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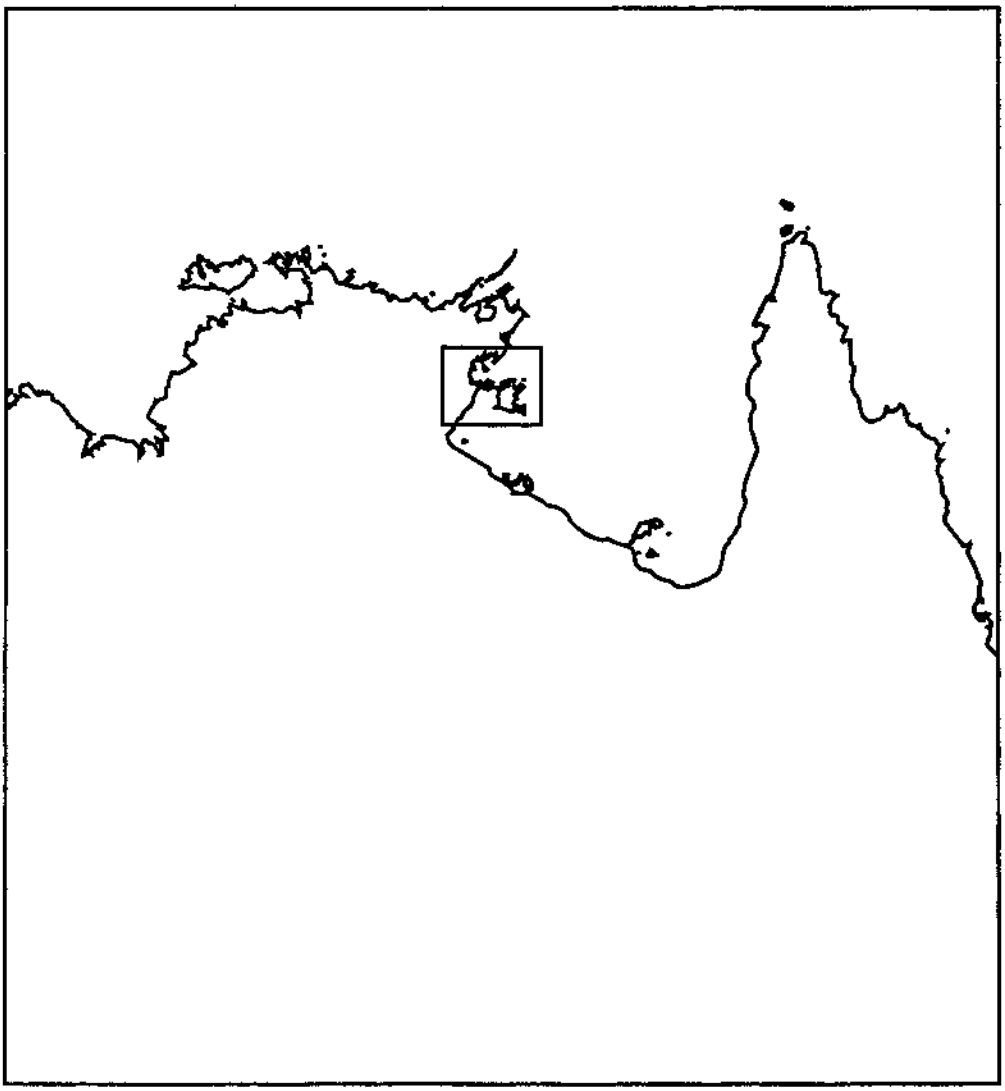

