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SUMMARY

Shortly before 0200 Eastern Standard Time 3 September 1991, the Russian container ship *Khudozhnik loganson,* whilst on passage from Manila to Melbourne, was in collision with the Australian prawn trawler *Zodiac* off Cairns.

No persons were injured, but the *Zodiac* sustained damage to the starboard fishing boom, the deckhouse starboard awning and to the stem post.

The Marine Incident Investigation Unit, under the provisions of Regulation 8 of the Navigation (Marine Casualty) Regulations undertook an investigation of the incident.

PERSONS INTERVIEWED

ZODIAC

Cairns 4 September 1991 and Townsville 10/11 September 1991

Skipper
Deckhand

KHUDOZHNIK IOGANSON

Melbourne 7/8 September 1991
(Interviews conducted jointly with Captain Viacheslav Trusov, representing the Russian Marine Administration and the Russian Consul, Mr Mikhail Tchoupakahine)

Master
Second Mate
Seaman (Helmsman)
Seaman (Lookout)

STATEMENT

A statement was provided by the Skipper of the Australian fishing vessel Alistar, on *13* March 1992, who also provided additional information over the telephone on 30 March 1992.

PROVISION OF TECHNICAL ADVICE

AMC School of Fisheries

N O T E

Under Regulation 16(3) of the Navigation (Marine Casualty) Regulations the Inspector must, where a report relates to a person's affairs to a material extent, if it is reasonable to do so, provide the person with a copy of the report or of the relevant part of the report. Such persons may then provide written comments or information relating to the report.

A submission was received from Mr D M Jones, endorsed by Mr S E Essery, including a signed statement from Mr F G Brooks, Skipper of the fishing vessel Alistar. The submission has been considered and is discussed in an annex to the report.

SEQUENCE OF EVENTS - ZODIAC

The *Zodiac*, a white, 46 feet (14.02 metres) wooden hulled fishing vessel, departed from Townsville on Sunday 1 September 1991, proceeding on an intended ten day voyage to trawl for prawns. The vessel was manned by the Skipper and one Deckhand.

Prawn fishing is conducted during hours of darkness, from around 1800 through to 0600 and that Sunday night the *Zodiac* operated off Bramble Reef. The vessel then moved north to spend the Monday at anchor off Fitzroy Island, southeast of Cape Grafton, the time at anchor being spent sleeping and generally resting.

Fishing resumed at 1830 Monday, to the north of Cape Grafton, the *Zodiac* being the southernmost of a group of around twelve vessels fishing in the area, the other vessels being strung out to the north. Speed during trawling operations was said to be 2.8 knots.

Whilst engaged in trawling both the Skipper and the Deckhand stated that the *Zodiac* was displaying the correct lights; an all round green light over an all round white light, sidelights and sternlight plus the white masthead light. The after deck working lights (four florescent strips and three spot lights) were also switched on.

The VHF radio was kept switched to channel 13 for listening to and talking to other fishing vessels. Channel 16, the international "Calling and Distress" Channel, was monitored occasionally, or if another vessel appeared to be approaching close.

Two 'shots' or trawls were carried out during the evening and a third was commenced around midnight, running in a southeasterly direction parallel to and around 9.8 miles off the coast. The course had been set by aligning the ship's heading marker on the radar parallel to the coastline and then engaging the auto-pilot, the Skipper stating this course to be 135° True.

At this time the Skipper decided to go below into the cabin space to get some sleep. He instructed the Deckhand to maintain a distance off the beach of between 9.7 and 9.8 miles and to run until such time as the Zodiac was between 8 and 11 miles off Cape Grafton, when he should alter onto a reciprocal course. He also instructed the Deckhand to call him at 0300.

The Deckhand maintained track by watching the radar, but considered that the compass course was between 132° and 135°. At a time which he thought to be around 0120 the Deckhand noticed a large ship about one point on the starboard quarter, at a distance he estimated to be around 2 miles; the ship was showing 'open' masthead lights and a red sidelight and from their aspect the Deckhand thought that it was heading in for Cairns. Some time later he checked on the ship, which was now about 3 to 4 points on the starboard quarter and, although the lights had 'straightened out a little', he still thought that it was headed in for Cairns.

About a ten minutes later, at about 0150, when the *Zodiac* had reached a position 8.2 miles from Cape Grafton and 7 cables from the position at which he intended to alter course, he heard a short blast on a ship's whistle. He looked astern, thinking that only other fishing vessels were in the vicinity, and saw that the Zodiac was about to be run down by a large vessel. All he had time to do was change from autopilot to manual and throw the wheel over to port, before the starboard trawl boom came in contact with the other vessel's hull.

The impact of the contact caused the boom to buckle downwards, under the *Zodiac*, allowing the starboard side of the deckhouse to also make contact. The *Zodiac* passed down the side of the other vessel and cleared astern. The impact of the collision awoke the Skipper, who immediately climbed up into the wheelhouse and broadcast a "MAYDAY" on VHE He then tried calling the unknown vessel on the VHF, but received no response.

The "MAYDAY" message was received by Cairns Port Radio and also by the other fishing vessels, one of which took the *Zodiac* in tow to False Bay, where the damaged fishing gear was recovered. The *Zodiac* then proceeded to Cairns under its own power.

The force of the collision had not only buckled the starboard fishing boom, but had also sheared the wooden stem post at the point where the trawl boom gantry forward bar-stay was connected. The starboard sidelight was damaged when the deckhouse came into contact with the other ship and the collision also caused the masthead light to fail.

SEQUENCE OF EVENTS - KHUDOZHNIK IOGANSON

The *Khudozhnik Ioganson*, a Russian flag container ship of 15306 GRT and 169.86 metres length overall, engaged in a liner trade from the Russian eastern seaboard to Japan, Hong Kong, Manila and Australian eastern ports, had sailed from Manila on 27 August bound for Melbourne via the Torres Strait and the inner two-way route of the Great Barrier Reef.

The ship entered Gannet Passage, at the western end of the Torres Strait, at 2000 EST on Sunday 1 September 199 1. The Master had transitted the area on a number of occasions without utilising the services of a Pilot of the Queensland Coast and Torres Strait Pilot Service and on this voyage also proceeded without a Pilot. For much of the passage through the Torres Strait and the inner two-way route the Master took personal charge for the safe conduct of the ship, leaving the bridge only when the Mate was on watch, or for brief spells for meals, or when the ship was passing through the more open water areas.

The passage through the Torres Strait and inner two-way route was uneventful and the *Khudozhnik Ioganson* passed Low Island, at the southern end of the inner two-way route, at 0026 3 September, a transit time of 28 hours 26 minutes. For the passage the officers and crew watchkeepers had maintained their normal watch routines, i.e. 4 hours on, 8 hours off. The Master, on the other hand, had spent some 16 hours on the bridge, but considered that he had had sufficient rest during the passage and that he was not tired on the morning of 3 September.

On passing Low Island, course was set at 1420 True for the run down to Fitzroy Island; from the positions plotted on the chart the ship was making good a speed of 17.5 knots. The Master remained on the Bridge, in charge, with the Second Mate, the Officer of the Watch, performing the navigational duties including plotting the ship's position at lo-minute intervals. One seaman was at the wheel, steering, and a second seaman was on lookout duties.

The weather was fine, with good visibility, the wind light at about force 3 from the east and only a slight sea was running. A number of fishing vessels were sighted at around 0100, the majority eventually passing clear either to port or to starboard at distances of between 0.2 and 0.5 miles, the *Khdozhnik Ioganson* not having to alter course for any of them. All the fishing vessels were showing bright working lights; navigation or fishing lights were seen on only a few.

When first noted by those on the bridge the most southerly of the group of fishing vessels was very fine, at about 3 degrees, on the port bow. Main attention was paid to the closer fishing vessels, as they were being approached and passed. According to the Second Mate, at 0120 the most southerly vessel was at a distance of around 6 miles. All four persons observed the fishing vessel, a glow of bright white lights, to be opening slowly to port.

At 0128, to make allowance for 10 high gyro error, course was adjusted to 1430 Gyro.

At 0133 more attention was paid to the most southerly of the fishing vessels and a visual bearing, 137° Gyro, and a radar distance, 3.9 miles, taken and noted. The Second Mate checked the visual bearing at approximately 2 minute intervals, which showed that the fishing vessel was opening out slowly to port.

At 0145, when the bearing was recorded as being 133° Gyro and the distance 1.6 miles, the &aster sounded one prolonged blast on the whistle and flashed the signal lamp in the direction of the fishing vessel, to warn of their presence. The bearing and distance were again taken and recorded at 0149, as 128° at 0.5 miles respectively.

At 0149.5 the Second Mate obtained a visual bearing of Fitzroy Island light and a radar distance and plotted the ship's position on the chart. Whilst carrying out the plotting he heard the Master order the wheel hard to starboard, heard one long blast on the whistle and heard the Master order him to give one short blast, which he immediately proceeded to do. Both the Master and the Lookout had seen a green light suddenly appear low down and forward of the bright working lights of the fishing vessel, which at that time was around 15 to 20 degrees on the port bow at a distance of 5 to 6 cables. The Master and lookout were positive that this was the fishing vessel's side light and that the fishing vessel had altered course to starboard, in towards the *Khudozhnik Ioganson*. The helmsman had lost sight of the fishing vessel, screened from his view by the containers stacked on deck; however as the ship swung to starboard the fishing vessel again became visible to him and he also was able to see the green side light.

