



## **Casualty Investigation Report CA 75**

**Grounding of Isle of Man registered vessel City of Sunderland  
at the Port of Hanko, Finland on the 1<sup>st</sup> January 2002**

***Isle of Man Government Marine Administration***

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## **Index of Titles**

**Part 1 - Summary**

**Part 2 - Details of the Ship**

**Part 3 - Sequence of Events**

**Part 4 - Comments and Analysis**

**Part 5 - Conclusions**

**Part 6 - Recommendations**

**Part 7 - Submissions**

**Part 8 - Appendices**

**Part 9 - Acknowledgements**

## Part 1

### Summary

- 1.1. On the evening of the 1<sup>st</sup> January 2002 the Isle of Man registered ship “City of Sunderland” 9576 Gross Tonnage grounded on the southern part of Vastertistron Island at 1926 hours ship’s local time (GMT +1), 2026 hours Finnish local time. The Island lies to the south of a group of islands in the approaches to the Port of Hanko, Finland. The ship’s position given at the time of grounding was recorded as 59 degrees 47.1 minutes North, 022 degrees 54.29 minutes East.
- 1.2. The ship was under pilotage at the time of the incident, attempting to come out of the port and return to a safe anchorage after failing to berth at Hanko Ro-Ro No.2. berth, with the assistance of the tug “Ajax”. The weather conditions deteriorated from the time of picking up the pilot to the attempt at berthing and the outward passage to the time of grounding. The wind was estimated to have varied between east to south south east 30 to 40 knots, the temperature was minus 8 degrees celsius, there was light icing in the harbour area and in the channels, the visibility was reduced by snow showers.
- 1.3. The route taken to return to the anchorage was different from the normal main channel approach to the port. The ship was led by the tug “Ajax” made fast from the bow as it proceeded outwards. The tug used its searchlight to identify buoys in the channel. When the swell and sea state increased so much as to affect the tug maintaining way it was let go. The ship continued down the channel on her own at full speed. Shortly after an alteration of course to port to avoid a buoy close to starboard, the ship grounded.
- 1.4. The pilot informed the Finnish Coastguard Rescue Centre. The ship’s crew were mustered and soundings taken in and around the ship. Ingress of water was reported from tank manhole covers and in an Engine Room double bottom. A Finnish Coastguard helicopter arrived on scene at 2240 hours and landed an officer who took alcohol breath test readings from the Master, Pilot and Helmsman. The results of these alcohol test readings have all proved to be negative. Another Coastguard Officer was landed onto the ship to co-ordinate communications with the shore authorities.
- 1.5. In the early hours of the following day Wednesday the 2<sup>nd</sup> January 2002 the “City of Sunderland” was attended by the Finnish Coastguard rescue ship “Merikarhu”. Later in the morning the oil pollution prevention ship “Halli” arrived and stood by. Meanwhile preparations were underway to begin a salvage operation. When confirmation was received that the owners had signed Lloyds Open Form the salvage team met to discuss the operation. On Thursday the 3<sup>rd</sup> January 2002 after shifting cargo and de-ballasting two tugs assisted in attempting to pull the ship off the rocks. The “City of Sunderland” was re-floated at 1640 hours local time ( GMT +2 ). The ship was towed from the grounding position to the Port of Hanko and berthed without further incident at 2042 hours The pollution control ship remained moored close by during the night and following day.
- 1.6. No injuries were reported amongst the crew of the “City of Sunderland”. No oil pollution or environmental damage was reported from the ship. The ship received extensive damage to her shell plating in way of three double bottom tanks, duct keel and propeller blades.

## Part 2

### Details of the Ship

- 2.1. The “City of Sunderland” is a Ro-Ro car carrier fitted with seven individual car decks. The ship operates mainly in North West European waters and the Baltic.
- 2.2. The ship was built as hull number 2761 at the Shin Kurushima Dockyard, Ehime, Japan in 1992/93 and was delivered to the owners Manx Car Carriers on the 2<sup>nd</sup> March 1993. The ship was registered in the Isle of Man on the 6<sup>th</sup> April 1993. The technical managers of the ship are Anglo Eastern Ship Management ( UK ) Limited ( formerly Denholm Ship Management Limited ). The managers operate a subsidiary office in the Isle of Man with respect to the ship’s manning.
- 2.3. The ship is manned by British officers and Polish ratings, the Safe Manning Certificate is issued for a total of 11 crew. At the time of the incident there were 11 crew on board.

IMO Number	9046356
Official Number	723606
Call Sign	MQPU 6
L.O.A.	99.92m
L.B.P.	94.00m
Breadth Moulded	20.60m
Depth Moulded	9.20m
Gross Tonnage	9576 Tons
Nett Tonnage	2872 Tons
Lightship	3318
Deadweight	2402
Summer Draft	5.019m
Machinery	Diesel - B & W 7L35MC
Power	4120 kW @ 210 rpm
Propeller	Single screw with a Schilling rudder unit
Bow Thrust Unit	Kamewa 430 kW @ 7.0 tonnes
Service speed	15.00 knots
Classification	Lloyds Register +100A1 Ice Class 1A + LMC UMS
Draft	Forward 4.10m, Aft 5.20m

### Part 3

#### Sequence of Events

- 3.1. The “City of Sunderland” had been in the Port of Copenhagen, Denmark from the 28<sup>th</sup> to 31<sup>st</sup> December 2001, discharging a part cargo of motor vehicles. The ship departed from Copenhagen at 0812 hours local time ( GMT +1 ) on passage for Hanko, Finland. The passage was to take approximately 1 day 8.5 hours at 15.00 knots. The Master had visited the Port of Hanko on several occasions in the past.
- 3.2. On the following day the 1<sup>st</sup> January 2002, the 2<sup>nd</sup> Officer arrived on the bridge to commence his 1200 / 1700 hours watch. The weather at this time was overcast with passing snow showers, the wind south westerly force 6, with a moderate sea and swell. The Master was standing his watch 0800 / 1200 hours. After handing over the Master departed and the OOW continued with his watch without incident. The normal procedure was to contact Hanko pilots 3 hours prior to arrival. The OOW made repeated attempts to make contact by VHF for approximately one hour, he was finally successful at 1515 hours. He advised the Pilots the ship’s estimated time of arrival (ETA) at the designated pilot boarding area south of Hanko No. 6 buoy to be 1715 hours. The OOW was advised of the current weather situation, wind direction 160 degrees 14 to 17 metres per second ( 28 to 33 knots ) with light icing in the harbour. The OOW was requested to rig the pilot ladder on the starboard side.
- 3.3. The Master arrived on the bridge at 1600 hours and the OOW appraised him of the situation with regard to ETA, weather and which side the pilot ladder was to be rigged. The weather recorded in the deck log book for 1600 hours was, overcast with frequent heavy snow showers, moderate beam sea and swell, wind south south east force 6 to 7. At 1618 hours notice was given to the duty engineer officer of 30 minutes to end of passage and the OOW began the pre-arrival checklist. Ten minutes later the OOW altered the ship’s course to 024 degrees following the passage plan in order to make good a course for the final alteration position and approach to Hanko. The Bosun contacted the OOW to advise that the starboard accommodation and pilot ladder combination could not be rigged due to the high winds on the starboard beam. He was advised to hold off until the next alteration of course which would place the wind astern. Meanwhile at 1630 hours the anchors were cleared for arrival and steering modes were tested.
- 3.4. At 1645 hours the Master took over the con of the ship advising the OOW. The ship was put onto hand steering and the engine speed was reduced from full sea speed to full ahead on the telegraph setting. End of passage was recorded at 1654 hours as the ship altered course and steadied onto a heading of 327 degrees, the approach course to the pilot boarding area south of Hanko No.6 buoy. At the same time the OOW advised the pilot station the ship was passing Hanko No.1 beacon abeam. The Pilot advised the ship that due to the weather conditions he would board the “City of Sunderland” to the north of Gustavsarn Island where the ship could provide the pilot launch with a good starboard lee. The Pilot advised the Master that the “Superfast Ferry” was to sail from Hanko West Harbour at 1730 hours.

At 1700 hours the Chief Officer relieved the OOW who advised him of the current situation with regard to the pilot boarding, the Master had the con, and the visibility was reduced to less than a mile in the snow showers. The OOW's last duty was to mark the course recorder for arrival at Hanko before leaving the bridge.