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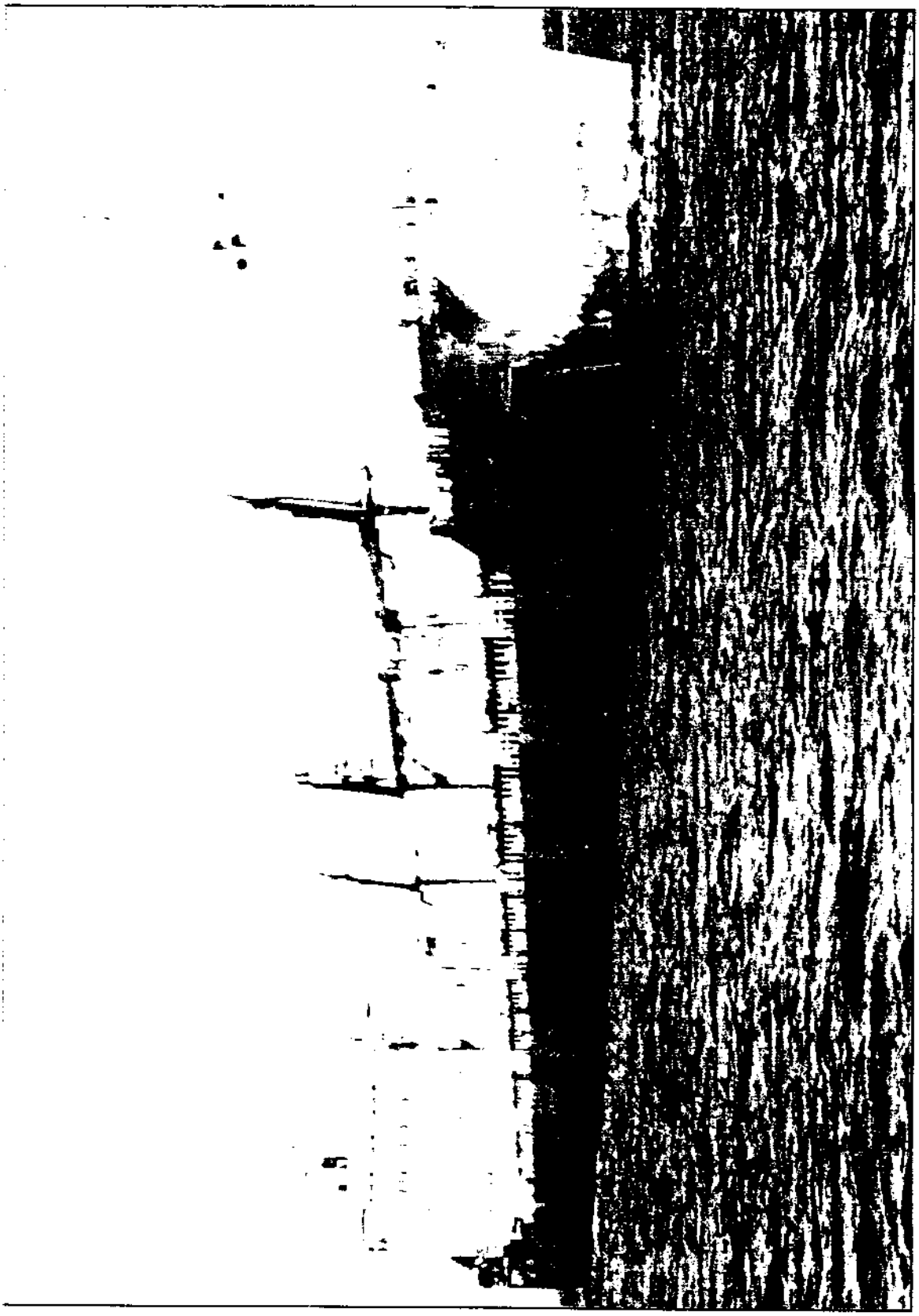

Malinska

Summary

The Malinska, a Maltese flag bulk carrier of 34,752 tonnes deadweight, loaded a full cargo of manganese ore at the Groote Eylandt loading terminal from 23 to 25 April 1993.

While sailing from the port, the ship, which should have cleared via a narrow channel of deep water through a bank stretching southward from Connexion Island, grounded on Burley Shoal, 1.5 miles north of "the gap". Initial attempts to refloat the ship were unsuccessful and 1100 tonnes of cargo had to be off-loaded before the ship was pulled off by tugs on 28 April 1993.

Sources of information

Malinska: Master, Mate, Third Mate, Helmsman.

Iron Carpentaria: Master.

Groote Eylandte: Harbour Master, Linesmen.

Royal Australian Navy, Hydrographic Office.

Acknowledgement

The Inspector gratefully acknowledges the advice provided by the ship simulator staff of the Australian Maritime College, Launceston.

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Sequence of events

The Malinska, a 34,752 tonnes deadweight bulk carrier registered in Valetta, Malta and manned by a crew from Croatia, arrived at the Groote Eylandt Pilot Station at 0730 on Friday 23 April 1993. The Pilot boarded on arrival and the ship was all fast alongside the Milner Bay manganese ore loading berth at 0915. Information concerning the port was given to the Master, including the hourly tide and current details.

Loading of cargo commenced at 1030. The ship loading gantry at Milner Bay is of the fixed type, thus requiring the ship to be moved along the wharf to align the gantry with the various holds. The main engine was not used for these movements, the ship being warped along the wharf, which required all the deck officers and deck crew for the operation. The deck officers maintained their normal sea watches throughout the loading.

Loading was completed at 1500 on 25 April, the draught survey being conducted by the Harbour Master. The loaded draught was recorded as being 9.44m fwd, 10.14m aft, 9.84m mid port and starboard, with the cargo quantity calculated as being 34,258 tonnes.

After the completion of loading, the crew closed and secured the hatches, lowered and secured the cranes, and generally prepared the ship for sea. The Third Mate went to the bridge at 1700, tested the steering and the main engine, switched on and tuned the Automatic Radar Plotting Aid (ARPA) radar, checked the gyro repeaters, but did not switch on the course recorder, or the second radar.

The Harbour Master went to the Master's cabin at 1700, to obtain signatures on the cargo documents. On entering the cabin, he found that the Master was entertaining a number of people, adults and children, among them a Croatian, who worked for the mining company. The Master offered the Harbour Master a drink of whisky, but he declined. Although he was not aware of the Master drinking, he noted a certain unsteadiness, or lack of direction, when the Master signed and stamped the documents, which caused him to think that perhaps the Master was under the influence of alcohol. When the paper work was completed, at 1730, the Harbour Master proceeded to the bridge, to pilot the ship off the berth, while the Master called the crew to stations.

The Harbour Master was joined on the bridge by the Third Mate and a seaman, and by the time the ship was singled up and the tugs were about to be made fast, the Master had still not appeared. Not wanting to proceed further without the Master, the Harbour Master asked the Third Mate where he was and

the Third Mate gestured towards the wharf. The Harbour Master then saw that the Master was on the wharf, apparently saying good-bye to his guests. Having singled up, the ship had moved about a metre off the wharf and the forward tug was instructed to push the ship back alongside, so that the Master could climb back aboard.