The *Khdozhnik Ioganson* responded very quickly to the hard to starboard helm and swung quickly to starboard. However the fishing vessel closed to a position at about mid length of the ship and at a distance of 15 to 20 metres. The only lights that could be seen were the very bright working lights and the green side light; no green over white fishing lights were visible to those on the bridge. The aspect of the fishing vessel was noted to be at about 50 to 60 degrees to the line of the *Khdozhnik loganson,* with the outline of the vessel and the trawl booms clearly visible.

At this point, with the *Khudozhnik Ioganson* swinging through about 2000 heading, the Master ordered hard to port, in an effort to prevent the stern from swinging onto the fishing vessel. The Master, Second Mate and Lookout all watched the fishing vessel from the port bridgewing. The fishing vessel passed clear under the bridgewing and then the starboard fishing boom was seen and heard to make contact with the ship's side in the area adjacent to bay number 37 (Attachment 3). All three observers considered that the contact was very minor, limited to the fishing boom and that neither the hull nor the deckhouse of the fishing vessel made contact. The fishing vessel was seen to rock slightly and then steady as it passed astern. At no time, as the fishing vessel passed down the port side, was anyone seen on the fishing vessel, either on deck or in the wheelhouse.

The Master then ordered the helmsman, who thought that the heading at that time was around 1700 to 180°, back onto course. Then, having satisfied himself that the fishing vessel was still afloat, the Master went to the VHF radio in the wheelhouse and called the fishing vessel on Channel 16.

The Second Mate immediately went and plotted the ship's position, Fitzroy Island light bearing 148°T, radar distance Cape Grafton 7.9 miles, noting the time as 0152. The Lookout remained on the port bridgewing, keeping an eye on the fishing vessel, the lights of which remained steady.

The Master was convinced, as were both the Second Mate and the Lookout, that the contact had been very minor, that the fishing vessel was in no danger of sinking and that there was no need for him to turn back to offer assistance. However, he tried to make contact with the fishing vessel for the next fifteen minutes, but failed to do so. He was satisfied that the VHF was working properly at the time; infact, contact was made with a northbound ship at 0215, for navigation purposes, the incident with the fishing vessel not being mentioned.

The K*hudozhnik Ioganson* continued on passage and the Master, although he was participating in the AUSREP system, did not report the incident to the MRCC. Only when he received a query from the MRCC requesting information about a collision did the Master advise the MRCC that his ship had been involved in the contact.

When the *Khudozhnik Ioganson* berthed at No.1 East Swanson Dock, Melbourne on 7 September an inspection of the hull revealed contact marks in the vicinity aft of the port bridgewing, in the area adjacent to Bay 37. A vertical white scratch mark indicated where the trawl boom had made contact, aft of which a curved horizontal scratch mark, containing chips of yellowish coloured paint, indicated where the wheelhouse awning had made contact.

COMMENT

For the collision to have occurred certain criteria needed to be met:

1. the two vessels were proceeding on converging courses and remained on steady relative bearings; or

2. one of the vessels altered course towards the other; or

3. both vessels altered course towards the other.

COURSES

ZODIAC

The *Zdiac* was fitted with a magnetic compass which, according to the owner, had been corrected and the deviation was negligible. Thus compass courses, for the purposes of analysis, have been taken as being magnetic courses.

Whereas the Skipper said that the course being steered was 135° True, the Deckhand said that the course was between 132° and 135° (southeast) compass, or magnetic.

The Magnetic Variation in the area is currently about 7.25° east, thus a magnetic course of 135° provides a true course of 142.25° and 132° magnetic a true course of 139.25°.

Position keeping and steering was purely by radar; positions were not plotted on a navigation chart and therefore there is no record of the *Zodiac's* positions or course made good. A line drawn through the prominent points of the coastline to the north of Cairns (Yorkeys Knob and Buchan Point) gives a direction of 142°/322°. However, in maintaining a course parallel to the beach there would be a tendency to steer parallel to that section of the beach running forward of the beam. From the time that Yorkeys Knob was abeam, at around 0100, the *Zodiac* was most probably making good a course of around 148° T, the general direction of the lie of the coastline to the south of Yorkeys Knob.

KHUDOZHNIK IOGANSON

Reference to the chart upon which the positions had been plotted at lo-minute intervals (Attachment 2) shows that the *Khudozhnik Ioganson* was making good the course laid down on the chart, i.e 142° True.

The *Khdozhnik Ioganson* is equipped with a course recorder and reference to the course recorder chart (Attachment 4) shows that the ship maintained a steady course, without alteration, until making a rapid alteration to starboard shortly before the collision. Initially the course was 142°, from the time of alteration of course at 0022, until 0 ***128,*** when 1° high gyro error was applied and the ship steered 143° by Gyro.

Conclusion
The two vessels are considered therefore to have been proceeding on slightly converging courses, with the *Zodiac* steering approximately 148° True.

SPEEDS

The speed of the *Zodiac* was said to be 2.8 knots whilst engaged in trawling; advice is that this would be typical for a trawler of this size engaged in prawn fishing. The speed of the *Khdozhnik Ioganson,* as measured from the ship's chart, was established as 17.5 knots; the approach speed therefore was 14.7 knots.

At an overtaking rate of 14.7knots the distance between the two vessels would have decreased at a rate of 1.0 miles every 4.08 minutes, or 0.245 miles every minute.

RELATIVE POSITIONS

ZODlAC

The Deckhand aboard the *Zodiac* stated that while he had noted the *Khudozhnik Ioganson* visually he did not see the ship on radar. He also stated that he did not take any compass bearings of the ship.

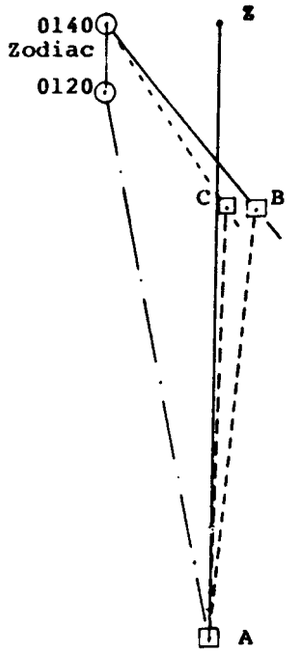
At the time that the *Zodiac* was inspected at Townsville the radar set had been removed by the servicing agent. Thus it was not possible to ascertain what blind sectors there may have been, to account for the *Khudozhnik Ioganson* not being indicated on the screen.

The Deckhand stated that when he first noticed the *Khdozhnik Ioganson,* at a time he thought was around 0120, it was about one point on the starboard quarter at a distance he estimated as being 2 miles and, from the disposition of the navigation lights, appeared to be headed for Cairns. From his observation he formed the opinion that the ship was passing clear.

Had the *Khudohznik Ioganson* been only 2 miles distant and headed for the Cairns fairway buoy, it would have been in a position forward of the *Zodiac's* beam by 0130. The Deckhand's estimation of the distance as 2 miles at 0120, approximately 30 minutes before the collision, is therefore grossly under-estimated; at that time, at the claimed speeds, the distance between the two vessels would have been around 7.5 miles.

The next time the Deckhand stated that he looked at the *Khudozhnik Ioganson,* some ten minutes before he heard the blast on the whistle, therefore at around 0140, it was between 3 and 4 points on the starboard quarter. In this time the *Khudozhnik Ioganson* would have travelled 5.8 miles.

As both the times and bearings are only approximate, an accurate reconstruction is not possible. However, based upon the Deckhand's observations (Diagram 1) the two vessels are indicated as having been on slightly diverging courses.



A Khudozhnik Ioqanson at 0120
1 point on starboard quarter
at 7.5 miles

B Khudozhnik Ioganson at 0140
3.5 points on starboard quarter

C Khudozhnik Ioganson at 0140
3 points on starboard quarter

AZ 'Parallel* to Zodiac track

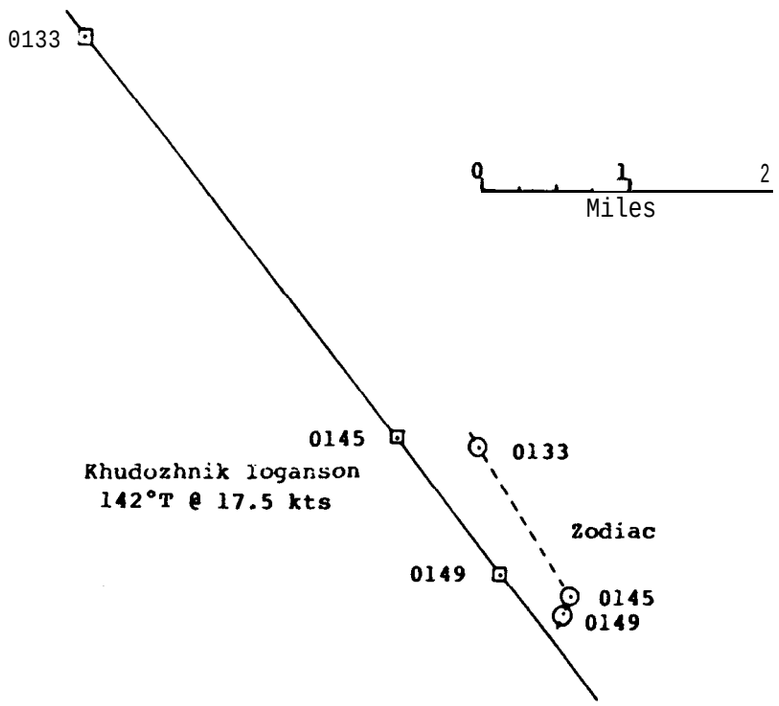
Diag. 1 Relative positions from Zodiac observations.

