Report on the investigation of

the collision between

Cepheus J and Ileksa

in the Kattegat

22 November 2004

MALTA MARITIME AUTHORITY

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Pursuant to the International Maritime Organization's 'Code for the Investigation of Marine casualties', the UK Marine Accident Investigation Branch (MAIB) has taken the role of lead investigating body in this joint investigation with the Malta Maritime Authority.

Throughout the investigation, MAIB has enjoyed the full co-operation of the Malta Maritime Authority.

Extract from

The Merchant Shipping

(Accident Reporting and Investigation)

Regulations 2005 – Regulation 5:

"The sole objective of the investigation of an accident under the Merchant Shipping (Accident Reporting and Investigation) Regulations 2005 shall be the prevention of future accidents through the ascertainment of its causes and circumstances. It shall not be the purpose of an investigation to determine liability nor, except so far as is necessary to achieve its objective, to apportion blame."

NOTE

This report is not written with litigation in mind and, pursuant to Regulation 13(9) of the Merchant Shipping (Accident Reporting and Investigation) Regulations 2005, shall be inadmissible in any judicial proceedings whose purpose, or one of whose purpose is to attribute or apportion liability or blame.

CONTENTS

GLOSSARY OF ABBREVIATIONS AND ACRONYMS

AIS	-	Automatic Information System
ARPA	-	Automatic Radar Plotting Aid
COLREGS	-	International Regulations for Preventing Collisions at Sea
CPA	-	Closest Point of Approach
ECDIS	-	Electronic Chart Display and Information System
ECS	-	Electronic Chart System
ENC	-	Electronic Navigational Chart
Gt	-	Gross Tonnage
IHO	-	International Hydrographic Office
IMO	-	International Maritime Organization
ISM	-	International Safety Management
Kts	-	Knots (nautical miles per hour)
MGN	-	Marine Guidance Note
MIN	-	Marine Information Note
MSN	-	Merchant Shipping Notice
OOW	-	Officer of the watch
Raster Chart	-	Electronic “copy” of a paper chart
RCDS	-	Raster Chart Display System
SMS	-	Safety Management System
SOLAS	-	Safety of Life at Sea
STCW	-	Standards of Training Certification and Watchkeeping
TCPA	-	Time of Closest Point of Approach
UKHO	-	United Kingdom Hydrographic Office
VDR	-	Voyage Data Recorder
VHF	-	Very High Frequency

SYNOPSIS

The 6454gt UK registered container ship *Cepheus J,* and the 4955gt Maltese registered general cargo ship *Ileksa,* were transiting the Kattegat off the Danish coast on 22 November 2004 when they collided. Both were following the recommended route 'T' on a south-easterly course. The weather was overcast and windy with rain, localised sleet and poor to moderate visibility. It was still dark. *Cepheus J* was proceeding at 16 knots, and *Ileksa* at 6.5 knots. VDR records from *Cepheus J* were recovered and analysed during the subsequent MAIB investigation.

On *Cepheus J'*s bridge, the chief officer had sent the lookout to clean the crew mess room, while he continued completing paperwork, standing at the chart table on the port side of the bridge. From there, he had an unrestricted view ahead, and close by, to his right, the displays of the ECDIS and radar were available. He did not see *Ileksa* until after the collision.

On board *Ileksa,* the third officer had just taken the watch and the master was also on the bridge, sending a daily report to the company. *Cepheus J* was noted astern by radar at between 3 and 3.5 miles and visually sighted astern at 1.5 miles. When the ships were 0.5 mile apart, *Ileksa* called *Cepheus J* by VHF radio to establish what her intentions were. When no reply was heard, and with the ships approximately 0.3 mile apart, *Ileksa* began to take evasive action, but with the wind ahead was not able to turn sufficiently to avoid collision.

At 0519 UTC, the two ships collided, with *Cepheus J'*s bow striking the stern of *Ileksa.* The impact caused severe damage to *Ileksa'*s stern and holed *Cepheus J* above the waterline. Both vessels were able to resume their voyages; there were no injuries and no pollution.

The accident was investigated by the UK's Marine Accident Investigation Branch and the Malta Maritime Authority, as a joint investigation under the International Maritime Organization's (IMO's) Code for the investigation of marine casualties and incidents.

Factors identified during the joint investigation were: the officer of the watch (OOW) on board *Cepheus J* being distracted by radio news and paperwork; the absence of a lookout on board *Cepheus J;* the poor use of Automatic Radar Plotting Aid (ARPA) and Automatic Information System (AIS); poor application of the COLREGS and both ships following the same ground track.

Subsequent to the accident, the operating company for *Cepheus J* has addressed the issues raised, and the Malta Maritime Authority has issued advice to the managers of *Ileska.*

Recommendations have been made to the International Chamber of Shipping to highlight the need for increased vigilance when transiting IMO recommended routes, and also to advise shipping companies on the value of VDR replay to confirm that company instructions are carried out at sea.

SECTION 1 - FACTUAL INFORMATION

1.1 PARTICULARS OF *CEPHEUS J* AND *ILEKSA,* AND THE ACCIDENT

Vessel details		*Cepheus J*
Registered owner	:	Mare Schiffahrtsqes.mbh&Co.KGms Cepheus J
Manager(s)	:	Jüngerhans Management Services GmbH &Co KG
Port of registry	:	London
Flag	:	UK
Type	:	Container ship
Built	:	Detlef Hegemann Rolandwerft, 2003
Classification society	:	Germanischer Lloyd
Construction	:	Steel – Ice class E3
Length overall	:	133.6m
Gross tonnage	:	6454
Engine power and/or type	:	MAK 8M43 7200kW
Service speed	:	16.5 knots
Other relevant info	:	Single screw, controllable pitch propeller, single rudder, bow thrusters
Persons on board	:	13
Injuries/fatalities	:	None
Damage	:	Hole in bow, above waterline. Plating dented along starboard shoulder

Vessel details		*Ileksa*
Registered owner	:	Ileksa Shipping, Valletta, Malta
Manager(s)	:	INOK N V, Verbindgsdok, Oostkaai 5-7 Antwerp
Port of registry	:	Valletta
Flag	:	Malta
Type	:	General cargo
Built	:	Sudostroitelnyy Zavod, Novogorod 1996
Classification society	:	Russian Maritime Register of Shipping
Construction	:	Steel
Length overall	:	140m
Gross tonnage	:	4955
Engine power and/or type	:	2 x 8NVDS-48A-3U 2640 hp/ 1940kW
Speed - full load	:	10.5 knots
Other relevant info	:	Twin screw, single centreline rudder. Screw in nozzles
Persons on board	:	15
Injuries/fatalities	:	None
Damage	:	Extensive damage to the stern, including a split in the aft ballast tank, deck distortion, damage to the stern anchor and denting of port quarter plating.

Accident details

Time and date	:	0519 UTC on 22 November 2004
Location of incident	:	57°13.'85N 011°32.'65E 28 miles south-west of Gotenburg
Time of morning nautical twilight	:	0538 UTC
Time of sunrise	:	0711 UTC