- 3.5. The Pilot boarded the "City of Sunderland" at 1736 hours ship's time (GMT +1 and 1836 hours local time ). After the exchange of information between the Master and Pilot, pilot card and ship's characteristics, the Pilot enquired if the Master had ordered a tug. The Master answered no, however, after a brief conversation the Pilot ordered a tug. He advised the Master there would be a delay as the tug was assisting the "Superfast Ferry" leaving Hanko West. The Master and Pilot took this opportunity to discuss which berth was available for the "City of Sunderland". The Pilot advised there were two choices, it was agreed with the Master to berth port side to and stern onto the westerly Ro-Ro Berth No.2.
- 3.6. Meanwhile, the "City of Sunderland" maintained position between Gustavsvärn Island and Hanko No.5 buoy. The weather continued to deteriorate during this delay and the wind was estimated to be between east and south east, 30 to 40 knots. The tug "Ajax" arrived after the "Superfast Ferry's" departure and took up station on the starboard side of the "City of Sunderland". On the approach to the narrows between the Pilot Station at Tulliniemi and the island of Tullisaari the Master called the crew to standby, the Chief Officer left the bridge and proceeded aft to his station, the Bosun and other crew went forward.
- 3.7. At approximately 1820 hours the "City of Sunderland" swung to port off the entrance to No.2 Ro-Ro Berth. The Master was on the port wing of the fully enclosed bridge using the telegraph remote control and requesting information from the Chief Officer stationed aft, as the Pilot relayed his instructions. The ship manoeuvred astern towards the berth using full port bow thrust, the schilling rudder being angled up to 65 degrees and with the tug assisting on the starboard side, but not made fast. Midway into the manoeuvre the effect of the wind caused the ship to fall off to starboard towards the western jetty. The Pilot ordered the tug to come around to the forward port side, also to avoid being trapped between the ship and the jetty. The "City of Sunderland" landed on the dolphins of the Western jetty at 1827 hours and was pinned by the weather conditions. The Master told the Pilot the ship would require a second tug before making any further attempt to berth in Ro-Ro No.2. The Pilot advised the Master it would be 6 to 7 hours before another tug could assist, because it would have to come from Helsinki.
- 3.8. The tug "Ajax" was made fast forward through the forecandle centre lead using two of the ship's ropes at 1842 hours. The Pilot was communicating in Finnish with the tug. The Chief Officer still aft informed the Master the ship should be moved astern to lie better on the dolphins to avoid damage. Without consulting the Master on a proposed plan of action, the Pilot ordered an ahead engine movement, the Master controlling the telegraph, and the "City of Sunderland" was towed out of the dock and off the western jetty at 1857 hours. The strength of the wind made it impossible to swing the ship to port and bring her head to wind. The Master enquired of the Pilot what his intentions were and he answered he was taking the ship back to the "roads" to await the second tug. The Pilot with the tug's assistance manoeuvred the "City of Sunderland" off to starboard and proceeded down the Western Channel out towards the anchorage area. The "City of Sunderland" cleared the mole at the southern end of the jetty at 1900 hours and the Master ordered the Chief Officer to finish aft and come to the bridge.

The Master had never passed this route before but decided to rely on the Pilot's local knowledge. The weather continued to deteriorate, with heavy snow falls being driven by a strong to gale force east south east wind, which affected the visibility.

- 3.9. The "Ajax" secured on a short tow was ordered to assist with keeping the "City of Sunderland" in the channel as she manoeuvred slowly. The ship continued down the channel on a west south west course passing the Kistskar islands to starboard. The ship then turned to port with Granskarsharun island Racon ahead to come round onto a south easterly course. The "Ajax" was using its searchlight to pick out the channel cardinal buoys and beacons.
- 3.10. As the ship manoeuvred down the westerly channel the Chief Officer returned to the bridge where he took over the helmsman's duties. The rating was ordered to re-direct the ship's port overside floodlight to act as a searchlight to assist the Pilot. He returned to steering duties relieving the Chief Officer who asked to leave the bridge to change his wet clothing. The pilot was having difficulty navigating the channel in the reduced visibility and complained to the Master about the radar picture. The Master adjusted the controls on the radar leaving it on an appropriate range scale, however, the Pilot kept changing the range scales.
- 3.11. When the "City of Sunderland" steadied on her course down the south easterly channel the weather started to affect the tug's progress. The "Ajax" was having difficulty in maintaining her way in the increasing sea and swell. The Pilot ordered the "Ajax" let go at 1914 hours, however, the tug found its release mechanism was frozen and there was a delay while the tug's crew cleared the ice before the ship's ropes could be let go. The "Ajax" meanwhile manoeuvred around onto the "City of Sunderland's" starboard bow where she was finally let go at approximately 1924 hours. The Pilot ordered full ahead on the "City of Sunderland" as the "Ajax" cleared the ship's starboard bow. As she did so her searchlight shone on to a buoy very close to starboard. The Pilot ordered the helm hard to port to avoid the buoy and to keep the ship in the channel. He continued pacing up and down in the wheelhouse. The Pilot then looked again at the radar, complaining about the picture. Shortly afterwards the "City of Sunderland" touched bottom with a shudder and then came to a stop at approximately 1926 hours ship's time. The position of the "City of Sunderland" from the ship's GPS was given as 59 degrees 47.1 minutes north, 022 degrees 54.29 minutes east, and her heading as 066 degrees as she settled aground.
- 3.12. The Chief Officer was returning to the wheelhouse from his cabin as the ship shuddered and came to a halt. The Master rang the bridge telegraph to stop the engine which had been at full ahead. He ordered the Chief Officer to call the 2<sup>nd</sup> Officer. The Master marked the time of grounding on the echo sounder and recorded the ship's position from the GPS. The ship's emergency contingency plan for a grounding was put into operation. The Pilot called the Port Authority at Hanko and the Finnish Rescue Services. When the crew were mustered the Master ordered the starboard anchor to be let go. The Chief Officer took soundings and conducted an inspection around the ship, while the 2<sup>nd</sup> Officer assisted the Master on the bridge.
- 3.13. At 2010 the Engine room reported the ingress of water to No.2 Diesel Oil Tank and the Waste Water tank. The Chief Officer reported water leaking onto the Tank Top deck, in way of the Duct Keel and No.2 Double Bottom tank manhole covers. Frames 47 to 50 on the port side of the Tank Top deck were reported to be damaged. At about 2240 hours a Finnish Coastguard helicopter arrived on scene and landed an Officer on board the "City of Sunderland" who carried out breathalyser tests on the Master, Pilot and Helmsman.

- 3.14. The helicopter returned later and landed a Coastguard Communications Officer. At 0100 hours on the 2<sup>nd</sup> January 2002 the Coastguard Rescue ship “Merikarhu” arrived on scene and anchored off. She was joined later that morning by the oil pollution ship “Halli”. A salvage Master boarded the “City of Sunderland” in the morning and the Owners confirmed that a Lloyds Open Form salvage agreement was signed. A meeting was held late in the day to discuss the salvage operation. On the 3<sup>rd</sup> January 2002, the tug “Neptune” arrived and stoodby with the tug “Ajax”. On board the “City of Sunderland” the cargo was shifted and the fresh water tank, fore and aft peak tanks were de-ballasted to lighten the draft. The “City of Sunderland” was pulled off the rocks at 1640 hours and checks were made around the ship for pollution. The tugs towed the “City of Sunderland” around to the Port of Hanko where she arrived at 2042 hours.