Being fine on the port bow of the *Khuhzhnik loganson,* at 0120 the masthead lights of the *Khdozhnik Ioganson* would have been only slightly open to the *Zodiac,* not broadly as stated by the Deckhand.

KHUDOZHNIK IOGANSON

When first noticed by those on the bridge of the *Kbudozhnik Ioganson* the *Zodiac* was said to be about three degrees on the port bow. The night was clear with good visibility and therefore it is likely that the powerful working lights of the *Zodiac* would have been visible in excess of 10 miles. At 10 miles distance and 3 degrees on the port bow, the *Zodiac* would have been 0.5 miles from the *Khudozhnik Ioganson's* track.

According to the Second Mate, at around 0120 the distance between the two vessels was about 6 miles. The visual bearing and radar distance of the *Zodiac* were noted at 0133 (137°, 3.9 miles), 0145 (133°, 1.6 miles) and 0149 (128°, 0.5 miles). Plotting these recorded bearings and distances (Diagram 2) gives the course and speed of the *Zodiac* between the times 0133 and 0145 as 148.5°True at 5.10 knots and between the times 0145 and 0149 as 203.5° True at 2.27 knots.



Diag. 2 Relative positions from Khudozhnik Ioganson observations

The Inspector accepts that the Second Mate noted down the visual bearings and radar distances as they were taken. However, given the inconsistencies in the speed of the *Zodiac* derived from the plots, it is considered probable that the times were recalled after the event and thus are not considered to be accurate.

TIME OF COLLISION

The Second Mate was at the chart table plotting the position for a time he noted as 0149.5, when the order to starboard the wheel was given. After the collision had taken place and once the *Zodiac* had passed astern the Second Mate took a visual bearing of Fitzroy Island light, a radar distance off Cape Grafton and plotted the position on the chart, noting the time as 0152.

The time of the collision is therefore considered to be between 0151 and 0151.5.

FATIGUE AND ALCOHOL

Due to the night-time nature of prawn trawling operations, sleep and rest are normally taken during the daytime. According to the Deckhand, he had also had about 3 hours sleep prior to midnight and was well rested. The Deckhand stated that he was a non-drinker and the Skipper stated that he had had no alcoholic drinks during the eight hours preceding the collision.

The Master of the *Khudozhnik Ioganson* had spent some 16 hours on the bridge during the passage through the inner two-way route and had been on the bridge continuously from 2000 2 September. However, he stated that he was well used to such demanding hours and considered himself not to be tired.

Although such hours are normal for ships' masters, under such circumstances, some element of fatigue cannot be ruled out as a possible contributing factor. The employment of a Pilot of the Queensland Coast and Torres Strait Pilot Service would have relieved the Master of some of the pressures during the passage and enabled him to spend a little less time on the bridge prior to passing Low Isles.

The Second Mate and the two crewmen had all had their normal sleep and were therefore unlikely to have been suffering from any acute fatigue.

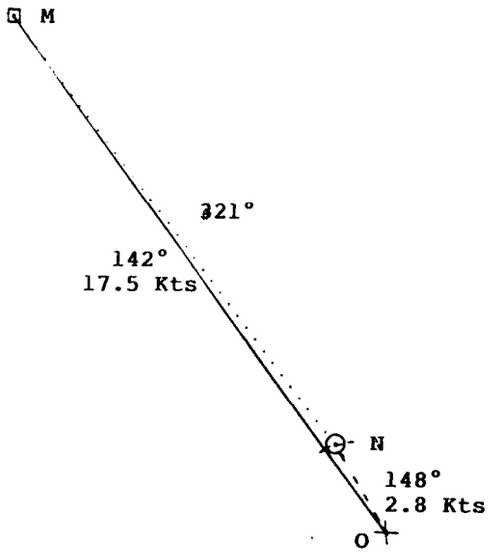
The policy on board the *Kbudozhnik Ioganson* is that alcohol is not available to any of the crew, only small quantities being held in the Master's bond for Master's entertaining purposes.

Whereas alcohol is not considered to be a contributing factor to the incident, it is considered that fatigue cannot be ruled out as having had an influence on the judgements and performance of the Master.

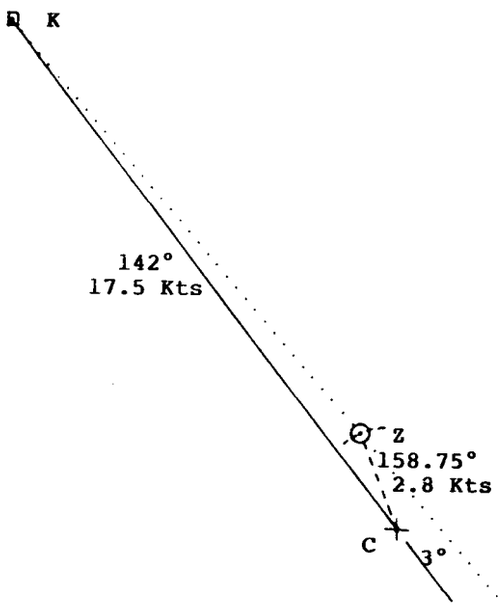
GENERAL

In many areas of the world, especially in Japanese waters, where large fishing fleets are encountered mariners are accustomed to passing close to fishing vessels. In passing the fishing vessels on the morning of 3 September at distances varying between 0.2 and 0.5 miles the actions of the Master of the *Khudozhnik Ioganson* are considered to be neither unreasonable nor unsafe. However, when passing other vessels at such distances it is essential that the situation is well monitored until the other vessels are passed and clear.

If neither vessel altered course, for a collision to occur the relative bearings would have had to remain steady.



Diag.3 Vector diagram showing track of Zodiac relative to Khudozhnik Ioganson ("NM")



Diag.4 Vector diagram showing course required of Zodiac ("ZC') to remain on steady 3° bearing

On a course of 148°T at 2.80 knots the *Zodiac's* movement relative to the *Khudozhnik Ioganson* would be in a direction of 321° ("NM" Diagram 3). Thus for the collision to occur the *Zodiac* would have had to remain on a steady bearing of 141°T, only 1 degree on the *Khudozhnik Ioganson's* port bow.

To remain on a steady bearing 3 degrees on the port bow of the *Khudozhnik Ioganson,* at a speed of 2.8 knots, the *Zodiac* would have had to maintain a course of 158.75 ° True ("ZC" Diagram 4). Such a course is not parallel to the coast and is not consistent with the statements of the Zodiac's Skipper and Deckhand.

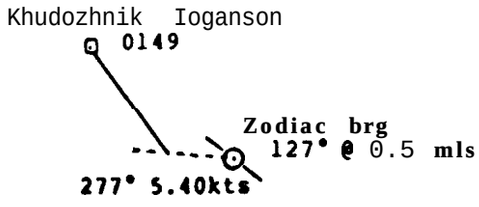
Both vessels maintained that the relative bearings increased and made the assessment that no danger existed.

It is therefore considered that in the period leading up to the incident, from when the two vessels first sighted each other until a few minutes before the collision, although on slightly converging courses, they were not on collision courses.

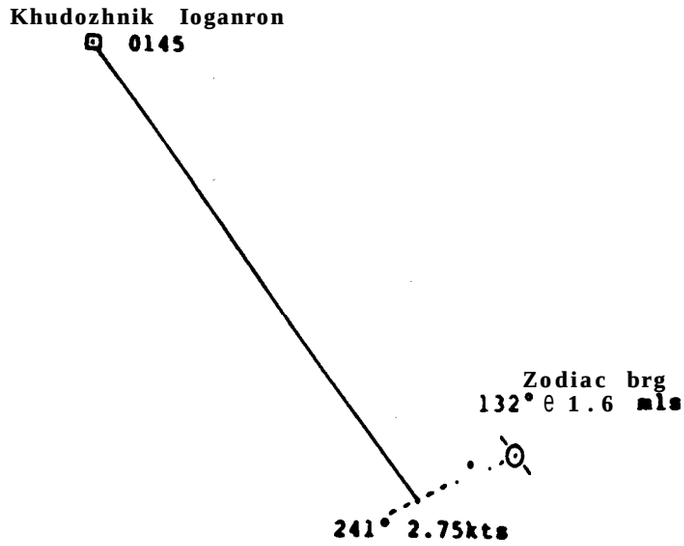
The evidence of the *Khdozhnik Ioganson's* course recorder and navigation chart showed that the ship did not alter course to port, towards the *Zodiac.* The only other variable, therefore, was the action of the *Zodiac,* for which there is no documentary evidence.

The bearing and distance noted by the Second Mate at 0149 (127°T at 0.5 miles) place the *Zodiac* 1.25 cables to port of the *Khudozhnik Ioganson's* track and 4.825 cables ahead of the bridge. For a collision to occur at 0151 from that situation the *Zodiac* would have had to be on a course of 277° T and proceeding at a speed of 5.40 knots (Diagram 5). The relative position of the Zodiac as noted by the *Khudozhnik Ioganson* at 0149 cannot be accepted as being accurate.