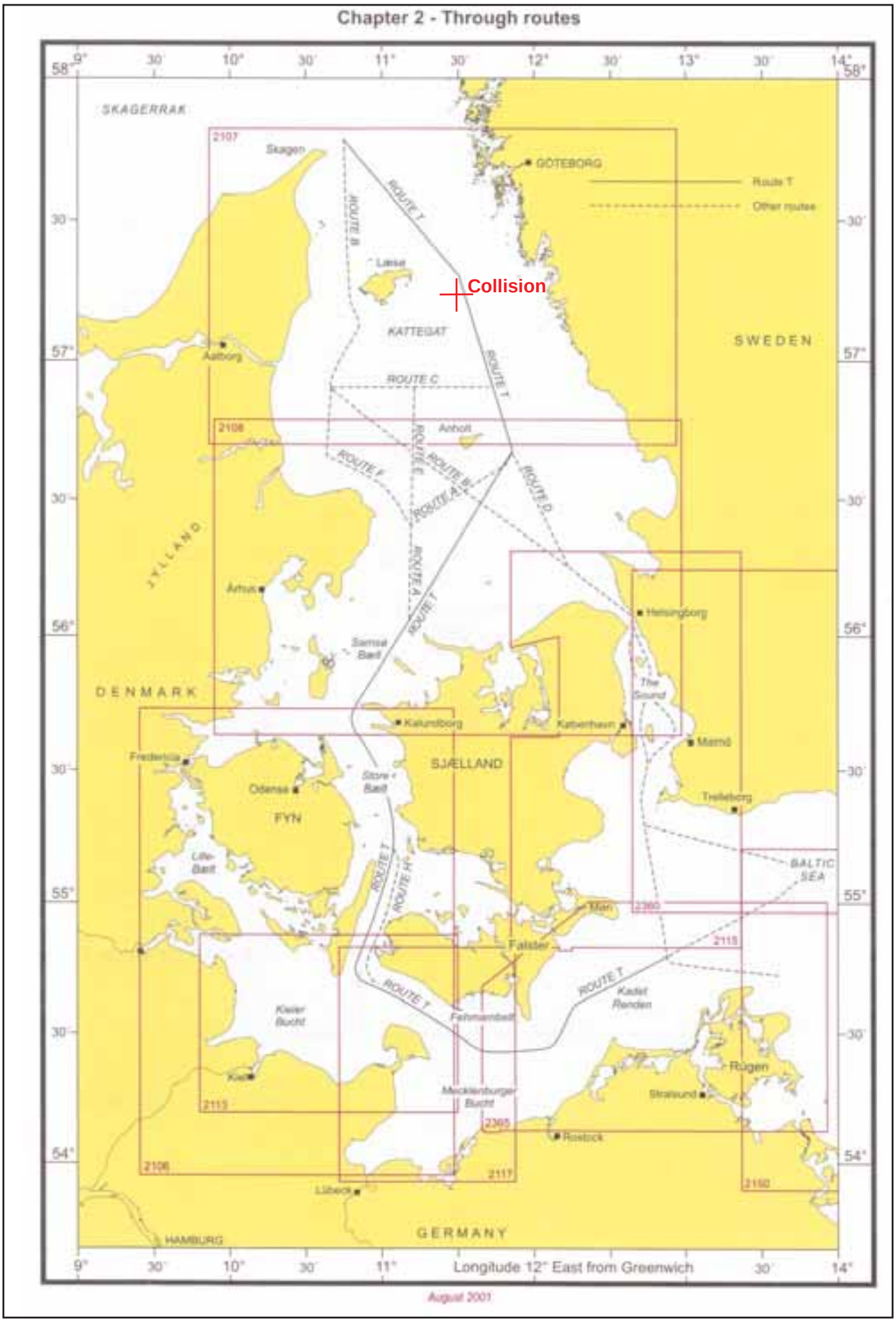
Figure 1

Cepheus J

Figure 2

Ileksa

Figure 3



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1.2 BACKGROUND

Route T was established in 1971 by the Danish Government, with the objective of "ensuring the safety of navigation of large ships passing through Danish waters and also of reducing the risk of oil pollution resulting from the grounding and collision of tankers". This is marked on the chart as a recommended route following the IMO guidelines **(see Figure 3)**.

1.3 NARRATIVE

(Times given are UTC, since both ships kept different time zones)

Ileksa sailed from Bilbao, Spain on 15 November 2004. She was in ballast and bound for Muuga in Estonia to load fertilizer. The passage across the Bay of Biscay and through the English Channel had been uneventful, with the three watchkeeping officers maintaining a 4 on / 8 off watch system. The weather had been rough crossing Biscay, and the ship's service speed of 9.5 knots in ballast had rarely been achieved. As she was in ballast, the vessel tended to slam, especially in head seas, and this sometimes made it difficult for the crew to sleep. However, since entering the English Channel, the weather had been astern or on the beam, and sleeping had not been a problem.

At 0100 on 22 November, the chief officer took over the watch. The engines were set at full ahead, but the ship was only making 6 to 6.5 knots due to headwind and sea. The watch was again uneventful, with the ship entering the Kattegat and following route T. The passage plan had been drawn with the ship's track 1 mile to the west of the Route T marked on the chart. The radar was in use and on the 6-mile range scale, with the display off-centred to the north-west, to maximise the view ahead. The view astern had been reduced to 3.5 miles, although the range scale was intermittently increased to monitor shipping at greater distances. The visibility had been reduced from time to time by passing showers of rain and sleet.

At about 0500, *Cepheus J* was detected astern by radar, and seen to be overtaking. Information concerning this ship was obtained from the AIS receiver, which was located on the port side of *Ileksa*'s bridge.

Shortly before 0500 (0800 Moscow time), the third officer relieved the chief officer as OOW. The master was also on the bridge, preparing to send the daily telex to the company. As part of the handover, *Cepheus J* was pointed out astern as an overtaking vessel. The chief officer left the bridge. The ship was heading 165° and making good a track of 160° due to the weather conditions, at a speed of between 6 and 6.5 knots.

Cepheus J had left Rotterdam on 20 November, bound for St. Petersburg. The navigational watches were shared between the master, chief and second officers, following a 4 on / 8 off watch system. The cargo for this voyage included 61 refrigerated containers, fewer than the usual 70-100 carried on most voyages. The carriage of refrigerated containers required a record to be kept, at

6-hourly intervals, of the temperatures of each container. This was the chief officer's responsibility, and the maintenance of the records was time consuming. Collection of the temperature data from the refrigerated containers was obtained by the on-watch AB.

The chief officer took over the watch from the second officer at 0300. Visibility was poor, it was dark and an AB was on watch as lookout. The vessel was following Route T through the Kattegat at 16.5 knots, with the autopilot engaged. There were no defects with the bridge equipment, and the AIS information was displayed on the radar screen. Shortly after taking over the watch, the chief officer sent the AB to log the cargo temperatures, and then began working on paperwork. He was working at the chart table on the port side of the bridge.

At 0400, the AB went to carry out rounds of the ship. After returning to the bridge, he was sent away to sweep the stairs and tidy the crew mess room. The chief officer continued to work on his paperwork at the chart table and, occasionally, at a computer situated on the starboard side of the bridge.

Just after 0500, the chief officer tuned the radio on the bridge to a station transmitting the news in Russian. The major item of news concerned the political situation leading to the presidential elections in the Ukraine.

Cepheus J was maintaining between 15.5 and 16.5 knots on a heading of 160°. The vessel was following the planned track 1 mile to the west of the Route T displayed on the chart. A VHF radio was on and tuned to channel 16.

At 0516, the OOW of *Ileksa* called *Cepheus J* on VHF channel 16 to ask what her intentions were. At that stage, *Cepheus J* was approximately 0.7 mile astern of *Ileksa*, and just on her starboard quarter. There being no response from *Cepheus J* to this and subsequent VHF calls, *Ileksa*'s master had the helm put into manual and altered hard to starboard. Because of the effect of the wind and weather, *Ileksa* did not alter her heading over the next few minutes. *Ileksa*'s master then decided to remain on his course and take any impact at the stern, rather than continue to try to turn and possibly expose the structurally weaker ship's side to a collision. At 0519, the ships collided, with *Cepheus J*'s bow striking *Ileksa*'s stern. The bow of *Ileksa* was pushed round to starboard through between 60° and 90°, and then altered rapidly back to port as *Cepheus J* passed her port quarter.

Most of the crew on board *Ileksa* were awake when the vessels collided, as it was 8.20am ship's time. After the collision, the general alarm was not sounded, and the internal communications were used to ensure that the vessel was checked for damage. The general alarm was not sounded on *Cepheus J* either, and because a different time zone was kept on board, most of the crew were still in bed. An AB, who acted as carpenter, was telephoned and instructed to check the forward spaces. Once he had reported back to the bridge that there was a hole in the bow, the rest of the crew were awoken by the AB on watch and set to work checking for water ingress and for other damage.

The damage to the after end of *Ileksa* was extensive, but there was no water ingress because all the damage was above the waterline. *Cepheus J* was holed at the bow (see Section 1.4). Neither ship reported the collision to the coastal state. After confirming with each other that they were able to continue, both ships resumed their voyages: *Cepheus J* to St. Petersburg, and *Ileksa* to Copenhagen, where an assessment was made of the damage she had sustained during the collision. *Ileksa* later sailed to Kaliningrad for repairs.

1.4 DAMAGE

1.4.1 *Cepheus J*

The following damage was temporarily repaired at the next port:

A hole in the shell plating at upper deck level at the bow, approximately 2.5m x 1.0m, in way of the forecastle store and upper deck bulwarks. Approximately 4m^2 of deck plating replaced in this area, and stringers replaced **(see Figure 4)**.

Other damage was also sustained, which resulted in the following repairs being scheduled for the vessel's next docking:

- Starboard shell plating and framing in way of number 1 hold, and void space to be replaced (approximately 25m^2).

1.4.2 *Ileksa*

Visual examination of the damage by the classification society surveyor revealed: **(see Figure 5)**.