## Part 4

### Comments and Analysis

- 4.1. The investigation set out to establish why a well found ship with experienced officers familiar with entry to this port and under pilotage should have grounded. The investigation examined the background of events leading to the grounding to determine whether there were any significant factors which may have contributed to the event. All times mentioned in Part 4 are ship's time unless otherwise stated.
- 4.2. The Master has served with Anglo Eastern Ship Management since 1992 in the capacity of 2<sup>nd</sup> Officer, Chief Officer and Master. He has served as a Master on both the City of Amsterdam and City of Barcelona which are similar sized car carriers to the City of Sunderland. He holds a United Kingdom Certificate of Competency issued under the provisions of the International Convention on Standards of Training and Watchkeeping for Seafarers 1978 as amended 1995, STCW under Regulation II/2. There are no applicable limitations applying to his certificate. He joined as Master 19 days previously on the 12<sup>th</sup> December 2001.
- 4.3. The Chief Officer has served with Anglo Eastern previously on the sister ship City of Barcelona. He is a former Chief Officer and Master of the Pegasus Bay. He joined the ship on the 24<sup>th</sup> December 2001, after a 5 month lay off due to a severe illness. He holds a United Kingdom Master of a Foreign Going Ship Certificate of Competency issued under the STCW 1978 convention. His 1995 STCW Certification application was being processed.
- 4.4. The 2<sup>nd</sup> Officer has served with Anglo Eastern since 1992 in this rank and has previously sailed on this ship and the sister ship City of Barcelona. He currently holds a United Kingdom Certificate of Competency issued under the provisions of the International Convention on Standards of Training and Watchkeeping for Seafarers 1978 as amended 1995, STCW under Regulation II/2 as Chief Mate. There are no applicable limitations applying for the rank of Officer of the Watch. He joined the ship on the 10<sup>th</sup> November 2001.
- 4.5. The helmsman was a Polish General Purpose Rating who holds a certificate in accordance with the provisions of the STCW Convention 1978 as amended 1995 under Regulation II/4. He therefore qualifies to undertake the duties of a navigational watch rating.
- 4.6. The Pilot was an employee of the Finnish Maritime Administration who is qualified to undertake pilotage duties for the Port of Hanko.
- 4.7. The passage plan was drawn up by the 2<sup>nd</sup> Officer. It was checked and approved by the Master prior to being implemented. The passage plan from Copenhagen to Hanko covered the normal passage procedures. This was supplemented by a pilot to berth plan which covered the voyage between the inner pilot station and the Ro-Ro berths Nos. 1 and 2. There were no deviation or contingency plans drawn up or indicated on the plan.

- 4.8. The weather contributed a pivotal role in the events leading up to the incident. Prior to arrival off the approaches to Hanko the weather recorded at 1600 hours ship's time was, moderate sea and swell, overcast with frequent heavy snow showers reducing visibility, wind south south east force 6 to 7, air temperature minus 6 degrees celsius. A gale warning and ice warning had been issued for many of the Baltic Sea areas including the Western Gulf of Finland area.

Extract from ship's Navtex unit:

*The 0700 hours GMT forecast for 1<sup>st</sup> January 2002 indicated the following prognosis, towards noon south east or east 15 m/s ( 30 knots ), tonight north east 18 m/s ( 35 knots ), snow at times with moderate to poor visibility.*

*The 1900 hours GMT forecast for 1<sup>st</sup> January 2002 indicated the following prognosis, south to south east 18 m/s ( 35 knots ) during the night backing north to north east and snowfall with poor visibility, the prognosis continued with, around noon decreasing to north to north east 9 m/s ( 17 knots ).*

The Finnish Meteorological Institute 1800 hours GMT prognosis weather map for the area of Hanko forecast winds of south east 35 knots. The Pilot station at Hanko, Tulliniemi only updated the Master on one occasion whereas the following data was available, and this may have only been passed to the pilot.

1535 GMT	w.s. average 17.5 m/s	w.s. maximum 20.5 m/s	wind direction 139 degrees
	( 34 knots )	( 40 knots )	
1635 GMT	w.s. average 17.7 m/s	w.s. maximum 22.0 m/s	wind direction 131 degrees
	( 34.5 knots )	( 42 knots )	
1725 GMT	w.s. average 19.1 m/s	w.s. maximum 21.5 m/s	wind direction 120 degrees
	( 37 knots )	( 41 knots )	

- 4.9. The 24 hour watch keeping routine on the "City of Sunderland" is made up of the following composition;

Master	0800 / 1200 hours and 2100 / 2300 hours
Chief Officer	0400 / 0800 hours and 1700 / 2100 hours
2 <sup>nd</sup> Officer	1200 / 1700 hours and 2300 / 0400 hours

- 4.10. The 2<sup>nd</sup> Officer took over his watch from the Master at 1200 hours. He was requested by the Master to contact the Hanko pilot station 3 hours prior to arrival with an update of the ship's eta. The OOW attempted to call Hanko pilots on the VHF at 1415 hours without success and continued for an hour before succeeding. He was advised of the current weather situation at Hanko which confirmed the wind at 28 to 33 knots. The Master returned to the bridge at 1600 hours where he was appraised of the current situation by the OOW. The Master also noted the latest weather forecast. At this point there was no discussion or decision as to whether the current weather conditions would necessitate a delay or postponement to berthing. He left the bridge for 15 minutes to prepare for berthing operations.

- 4.11. The pre-arrival checklist was commenced at 1618 hours when the OOW informed the Engine Room of 30 minutes notice to the end of passage. The main engine data logger was reported to be inoperable in the remarks column. Examination of the course recorder trace has found the unit to be inaccurate by 15 minutes and course steered trace to be out by as much as 10 degrees with the actual course steered by the ship. The OOW last duty was to mark the course recorder trace for the arrival at Hanko. Another of the items signed off was the berthing requirements agreed by the port/terminal. The Master had received a communication from the ship's agent at Hanko informing him the terminal operators requested the ship to be berthed port side to in No. 2 Ro-Ro Berth.

Extract from Company procedures:

*Company Form OP 22: Deck Telegraph Movement Book ( Bell Book )*

*Whenever the ship is manoeuvring the Company Form OP 022: Deck Telegraph Movement Book shall be maintained as follows;*

- *all orders on the telegraphs and the time of such orders shall be recorded, except when the automatic recorder is fitted and operational*
- *when proceeding under manoeuvring conditions, the progress of the ship and other notable events shall be recorded*

*In circumstances which might lead to an emergency, and in conditions of emergency it may be appropriate to record all helm orders issued and received, in which event, the Master and the Officer of the Watch shall ensure as far as circumstances permit that such entries are made.*

No crew were utilised to record the engine movements as cover for the faulty engine data logger.

- 4.12. At 1645 hours the Master took over the con of the ship. The steering mode was changed from automatic to manual, the General Purpose Rating took up his duties as helmsman. The end of passage was delayed slightly on the Master's orders and confirmed to the Engine Room at 1654 hours when the ship steadied on course 327 degrees. The position is recorded as a radar bearing and distance on the chart. The Master instructed the OOW to contact the Pilot station to advise them of the ship's latest position. This was when the pilot station first informed the Master he would have to proceed to the inner pilot station position. The Master asked the OOW to call Hanko pilots again when abeam of Hanko No.1 beacon. The ship passed abeam at 1700 hours. The Master was now advised by the pilot station to manoeuvre the "City of Sunderland" to a position north of the island of Gustavsvarn to pick up the pilot, this was due to the weather conditions. He advised the Master that the "Superfast Ferry" was due to depart from Hanko West Harbour at 1730 hours.
- 4.13. The Chief Officer arrived on the bridge at 1700 hours and relieved the 2<sup>nd</sup> Officer. The Chief Officer was advised of the situation including the fact that the visibility was reduced to less than a mile in the snow showers. Otherwise the visibility remained acceptable as the "Superfast Ferry" was observed leaving Hanko port by the Master and OOW.

- 4.14. There were only two more positions recorded on the approaches to Hanko, Admiralty Chart No. 3443, 1703 hours and 1720 hours. The Pilot to Berth passage plan commences in a position to the south south east of the charted pilot position on a course of 319 degrees indicated by leading lights. The “City of Sunderland’s” 1720 hours position indicates the ship had tracked to starboard of the intended course line by 3 cables. The course recorder trace indicates roughly four different courses completed on this leg. This would account for the manoeuvring of the ship while awaiting the pilot.
- 4.15. The largest scale Admiralty Chart No. 3437 was provided for use in the harbour approaches area, courses were prepared and laid off on the chart. However, no positions have been recorded to indicate the ship’s track at any time from when the ship arrived off Gustavsvärn through to the time of grounding.
- 4.16. The pilot launch met the “City of Sunderland” off Gustavsvärn Island and the Pilot boarded at 1736 hours. The Master exchanged information with the Pilot and he was given the pilot card to review. The pilot inquired as to whether the Master had ordered a tug. The reply was negative from the Master who commented, “if you feel we need one then we can order a tug”. The Pilot ordered the tug, he advised the Master it would be delayed as it was attending the departure of the “Superfast Ferry” The Sailing Directions Baltic Pilot Volume III Ch.4.63 states that tugs for the port of Hanko are available, there is no mention of type, how many, waiting or notice period. The Master said he took the opportunity of a delay to discuss the berthing plan with the Pilot. The Master was of the opinion that as the Pilot was the person undertaking the berthing he should choose the easiest option or berth available. The Pilot agreed to berth port side too therefore confirming the berth would be No.2 Ro-Ro Berth. The Master related to the Pilot the instructions from his agent confirming the berth as No.2 Ro-Ro Berth. It must be remembered the Master was also engaged in manoeuvring the ship at this time.
- 4.17. From the conversation it would appear neither the Master or Pilot consulted each other over the more critical problem, that of the deteriorating weather. Consideration should have been given as to whether or not the berthing operation could have been postponed. If the Master and Pilot had finalised the inward passage plan, the tactics to be used in the execution of the plan should have been decided. The one factor to take into account should have been the meteorological conditions. It was also important at this stage for the Master to consider whether any particular circumstance would have introduced an unacceptable hazard to the safe conduct of the passage. The other key element to have been considered in the exchange with the Pilot should have been a contingency plan outlining an alternative plan of action in the event of an emergency necessitating abandonment of the passage plan. The most obvious alternative plan of action being the return route of the inward passage, and then exploring whether any alternative routes were available.
- 4.18. The “City of Sunderland” by the very nature of her build is a high sided Ro-Ro ship which suffers strongly from windage. The ship’s data gives warning to the limitations of the bow thruster unit which states that the bow thrust ceases to be effective with 25 knots of wind on the beam. The bow thruster unit on this ship exerts a thrust equivalent to 7.0 tonnes at maximum output. The use of the schilling rudder unit ( maximum angle 65 degrees ) in conjunction with the main engine contributes a stern thrusting force. The sum of these forces acting in conjunction with the tug’s assistance should have been sufficient in total to overcome a fairly strong adverse beam wind when coming alongside No.2 Ro-Ro berth.