Courses and speeds required of Zodiac to reach collision paint from 0149 and 0145 relative positions



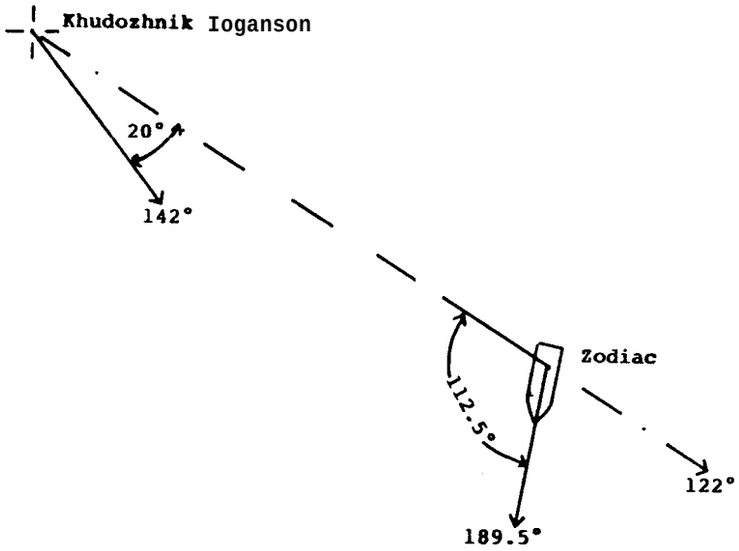
Diag. 5 Observed situation 0149



Diag.6 Observed situation 0145

The bearing and distance noted at 0145 place the *Zodiac* in a position 2.70 cables to port and 1.58 miles ahead of the *Khudozhnik Ioganson* bridge (Diagram 6). For a collision to occur from this position the Zodiac would have had to be on a course of 241° T and making a speed of 2.75 knots. This throws some doubt upon this position also, as the green side light of the *Zodiac* would have had to have been visible for some time.

When the green light was first noted the *Zodiac* was said to be bearing around 15 - 20 degrees on the bow, i.e. between 122° and 127° True. For this green sidelight to be visible to those on the *Khudozhnik Ioganson* the *Zodiac* had to be on a heading of at least 189.5 ° True (Diagram 7).



Diag .7 Least heading of Zodiac for green side light to be visible

The sidelight fitting was damaged in the collision, therefore it was not possible to determine whether the light was screened correctly to be visible as required by the International Regulations for Preventing Collisions at Sea. However, the *Zodiac* was under current survey with the Queensland Authorities and therefore it can be assumed that the starboard sidelight was screened correctly.

The Helmsman stated that he had lost sight of the *Zodiac* by the time the green sidelight was sighted, due to the fishing vessel being concealed from his view by the container stack. From the steering position the *Zodiac* would have become lost to view once it had closed to within 6.2 cables forward of the bridge and to within 1.4 cables of the ship's track.

From the reconstruction of the collision, discussed later, it is estimated that the Zodiac would have become lost to view by the helmsman very shortly before 0149, a little over half a minute before the Master and Lookout observed the green sidelight and when the bearing and distance of the Z*odiac* would have been around 122°T at 0.4 miles.

With the *Khdozhnik Ioganson* swinging to starboard, the *Zodiac* closed to a position just 15 to 20 metres off the port side, at about mid length of the ship, and was observed to be heading in a direction of 50 to 60 degrees across (in towards) the ship. From the course recorder chart the maximum alteration was to 205°, therefore at the time of ordering the wheel hard to port the heading was more probably around 190°. At that time, from the observations of those on the bridge of the *Khdozhnik loganson,* the *Zodiac* must have been heading around 240° or 250°.

According to the Skipper of the *Zodiac,* in the prevailing wind and sea conditions at that time, the fishing vessel would take 10 minutes to alter round onto a reciprocal course, providing a turning rate of 18 degrees per minute. On this basis for the *Khudozhnik Ioganson* to see the green side light at 0149.5 the *Zodiac* would have had to commence altering course at 0147.

From the initial sighting of the sidelight to the *Zodiac* becoming close to the side of the *Khudozhnik Ioganson* only about one minute appears to have elapsed, in which time the heading of the *Zodiac* needed to alter through at least a further 50° to be headed as reported. As the two vessels closed interaction forces would take effect, but it is also considered likely that initially, due to the glare of the bright working lights and the height of eye on the bridge of the *Kbudozhnik loganson,* the sidelight may not have been noticed until a broader aspect had been presented.

Despite the Deckhand's assertion to the contrary, it is considered that the *Zodiac* did alter course and that the alteration commenced at around 0146. At that time the *Zodiac* was approaching the minimum distance off Cape Grafton (8.0 miles) that the Skipper had instructed the Deckhand to make the turn. Also, the Deckhand had assumed that the *Khudozhnik Ioganson* was well clear, headed in for Cairns. After five minutes at a rate of turn of 18 degrees per minute the *Zodiac* would have been on a heading of nearly 2400 True.

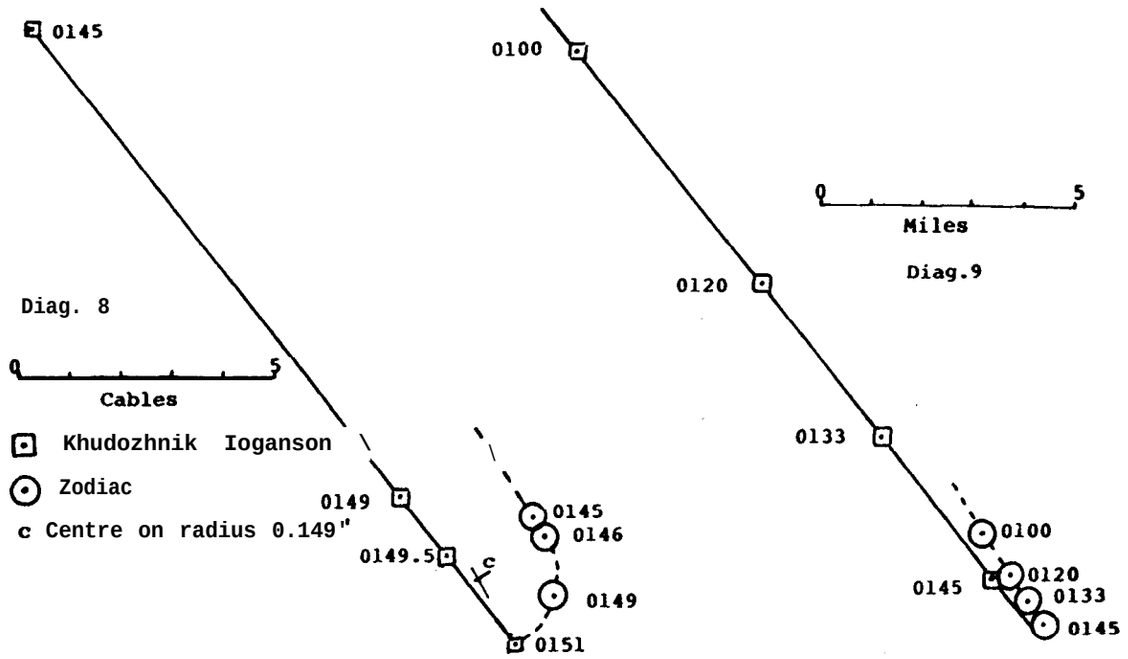
The seat in the wheelhouse of the *Zodiac* is located in the aft port corner, almost 2 metres back from the windows. This fact, in conjunction with the low deckhead and the fact that there is no starboard side door to the wheelhouse means that in all probability the navigation lights of the *Khudozhnik loganson,* once the two vessels were in close proximity, would have been above the line of sight of the Deckhand. For the same reasons the Deckhand would not have been visible to those on the Bridge of the *Khudozhnik Ioganson*.

When making a turn with the trawl gear deployed it is essential to ensure that the trawl gear does not get too far round towards the beam. The turn is gauged by keeping a watch, through the aft door, on the gear, thus attention is directed aft, not forward, detracting from the keeping of a proper lookout.

RECONSTRUCTION OF THE COLLISION

From the manoeuvring characteristics diagram located in the wheelhouse of the *Khudozhnik Ioganson,* in the normal loaded condition and at full speed, with the wheel hard to starboard the ship takes 1 minute 48 seconds to alter course 90 degrees and advances 0.3 miles.

At the time of changing from hard to starboard wheel to hard to port the *Khudozhnik Ioganson* had altered course about 50° and would have advanced around 0.18 miles. However, because of the turning characteristics, the section of the hull aft of the bridge would have still been on the original line of advance (Attachment 5). The time factor from the initial hard to starboard order to the hard to port order is indicated as being around 1 minute 15 seconds.