After all the lines had been let go, at 1750, the tugs moved the ship off the berth and around to a north-westerly heading. While this was in progress the Master asked the Harbour Master if it was all right to sound a "farewell" signal on the whistle, and then proceeded to sound a whole series of three long blasts, which the Harbour Master considered excessive.

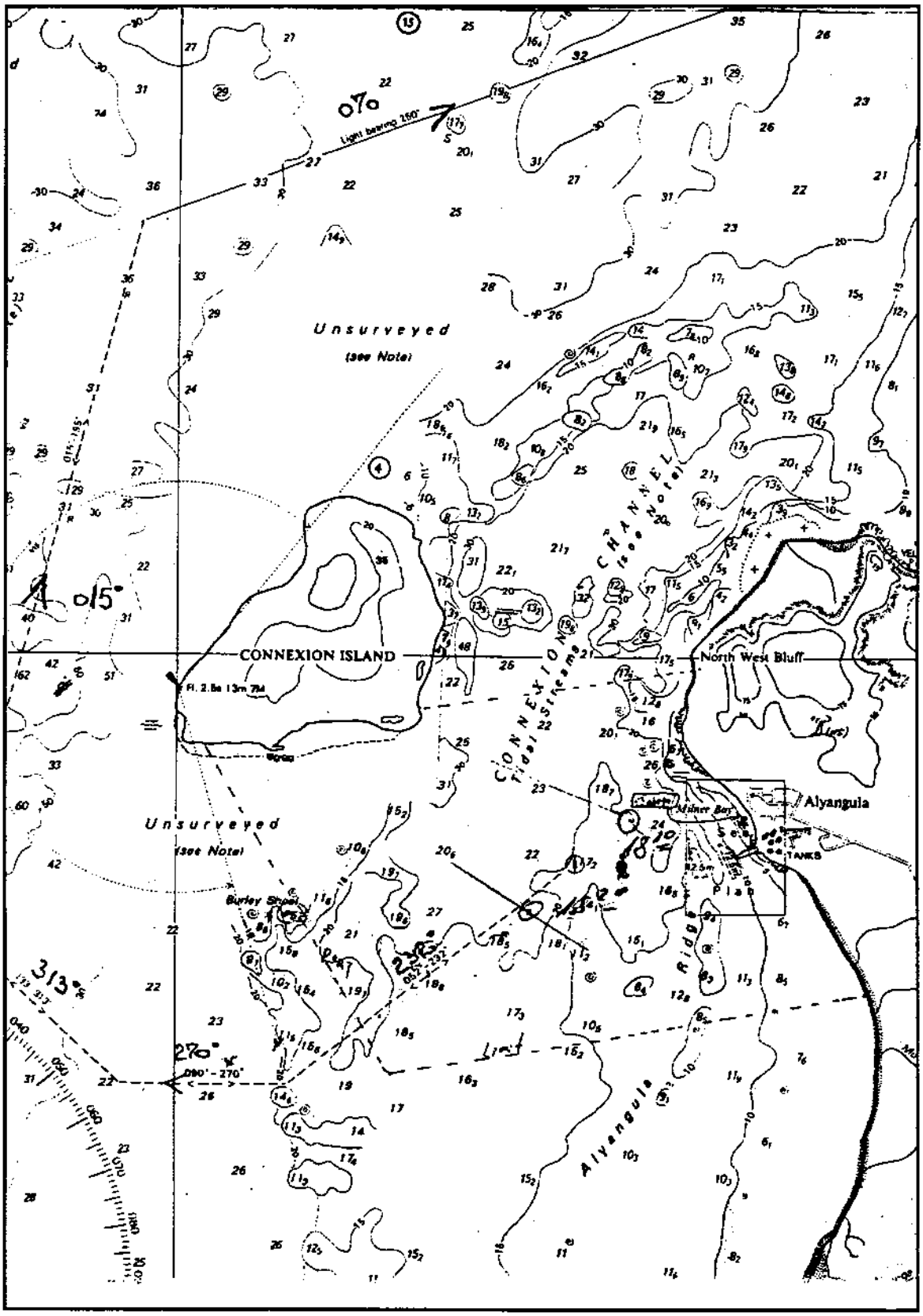
When the ship was clear of the berth, the Harbour Master advised the Master about an inbound ship, the Iron Carpentaria, the Master of which had said that he would keep clear of Malinska, by keeping to the south, and would pass "port to port". Being a little concerned as to whether or not the Master had fully understood, he repeated the whole message to the Third Mate.

The tugs were let go at 1756 and the Harbour Master brought the ship round to proceed due west, but because of the northerly running tide, instructed the Helmsman to steer 260 degrees. After checking astern from the bridgewing for line of drift against the shore, the Harbour Master found that the Master had made further adjustment to the course, which led him to believe the Master was aware of the northerly set and had taken over. He advised the Master of the correct course, 232 degrees, for proceeding south of Connexion Island, then left the bridge escorted by the Third Mate and disembarked to the tug Makada.