- The shell and framing at the transom construction were badly damaged in way of connection with the upper deck, measuring about 800mm x 2000mm.
- Deformities of ship's structure in way of the poop deck.
- Damage to stern anchor.
- Split in the after ballast tank, measuring about 850mm x 1000mm, above the waterline.
- Aft mast bent and three lower lights damaged.
- Port side bulwark in way of frames 183 - 195, guardrails in way of frames 140 - 183 and fender guard in way of frame 140 -aft, partly bent and damaged. Air pipes in this area bent inwards.
- Hawse pipe for aft anchor deformed in way of frame 171.
- Deformities in way of the lifeboat deck.
- Slight deformation to the internal aft bulkhead in the emergency generator room.

All the above damage was above the waterline. However, there was some ingress of water into the after ballast tank through a split in the plating above the waterline.

Figure 4

Bow damage to *Cepheus J*

Figure 5

Stern damage to *Ileksa*

1.5 CREWS

1.5.1 *Cepheus J*

Cepheus J had a multinational crew of 13. The master and chief engineer were Polish, the chief officer and second engineer were Ukrainian and the rest of the crew were Filipino. The working language on board was English.

The master, chief officer and second officer shared a 4 on / 8 off watch system, with the master taking the 8-12, the chief officer the 4-8 and the second officer the 12-4. This routine was adjusted, as necessary, to ensure the watchkeepers received adequate periods of rest after a port visit.

1.5.2 *Ileksa*

Ileksa's crew of 15 were all Russians, and most had been on the ship for a number of contracts. Each contract was for 4 months (± 1 month). The chief officer, second and third officers shared the bridge watches, maintaining a 4 on / 8 off watch routine. The master was available at all times.

1.6 ENVIRONMENTAL CONDITIONS

The following weather information, covering the area south-east of Laesoe on the morning of 22 November, was issued by the Danish Meteorological Institute:

At 0515 (UTC):

Overcast and windy with rain, localised sleet and poor to moderate visibility.

Wind: southerly 15.4 m/sec.(29.9 knots or Beaufort force 7)

Visibility: 1.0 - 6.0 km

Wave height: 3.0 - 4.0 metres

Temperature: 4 degrees Celcius.

Weather forecasts had been taken by both ships via NAVTEX.

1.7 PASSAGE PLAN

The IMO-recommended routes established through the area provide guidance for route planning in the vicinity of the Kattegat **(see Figure 3)**. Route T has been established as the standard route from the North Sea to the Baltic Sea. Both ships had established a track 1 mile to the west of the route median line, which followed the directional arrows as printed on charts of the area. The median line is marked with buoys and, at the time of the collision, all were in place.

Cepheus J was using both paper and raster charts, with the passage plan shown on both. They were both UKHO publications and up to date. *Ileksa* was using a Russian chart of the area, and had planned an identical track to that of *Cepheus J*. Both the Russian and UKHO charts were based on the Danish charts of the area, and were part of the IHO chart series.

1.8 BRIDGE EQUIPMENT

1.8.1 *Cepheus J*

The Integrated Bridge System on board *Cepheus J* met the requirements for bridge equipment of SOLAS for a vessel of her size, and included two radars and an ECDIS system **(see Figure 6)**. Manufactured by STN Atlas, the radars were the RadarPilot 1000 type, both having an ARPA facility. The ECDIS displayed the raster chart of the area, and since Electronic Navigational Charts (vector charts) of the area were available, the system should more properly be described as a Raster Chart Display System (RCDS). The ship was not equipped to operate without paper charts, and UKHO paper charts were also in use.

The ship was fitted with a Voyage Data Recorder (VDR). The information recorded during the accident was downloaded by the MAIB and analysed. The VDR recorded the video output from the port radar, making it possible to view what the OOW could see on his screen, and how he had set up his radar, since this was the radar in use at the time of the accident. The bridge audio was also recorded, with separate channels for recording any sound on the bridge, and for the VHF radio.

Text AIS information was available on the radar screen. Additionally, the symbols for ship AIS targets were on the radar screen in the hours before the collision. The vessel was being steered by autopilot, and the navigation lights for a vessel of her size were being shown.

1.8.2 *Ileksa*

The bridge equipment on board *Ileksa* complied with the requirements of SOLAS for a vessel of her size, but included an additional radar. The radar displays were placed on either side of the engine and steering control console, which was arranged such that the helm controls were at the centreline **(see Figure 7)**. Both radars were manufactured by Furuno, and had 50.8cm high resolution colour displays. Each radar was fitted with a basic plotting aid (E plot), and had the facility to display target trails. The radar scanners were mounted above the bridge, on a gantry. This gantry created shadow sectors on both radars, which extended abeam, and were a maximum of 5° wide. This did not affect the radar picture in the fore and aft direction.

An AIS receiver was fitted on the port side of the bridge. This was not integrated with any of the other bridge equipment, nor was it required to be.

The navigation lights were on, and, as part of the watch handover routine detailed in the SMS, were required to be checked before taking over. The third officer, who had just taken over the watch, had checked that all the lights were illuminated. Should a lamp have failed, an alarm would have sounded on the bridge.

Figure 6

Cepheus J 's bridge

Figure 7

Ileksa's bridge

The ship was operating in autopilot until shortly before the collision. The changeover from automatic to hand steering required the operation of a single control. Small course changes could be effected by adjusting the required course on the autopilot.

The ship was not fitted with, nor was required to be fitted with a VDR. However, a course recorder was fitted, and copies of the record were given to the MAIB investigation team **(see Annex 1)**.

1.9 MANOEUVRABILITY

Cepheus J was of conventional construction, and was fitted with a single screw, single rudder arrangement. Turning data supplied to the ship after trials in November 2003, shows that for a 90° alteration, an advance of 754m (≈ 4 cables), and a transfer of 183m (≈ 1 cable) was achieved **(see Annex 1)**.

Ileksa was originally designed to trade on the rivers of southern Russia, and was defined as a Don class vessel. She was fitted with an unusual propulsion and steering arrangement. The twin propellers were in Kort nozzles, which could be operated either in tandem or independently. Kurt nozzles constrain the propeller wash and increase the efficiency of the propeller, the nozzles can be rotated, increasing the vessel's manoeuvrability, especially at slow speeds and when berthing. A single rudder was fitted on the centreline, between the two nozzles. In the seagoing condition, the nozzles and the rudder were operated together, such that a movement of the wheel actuated the rudder and nozzles, with the nozzles limited to a small proportion of their maximum travel. In the manoeuvring mode, the nozzles could be operated independently, and this is what gave the improved manoeuvrability when berthing **(see Figure 8)**.

Figure 8

Stern of the *Ileksa*, showing centre line rudder and, nozzles port and starboard

The manoeuvring data for *Ileksa* showed that, in calm conditions at full speed of 10.5 knots, with the vessel in ballast, a turn through 90° would have taken 1 minute and 5 seconds, with an advance of 2.0 cables and a transfer of 0.9 cables **(see Annex 1)**. As can be seen from the diagram, for the first 1.3 cables of the advance, there is no transfer. The alteration of course to this point would be about 45°, taking about 40 seconds.

1.10 DISTRACTIONS

The chief officer on board *Cepheus J* was required to compile a record of the temperatures maintained in the refrigerated cargo containers. This required that the temperature be recorded every 6 hours. The method adopted was for the temperature to be obtained by the AB on watch and then transferred to a fair copy by the chief officer. There were 61 refrigerated containers on board *Cepheus J* at the time of the collision, which was fewer than usual, however, the chief officer still spent a considerable amount of time each day completing the fair copy temperature log. It was this task that the chief officer was engaged in at the time of the collision.

As a Ukrainian national, the chief officer was naturally interested in the political situation of his country in the run up to the presidential elections. This is why he chose to listen to the radio during the time he spent on watch.

1.11 THE INTERNATIONAL REGULATIONS FOR PREVENTING COLLISIONS AT SEA

An extract of the pertinent regulations which were a factor in this accident, are shown at **Annex 2**.

1.12 LOOKOUT

The regulations concerning lookout are given in the International Regulations for Preventing Collisions at Sea (COLREGS) Rule 5 (see Section 1.10), and in the Code for Standards of Training and Certification of Watchkeepers 1995 (STCW95). The UK MCA gives further advice in the form of Merchant Shipping Notices (MGN 137 M+F, MGN 202 M+F).

STCW 95 Section A VIII/2 part 3.1 describes the principles to be observed in keeping a navigational watch.