The Pilot Information Card is reproduced below for reference. A further extract of information is included which provides information on the indicated wind forces acting upon the ship's hull and superstructure.

M.v. City of Sunderland PILOT CARD		APPROVED BY MASTER
Locally controlled document no:30	Page 1 of 1	
Issue no:01	Revision No:0	Amendment No:0

PORT: <b>HANICO</b>		DATE: <b>01-07-02</b>	
DRAFT		FWD <b>4.10</b>	AFT <b>5.20</b>
MV CITY OF SUNDERLAND			
GROSS TONNAGE	<b>9576T</b>	NETT TNNGE	<b>2872T</b>
L.O.A.	<b>99.92M</b>	BREADTH	<b>20.60M</b>
MAIN ENGINE	<b>B&amp;W 7135MC X 1</b>		
PROPELLOR	<b>1 X SINGLE RIGHT-HANDED PROPELLOR. VERY RIGHT-HANDED WHEN GOING ASTERN.</b>		
RUDDER	<b>1 X SCHILLING MONOVEC MAX ANGLE 65 DEGREES</b>		
BOW THRUST	<b>1 X 585PS = 7.0MTONNES. EFFECTIVE RANGE FROM STOP TO 5 KNOTS. AT 25 KNOTS RELATIVE BEAM WIND THRUSTER NOT EFFECTIVE.</b>		
MANEOUVRING SPEEDS;			
F.AHD	<b>9.70 KNOTS</b>	H.AHD	<b>8.60 KNOTS NB CRITICAL RPM</b>
S.AHD	<b>6.40 KNOTS</b>	D.S.AHD	<b>4.90 KNOTS</b>
GENERAL NOTES;			
<b>STEERING; VESSEL WILL STEER OK WITH ENGINE GOING AHEAD, NEEDING MORE RUDDER AT D.S.AHD. BUT WILL LOOSE STEERAGE AS SOON AS ENGINE STOPPED.</b>			
<b>RUDDER; FOR MAXMM LIFT OF STERN USE 40 DEGREES HELM. AFTER THIS TO 65 DEGREES THERE IS LESS LIFT BUT A REDUCTION IN HEADWAY THUS A THRUSTER EFFECT IS OBTAINED. KEEP RUDDER MIDSHIPS WHEN ENGINE GOING ASTERN. WHEN MAKING STERNWAY USE RUDDER WITH AHEAD KICK ON ENGINE.</b>			
<b>THE VESSEL SUFFERS FROM HIGH WINDAGE AND THRUSTER WILL CEASE TO BE EFFECTIVE WITH 25 KNOTS WIND ON BEAM OR RELATIVE AMOUNT. WINCHES ARE FAST AND 3 ROPES EACH END ARE ON DRUMS.</b>			

CITY OF SUNDERLAND

ESTIMATED WIND FORCES

The following tables show an indication of the Wind Force (tonne) acting on the hull when the wind direction is ahead or astern, 45 degrees on the bow or quarter, or abeam.

Draught (metres)	WIND SPEED			WIND FORCE ON HULL (tonne)		
	kts	m/s	Beaufort	WIND DIRECTION		
				AHEAD OR ASTERN	45 DEGREES ON BOW OR QUARTER	ABEAM
5.00	10	5.2	3	0.69	1.93	2.64
	15	7.8	4	1.56	4.34	5.94
	20	10.4	5	2.78	7.72	10.56
	25	13.0	6	4.34	12.07	16.51
	30	15.6	7	6.25	17.38	23.77
	35	18.2	8	8.51	23.65	32.35
	40	20.8	8	11.11	30.89	42.25
	45	23.4	9	14.06	39.10	53.48
	50	26.0	10	17.36	48.27	66.02
	4.00	10	5.2	3	0.73	2.04
15		7.8	4	1.64	4.60	6.29
20		10.4	5	2.91	8.17	11.18
25		13.0	6	4.55	12.77	17.47
30		15.6	7	6.56	18.38	25.15
35		18.2	8	8.92	25.02	34.24
40		20.8	8	11.65	32.68	44.72
45		23.4	9	14.75	41.35	56.59
50		26.0	10	18.21	51.06	69.87

The bow thruster on this ship exerts a thrust of approximately 7.0 tonnes at maximum output.

- 4.19. The Master completed the last of the pre-arrival checks when the Pilot boarded, this was testing the engines ahead and astern for manoeuvring. The wait for the tug to complete its work with the departing "Superfast Ferry" is estimated to have delayed berthing by 30 minutes. The Master spent some of the time controlling the movements of the ship. It was difficult in the confined area north of Gustavsvärn with the deteriorating weather, as the force of the wind increased steadily.

Evidence of this increase has been confirmed from the Finnish Meteorological weather records obtained which show the recorded mean wind at Hanko Tulliniemi increasing from 17.7 m/s to 19.4 m/s ( 33.5 knots to 37.4 knots ) gusting to 22.8 m/s ( 44.0 knots ) covering a period from 1735 to 1825 hours. The period from when the Pilot boarded to approaching the berth

Extract from Company Procedures

*Passage Planning and Prosecution*

*10.7 Pilots*

*The Pilot shall be regarded as a valuable member of the Bridge Management Team and shall be given the support of other members of the team throughout the pilotage. Whenever possible the Master / Pilot exchange shall be carried out.*

*The presence of the Pilot on board in no way absolves the Master or OOW from their responsibilities and authority. Whenever a Pilot, whether compulsory or otherwise, is on board his name shall be recorded. A full and continuous surveillance of the ship's position shall be maintained by the Officer of the Watch.*

*The Master will normally take charge of the Bridge whenever a Pilot is on board. However,, in his absence the OOW shall be in no doubt that the Pilot is on board only in an advisory capacity.*

*When a Pilot is to be used, the Master shall arrange, whenever possible, for him to board in sufficient time and at a suitable place to allow for proper exchange of the information contained in the Pilot Card and Passage Plan.*

*The Pilot Card should be prepared in accordance with ICS Bridge Procedures Guide and shall be used by the Master to brief the Pilot on the particular characteristics of the ship and any abnormal conditions. The Master shall use the Passage Plan to discuss and agree with the Pilot the intended tracks and any other details pertinent to the pilotage. The Passage Plan is then to be amended as necessary.*

*During the pilotage, the Master or the OOW shall ask the Pilot to explain any significant deviation from the previously agreed passage plan. If the explanation is not satisfactory the Master shall take whatever action he considers necessary to ensure the safety of the ship.*

- 4.20. The time the tug “Ajax” arrived on station at the “City of Sunderland” has not been determined, the nearest estimate from the ship’s course recording trace would indicate 1810 hours which is the time the ship commenced its approach to the narrows between Tulliniemi and Tullisaari. The Master ordered the crew to stations approaching the narrows. The Chief Officer left the bridge to proceed aft with one rating, the Bosun went forward with one rating. The bridge composition was now made up of the Master, helmsman and the Pilot. The purpose of having the Chief Officer stationed aft is not just to assist in mooring but to be in direct communication with the Master to advise him of the ship’s progress and positioning approaching the berth.