As soon as Makada was clear, the Master brought the ship on to the 232 degrees course, increased speed to half ahead and then to full ahead, "finished with manoeuvring", at 1810, at which time the Third Mate plotted the ship's position on the chart. After this the procedure of gradually increasing the propeller pitch, in small increments, in the process of working up to full sea speed, was initiated.

After disembarking from Malinska, the Harbour Master instructed the tug Skipper to head out towards Iron Carpentaria. Makada proceeded on a parallel course to Malinska and worked up to full speed, 8 knots, but Malinska drew ahead, obviously making a greater speed. On reaching the normal pilot boarding area, Makada reduced speed, to between 4 and 5 knots, but continued on the 232 degree course.

The inbound ship was first seen shortly after 1800, at a distance stated to be four miles, as it cleared beyond Connexion Island. With Malinska steadied on 232 degrees, the inbound ship, the Iron Carpentaria, was about 50 degrees



Photocopy of chart in use aboard Malinska
Extract from chart Aus 14

on the starboard bow - it could be clearly seen, there being ample daylight, sunset that day being at 1813.

The Master acquired the inbound ship as a target on the ARPA, which was operating in the "true motion, course up" mode and switched to the 6-mile range. The range rings were not switched on.

At 1815, the crew were stood down from stations forward. The Mate gave instructions to the Bosun to secure the anchors and then went to his cabin to wash and change out of his boilersuit, before proceeding to the bridge to take up his watch.

At 1820, the Third Mate plotted Malinska's position, again using the radar bearing and distance of the south point of Connexion Island, and the Master switched the radar from the 6-mile to the 3-mile range. At this time the inbound ship was said to be 20 to 25 degrees on the starboard bow.

While the Third Mate was plotting the position, the inbound ship called on VHF 16, requesting a port to port passing, and the Master confirmed this. Very shortly after this the inbound ship was observed to be altering course to port and the ARPA indicated a collision situation with, according to the Master, a target course of 070 - 075 degrees, and a distance of 1.9 miles. The Master said that he checked the radar bearing (259 degrees) and distance (1.9 miles) of the ship and that the visual indication was that the ship was close, therefore immediate avoiding action was needed.

Whereas an alteration of course to port would have taken the ship away from the unmarked shoal waters to the north, he had agreed to a "port to port" passing and therefore considered that an alteration of course to starboard was necessary, even though it would take him off the recommended track, towards Burley Shoal. He checked a course of 260 degrees on the radar, using the electronic bearing line and, satisfied that it was a safe one, ordered the Helmsman to steer 260 degrees.

At about 1823, the Skipper and Harbour Master, aboard Makada, noticed that Malinska was altering course to starboard and was doing so far too early. The Harbour Master called Malinska on VHF 16, to warn the Master that he was standing into danger, but despite repeated calls, received no response.

As Malinska was altering course, the Master heard the Pilot calling on the VHF, but he was concentrating on avoiding the inbound ship, and ignored the call.

The Mate arrived on the bridge at a time he put at 1825, as the ship was coming on to the new course, with the other ship just two or three degrees on the port bow. The Third Mate handed over to him,

showing him the 1820 position on the chart, advising him that the engine was on "full ahead, finished with manoeuvring". He was also advised of the Iron Carpentaria's VHF request for "port to port" passing and that the Master was altering course to starboard. The Third Mate then left the bridge.

The Mate went to the radar, noting that the target echo of Iron Carpentaria was just to port of the heading line, and took a bearing and distance of Connexion Island, to check the ship's position.

After about five minutes on the 260 degree course, and as the Mate was laying off and checking the position on the chart (which showed the ship to be very close to Burley Shoals), the Master instructed the Helmsman to put the wheel to port 15, in order to follow the stern of the inbound ship as it opened out. However, the Helmsman, having applied port 15 wheel, advised the Master that the ship was not responding.

Almost immediately after this the Chief Engineer telephoned the bridge to say that the load on the engine had increased considerably. The Mate went to the bridge wing, looked over the side and advised the Master that the ship was not moving through the water. Although the Master could not believe it, as nothing (no shock or jolt) had been felt, Malinska was aground. The engine was stopped and the Mate plotted the ship's position on the chart, which indicated that Malinska was on Burley Shoal.

The engine was started again and the pitch put to astern, working up to full astern pitch, in attempt to work the ship off the shoal. The Third Mate arrived back on the bridge, to assist, and noted the ship's head as being 259.6 degrees. Further VHF calls from the Harbour Master were ignored.

The Bosun was instructed to sound round the ship's tanks and the Mate and Third Mate sounded around the ship with the hand lead, a strong current making this very difficult. The ship was found to be heavily aground, but the hull integrity did not appear to have been breached. After further attempts to refloat the ship using astern movements, all of which were unsuccessful, the Master decided to wait until daylight and the next high tide before making further attempts. As it was a Sunday, the Master considered it pointless trying to make contact with the ship's owners. He therefore went to bed.

Iron Carpentaria

On Sunday 25 April 1993, the Australian 45,432 tonnes deadweight bulk carrier Iron Carpentaria was inbound for Milner Bay at the ballasted draught of 8.0m. At 1600 the ship passed Brady Rock, 11 miles northward of the port. On the bridge were the

Master, the Mate, who had just taken over as Officer of the Watch, and a Cadet. The Master called the Harbour Master on VHF 16, to confirm the ETA and was advised that the Malinska would be sailing at 1730. He realised that the two ships might meet to the south of Burley Shoal and therefore asked the Harbour Master to advise the Master of Malinska that Iron Carpentaria would keep clear. He said he would keep to the south of the (shoal) patches if necessary, to give Malinska priority and to pass "red to red".