Section 12 states the responsibility of the OOW for safe navigation of the vessel, and compliance with the COLREGS. Section 13 reinforces the requirements of Rule 5 of the COLREGS, and further explains that the lookout shall serve the purpose of:

1. *Maintaining a continuous state of vigilance by sight and hearing as well as by all available means, with regard to any significant change in the operating environment;*

2. *Fully appraising the situation and the risk of collision, stranding and other dangers to navigation; and*

3. *Detecting ships or aircraft in distress, shipwrecked persons, wrecks, debris and other hazards to safe navigation.*

Section 14 requires that:

> *The look-out must be able to give full attention to the keeping of a proper lookout and no other duties shall be undertaken or assigned which could interfere with that task.*

STCW95 also states that the management company of a ship also has a responsibility for ensuring that the obligations given in the Code are given 'full and complete effect'. It also reinforces the requirement for lookout given in Rule 5 of the COLREGS.

The International Safety Management (ISM) Code requires that a company's safety management system should ensure compliance with mandatory rules and regulations. This is achieved by, including in the safety management system, instructions and procedures to ensure the safe operation of ships and protection of the environment in compliance with relevant international and flag state legislation.

1.13 VHF RADIO

The VDR recording on *Cepheus J* included three audio channels. Channels one and two were general recordings from microphones positioned to port and starboard on the bridge. The third channel recorded the VHF channel in use on the ship. The VHF recorded was the set on the starboard side of the main console.

Both ships were fitted with AIS, so the names and call signs of both vessels were available to each other before the collision.

The recording of VHF transmissions obtained from the VDR shows that *Ileksa* did try to alert *Cepheus J.* The recorded transmissions before the collision were:

> *"What are you doing? Alter your course"*

followed by:

> *"Red to Green, Red to green"*

These transmissions were made in English, and further transmissions between the two vessels, after the collision, were in Russian, using ships' names during the call.

1.14 SIGNALS TO ATTRACT ATTENTION

Rule 36 of the International Regulations for Preventing Collisions at Sea states in part:

> *"If necessary to attract the attention of another vessel any vessel may make light or sound signals that cannot be mistaken for any signal authorised elsewhere in these Rules, or may direct the beam of her searchlight in the direction of the danger, in such a way as not to embarrass any vessel."*

Ileksa was fitted with a searchlight on either side, above the bridge wings, and these could both be rotated through 360°, using a lever in the deckhead. Although when pointed directly astern they were partially masked by the funnels, *Cepheus J* was 5° to starboard of the fore and aft line and therefore could be seen clearly from both the searchlight positions.

SECTION 2 - ANALYSIS

2.1 AIM

The purpose of the analysis is to determine the contributory causes and circumstances of the accident as a basis for making recommendations to prevent similar accidents occurring in the future.

2.2 FATIGUE

Fatigue was not an issue in this accident, with the OOWs on both ships recording sufficient hours of rest.

2.3 LOOKOUT

2.3.1 International Regulations for Preventing Collisions at Sea

Rule 5 of the above rules states:

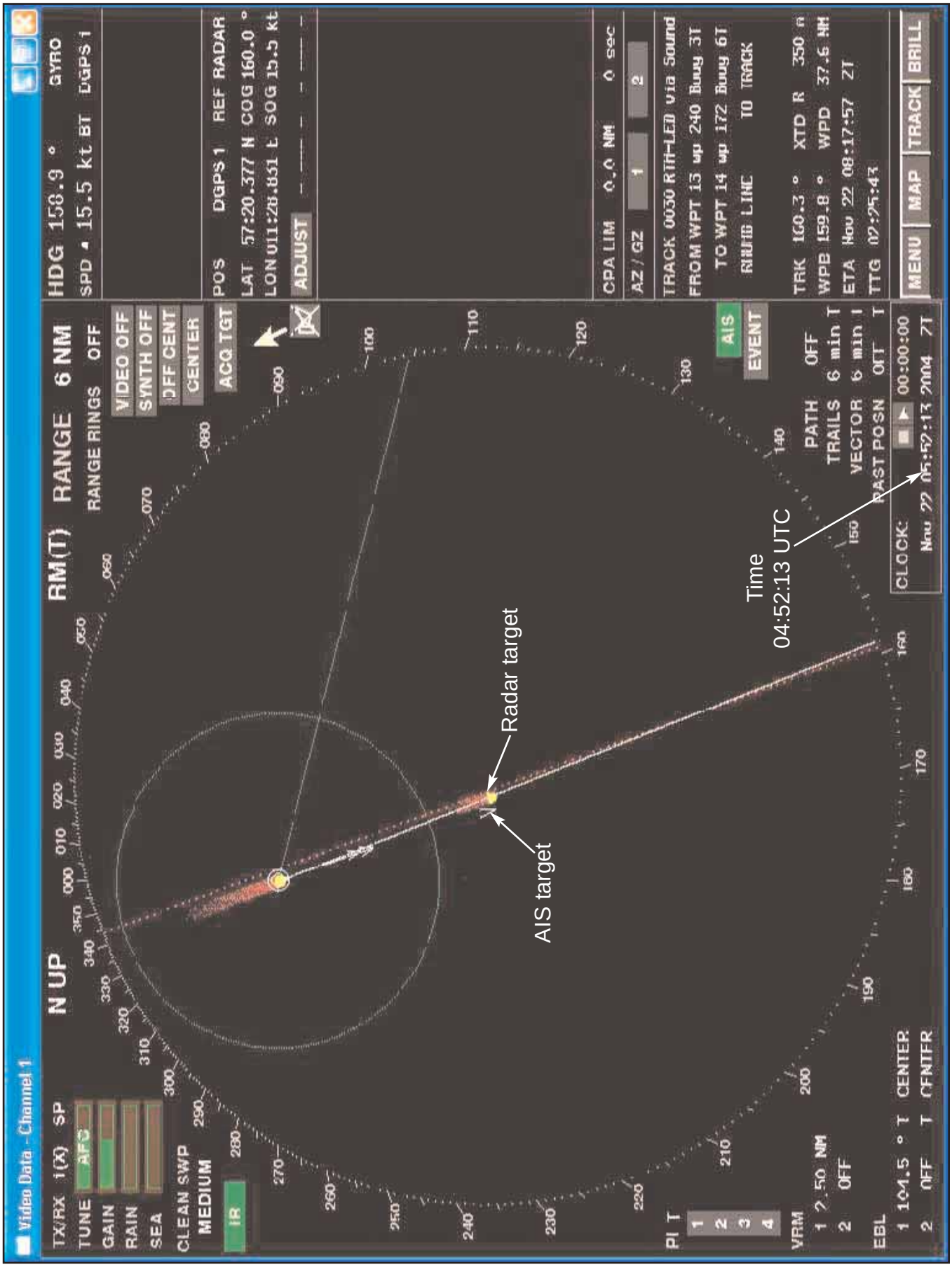
> *"Every vessel shall at all times maintain a proper look-out by sight and hearing as well as by all available means appropriate to the prevailing circumstances and conditions so as to make a full appraisal of the situation and of the risk of collision."*

Cepheus J had a number of "available means appropriate". They included: radar, AIS, VHF and a visual lookout. Employing any one of these would have alerted the OOW to the presence of *Ileksa,* and thereby enabled action to be taken to avoid collision.

For a period of at least 1 hour before the collision, the target of *Ileksa* was on the radar of *Cepheus J*, though appearing under the heading marker of the display **(see Figure 9)**. This did not entirely hide the target, but did make it difficult to see. However, the AIS information was also being displayed on the radar, with the symbol for a ship underway appearing close to the west of the radar target, and clear of the heading line. This should have alerted the OOW to the presence of *Ileksa* ahead of him.

The VHF radio on *Cepheus J* was switched on and set to Channel 16. When *Ileksa* called to ask the intentions of *Cepheus J*, the call did not include the ship's name, despite this being available to the officers on board *Ileksa,* from the AIS. Probably because of this, the call did not attract the attention of the OOW on *Cepheus J*, who, in any case, was listening to the news on another radio and carrying out paperwork.

With the visibility restricted to 1.5 miles, *Ileksa* would have been visible from *Cepheus J* for 9 minutes before the collision. *Ileksa* was displaying the lights required for a vessel of her size, which would have meant that *Cepheus J* would have seen at least a single white sternlight. However, additional lighting was illuminated around the accommodation, which would have enhanced the visibility of the vessel from astern.



Plot from *Cepheus J* 's radar display

An efficient lookout was maintained on *Ileksa*. *Cepheus J* was first noted astern by radar at 3.5 miles, visually sighted at 1.5 miles, and the ship's name and other details noted from the AIS.