An effective bridge organisation should have been promoted to manage all the resources that are available. An effective bridge organisation should eliminate the risk that an error on the part of one person remains undetected, which could result in a dangerous situation. All crew present on the bridge, not just officers who have bridge watchkeeping duties, are part of the bridge team. The Master and the Pilot where necessary will be there to support the team which should comprise the OOW, a helmsman and lookout.

The bridge team was depleted by the departure of the Chief Officer to his standby station. Duties could not be assigned, therefore monitoring and detection of any deterioration in performance was unavailable, there was no team support available because nobody else was there to provide support. Bridge team members providing support to each other will have good situation awareness. The team would then be able to anticipate dangerous situations arising and recognise the possibility of an error chain developing.

Extract from Company Procedures:

*Composition of Bridge Watches*

*The composition of the bridge watch shall, at all times, be adequate and appropriate to the prevailing circumstances and conditions.*

*When deciding the composition of the bridge watch the Master shall take into account:*

- *the requirement the bridge must be manned at all times with at least one appropriately certificated officer when the ship is underway*
- *the prevailing or forecast weather conditions, visibility and whether it is daylight or darkness*
- *the proximity to navigational hazards or other vessels which may involve the Officer of the Watch in additional navigational duties*
- *the operational status of navigational equipment including radar and position fixing aids, which may affect the safe navigation of the ship*
- *any additional demands on the navigational watch which arise as a result of special operational circumstances*
- ***when entering or leaving port or navigating in other confined waters, the Bridge watch shall include a Bridge Watchkeeping Officer to assist the Master.***
- *when underway, during the hours of darkness a lookout in addition to the Officer of the Watch shall be posted*

Extract from: *Company Bridge Watchkeeping Standing Orders:*

*The Master shall appoint a Watchkeeping Officer to take charge of each navigational watch and shall assign crew members to assist.*

*The Watchkeeping Officer shall maintain a navigational watch strictly in accordance with the IMO Recommendations on Basic Principles and Operational Guidelines Relating to Navigational Watchkeeping, supplemented by the ICS Bridge Procedures Guide. He shall also have due regard to the Master's Standing Orders.*

*The presence of the Master on the bridge shall not relieve the Watchkeeping Officer of his primary function and responsibilities until the Master specifically states that he is taking personal charge of the navigation, the Watchkeeping Officer shall continue his duties and give the Master every assistance.*

*When the availability of navigational marks or position fixing systems permits, the ship's position shall be fixed at least every 30 minutes. In confined waters the frequency of fixes shall be increased to at least every 15 minutes and when manoeuvring in a planned approach, position fixing shall be virtually continuous.*

*In conjunction with his navigational duties the Watchkeeping Officer shall remain constantly alert to all matters affecting the ship and on noting any abnormality shall take prompt corrective action.*



Picture No.1

“City of Sunderland” berthed at No. 2 Ro-Ro Berth Hanko after refloating

- 4.21. The “City of Sunderland” arrived off the entrance to No.2 Ro-Ro Berth dock accompanied by the tug “Ajax” assisting on her starboard side at 1820 hours. The ship commenced a port swing to come astern onto the berth. The wind was 110 degrees, between 35 to 40 knots, the situation being further compounded by snow showers. The port swing placed the ship directly across the wind, therefore upwards of 42.25 tonnes of wind force or more was acting on the ship’s beam. This represented six times the force exerted by the bow thruster unit. Furthermore the additional forces, that of the schilling rudder providing a stern thrust moment and the use of the tug “Ajax” assisting on the starboard side aft in conjunction with the bow thrust were unable to provide enough power against the momentum of the wind acting on the ship. The result was the ship fell off to starboard towards the Western jetty and the starboard bow landed on the middle dolphin section of the jetty at 1827 hours. It has not been determined whether the sum of these forces acting in conjunction with the tug’s assistance were sufficient in total to overcome the adverse beam wind when coming alongside No.2 Ro-Ro berth.

A contributing factor in the lack of thrusting force against the adverse wind could have been when the ship was coming astern towards the berth. The action of the schilling rudder in providing a stern thrust moment is not effective when the ship is going astern and it is recommended to be positioned amidships when going astern, furthermore when making stern way effective use of the rudder is only possible by using an ahead movement on the engine. It was further reported that the bow fender of the tug and the ship’s side plating were iced up, therefore the tug could not maintain the correct position and thereby initiate a straight push so exerting the proper force. This fact has been substantiated by the evidence given by the Master of the tug “Ajax” at the Marine Court. He advised the pilot that the tug was unable to get a grip on the ship’s hull side plating due to the ice. The Master states that this information was never passed on to him and he was only made aware of it at the Marine Court. Therefore it could be reasoned that the tug was in attendance, however, it was providing no real assistance against the prevailing weather conditions.



Picture No.2

Shows the Western Jetty where the “City of Sunderland” landed eventually across the Dock from the intended Ro-Ro Berth No.2

- 4.22. The ship was forced onto the Western Jetty and pinned there by the severe weather conditions. The starboard bow landed on the middle dolphin. There was 50 metres or more of the ship overlapping the inner dolphin and the ship was lying at angle to the jetty. The Master told the pilot he would require another tug before any further attempt was made to manoeuvre the ship onto the Ro-Ro berth. The Pilot advised the Master another tug could be ordered from Helsinki, but it would take up to 6 or 7 hours to arrive. Meanwhile the tug “Ajax” was being made fast forward, the Deck CPO confirmed this fact at 1842 hours. The Master was unhappy about the ship’s angled position as she lay on the jetty, this fact was confirmed by the Chief Officer from aft. He requested the Master to move the ship forward to avoid any further damage on the dolphin. As the Master attempted to manoeuvre the ship forwards on the main engine the Pilot had the tug “Ajax” pull the ship forward. However, the Pilot’s intention was to pull the ship off the berth, and take it out to the anchorage via the main channel. The Master’s actions were to manoeuvre his ship sufficiently forward with the sole intention of providing a safe place for the ship to lie and await the second tug. The Pilot was of the opinion that the ship would be damaged if it remained on the jetty. It appears the Pilot never discussed or told the Master his intention to return to the anchorage, or sought his agreement to leave the port. The “City of Sunderland” has apparently stayed on this jetty previously to wait for a tug. The Pilot ordered the Master to provide the engine movements as the tug “Ajax” attempted to pull the ship off the jetty and up into the wind. The strength of the wind again proved too much, the Pilot was forced into the decision to turn the ship to starboard and proceed down the secondary channel via Granskarharun and Albertsklackarna to the anchorage area.

- 4.23 The conclusion is the Pilot excluded the Master from his intention to return to sea. Furthermore the Master and Pilot did not communicate with each other properly to consider all the options available in order to execute an effective plan. Pilots make a significant contribution to the safety of navigation in approaches to ports and confined waters. Part of his services to the ship and ultimately to the Master are to provide all the information he had available and pass this on to the Master. This would include the external advice from the tug, port authorities and / or pilot station. Thereby informed decisions could be made about the planned operation. Pilots have updated knowledge, however, it cannot be stressed enough the responsibilities of the ship's navigational team and the OOW or Master do not transfer to the Pilot. The ship first landed on the jetty at 1827 hours, the tug was made fast 1842 hours and the ship towed off the berth at 1857 hours. A period of 30 minutes, a busy period given the circumstances, however, still a period in which the situation could have been properly assessed.
- 4.24. The ship could have safely remained moored to the jetty, the tug could have remained on station to provide assistance. The Master should have exerted his authority to the Pilot at this point. He claims that he did indeed exert his authority and that he expected the Pilot to take notice of his instructions. The Chief Officer stationed aft even confirmed the shore mooring gang arrived on the western jetty. The Master was excluded from the Pilot's decision making because all his radio communications with the tug "Ajax" and the pilot station had been conducted in Finnish, a language the Master clearly did not understand. Evidence would suggest the Pilot only confirmed his intentions to the Master when the ship was underway and being pulled off the jetty. The strength of the wind acting on the ship forced the Pilot to manoeuvre the ship to starboard instead of to port. Thus the Pilot was forced to manoeuvre the ship down the secondary channel and out to sea. This track was one which had never been considered by the Master as an alternative in case of any unforeseen circumstances. The route outwards from Hanko should have been the reverse of the inward passage.
- 4.25. The distance from the Western Jetty to the alter course position off Granskarsharan is approximately 1.13 miles. A large alteration of course is required to follow the channel in a south easterly direction to pass between Albertsklackarna and Vastertistron 1.2 miles away, and the more open waters to the north of Russaro. The weather conditions have been described as atrocious, the visibility was affected by what has been described as blizzard conditions, the channels were covered by light ice. The tug "Ajax" was used to guide the "City of Sunderland" down the channels. The Pilot had the tug use her searchlight to pick out the channel buoys and beacons marking obstructions. The Master was kept extremely busy but was restricted to answering the Pilot's many orders for engine movements, helm orders and occasional glances into the radar. There was no OOW to assist with the safe navigation of the ship or advise the Pilot. The Pilot complained on several occasions about the radar picture, to which the Master made several adjustments to the controls, tuning and sea clutter.
- 4.26. The ship was unprepared for this route, firstly in that the passage had not been discussed with between the Master and Pilot. Under evidence the Pilot never mentioned at any time that he discussed the plan of action with the Master. Clearly the Pilot was caught out by the weather conditions leaving the western jetty. His primary intention was to return to sea via the main channel, however, by the strength of these weather conditions he was forced into an alternative he may not have initially considered. Secondly the Master was not given the chance to call on the 2<sup>nd</sup> Officer to act as OOW for this unplanned passage.