At around 1730, VHF messages could be heard, regarding Malinska's departure from the berth and the ship was identified on the radar. First visual contact of Malinska was at 1809, as both ships cleared the southern end of Connexion Island.

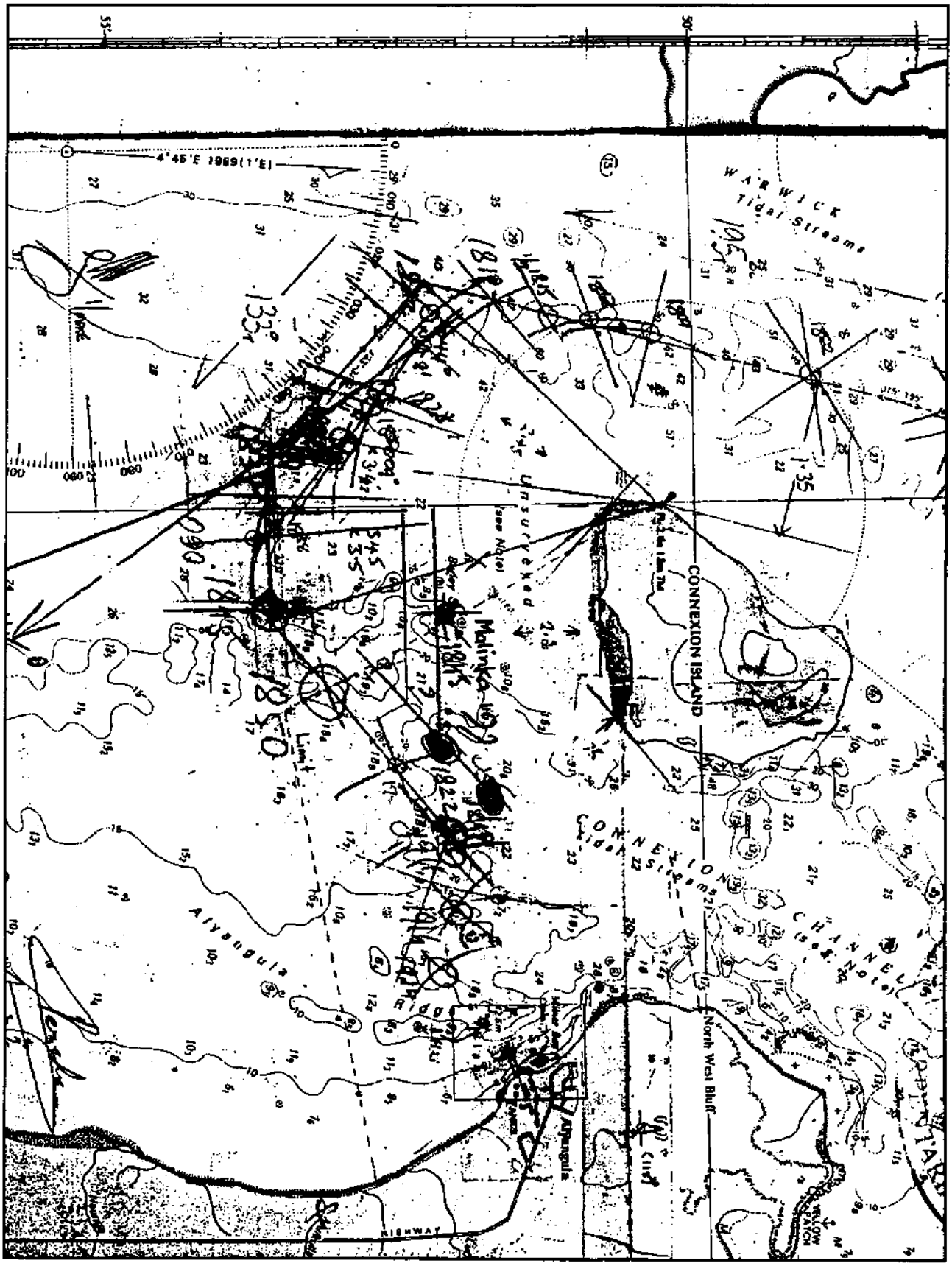
Stand-by-below was rung at 1812, at which time the Master contacted Malinska by VHF radio on channel 16 and repeated the "red to red" message, telling the Malinska to keep coming, that he would stay out of his way. The Master of Malinska, which at this time was headed in a south-westerly direction, repeated the full message and confirmed "port to port".

Iron Carpentaria reduced speed to "half ahead" (8 knots) at 1814, the Master conning the ship positioned at the radar. The ship's position was being plotted at frequent intervals by both the Master and the Cadet. At 1819, a visual bearing and radar distance (stated to be 091 and 4.35 mls) were taken of Malinska and plotted on the chart, to check on its actual position.