2.3.2 STCW 95

The principles to be observed in keeping a navigational watch, as contained in STCW 95 Section A VIII/2 part 3.1, describes, in Section 12, the responsibility of the OOW for safe navigation of the vessel, and compliance with the COLREGS. Section 13 reinforces the requirements of Rule 5 of the COLREGS, and Section 14 emphasises that the sole duty of the lookout is the maintenance of a proper lookout.

The OOW had sent the dedicated lookout away from the bridge, to carry out cleaning tasks elsewhere in the ship. Therefore, he was acting as the sole lookout. Since it was still dark, this was in contravention of STCW 95, which states, in Section A VIII part 15, that *the officer in charge of the navigational watch may be the sole lookout in daylight.*

Cepheus J's OOW was involved in tasks which distracted him from his primary duty of lookout. This meant that he was not paying attention to the radar or to keeping a visual lookout. Because he was listening to the news on the radio, he was unable to monitor the VHF radio effectively so he missed yet another indication of the presence of *Ileksa.* Had the requirements of the STCW 95 Code been followed, an efficient lookout would have been maintained on *Cepheus J*, and it is unlikely that the collision would have occurred.

2.3.3 M Notice advice

M notices are issued in the UK by the MCA. They are designed to offer advice to both the merchant and fishing fleets, on all matters associated with the operation of ships at sea and in port. There are three categories of notice: Marine Guidance Note (MGN), Marine Information Note (MIN) and Merchant Shipping Notice (MSN).

M-notices in force at the time of the collision included:

MGN 137 (M+F) Lookout During Periods of Darkness and Restricted Visibility

MGN 202 (M+F) Navigation in Fog

MSN 1767(M) Hours of work, Safe Manning and Watchkeeping Provisions.

MGN 137 is a reminder to all UK ships, wherever they may be, and to other ships operating in UK territorial waters, of the legal requirements for keeping a proper lookout, especially during the hours of darkness. It draws the attention to the requirements of the STCW Code Section A-VIII.

MGN 202 discusses the requirements of the COLREGS, with particular emphasis on good watchkeeping practices. Although this collision did not occur in fog, the visibility was reduced, and the advice applies.

MSN 1767 reminds masters, owners and operators that it is not safe for the officer of the navigational watch to act as sole lookout during periods of darkness or restricted visibility.

It is clear, from the evidence collected during the joint investigations, that the watchkeeping arrangements in place on *Cepheus J* at the time of the collision, took no account of the advice contained in any of these M-notices.

2.3.4 International Safety Management Code (ISM)

The ISM Code expressly provides that it is the duty of the managing company to take all reasonable steps to ensure that the ship is operated in a safe manner. The company must have established and implemented an effective safety management system which includes procedures to ensure the safe operation of ships, as well as reporting accidents and non-conformities.

The managing companies of both *Cepheus J* and *Ileksa* had implemented the ISM Code on board their respective vessels, and issued comprehensive instructions for the maintenance of a proper and effective lookout, which closely followed the requirements of the STCW 95 Code.

The results of internal and external audits will usually provide managers with an assessment of how well its Safety Management System is working on board its vessels. The presence of company or external audits on board a vessel will often ensure that ship's staff are careful to simply be seen to comply with laid-down procedures and working routines. Evaluation of VDR data taken from vessels following accidents, has provided the MAIB with invaluable evidence on how ships normally operate away from the scrutiny of company officials or external auditors. As a consequence, the MAIB believes the routine examination of VDR data would provide ships' managers with an incontrovertible assessment on the standards of watchkeeping displayed by ships' staff under 'normal' operating conditions.

2.3.5 Application of the regulations

The managing companies of both vessels had followed the requirements of the ISM Code, and had issued instructions to the ships' staff concerning lookout and navigational watchkeeping. Both sets of instructions re-stated the requirements for lookout, paraphrasing STCW 95 and/or the COLREGS.

The obligations for lookout rest with the individual OOW, overseen by the master of the ship. The routines should be established by the management company, and be to the satisfaction of the flag State.

2.4 APPLICATION OF THE COLREGS

2.4.1 Actions by *Cepheus J*

When the vessels were in radar range, but not in sight of each other, it would have been prudent for *Cepheus J* to have maintained a radar watch. VDR recorded the fact that the radar was operating, but that no targets had been acquired with the ARPA. It also showed that no other systematic observation of detected objects was being carried out. Had *Ileksa* been observed, *Cepheus J* could have altered to port or starboard to avoid collision under Rule 19. When the vessels were 1.5 miles apart, they could have seen each other visually, and the Section II rules would have applied. As the overtaking vessel, under Rule 13, *Cepheus J* was again obliged to give way, and could have altered in either direction to avoid collision. A 20° alteration of course on first sighting *Ileksa* would have allowed a 0.8 mile passing distance.

The lack of a visual lookout or a radar watch, meant that the presence of *Ileksa* was not noted on board *Cepheus J,* so no avoiding action was taken.

2.4.2 Actions by *Ileksa*

The approach of *Cepheus J* was closely monitored by *Ileksa*'s OOW, and risk of collision was determined. However, *Ileksa* was a slow ship, so it was not unusual for her to be overtaken. In this respect, the OOW was used to vessels taking late avoiding action. He was, therefore, not unduly concerned that *Cepheus J* was approaching and, apparently, taking no action. At a range of 2 miles, *Ileksa* could have altered course to avoid collision under Rule 19 of the COLREGS, since *Cepheus J* could not be seen. Having sighted the lights of *Cepheus J*, *Ileksa* was obliged to maintain her course and speed, as required by Rule 17 (a)(i) **(see Annex 2)**. When it became obvious that *Cepheus J* was taking insufficient action, *Ileksa* began to take action as allowed under Rule 17(a)(ii). However, because the strong wind was right ahead, and the vessel altered only slowly out of the wind, the action had not started to take effect before the vessels collided. There had been an attempt to contact *Cepheus J* by VHF, but this did not use the ship's name or call sign (see Section 1.13). Other methods may be used to attract the attention of an approaching vessel within the COLREGS, but these were not used or attempted.

In conclusion, *Cepheus J* should have kept clear of *Ileksa*, but was not keeping a lookout, so was unaware of her presence. *Ileksa*, once it became clear that *Cepheus J* was taking no action, should have taken avoiding action earlier, given the prevailing weather conditions.

2.5 MANOEUVRABILITY

As the design and build of *Ileksa* was for inland waters operation, the propulsion and steering arrangements fitted produced limited manoeuvring characteristics in open sea operation. Her manoeuvring data showed that, in calm conditions, at full speed of 10.5 knots, in ballast, a turn through 90° would have taken 1 minute and 5 seconds, with an advance of 2.0 cables and a transfer of 0.9 cables **(see Annex 1)**. As can be seen from the diagram, for the first 1.3 cables of the advance, there is no transfer. The alteration of course to this point would be about 45°, taking about 40 seconds.

Because the vessel's accommodation was at the after end, this would have had the effect of a sail, and would have tended to keep her head to wind. Turning the vessel off the wind would have been difficult, especially with the winds of near gale force from ahead being experienced at the time of the collision. This situation was worsened by her limited manoeuvring characteristics. With the speed through the water reduced by the headwind, the water flow over the rudder was reduced. Since the single rudder was positioned on the centreline, it was clear of the propeller wash; this, too, reduced its efficiency.

In conclusion, *Ileksa's* inherent poor manoeuvring characteristics, especially in the prevailing weather conditions, should have encouraged earlier action, or a more concerted attempt to contact *Cepheus J* by VHF radio.

2.6 PASSAGE PLANNING

The principles to be observed in voyage planning are contained in IMO Resolution A893(21). This includes advice that routeing measures should be adhered to. Route T had been established in 1971 (see Section 1.3). As the main route from the North Sea to the Baltic Sea, it would have been the obvious choice for either ship for its intended voyage. The median line with direction arrows was shown on the charts in use on both vessels. This indicated that the median line should have been left to port, by both north and south-bound vessels. By leaving a distance between the planned track and the median line, the two opposing streams of traffic are separated, reducing the number of "head-on" encounters.

Both ships had picked a track 1 mile to the west of the median line, which was a reasonable choice. However, knowing that this was the main route through the area, should have encouraged heightened vigilance due to the increased likelihood of encountering other traffic heading in the same direction.

IMO resolution A893(21) also states that account should be taken of "volume of traffic likely to be encountered" when appraising the passage plan. The fact that the chosen track followed an IMO recommended route, should have indicated to the navigator that there might have been other traffic using it, therefore the lookout should have been enhanced.

