages from the vessel to the sea.

2.4 Assessing the VTS activities

The communication between the VTS and the pilot before the accident took place was carried out in Finnish, and the pilot conveyed the information with reference to navigating the vessel to the Master. Thus the Master got the information dealing with his vessel, but there was a minor time lag. According to the present practice, foreign vessels do not hold an equal position with Finnish vessels, because for example general information about the traffic situation is not necessarily conveyed in its entirety.

In accordance with its task description, the VTS warned the OOCL NEVSKIY about the shoal in English. However, the vessel did not react to the first attempts to communicate, and stopping the vessel was delayed.

2.5 Other accidents which have taken place in connection with a pilot boarding or departing a vessel

The M/S AURORA ran aground on 6 March 2000 on the same Uusimatala shallow as the OOCL NEVSKIY. By comparing the routes of the OOCL NEVSKIY and the M/S AURORA it is possible to notice that pilot departing took place according to a similar plan. In both cases the plan with reference to pilot departing was neither exceptional nor rare. These cases show that if disturbing factors occur during pilot departing or after that, the safety margins are minor when the vessel is placed across the fairway with respect to the direction of traffic.

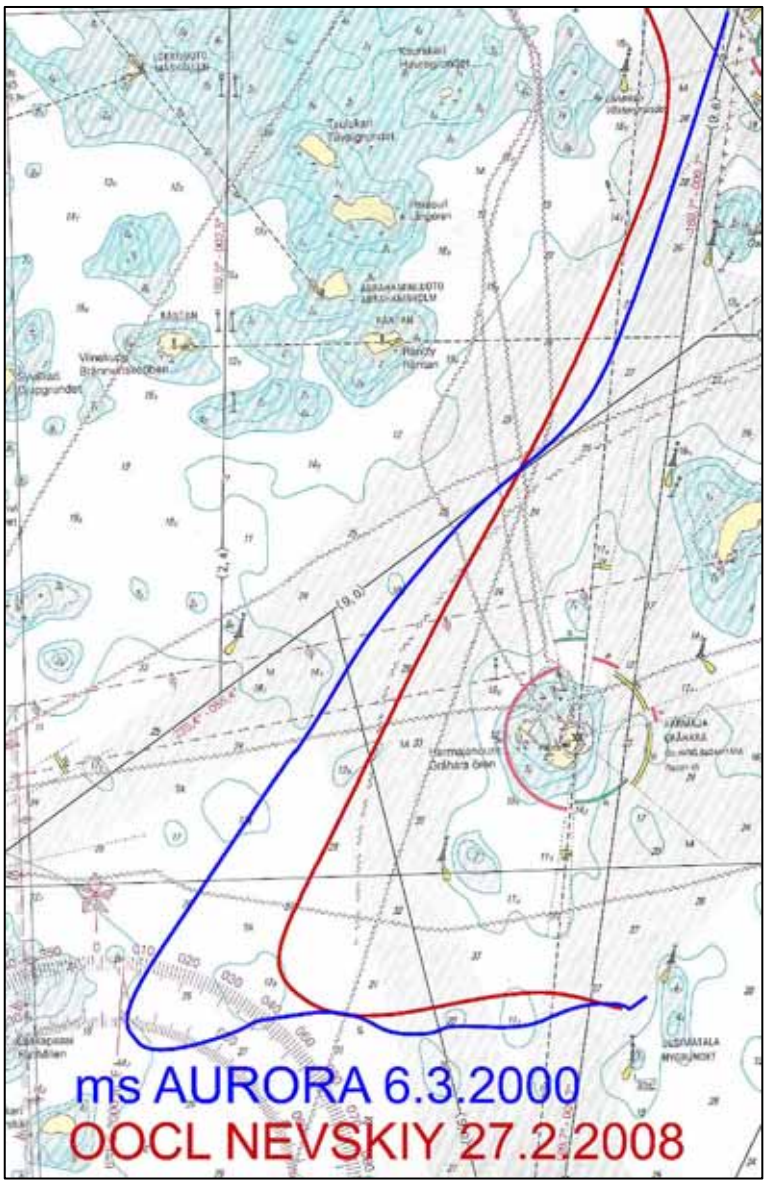

Figure 7. The OOCL NEVSKIY and the M/S AURORA.

Other accidents which have taken place in connection with pilot boarding or departing and which have been investigated by the Accident Investigation Board are the OCEAN PRIDE in Orrengrund 6th March 2000, the ANNE SIBUM also in Orrengrund 2nd April 2008 and the TALI in Norway 29th January 2008.

Even though the reasons for the cases are different, the common factor for all of them is that pilot boarding or departing has taken place at a point where the safety margins have been minor with reference to time. In these kinds of cases safety could be improved by giving the VTS a more active role than now as the provider of navigational assistance.