At 1820, Iron Carpentaria was in a position 228 degrees 2.5 miles from Connexion Island light and course was altered to 145 degrees, to take the ship south of the recommended track and to pass south of the 11.3m patches located south of "the gap". A second visual bearing (089.5) and radar distance (3.75 mls) were taken of Malinska at 1822, and while the Master was studying these on the chart, the Mate called out that Malinska was turning to starboard. The Master queried this, but the Mate confirmed, saying that he could now see the red side light.

Iron Carpentaria was found to be setting strongly to the north and was four cables north of the recommended 133 degree track, therefore at 1832, course was altered to 160 degrees. At about this time the Harbour Master was heard calling Malinska two or three times on VHF 16, but there was no response from the ship.

At 1835, the Master called the Harbour Master on VHF and expressed concern about Malinska's position - the ship appeared to be stopped close to Burley Shoal. At the same time course was altered to 100 degrees, to make good a course of 090 degrees, to pass through "the gap".



Photocopy of chart in use aboard Iron Carpentaria
Extract from chart Aus 14

At 1845, as Iron Carpentaria passed through "the gap", Malinska was in transit with the south point of Connexion Island, the distance off placing it on Burley Shoal. Course was altered to 052 degrees, to make up for the pilot boarding ground, the Harbour Master boarding from the tug Makada at 1900, in a position seven cables south-west of the designated pilot boarding ground. After boarding, the Harbour Master confirmed that he had passed the message, about the Iron Carpentaria's intention to keep clear, to Malinska.

Recovery

After Iron Carpentaria had berthed and arrival formalities had been completed, the Harbour Master again called Malinska on VHF radio. Receiving no response, he broadcast a message, advising the Master that he had an obligation, under the MARPOL Convention, to notify the Authorities if any oil pollution had occurred. He then contacted the local police and made arrangements to go out to the ship with them.

Due to problems with the pilot launch and the need to arrange an alternative, they did not leave the boat harbour until after midnight. A circuit of the ship was made, but no indication of oil pollution was found. Contact was made with the Second Mate, who was informed that they would return during daylight.

The Harbour Master and police went out to the ship again at 0800 on 26 April, this time checking the soundings around the ship, to find out how well the ship was aground. On this occasion no contact was made with the ship.

At 1100, the Harbour Master returned to the ship with the two tugs to assist in an attempt to refloat the ship at high water at 1251. The tugs were made fast, one on each quarter and, with the ship's engine running full astern, attempts were made to pull the ship free. As this proved unsuccessful, the tugs then laid out the ship's anchors, leading aft, and further attempts were made, with the ship also heaving on the anchor cables. This too proved unsuccessful.

Calculations were then made to determine how much cargo needed to be discharged from Malinska, to sufficiently lighten the ship so that it would refloat. The lightening operation was agreed to by the Owner and the Francis Bay, a coastal supply ship due at Groote Eylandt, was contracted to go alongside Malinska and take the cargo to be off-loaded.

The Francis Bay went alongside Malinska during the afternoon of 27 April and the Malinska's crew started transferring cargo from Nos 3 and 5 holds. Transfer operations continued throughout the night, until 1200 28 April, by which time it was considered that about 1100 tonnes had been transferred to Francis Bay.

The two tugs were again made fast on the port and starboard quarters, and Francis Bay moved clear. With the tugs pulling on full power and the ship heaving on both anchors, Malinska moved slowly astern off the shoal, floating free at 1300, one hour before high water. After the anchors had been hove up and Malinska towed well clear of the shoal, the Harbour Master took the ship to anchor off Milner Bay.

An underwater survey conducted on Sunday 2 May, indicated that the ship's seaworthiness had not been affected by the grounding and the ship was cleared to sail.

Comment

Malinska grounded on Burley Shoal following a deliberate and conscious alteration of course by the Master. It is therefore necessary to look at that action, the circumstances that lead to it and the factors behind it.

Port Approaches

Much of the area around Groote Eylandt is unsurveyed. Although there is no accuracy diagram on the chart, study of the chart and the soundings provides an indication of the extent of the surveyed areas.

The route into and out from Milner Bay is by way of a recommended track clearly indicated on the chart (Aus 14). The track passes through Warrick Channel, on the west side of Connexion Island, then south of Connexion Island, through what is locally called "the gap", a 3.5 cables (650m) wide, natural channel of deeper water through a bank that stretches southward from the island. Depths either side of "the gap" are around 11.5m, so that departing deep draught ships need to pass through "the gap". Ships in ballast at light draught may cross the bank outside, preferably to the south of "the gap", but should do so with caution.

When two ships are approaching one another in a buoyed channel that threads its way through shoal waters, at times they may well be proceeding on apparent collision courses. However, such situations will change whenever one or other of the ships alters course at a bend in the channel. Under these circumstances caution is necessary, so as to avoid passing in narrow sections of the channel, or at sharp bends.

When navigating in areas of limited survey, where recommended tracks provide safe passage, ships must navigate on or close to the track laid down. Although such tracks are not buoyed channels, mariners are similarly limited in the availability of safe water and must bear this in mind when manoeuvring to avoid collision. The track leading to and from Milner Bay is such a track.

Pilotage at Milner Bay is compulsory only for berthing and unberthing, the pilot boarding ground being located 1.4 miles west of the berth and about three miles inward from "the gap".