2.7 USE OF RADAR

2.7.1 Radar on *Ileksa*

The radars were provided with an elementary plotting aid, which required the operator to mark the position of the target on the screen at regular intervals. The computer then performed the calculations necessary to provide the observer with the required information about the target. Although a useful tool, it required continuous monitoring to ensure that the target was marked sufficiently frequently to give reliable and up to date information.

These radars were also capable of displaying both true and relative trails. At the time of the collision, the radar was displaying relative trails, and the plotting facility was not being used. However, a paper plot was being maintained by the third officer, from ranges and bearings read off from the radar by the master.

Not all the facilities of the radar were being used, but *Ileksa* was aware of the presence of *Cepheus J* and had assessed the risk of collision.

2.7.2 Radar on *Cepheus J*

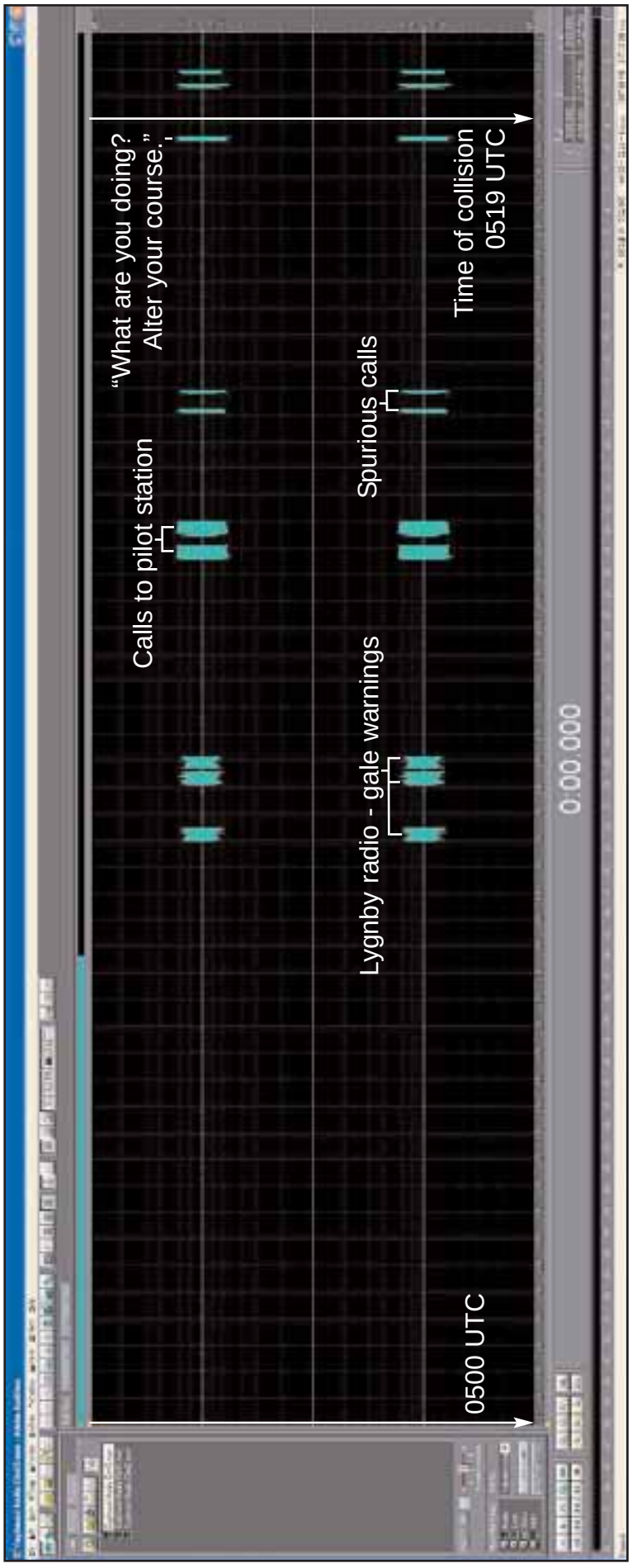
Cepheus J was fitted with a modern NACOS Integrated Bridge System designed by STN Atlas (now SAM Electronics). The two radar screens were independent and inter-switchable, with the port screen mounted next to the electronic chart display. The radars were both fitted with ARPA facilities.

The ARPA facility allows a target to be tracked after manual acquisition by the operator. It also enables a guard zone to be established around the ship. This guard zone facilitates the automatic acquisition of any target appearing within the zone. Should a target appear in the zone, it is automatically acquired and an alarm will sound to alert the operator. Once the target is acquired, it will be tracked by the ARPA, and information concerning its track will be calculated. This includes its closest point of approach and the time at which this will occur. An alarm facility is available, which will warn the operator if the target will breach user defined limits for CPA and TCPA.

The VDR recording shows that no targets had been acquired and that no guard zone had been established. Had either manual or automatic acquisition of targets been used, the OOW would have been alerted to the possible collision with *Ileksa,* and could have taken action to allow safe passing.

In addition to the ARPA facility, the radar displayed AIS information. This put a triangular symbol on the screen adjacent to the position of the target. Although this did not coincide exactly with the radar target, there could be no doubt that the two were the same vessel, since there were no other targets in the vicinity. As previously stated, the radar return of *Ileksa* was positioned underneath the heading marker of *Cepheus J*'s radar, rendering it difficult to see. The AIS target positioned to one side of the heading marker, would have highlighted the presence of a target near that position.

Figure 10



Recording from the VHF commucations on board *Cepheus J*

Relative trails were selected for display at the time of the collision. Since the relative approach of *Ileksa* was down the heading marker, the relative trails would also have painted there, so would have been masked to the observer.

The OOW was not using the integrated bridge equipment, with which he was provided, to its best effect.

2.8 USE OF VHF RADIO AND OTHER SIGNALS TO ATTRACT ATTENTION

2.8.1 VHF radio

When *Ileksa* called *Cepheus J* before the collision, no ships' names or call signs were used during either of the two transmissions. The sounds recorded by the VDR, on *Cepheus J*'s bridge, show that these transmissions were clear. They would not, however, have been sufficiently different to other random transmissions picked up during the minutes before the collision, for the OOW's attention to have been distracted from the radio news **(see Figure 10)**.

The MAIB believes that strict adherence to the ColRegs will always prevent collision, and the use of VHF as a means of negotiating avoiding action at sea can lead to confusion and should be avoided.

2.8.2 Other signals to attract attention

Apart from the use of VHF, no signals were attempted by *Ileksa* to attract the attention of *Cepheus J*. Additional signals are permitted under the COLREGS (Rule 36). It is likely that one of the most efficient in this case would have been to have pointed a searchlight in the direction of *Cepheus J*.

SECTION 3 - CONCLUSIONS

3.1 SAFETY ISSUES

The following safety issues have been noted during the investigation. They are not listed in any order of priority.

1. The lookout on the bridge of *Cepheus J* had been sent to carry out cleaning duties elsewhere on the ship. [2.3.2]

2. An efficient lookout was maintained by *Ileksa.* [2.3.1]

3. *Cepheus J*'s OOW was involved in tasks that distracted him from his primary duty of lookout. [2.3.2]

4. The watchkeeping arrangement in place on *Cepheus J* at the time of the collision, took no account of the advice contained in M Notices. [2.3.3]

5. The management companies of both vessels had adopted the requirements of the ISM code, and issued instructions to the ship staff concerning lookout and navigational watchkeeping. [2.3.5]

6. *Cepheus J* was not keeping a lookout. This meant that the presence of *Ileksa* was not detected, so no avoiding action was taken. [2.4.1]

7. Once it became clear that *Cepheus J* was taking no action, *Ileksa* should have taken action earlier, given the prevailing weather conditions. [2.4.2]

8. The poor manoeuvring characteristics of *Ileksa,* in the prevailing weather conditions, should have encouraged earlier action. [2.5]

9. The chosen track followed an IMO recommended route. This should have indicated to the navigator that there might have been other traffic using it, and prompted a heightened lookout. [2.6]

10. Not all the facilities of the radar on *Ileksa* were being used, but the presence of *Cepheus J* was known and the risk of collision had been assessed. [2.7.1]

11. *Cepheus J*'s OOW was not using the integrated bridge equipment, with which he was provided, to its best effect. [2.7.2]

12. *Ileksa* could have used signals permitted in the COLREGS which might have attracted *Cepheus J*'s attention in sufficient time to have allowed action to be taken to avoid collision. [2.8]

SECTION 4 - ACTION TAKEN

The following action has been taken as a result of this collision:

4.1 *CEPHEUS J*'S OPERATING COMPANY

Jüngerhans ship management has taken the following actions:

- Ships of the fleet have been reminded to follow relevant lookout regulations.
- The company's auditors and inspectors will increase their scrutiny of lookout procedures during ship audits and inspections.
- VDR data to be downloaded periodically, and reviewed in office.