Picture No.3

Depicts the westerly course of the secondary channel from the Western Jetty to Granskarsharun in the distance

- 4.27. When the Chief Officer returned to the bridge from his aft station he was engaged to relieve the helmsman from steering duties, while he mopped up the wheelhouse deck which had become slippery and adjust the ship's floodlight. Once this task was completed he returned to steering and the Chief Officer left the bridge to change his wet clothing. No positions were recorded to track the ship's progress, no engine movements were recorded because the data logger was faulty. The Master as previously stated was unaware of the alternative route to the main anchorage area, therefore completely unprepared for the navigation of these channels. He was therefore relying solely on the Pilot's local knowledge.



Picture No.4

Depicts the south easterly course from Granskarsharun to Albertsklackarna

4.28. Again the bridge team was depleted by the absence of an OOW and situation awareness was easily lost. The OOW has an essential role to play in monitoring the progress of the ship, therefore any errors can be detected in time to prevent an incident. In this instance we have a moving ship which required to be properly controlled with respect to navigation. Therefore errors arose through the following omissions;

- Relying solely on the Pilot's local knowledge.
- Failure to maintain the sequence of the passage plan, contingency plan or updates.
- Undetected differences between intended track and track made good.
- Not keeping a proper lookout.
- Omitting to monitor the performance of bridge located displays.
- Correct identification of a light, navigational mark either visually, on radar or on the chart.

The Master's argument would be that he could not have possibly foreseen the eventual circumstances as the Pilot had not informed him of his intentions to depart from the safety of the Western jetty. Therefore he had no warning or no time to execute a revised passage plan.

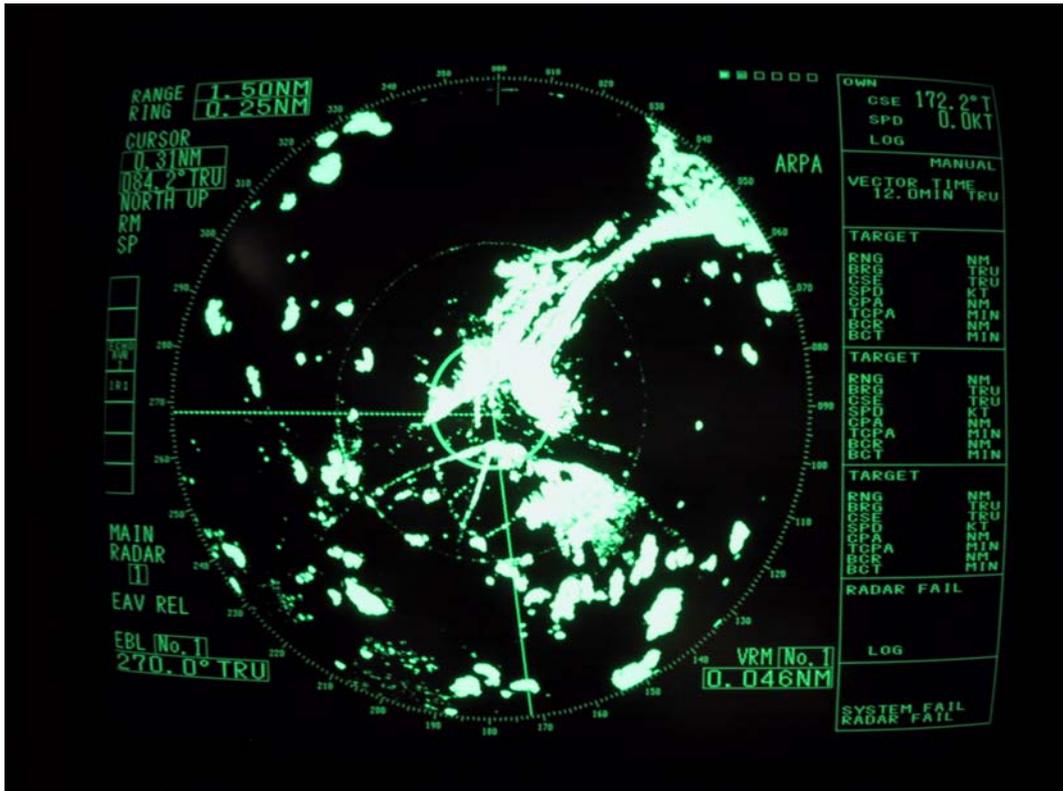
- 4.29. The course recorder trace indicates the “City of Sunderland” proceeded down the first channel at 1905 hours. At 1915 hours the ship altered course to proceed down the next channel, the courses should have been approximately 141 degrees for 6.5 cables, followed by 121 degrees for 8.5 cables to reach the open water to the north of Russaro. An entry in the Deck Log Book for 1914 hours confirms the order was given to let go the tug “Ajax”. The Pilot requested the tug to be let go when the weather became too severe for the tug to maintain way, however, the Master and Pilot confirmed this operation only happened when the ship had altered course and was proceeding south easterly into the weather. The tug had difficulty in releasing the ship’s ropes. The actual problem of release was identified as being a frozen release mechanism on the tug’s hook. The problem took ten minutes to resolve. Evidence from the tug’s Master at the Marine Court stated he advised the Pilot to tell the Master to cut the towing rope because her towing hook was frozen. This information to cut the ship’s ropes was never passed onto the Master. Therefore vital time was wasted at slow speed trying to manoeuvre the ship thus enabling the tug to work out how they were going to release the tow lines. This would have contributed to the rate of drift within the south east bound channel. The tug eventually manoeuvred itself around to the starboard bow of the ship. This was to assist in shortening the tow lines for letting go and to afford shelter from the increasing sea state and swell coming in from an east south easterly direction. The difficulty in letting go the tug and the amount of time wasted would have distracted the Pilot from attempting to safely navigate the channel. The Master would have been equally distracted by the number of orders from the Pilot, requiring helm orders for course adjustments and engine movements to maintain way in the channel, not to mention the adjustments made to the radar as the Pilot kept complaining about the picture. The poor radar image was probably due to the breaking waves and build up of ice in the channel which caused a considerable amount of clutter in the radar picture. The poor radar picture would not have assisted the Pilot in determining the ship’s heading in relation to the channel. There is no evidence to suggest that the radar was faulty.
- 4.30. Immediately before or after the release of the ship’s ropes at 1924 hours, the tug’s searchlight picked out a buoy very close to starboard, the actual time the buoy was noticed has not been verified. The buoy could not be clearly identified. The Master noticed the buoy highlighted by the tug’s searchlight from the port bridge wing. The Pilot had ordered the engine to full ahead after the release of the tug. It has been established from the Chief Engineer the engine speed was 130 rpm ( full ahead ) at the time of grounding. The very closeness of this buoy made the Pilot order the helm to port. A short time after this the ship hit something, the Master recollects hearing a thump on the port side aft of the bridge wing followed by another. The ship’s course recorder trace indicates the grounding to have happened at 1926 hours. The combination of port helm and the full speed caused the ship to come round and ground on the rock ledges on the southern side of the island of Vastertistron. The ship’s head was noted to be 066 degrees after impact.



Picture No.5

Depicts the beacon lying close to the south west of Vastertistron Island and the area close to the south of the island where the City of Sunderland grounded

- 4.31. The lack of recorded ship's positions on the south easterly heading makes it difficult to identify the actual buoy which was picked out by the tug's searchlight. However, given the close proximity of the time of grounding to the time the tug was let go, the probable identity of this buoy is the north cardinal mark positioned on the north eastern edge of the Albertsklackarna group of islands. It has not been determined whether this beacon was ever correctly identified.