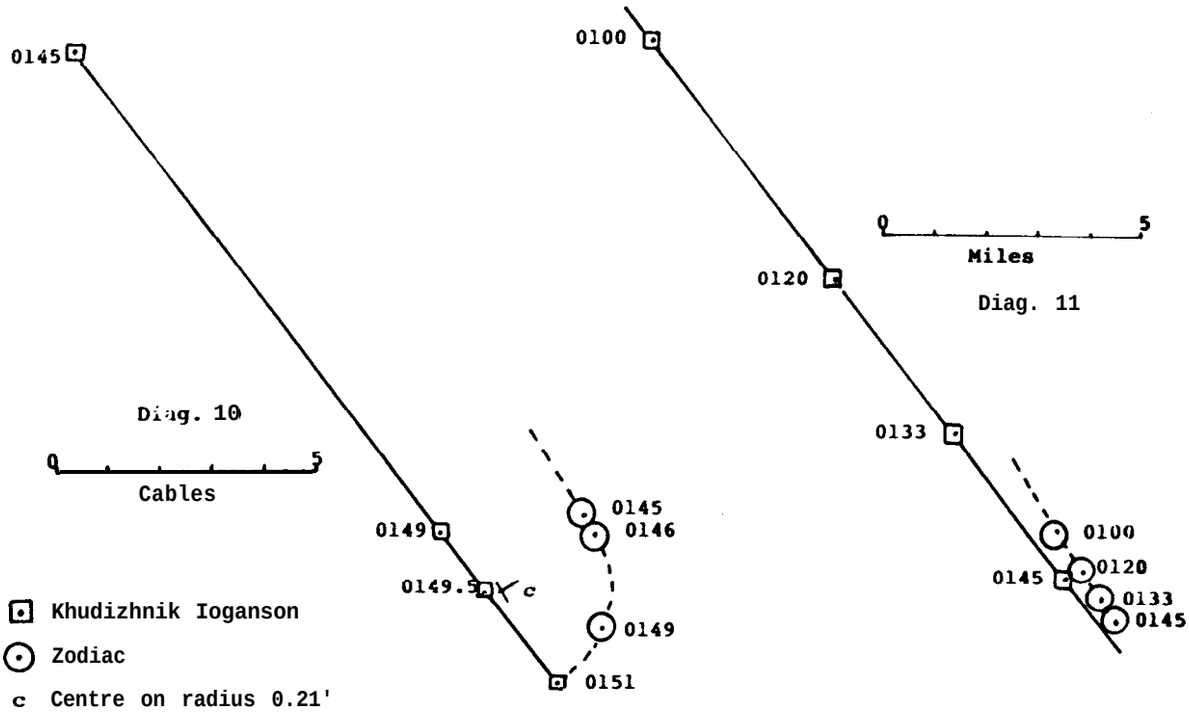
Reconstruction of incident based on zodiac speed 2.8kts, radius of turn 0.149mls

The time required for the Zodiac to alter course through 90 degrees in the sea conditions at that time was stated to be five minutes, thus the turn needed to commence at 0146. At a speed of 2.8 knots the radius of turn is 0.149 miles, which would place the Zodiac at a distance of 1.77 cables to port of the *khudozhnik Ioganson's* track at 0146 (Diagram 8). To arrive in that position on a course of 148° T and at a speed of 2.8 knots the bearings and distances of the Zodiac (Diagram 9) would have been as follows:

0100	140.5°T	12.30nm
0120	139.75°T	7.45nm
0133	138.75°T	4.25nm
0145	135°T	1.38nm

In these circumstances the Zodiac would have been only 1.5 degrees on the port bow when first seen and only 3.25 degrees on the port bow at 0133.

Reconstruction on the assumption that the bearing of 132° T at 0145 (Diagram 10) was correct provides a radius of turn of 0.21 miles, which requires a speed of 3.96 knots for the alteration of 90 degrees in 5 minutes.



Reconstruction of incident based on 0145 brg of 132°

When making such a turn the direction of thrust of the propeller is at an angle to the direction of pull on the trawl gear, which, due to a pivotal (fulcrum) effect, results in an increase in speed. Advice from the Australian Maritime College School of Fisheries is that under favourable conditions an increase in speed of one knot is possible and that some Skippers increase the engine power to assist such turns.

In this case the relative position at 0145 would have been 132° T at 1.33 miles and the bearings and distances of the *Zodiac* prior to the commencement of the turn (Diagram 11) would have been:

0100	140.0° T	12.27 nm
0120	139.5° T	7.39 nm
0133	138.°T	4.26 nm
0145	132.°T	1.33 nm

Although these bearings and distances do not agree fully with those noted aboard the *Khudozhnik Ioganson* they are considered to be a reasonably fair portrayal of the relative positions.

CONSIDERATION OF ACTIONS

ZODLAC

The Skipper and Deckhand had sailed together for about two years and the Skipper was satisfied with the capability of the Deckhand to maintain the correct course during trawling operations. At the time that the Skipper went below to get some sleep, shortly after midnight, apart from the other fishing vessels in the area, there was no other shipping around.

The Skipper, in leaving the wheelhouse to get some sleep, left the sole responsibility for the conduct of the vessel, including a major alteration of course, to an unqualified deckhand with no formal marine training. The Deckhand's knowledge of the Colregs was very limited and he did not know the meaning of the whistle signal that he heard shortly before the collision.

The Deckhand failed to maintain a proper lookout and failed to properly ascertain the direction in which the *Khudozhnik Ioganson* was proceeding, wrongly assuming that the ship was well clear.

As a vessel engaged in fishing and also as a vessel being overtaken the *Zodiac* had a responsibility, under Rule 17(a)(i) of the Colregs, "Action of the Give-way Vessel", to maintain course and speed until overtaken.

In failing to look to see where the *Khudozhnik Ioganson* was before commencing the turn the Deckhand precipitated the collision.

KHUDOZHNIK IOGANSON

The *Khudozhnik Ioganson* was proceeding at a speed of 17.5 knots, a little under full sea speed, a speed at which the ship was very manoeuvrable. The night was clear, with good visibility and in the area through which the ship was passing there was sufftcient depth and width of water in which to manoeuvre. Although there were a number of fishing vessels in the area these were well spread out and before the encounter with the *Zodiac* ***the*** *Khdozhnik Ioganson* had not had to alter course for any other vessel. The engineroom was manned and the engines were available for manoeuvring should it have been considered necessary. It is considered that in the conditions prevailing at the time the *Khudozhnik Ioganson* was proceeding at a safe speed.

On the bridge of the *Khudozhnik Ioganson* there was the Master, in charge; the Second Mate in support and responsible for the navigational duties; a seaman at the wheel and a second seaman on lookout duties. Such manning is considered to be adequate and safe.

Although no-one on the bridge of the *Khudozhnik Ioganson* could see the *Zodiac's* fishing signal lights, the bright working lights, in conjunction with the other fishing vessels in the area, indicated that the *Zodiac* was in fact a fishing vessel. Under Rule 18 (a) of the International Regulations for Preventing Collisions at Sea (Colregs) a power driven vessel is required to keep out of the way of a vessel engaged in fishing. Regardless of whether the *Zodiac* was engaged in fishing, under Rule 13 (overtaking) of the Colregs, any vessel overtaking any other shall keep out of the way of the vessel being overtaken. It was therefore clearly the responsibility of the *Khdozhnik Ioganson* to keep clear of the *Zodiac* until it was finally passed and clear.

The *Khdozhnik Ioganson* is equipped with three radars, including an ARPA. Two of the radars were switched on on the morning of 2 September and were being used for navigational, position fling, purposes and for keeping a check on other vessels. Although the ARPA was said to work well on large vessels, it was not considered to be very effective with small craft, such as fishing vessels, and therefore the fishing vessels had not been targeted on the ARPA.

The bearing of a vessel on a parallel or near parallel course being approached fine on the bow will only alter very slowly. Provided the bearing opens out appreciably a safe situation can be considered to exist, so long as both vessels maintain their course and speed and provided due caution is exercised. However, just watching the bearing does not give any indication as to whether the course of the other vessel is a parallel one or a converging one. Although the Second Mate made a note of a number of bearings and distances, these do not appear to have been plotted at the time; rather it was accepted that the bearing was opening satisfactorily, although between 0133 and 0145, a period of twelve minutes, the bearing reportedly opened by only 4 degrees.

Had earlier bearings and distances been noted and plotted the Master would have been made aware that the *Zodiac* was on a converging course and that the passing distance would be reduced. By not taking earlier bearings and distances and by not plotting the bearings and distances obtained the Master and Second Mate failed to make proper use of the radar equipment.

The bearing and distance obtained at 0149, in conjunction with those taken at 0145, showed that the *Zodiac* had altered course to starboard, towards the *Khudozhnik Ioganson* and that a collision was imminent. However, the timing of the warning that it would have provided may well have coincided with the sighting of the green side light.

At 0145 and again immediately when the green side light was seen the Master sounded one prolonged blast on the whistle, to give warning of the presence of the *Khudozhnik loganson.* Such a signal is a recognised signal in Japanese waters for that purpose and is used frequently to warn off fishing vessels. Under Rule 36 (Colregs) a vessel, if necessary to attract the attention of another vessel, may make light or sound signals that cannot be mistaken for any signal authorized elsewhere in those rules.

The fact that the Master gave a prolonged blast at 0145 indicates an awareness that the *Zodiac* would be passed at a closer distance than originally estimated and therefore that an alteration of course to starboard would have been in order. At that time an alteration of course to starborad of only five or ten degrees would have prevented the collision from occurring. However, it would have been prudent to have made a more substantial alteration of course to starboard at that time, in compliance with Rule 8 of the Colregs.

At interview the Master stated that such action was prevented by the presence of other fishing vessels on the starboard bow. However, there were no other fishing vessels operating immediately to the south of the *Zodiac,* the only other vessel known to be in the area at that time being the dredger Sir Thomas Hiley. The Sir Thomas Hiley had departed the dumping ground at 0139 to return to the Cairns approach channel, thus at 0145 was some 6 miles to the south of the *Khdozhnik loganson.*

The sounding of a prolonged blast at 0149.5, when the green sidelight was observed and it was realised that the *Zodiac* had altered course, was not the correct signal to have sounded. The correct signal to have been sounded at that time was that prescribed in Rule 34(d), at least five short and rapid blasts on the whistle.

The Master's ordering of the wheel to hard to starboard, on realising that the *Zodiac* was now headed towards the ship, is considered to be the correct action, as was also the sounding of the one short blast to indicate the action being taken. The ordering of the wheel to hard to port when the *Zodiac* had closed to the port side in all probability prevented a much more serious collision.