4.2 MALTA MARITIME AUTHORITY

The Malta Maritime Authority has written to the managers of *Ileksa* to advise on the application of the COLREGS, especially with regard to the action to be taken by the stand-on vessel, and the signals used to attract attention.

SECTION 5 - RECOMMENDATIONS

The International Chamber of Shipping is recommended to highlight to its national ship owner associations:

2005/170 The need to be aware that ships complying with an IMO routeing system may be using passage plans with identical waypoints, and therefore increased vigilance should be maintained.

2005/171 The value of using the VDR replay to ensure that company instructions are being carried out at sea.

Marine Accident Investigation Branch
July 2005

Safety recommendations shall in no case create a presumption of blame or liability

ANNEX 1

Turning data for both vessels and course recorder trace for *Ileksa*

2.2 TURNING CIRCLES in DEEP WATER

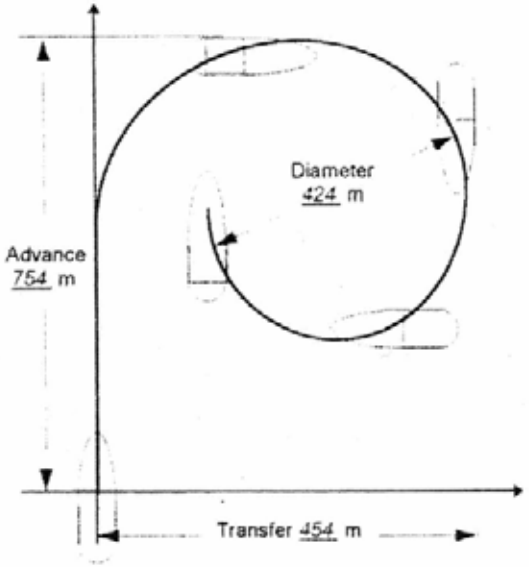
2.2.1 Turning Circle to Starboard at full Sea Speed

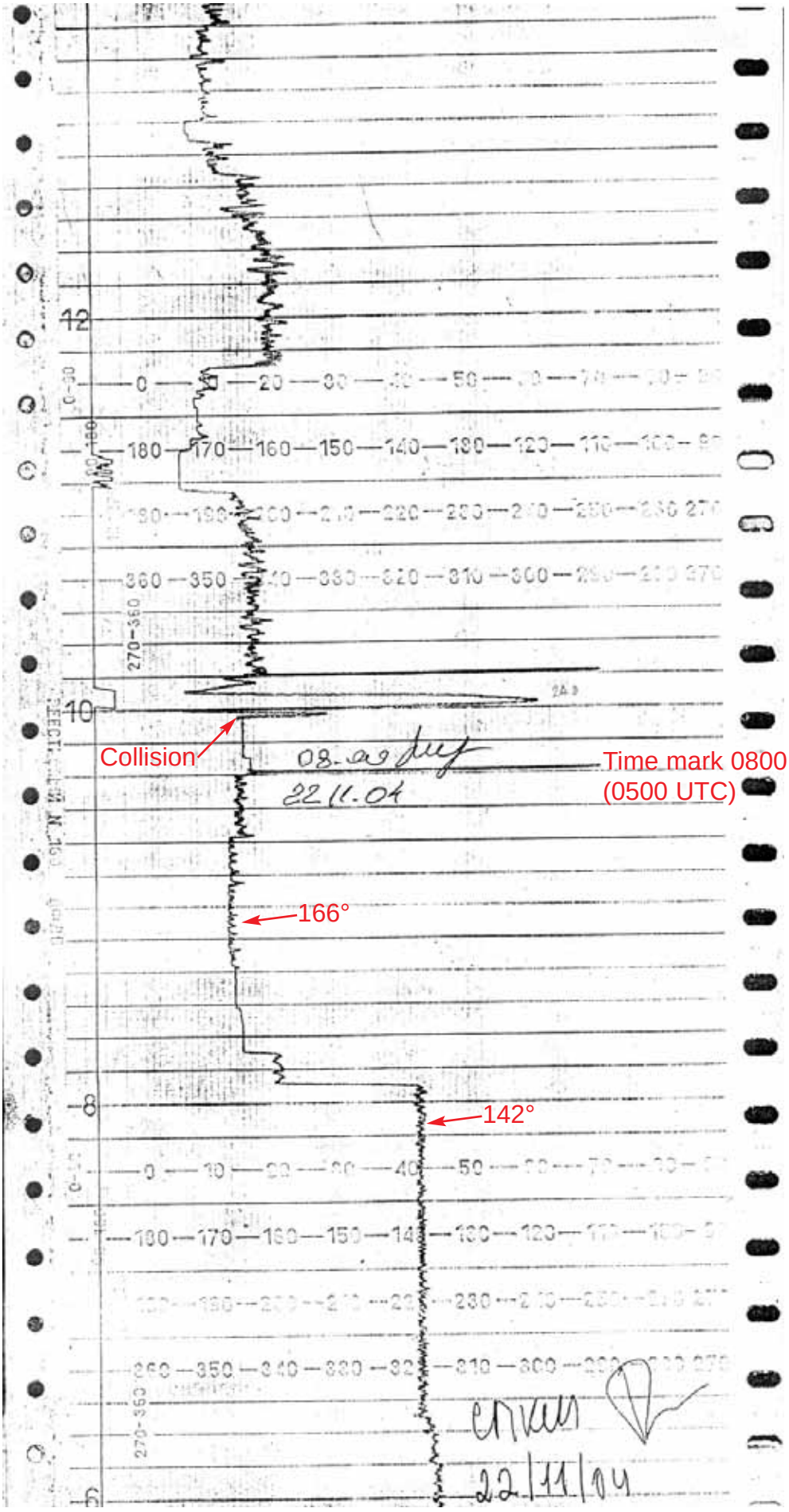
Date :	01.11.2003	Time from / to :	1952 - 1956
Man. Executed by :	Owner	H. Pohl	Schacht
Location of vessel :	German Bight	Depth of water :	40 m
Draught fwd. :	4.06 m	Draught aft :	5.22 m
Wind :	W 6 Bft	Sea :	3 Bf

Test No.:	198 / 1 m	Rudder Angle:	35 deg
Nos. Steer. Pumps :	1	Measured by :	DGPS
RPM / Pitch at Start:	180/95	Speed at Start :	17.02kts
RPM / Pitch at End:	180/80	Speed at End :	7.0 kts
Shaft Power abt. :	6,800 kW	Heeling Angle:	2 deg
Initial Heading :	090 deg	Final Heading :	090

Change of Heading	Act. Heading	Time [' "]	Speed [kts]
000°	090	0' 00"	17.0
090°	180	1' 11"	10.9
180°	270	2' 07"	6.0
270°	360	3' 03"	6.3
360°	090	$' 04"	7.0

Advance	754	m	4,07	cbl
Transfer	454	m	2,45	cbl
Diameter	424	m	2,29	cbl





Course recorder trace - mv *Ileksa*

GROSS TONNAGE	4955 grt
NET TONNAGE	1645 nrt
MAX DISPLACEMENT	8917 t
DEADWEIGHT	5885 t
BLOCK COEFFICENT AT SUMMER FULL LOAD DRAUGHT	107

SHIP'S MANOEUVRING CHARACTERISTICS

ТАБЛИЦА МАНЕВРЕННЫХ ЭЛЕМЕНТОВ

M/V "ILEKSA" **9HKZ5**

PERFORMANCE MAY DIFFER FROM THIS RECORD DUE TO ENVIRONMENTAL HULL AND LOADING CONDITIONS

BALLAST

В БАЛЛАСТЕ

DRAUGHT: 2.78 м

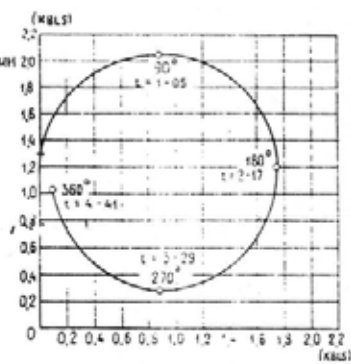
СКОРОСТЬ при 428 об/мин

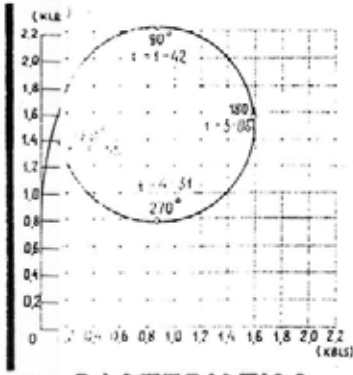
TURNING CIRCLE / TIME ЦИРКУЛЯЦИЯ / ВРЕМЯ	
Δ(курс) hdg	правый борт 35°
15	0 - 18
30	0 - 39
45	1 - 02
60	0 - 49
75	0 - 56
90	1 - 05
105	1 - 17
120	1 - 29
135	1 - 41
150	1 - 55
165	2 - 05
180	2 - 17
195	2 - 29
210	2 - 41
225	2 - 53
240	3 - 05
255	3 - 17
270	3 - 29
285	3 - 44
300	3 - 55
315	4 - 05
330	4 - 17
345	4 - 29
360	4 - 41
D (KABS)	1,75