3 CONCLUSIONS

3.1 The course of the event

1. The vessel left the West Harbour in Helsinki at 12.20 and the pilot noticed that the Master who is advanced in years manoeuvred the vessel with some uncertainty. The pilot and the Master had not yet at this stage discussed the unusual pilot departing place.
2. At Pihlajasaari the pilot informed the Master that he would depart the vessel before the official point southwest of Harmaja. The Master agreed with the plan.
3. The vessel passed Harmaja at 13.05. The swell of sea came directly from south and the wave height was 1–1.5 m. The pilot was more convinced than before that the vessel will be turned to course 090° before he departs the vessel. The plan with reference to the pilot departing the vessel was conveyed to the VTS, who informed that there was no oncoming traffic. The pilot conveyed this message to the Master and made thoroughly clear to him the measures in connection with the pilot departing the vessel as well as the measures after that. The Master said that he understood the pilot's instructions.
4. The pilot departs the vessel when the course showed 110.4°. The vessel however continued its turn until it reaches course 075°.
5. The VTS called the OOCL NEVSKIY 2 minutes and 40 seconds after the pilot had departed the vessel and warned the Master that the vessel was approaching a shoal and asked the vessel to back and a moment later to make "full astern".
6. In spite of the warnings and attempts to stop the vessel, it ran aground 4 minutes after the pilot had departed the vessel.

3.2 The causes and underlying factors of the incident

The official pilot departing place was apparently not safe for the pilot to depart the vessel in the prevailing weather conditions. The safest one of the other options would have been to follow the vessel to Kotka. However, in the prevailing circumstances that kind of decision might have been exaggerated, and as far as it is known, this option was not even considered. Furthermore, it is fairly difficult to assess how an experienced Master manages the measures to be taken after the pilot has departed the vessel, especially as the Master said that he had understood the pilot's instructions.

The place which was now used for pilot departing is commonly used when the wind blows from between south and southwest, but it has its own risks because the vessel is turned crosswise with respect to the direction of the traffic in the fairway. When it comes to the case in question, there were good grounds for choosing where and how the pilot would depart.

The safety role of vessel traffic service accentuates in the surveillance area when the vessel does not have a pilot onboard. Thus the cooperation with the vessel should be close before pilot comes onboard and after she/he has departed.

The cooperation on the bridge is important in navigation. All navigators on the bridge should follow closely the movements of the ship and the actions of the navigator in charge. There should be no “authority gradient” in the modern bridge cooperation. The Master has an important role when making this clear to the OOW.

When the pilot left the bridge, the second officer stayed there to assist the Master. The duties of the second officer also included navigation, but the second officer stated that he was not involved in it. It is generally known that it is difficult for officers to interfere in the actions of an experienced and considerably older Master. Thus insufficient bridge co-operation was a contributing factor in the accident.

The immediate cause of the accident can be concluded to be the human error in navigating the vessel.

3.3 IMO’s attention to problems concerning Pilot Boarding and Departing Areas

The IMO’s FSI Subcommittee (Flag State Implementation) Correspondence Group on Casualty Analysis has in its report (FSI 16/6) paid attention to the matter Pilot Departing Area (FSI 16/6, Chapters 7[7] and 8) based on accident reports which have been sent to IMO. One grounding related to the subject is attached to the report (FSI 16/6 Annex 2, case 5).

After discussing the previous case, the Casualty Statistics and Investigations Working Group at FSI 16 concluded in its own report (FSI 16/WP.1, Chapter 9) that according to Resolution 960(23), Annex 2, Paragraph 3, the competent pilotage authority should define and bring into force safe pilot boarding and departing places.

[7] ”There has been reported marine casualties both in previous analyst reports as well as for FSI 16 where the pilot left the ship before the pilot boarding area was reached. This was done without ensuring the instructions given to the captain was fully understood. “

4 RECOMMENDATIONS

The Investigation Commission does not issue any recommendations on account of the OOCL NEVSKIY's accident.

There have been several accidents and close calls in connection with a pilot boarding and departing a vessel. The Accident Investigation Board follows the development of the situation according to the reporting of the Finnish Maritime Administration's Vessel Traffic Service.

Two other accidents involving pilot departure are currently under investigation by Accident Investigation Board of Finland, *MS ANNE SIBUM, grounding at Orregrund 2.4.2008* and *MS TALI, grounding in Norway 29.1.2008*. When these investigations have been completed safety recommendations will be considered on this topic.

Helsinki, 18 February 2009

Juha Sjölund

Mikko Kallas

LIST OF SOURCES

1. List of Actions by the Gulf of Finland Coast Guard 27.2.2008

2. A written report by the pilot 27.2.2008

3. Investigation Report C2/2000M ms AURORA, Dangerous Incident and Grounding South of Helsinki Pilot Station Harmaja 6.3.2000

4. Helsinki VTS recording of the events

5. Marine accident report

6. Germanischer Lloyd, inspection report 28.2.2008

7. Crew list

8. The investigators' own notes and photographs