All persons on the bridge were of the opinion that the contact had been minor and that the lives of the fishermen were not in danger. Although attempts to make contact with the *Zodiac* on VHF were unsuccessful, the *Khudozhnik Ioganson* was not turned about in order to ascertain whether the *Zodiac* was in fact all right or whether assistance was required.

Under Article 98 (Duty to render assistance) of the United Nations Convention on the Law of the Sea the master of a ship is required, after a collision, to render assistance to the other ship, its crew and passengers and, where possible, to inform the other ship of the name of his own ship, its port of registry and the nearest port at which it will call.

The Master failed to fulfil1 this requirement; having failed to make contact by VHF he should have turned about, reduced speed and approached the *Zodiac* to ascertain that none of the *Zodiac* crew had been injured and that no danger to the crew existed.

It has not been possible to determine why the attempts to call the *Zodiac* on VHF were unsuccessful. The Master maintained, supported by the Second Mate and crew members, that he called a number of times over a fifteen minute period. None of these calls were heard by the *Zodiac*, or by the Cairns Port Radio, which was monitoring Channel 16 and which later heard the contact between the *Khudozhnik Ioganson* and the north bound vessel.

LIGHTS OF THE ZODLAC

The lights required to be exhibited by the *Zodiac* when engaged in trawling [Rule 26(b)] are two all-round lights in a vertical line, the upper green and the lower white; sidelights and a sternlight; being less than 50 metres in length the *Zodiac* was not obliged to show a white masthead light, but reportedly did so. The minimum visible ranges for these lights [Rule 22(b)] are 2 miles for the all-round, side and stern lights, 5 miles for the masthead light; the luminous intensity being 4.3 and 52 candelas respectively.

When the *Zodiac* was inspected in Townsville on 11 September 1991, the all-round green and white lights, which were of the 'well glass' type and located on the forward side of the trawl boom gantry, were found to be encrusted with salt and dust, greatly reducing their effectiveness.

Under Rule 20(b) (Application) no other lights shall be exhibited except such lights as cannot be mistaken for the lights specified in these Rules or do not impair their visibility or distinctive character, or interfere with the keeping of a proper lookout.

Fishing vessels are also required to be fitted with bright working lights for handling and sorting of the catch. Where the catch is for the export market the minimum intensity of illumination requirements for these working lights are contained in 68.2 of the Commonwealth "Export Control (Fish) Orders"; for processing areas this is 220 lx.

The relationship between illuminance and candlepower is defined by the equation:

$$E = \frac{\text{candlepower of source (I)}}{(\text{Dist from source to surface})^2}$$

For the *Zodiac* the luminous intensity of the deck lights is around 3000 candelas, nearly 700 times more intense than the navigation lights.

Customarily these working lights, which on the *Zodiac* are located at various heights on the after side of the trawl boom gantry, are displayed during trawling operations in order that a watch may be maintained on the trawl gear.

These powerful working lights not only obscure the stern light and fishing signal lights, they are also likely to interfere with the keeping of a proper lookout aft. From the evidence of those on the *Khudozhnik Ioganson* ***the*** intensity of the working lights was such that the green and white all-round lights were not visible at all, even from well forward of the beam. The display of the working lights by the *Zodiac*, whilst not actively engaged in processing the catch, was therefore contrary to Rule 20(b).

CONCLUSIONS

It is considered that:

1. The *Khudozhnik Ioganson* was proceeding at a speed commensurate with the visibility and traffic density.

2. The *Khudozhnik Ioganson* was an overtaking vessel within the meaning of the International Regulations for the Prevention of Collisions at Sea (Colregs) and had a duty to keep clear of the *Zodiac,* irrespective of whether or not the *Zodiac* was engaged in fishing, until finally passed and clear.

3. The Master's actions of passing fishing vessels at a distance of 0.2 miles when in coastal waters were in accordance with common practice and not unduly hazardous when both vessels comply fully with the Colregs.

4. Prior to 0145 the *Zodiac* was proceeding on a slightly converging course with that of the *Khudozhnik Ioganson* of around 148 degrees True.

5 Had both vessels maintained their courses and speeds of prior to 0145 a collision would not have occurred.

6. The *Khudozhnik Ioganson* maintained a straight and steady course until taking evasive action shortly before the collision.

7. The *Zodiac* altered course to starboard at approximately 0146.

8. The Master of the *Khudozhnik Ioganson* did not ascertain that the *Zodiac* had altered course to starboard until such time as collision was unavoidable by the actions of the *Khudozhnik Ioganson* alone.

9. The Master and Second Mate of the *Khudozhnik Ioganson* failed to fully utilise the radars and the observed visual bearings and radar distances to ascertain the course and speed of the *Zodiac* [Rule 7(b) of the Colregs].

10. After the collision the Master of the *Khudozhnik Ioganson* failed in his responsibility to ascertain whether the *Zodiac* crew had sustained injury and whether assistance was required.

11 .The Skipper of the *Zodiac* failed in his responsibilities by leaving the navigation of the vessel in the charge of an unqualified deckhand.

12. The *Zodiac* failed to maintain course and speed as required under Rule 17(a)(i) (Action by Stand-on Vessel) of the Colregs.

13. The Deckhand of the *Zodiac* failed to keep a proper lookout as required by Rule 5 of the Colregs and failed to ascertain that it was safe to alter course before doing so.

14. Alcohol was not a contributing factor to the incident.

15. Fatigue cannot be ruled out as having affected judgements prior to the collision.

16. The glare of the working lights of the *Zodiac* was such as to obscure the navigation/fishing lights and therefore their display was contrary to Rule 20(b) of the Colregs.

17. The siting of the *Zodiac's* all-round green and white lights on the same structure as the working lights was instrumental in their being obscured by the glare of the working lights.

ANNEX
FISHING VESSEL ALISTAR

On 3 September 1991 the fishing vessel Alistar was fishing in the same area as the *Zodiac.* A new "shot" had commenced at 001.5 and the Alistar was proceeding in a southeasterly direction (Magnetic), maintained by radar distance off the beach. Alistar was fishing astern of the *Zodiac,* the most southerly of a loose group of fishing vessels, which was maintaining a position about 2 miles ahead and 3 to 4 degrees on the Alistar's starboard bow.

According to the Skipper, at approximately 0145 he had to take 'severe evasive action by swinging my vessel to port in order to avoid being hit by a large container vessel'. The vessel, which later collided with the *Zodiac,* was stated to pass within 150 feet of the Alistar.

The Skipper stated that he called the container vessel a number of times on VHF Channel 16, but received no reply and, although continuing to monitor Channel 16, he did not hear the vessel calling to make contact with the *Zodiac.* He also stated that he was aware that other fishing vessels, who had been forced to take evasive action by the same container vessel, had tried to make contact by VHF, also without success.

On hearing the "mayday" message broadcast by the *Zodiac* the Alistar went to that vessel's assistance. The Skipper stated that the *Zodiac's* starboard fishing boom had been buckled downwards under the vessel and back towards the propeller.

Comment

In a position 2 miles ahead and 3 to 4 degrees on the starboard bow of the Alistar, the *Zodiac* would have been between 630 and 850 feet to the west (to starboard) of the Alistar's track.

The collision occurred approximately 6 minutes after the Alistar was said to have to take evasive action. The *Khudozhnik Ioganson* was closing the *Zodiac* at a rate of 14.7 knots, therefore the *Zodiac* would have been approximately 1.47 miles ahead of the Alistar. At this distance the *Zodiac* would have been between 590 and 625 (approximately 1 cable) to the west of Alistar's track.

If, as stated, the *Khudozhnik Ioganson* passed within 150 feet of the Alistar, the *Zodiac* would have been on the starboard bow of the *Khuduzhnik loganson,* which was not the case.

Bearing in mind the great difficulty of estimating distances at night, it is considered that the distance at which the *Khudozbnik Ioganson* was said to pass the Alistar was considerably under estimated. However, the stated incident does indicate that the passing distances as stated by the *Khudozhnik Ioganson* may in all probability have been over estimated.

DETAILS OF VESSELS

ZODIAC

Official Number	FQAB
Construction	Wood
Type	Prawn Trawler
Colour	White Hull and housing, yellow top
Length	14.02 metres
Sea Speed	8 knots
Home Port	Townsville
Owner	Hart fisheries, Townsville
Number of Crew	2