ENGINE ORDER	REV (RPM)	SPEED (KTS)
MIN.RPM	143	
DEAD SLOW AHEAD	154	4,26
HALF AHEAD	343	10.1
FULL SEA AHEAD	432	11.9
SPEED AHEAD FULL ASTERN	412	

TURNING CIRCLES

ЦИРКУЛЯЦИЯ





LOADED

В ГРУЗУ

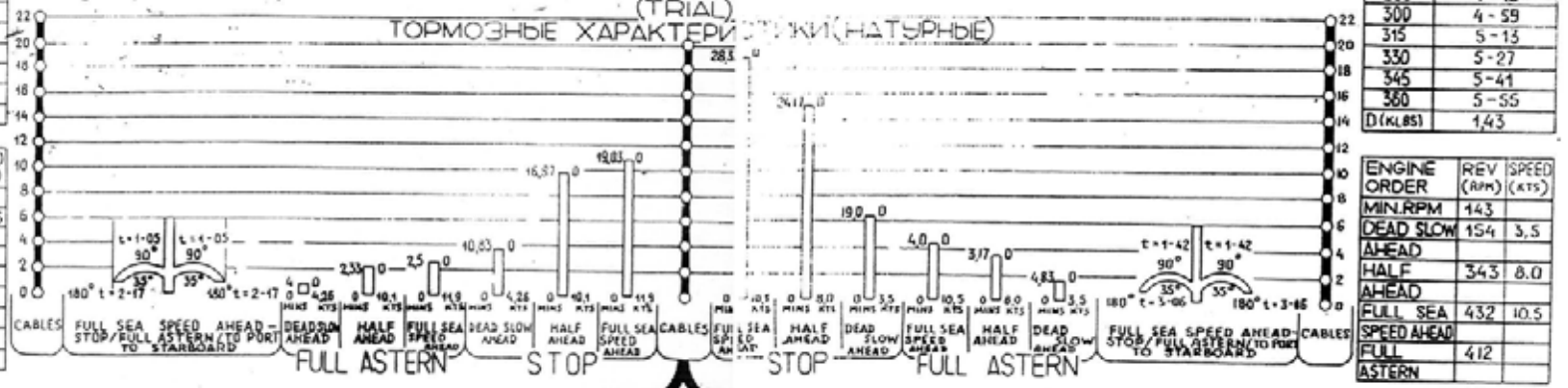
DRAUGHT: 3,6 м

СКОРОСТЬ: при 428 об/мин

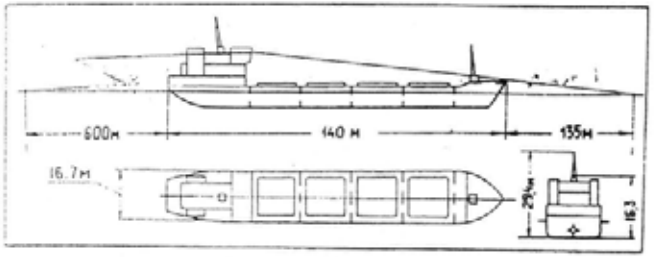
TURNING CIRCLE / TIME ЦИРКУЛЯЦИЯ / ВРЕМЯ	
Δ(курс) hdg	правый борт 35°
15	0 - 21
30	0 - 41
45	0 - 59
60	1 - 14
75	1 - 28
90	1 - 42
105	1 - 56
120	2 - 10
135	2 - 24
150	2 - 38
165	2 - 52
180	3 - 06
195	3 - 20
210	3 - 34
225	3 - 48
240	4 - 03
255	4 - 17
270	4 - 31
285	4 - 45
300	4 - 59
315	5 - 13
330	5 - 27
345	5 - 41
360	5 - 55
D (KABS)	1,43

STOPPING CHARACTERISTICS (TRIAL)

ТОРМОЗНЫЕ ХАРАКТЕРИСТИКИ (НАТУРНЫЕ)



ENGINE ORDER	REV (RPM)	SPEED (KTS)
MIN.RPM	143	
DEAD SLOW AHEAD	154	3,5
HALF AHEAD	343	8.0
FULL SEA AHEAD	432	10.5
SPEED AHEAD FULL ASTERN	412	



PROPULSION	PARTICULARS
TYPE OF ENGINE	6NVDS48A - 3V
CRITICAL REVOLUTION MINIMUM RPM	440 RPM / 143 RPM
ASTERN POWER	80% AHEAD
EMERGENCY FULL AHEAD TO FULL ASTERN	240 SEC
MAX.NO OF CONSECUTIVE STARTS	12
TYPE OF PROPELLER:	SOLID DIRECTLY DRIVEN

STEERING PARTICULARS	
TYPE OF RUDDER - НЕЖ	
MAXIMUM RUDDER ANGLE	35°
TIME HARD OVER TO HARD OVER: WITH ONE POWER UNIT	28
MINIMUM SPEED TO MANTAIN COURCE PROPELLER STOPPED	
RUDDER ANGLE FOR NEUTRAL EFFECT	4°

ANCHOR CHAIN

1 SHACLE = 25м

TWO SPEEDS	NO OF SHACKLES	MAX.RATE OF HEAVING
PORT	10	2,5 MIN
STARBOARD	10	2,5 MIN

ANNEX 2

The International Regulations for Preventing Collisions at Sea

The International Regulations for Preventing Collisions at Sea (1972) (COLREGS)(as amended) are designed to enhance safe navigation, by proscribing the conduct of vessels underway, specifying the display of internationally-understood lights and sound signals and set out collision avoidance actions where risk of collision exists.

Part B, the steering and sailing rules, are the rules determining actions to avoid collision, and are divided into three sections. Section I applies in any condition of visibility, section II to vessels in sight of one another, and section III to vessels in restricted visibility.

Although all the COLREGS can be said to apply at all times the following extracts are of particular importance to this case.

Section I

Rule 5 Lookout

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

Rule 7 Risk of collision:

a) *Every vessel shall use all available means appropriate to the prevailing circumstances and conditions to determine if risk of collision exists. If there is any doubt such risk shall be deemed to exist.*

b) *Proper use shall be made of radar equipment if fitted and operational, including long-range scanning to obtain early warning of risk of collision and radar plotting or equivalent systematic observation of detected objects.*

Rule 8, Action to avoid collision:

a) *Any action taken to avoid collision shall be in accordance with the Rules of this Part and shall, if the circumstances of the case admit, be positive, made in ample time and with due regard to the observance of good seamanship*

Section II

Rule 13 Overtaking:

a) *Notwithstanding anything contained in the Rules of Part B, Sections I and II, any vessel overtaking any other shall keep out of the way of the vessel being overtaken*

Rule 16 Action by the give-way vessel

Every vessel which is directed to keep out of the way of another vessel shall, so far as possible, take early and substantial action to keep well clear.

Rule 17 Action by the stand-on vessel

a) (i) *Where one of two vessels is to keep out of the way the other shall keep her course and speed.*

(ii) *The latter vessel may however take action to avoid collision by her manoeuvre alone, as soon as it becomes apparent to her that the vessel required to keep out of the way is not taking appropriate action in compliance with these Rules.*

b) *When, from any cause, the vessel required to keep her course and speed finds herself so close that collision cannot be avoided by the action of the give-way vessel alone, she shall take such action as will best aid to avoid collision.*

Section III

Rule 19 Conduct of vessels in restricted visibility

d) *A vessel which detects by radar alone the presence of another vessel shall determine if a close-quarters situation is developing and/or risk of collision exists. If so, she shall take avoiding action in ample time, provided that when such action consists of an alteration of course, so far as possible the following shall be avoided:*

i) an alteration of course to port for a vessel forward of the beam, other than for a vessel being overtaken;

ii) an alteration towards a vessel abeam or abaft the beam.