Picture No.6

View of radar picture covering the area from the berth at Hanko to Vastertristron

- 4.32. The available evidence would point to the fact that the buoy picked up in the tug's searchlight was probably this north cardinal mark. The Pilot thinking he was now well to starboard of his track, a course of 121 degrees, ordered the ship's helm to port with the intention of clearing the buoy and bringing the ship back into a mid-channel position. The ship's swing to port would have brought the wind around onto the starboard bow thus increasing the rate of turn to port. Unaware of his exact position the Pilot did not counteract the port swing with starboard helm in sufficient time. Therefore the ship proceeded to run aground in the shallow water to the south east of Vastertristron Island on a heading of approximately 066 degrees.

- 4.33. The Master did not sound the General Alarm as all but two of the crew were up and on duty. These two off duty crew members were very quickly awake and to their respective stations once the ship had grounded. The crew very quickly established their emergency contingency plan duties for such an incident. The Pilot informed the Finnish authorities of the grounding. Two ships were subsequently dispatched to the scene of the grounding. The Finnish Coastguard landed an Officer by helicopter to carry out breathalyser tests, which all proved to be negative.
- 4.34. Damage was sustained to the underside of No.1 Fuel Oil Tank ( P ) frames 105 to 109, No.1 Double Bottom Tank ( P ) & ( S ) frames 70 to 90, No.2 Double Bottom Tank ( P ), No.2 Fuel Oil Tank ( P ) frames 39 to 54, Engine Room Oil Tanks on the port side in way of frames 17 to 28. A number of cracks were found in the areas of hull indents mentioned above, cracks were also discovered on the propeller blades. The resulting grounding caused no apparent oil pollution or environmental damage to the area.



Picture No.7

“City of Sunderland” preparing to be re-floated with the assistance of tugs at Vastertistron Island

## Part 5

### Conclusions

5.1. A number of factors have been highlighted by the investigation. Therefore on the basis of the analysis in Part 4 of this report the following conclusions are reached;

( a ) The prevailing weather conditions which were to affect the ship's manoeuvring characteristics were not sufficiently appreciated by either the Master or the Pilot.

( b ) The initial Master/Pilot information exchange identified the use of a tug due to the prevailing weather conditions. This necessitated a delay to berthing, meanwhile the weather conditions deteriorated further. It is concluded neither the Master or Pilot gave proper or full consideration to the following;

( i ) the use of a second tug which would have caused an abandonment to the initial berthing plan.

( ii ) a contingency plan was never considered in case of an emergency or deviation to the intended passage plan from pilot to berth.

( iii ) the ship's manoeuvring capabilities to be able to cope with the prevailing weather conditions.

( iv ) the updated weather forecast information available to the Pilot was not passed to the Master thereby allowing him to make an informed decision.

In view of the weather conditions and evidence available to both the Master and Pilot the plan to berth the ship on No.2 Ro-Ro Berth was ill conceived.

( c ) The icing up on the tug's bow fender and the ship's starboard side in effect rendered the assistance of the tug to be virtually useless. The Pilot withheld this information from the Master when it was reported by the Master of the tug. Thus the lack of effective power including that of the tug against the weather conditions caused the ship to fall off towards the Western jetty.

( d ) Finding the ship pinned to the Western jetty the Master clearly instructed the Pilot to order a second tug before making any further attempt at berthing. The Pilot did not explain his intentions to the Master, that the ship should attempt to return to the anchorage area, when clearly it would have been prudent in the weather conditions to remain on a safe berth.

( e ) The Pilot failed to fully appreciate the ship's manoeuvring capabilities and in misjudging the weather conditions, was forced to deviate from his intended return route to the anchorage area via a secondary channel

- ( f ) The Master did not exercise his authority to take whatever action he deemed necessary, and even if he did indeed do so the Pilot chose to ignore the Master's instruction to remain on the Western jetty for the arrival of the second tug.
- ( g ) The frozen release mechanism on the tug "Ajax" delayed the release of the tow line. This event contributed in part to the unfolding incident in that the ship was forced to maintain a slow speed in the channel.
- ( h ) The following conclusions are drawn because no effective bridge team was in place to safely navigate the ship;
- ( i ) the bridge watch should have included an Officer of the Watch to assist the Master when entering the port or navigating in confined waters, the bridge team resources were depleted by the removal of the Chief Officer to his standby station or the 2<sup>nd</sup> Officer because he was relieved from duty.
  - ( ii ) the ship's position was not monitored or plotted to ensure compliance with the intended passage plan or deviation.
  - ( iii ) the poor radar image, the increased sea clutter filled by breaking waves and the ice in the prevailing weather conditions deprived the Master and Pilot to determine the correct heading and possible rate of drift of the ship in the channel.
  - ( iii ) the proximity of navigational hazards were not clearly identified.
  - ( iv ) the depletion of the bridge team left the Master with too great a work load and the certainty that any errors in navigation could not be detected at an early stage.
- ( i ) The main engine data logger unit was identified as faulty in the pre-arrival checklist, no provision was made to record engine movements manually contrary to Company operating procedures.
- ( j ) In summary, the lack of effective communications between the Master and Pilot, the Pilot's decision alone to leave the Western jetty and the inappropriate weather conditions ultimately led to the grounding incident. Other contributing factors were the lack of effective planning for emergencies or deviations, ineffective bridge team management, and the building up of sufficient errors to form a chain of events, culminating in loss of situation awareness.

## Part 6

### Recommendations

There have been many reported incidents of ships grounding. Such incidents continue to happen because of simple mistakes or errors which culminate in a chain of events leading to loss of situation awareness.

The following recommendations are made based on the available evidence at this time.

The following recommendations 6.1. and 6.2., are directed to this Company and the operation of their ships, however, they should apply to all ships and seafarers;

- 6.1. The Company should introduce new procedures to address the problem of the ship's manoeuvring capabilities in high winds and the provisions for the use of tugs to assist in manoeuvring safely in harbour. A revised table on a range of wind speeds and wind forces allowed to act upon the hull from either, ahead or astern, 45 degrees on the bow or quarter, or abeam, or even 60 degrees to the centreline should be clearly indicated, against the assessment of available thrust. This would give the Master a clearer understanding as to the limitations in which the ship is to be safely manoeuvred without the assistance of tugs. Above certain designated wind force criteria acting upon the ship the use of tugs to assist in manoeuvring should be clearly defined.
- 6.2. The Company are to review their written procedures on Navigation in respect of whether any amendments are required based on the findings of this investigation.
- 6.3. The Finnish Marine Administration Pilot should be cautioned for his failure to communicate with the Master,
  - ( i ) to pass updated weather information to the Master, thus enabling him to make an informed decision as to weather to abandon the initial berthing.
  - ( i ) to pass information concerning the situation of the tug's inability to assist effectively in the initial berthing operation,
  - ( ii ) to pass information on his decision to return to a safe anchorage area outside the port,
  - ( iii ) for giving due consideration and advice to the Master on any deviation which may have been required from this route in the weather conditions,
  - ( iv ) to advise on an alternative route and discuss the preparations required for an effective passage plan,
  - ( v ) on understanding the manoeuvring capabilities of the ship in the prevailing weather conditions.

## **Part 7**

### **Submissions**

#### **Investigation and Evidence**

- 7.1. The basic details of the incident were reported to the Isle of Man Administration almost immediately after the event by the operators Anglo Eastern Ship Management.

An investigation officer from the Isle of Man Administration attended as quickly as possible and this report is compiled from the physical evidence on board and from the interviews with the with the ship's key personnel. At the same time the Finnish Accident Investigation Bureau attended the ship and commenced their own investigation into the incident.

A draft version of this report was submitted to the operators, Anglo Eastern Ship Management, the Master of the "City of Sunderland" and the Finnish Accident Investigation Bureau.