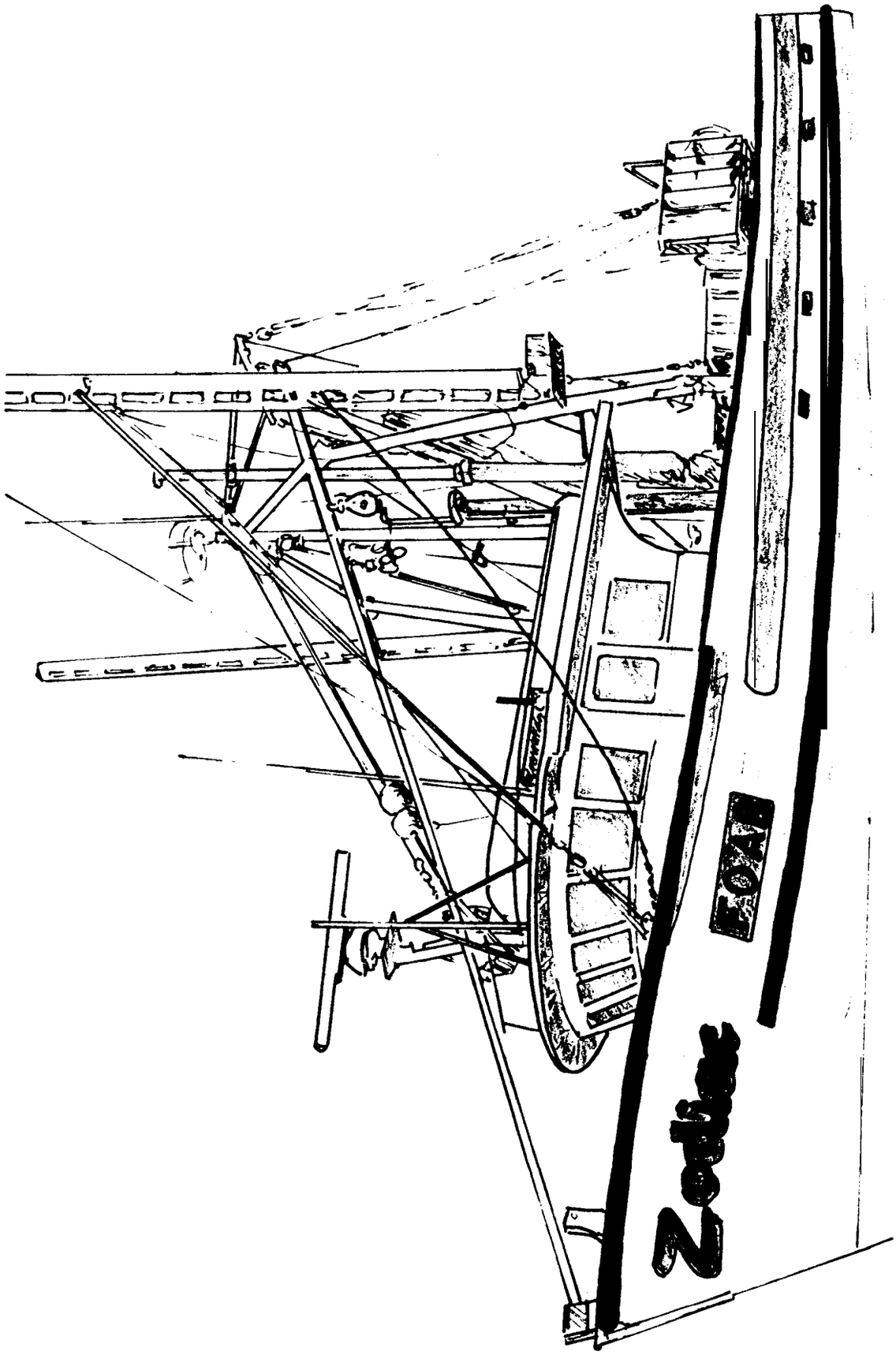
KHUDOZHNIK IOGANSON

Port of Registry	Vladivostock
Type	Container Ship, 712 TEU
Length Overall	169.86 m
Beam	25.48 m
Moulded Depth	17.45 m
Maximum Draught	9.20 m
GRT	15,306
NRT	8,084
Summer Deadweight	14,490
Main Engine	6 cyl Sultze Diesel 17,400 bhp-12,799 kW
Normal Service Speed	18.8 knots
Colour	Black topsides, white superstructure
O w n e r	Far Eastern Shipping Co. Vladivostock

International Safety Certificate Expiry Dates

Safety Construction	24.10.94
Load Line	24.10.94
Safety Equipment	24.10.91
Safety Radio	12.4.92
MARPOL	24.10.94