Navigation aids in the area are few and there are no buoys or beacons marking Burley Shoal or "the gap". Mariners are very much reliant on radar, particularly during hours of darkness, for maintaining position on the recommended track. As tidal streams are known to run strongly in the area, the parallel indexing method of radar navigation is the most practical and effective means for providing early warning of tidal effects and for maintaining track.

Sunset at Milner Bay on 25 April was at 1813, with civil twilight at 1835. The weather was fine and clear. At the time leading up to the grounding, both the light and the visibility were good.

The operational decision

Malinska was outbound from Milner Bay on a course of 232 degrees. Iron Carpentaria was proceeding inwards, following the recommended track on a course of 195 degrees. In the initial stages of the incident the aspect of Iron Carpentaria from Malinska was that of a crossing vessel on the starboard bow.

The Master of the Malinska stated that he had acquired Iron Carpentaria as an ARPA target and that it was the information provided by the ARPA, supported by checks of the radar bearing and distance, plus actual visual observation, that caused him to alter course to starboard to avoid collision. According to him the information provided by the ARPA was that a collision situation existed, that the target's course was 070 to 075 degrees and distance 1.9 miles. He also stated that he checked the target bearing and distance as 259 degrees and 1.9 miles, and that he had to bear in mind that Malinska was sluggish in the loaded condition. His alteration to starboard was also directed by the agreement to pass Iron Carpentaria in a "port to port" situation.