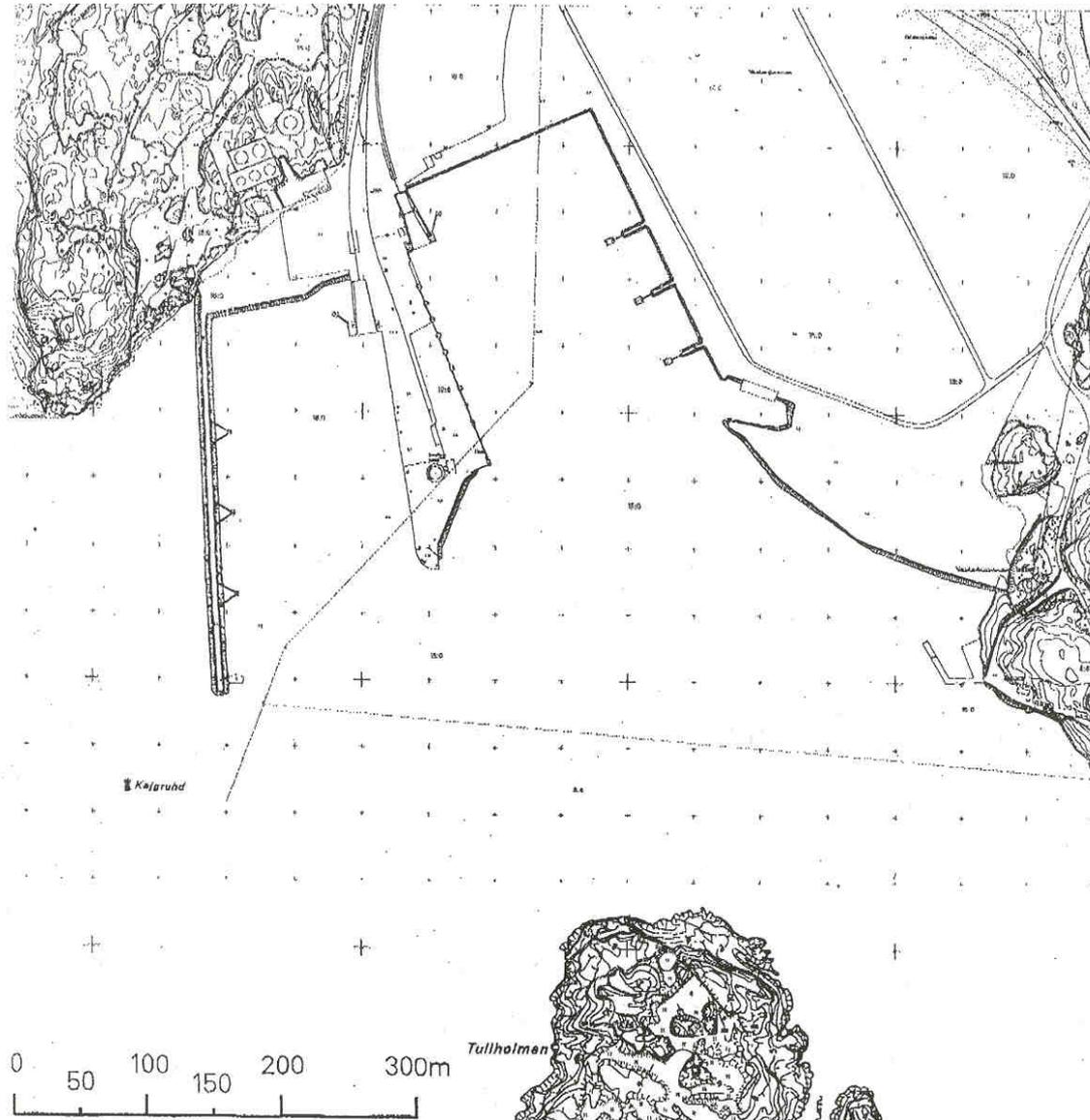
- 7.2. Submissions were received from the following, Anglo Eastern Ship Management as the operators, the Master of the "City of Sunderland", and from the Finnish Accident Investigation Bureau in the form of a draft report of their own investigation and findings.

At the time of the Marine Administration's investigation conducted at Hanko, Finland the Finnish Administration had not convened their Marine Court. At this Marine Court certain facts became evident under oath from the various parties connected with the incident.

This report has been amended where appropriate taking into account comments and evidence received from the interested parties.

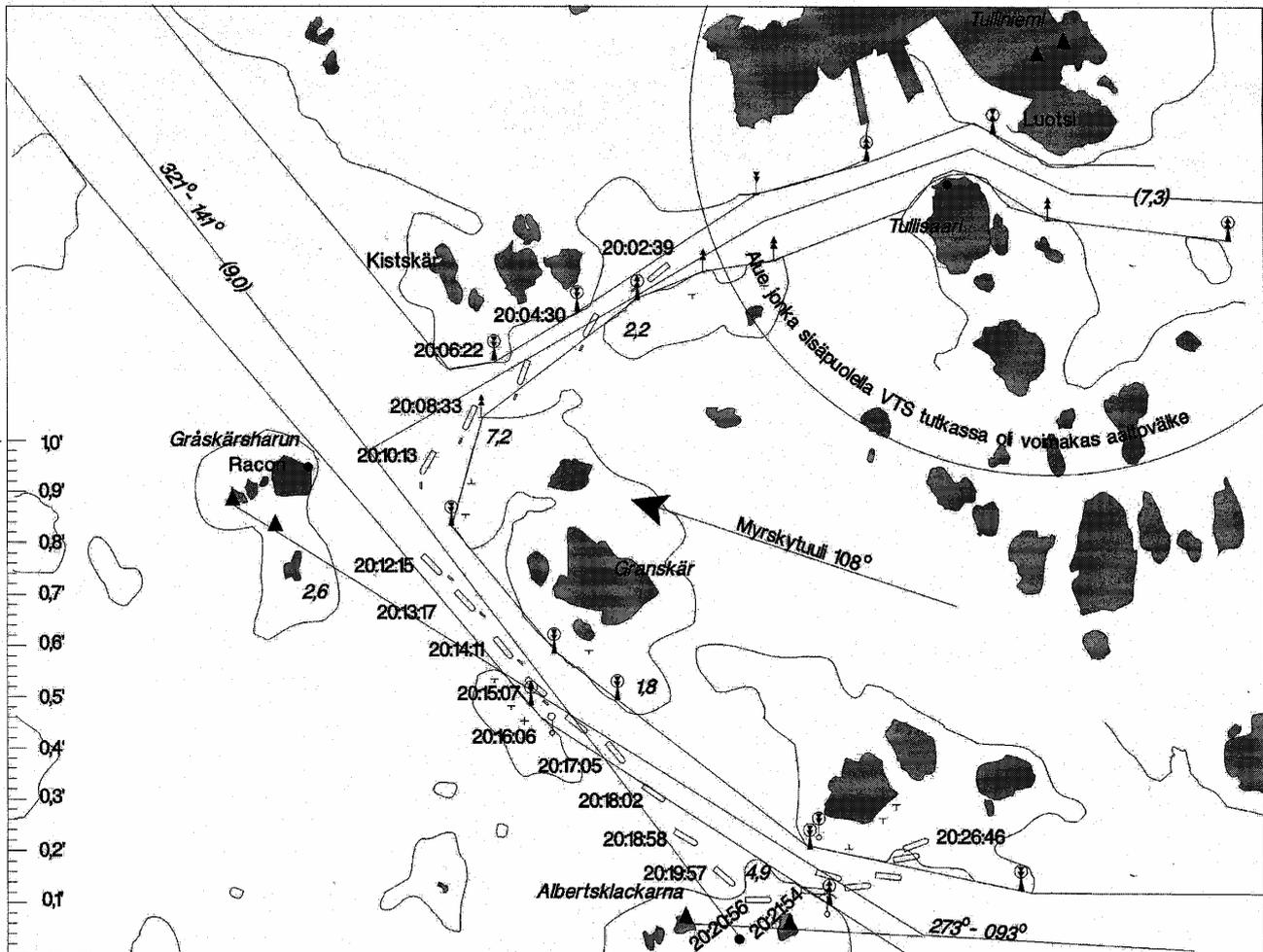
Part 8

Appendices



Appendix I

Plan view of Hanko Outer Harbour shows Ro-Ro Berths and Western Jetty



Appendix II

A section from a Finnish chart representing the Approaches to Hanko.  
The "City of Sunderland's" track has been recorded from an unknown source west of the Western Jetty to the position of grounding south-east of Vastertiströn Island

Part 9

Acknowledgements

- The Master, officers and crew of the “City of Sunderland”.
- Anglo Eastern Ship Management ( UK ) Limited operators of the “City of Sunderland”
- Government of Finland :
  - Finnish Accident Investigation Board
  - Finnish Maritime Administration - Gulf of Finland Maritime District
  - Gulf of Finland Coastguard District - Hanko Coastguard Area
  - Finnish Meteorological Institute