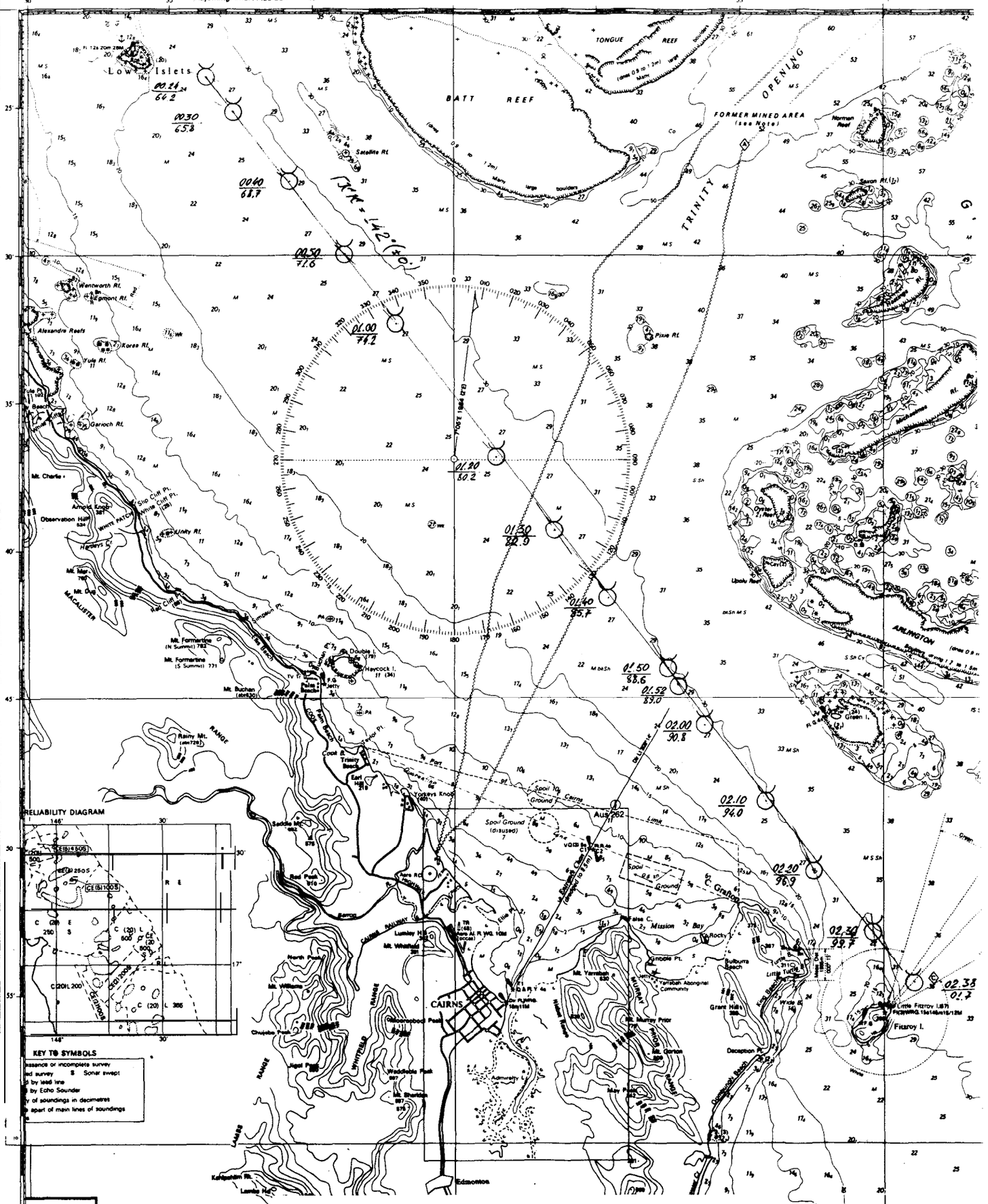
ATTACHMENT 1



FISHING VESSEL ZODIAC

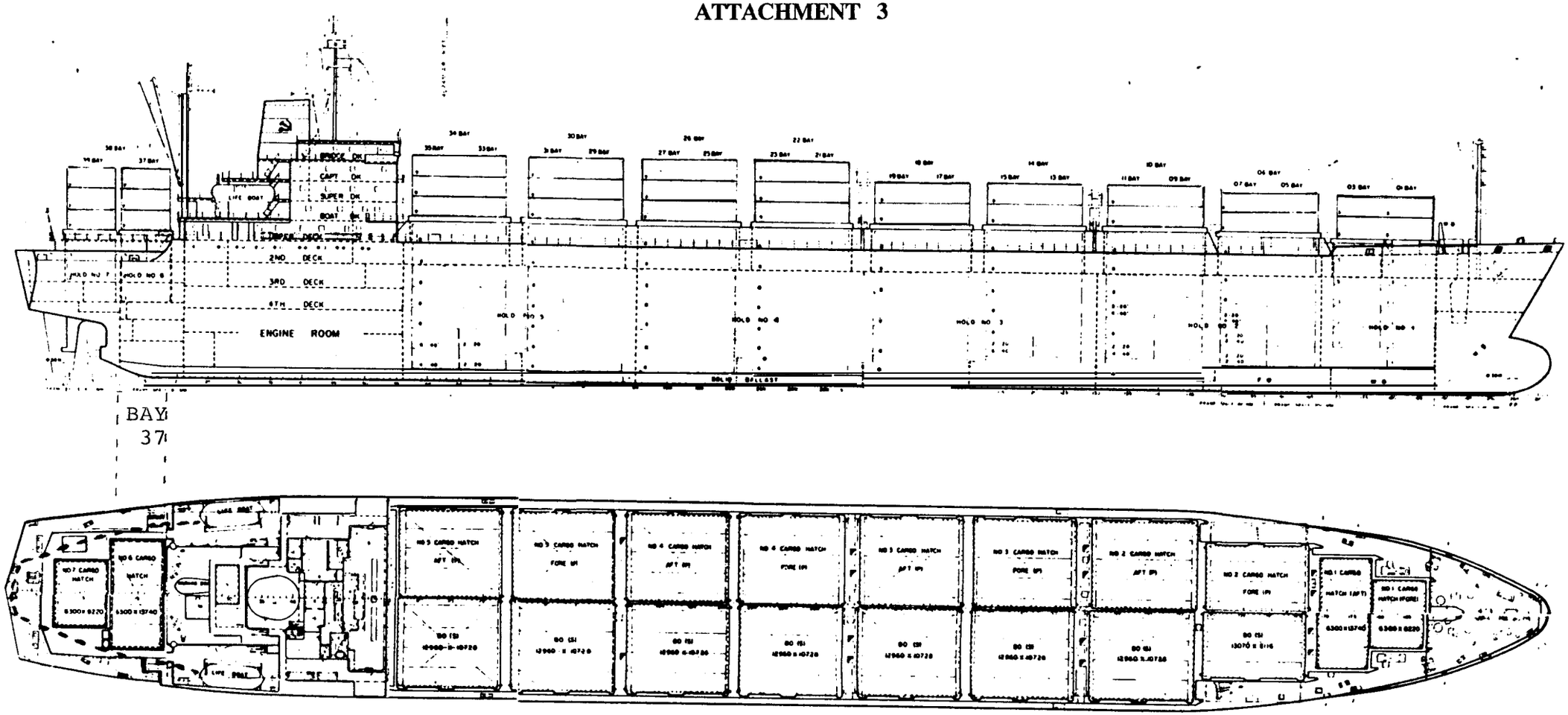
ATTACHMENT 2

Adjoining Chart Aus 831



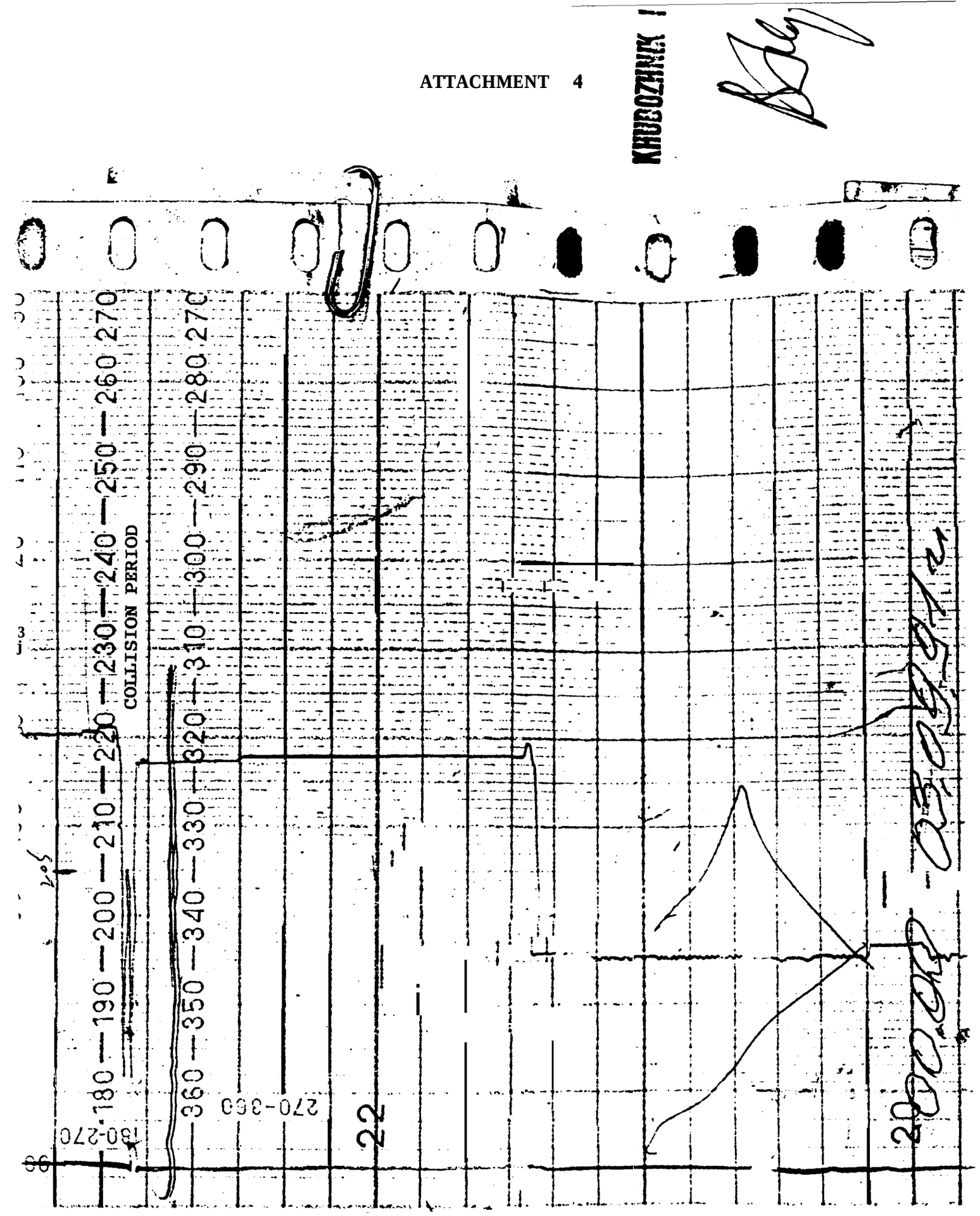
PORTION OF CHART AUS 830 SHOWING KHUDOZHNIK IOGANSON'S POSITIONS

ATTACHMENT 3



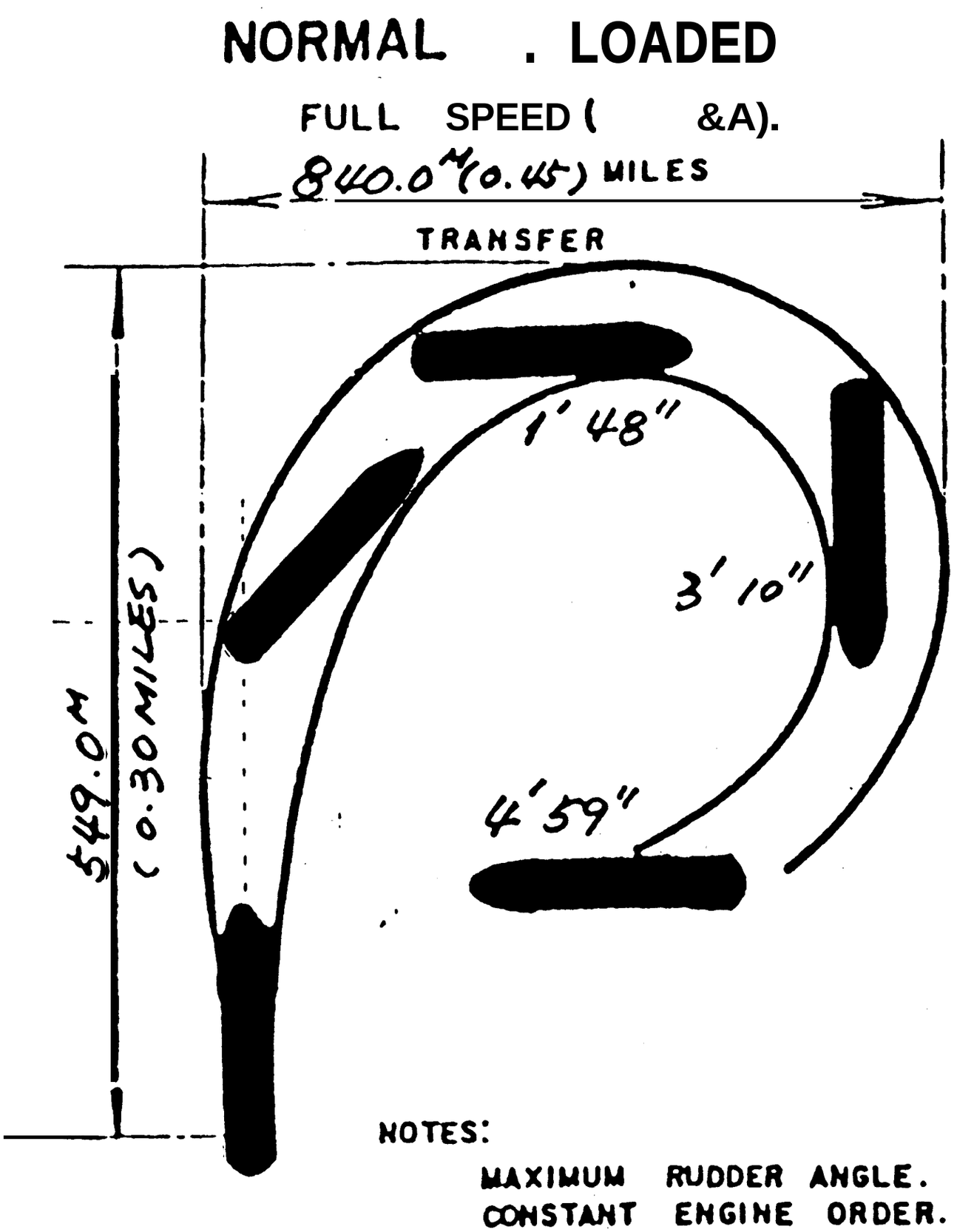
KHUDOZHNIK IOGANSON - GENERAL ARRANGEMENT

ATTACHMENT 4



PORTION OF KHUDOZHNIK IOGANSON'S
COURSE RECORDER CHART

ATTACHMENT 5



KHUDOZHNIK IOGANSON'S STARBOARD TURN
MANOUEVRING CHARACTERISTICS