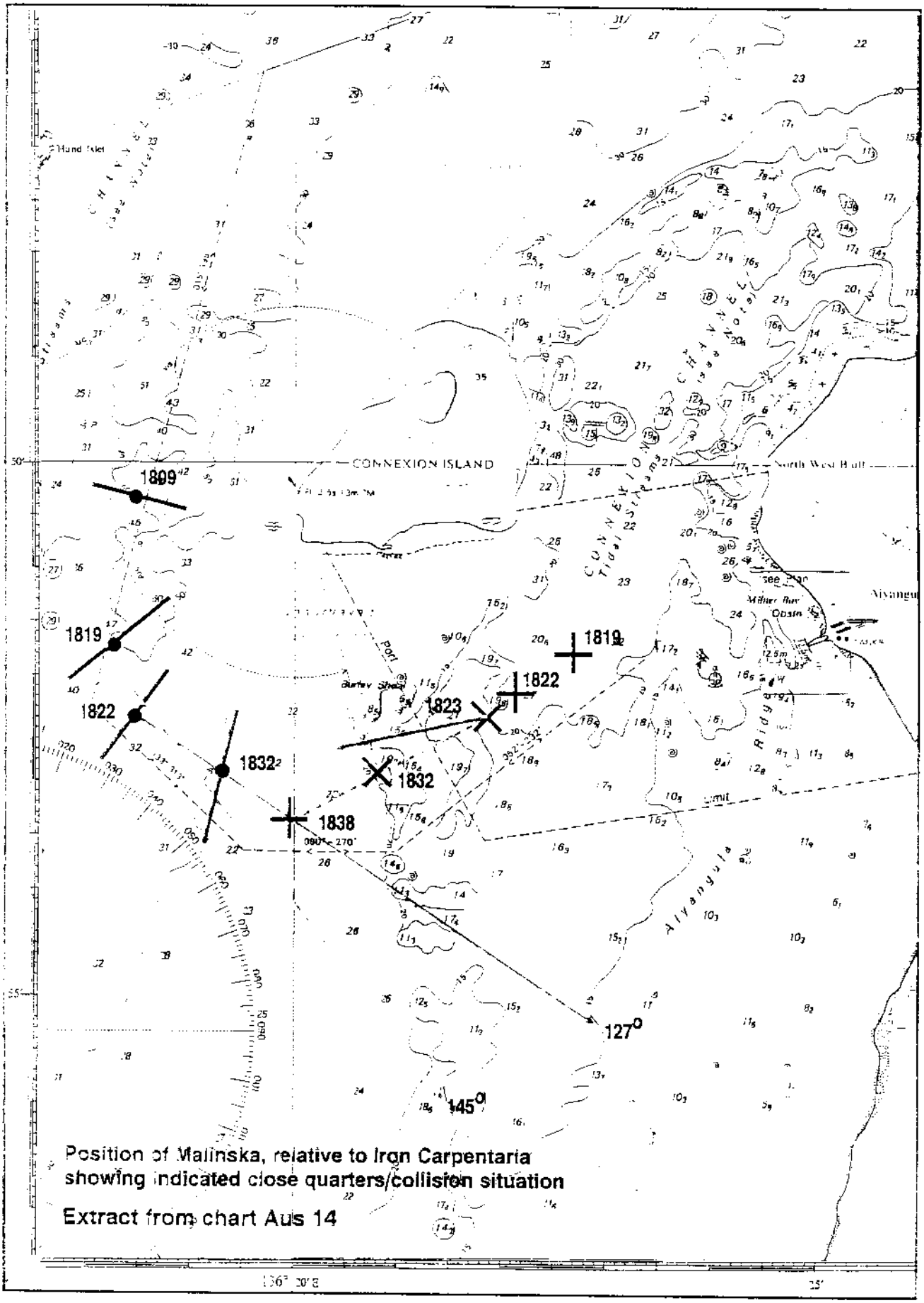
Analysis of the situation

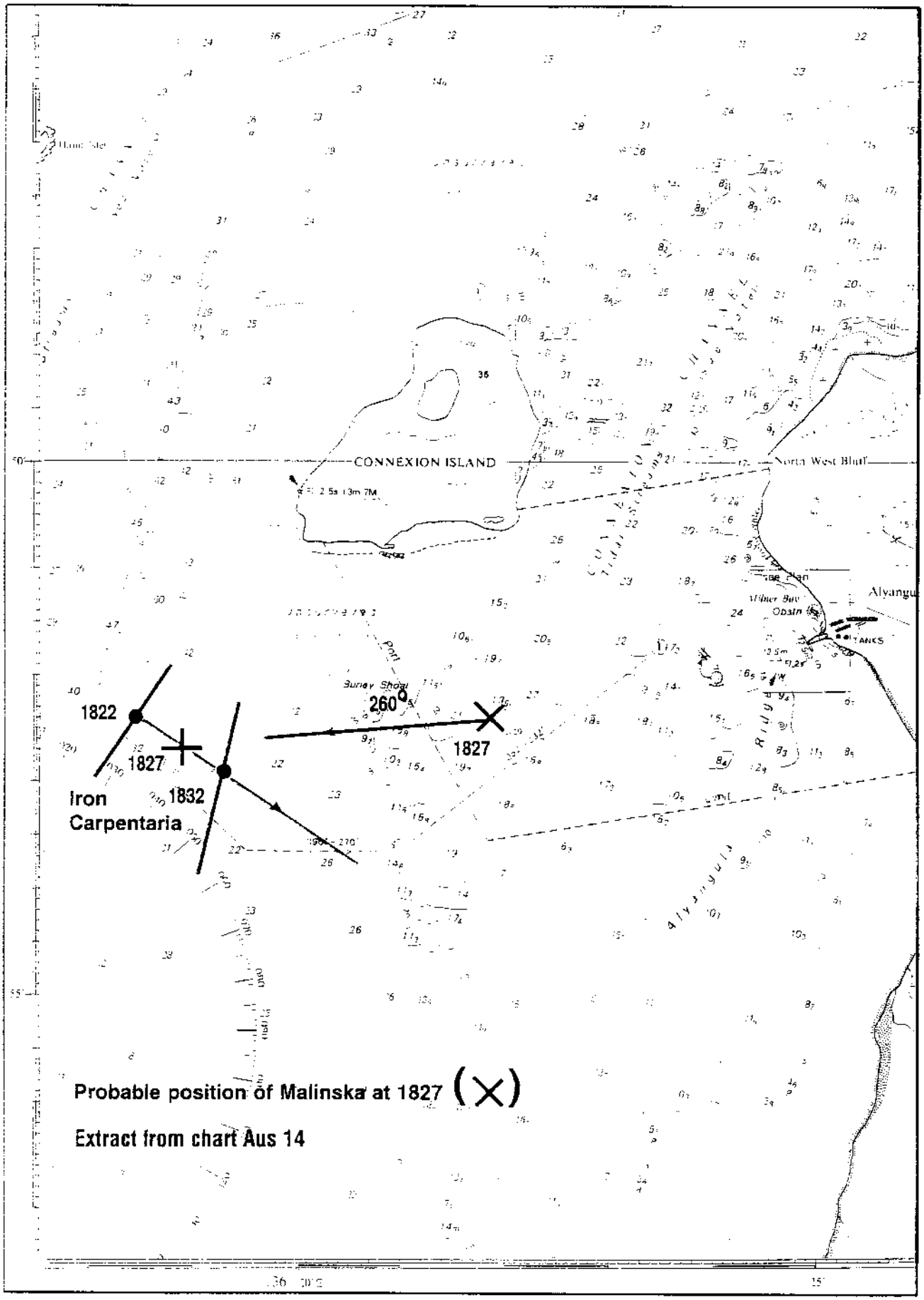
Both ships were proceeding towards "the gap", following the recommended track, from opposite directions, with an expected encounter close to "the gap" itself. The Master of Iron Carpentaria intended to keep clear of Malinska, by keeping to the south of "the gap" if necessary, and passing in a port to port situation.

Two positions were plotted on the Malinska's chart, at 1810 and 1820, the latter placing the ship just south of the recommended track and indicating that the course of 232 degrees had been made good and that there had been no tidal effect.

Malinska had sailed on a falling tide, with low water predicted at 2307. According to the tidal predictions supplied to the Master, in Connexion Channel the tide should have been setting in a north-north-easterly direction at about 0.8 knots, while in Warrick Channel the tide should have just turned and been running in a southerly direction at about a quarter of a knot. However, Iron Carpentaria was experiencing a strong northerly set (in excess of two knots), indicating that the tide was running later and stronger than predicted.

Those on the bridge of Iron Carpentaria had taken a visual bearing and radar distance of Malinska at 1819 and again at 1822, plotting these relative positions on the chart, to better


CONNEXION ISLAND
1809
1819
1822
1832
1838
1823
1819
1822
1832
127°
145°
Position of Malinska, relative to Iron Carpentaria
showing indicated close quarters/collision situation
Extract from chart Aus 14


CONNEXION ISLAND
North West Bluff
Alyangu
TANKS
Survey Shoal
1822
1827
260°
1827
Iron
Carpentaria
1832
Probable position of Malinska at 1827 (X)
Extract from chart Aus 14

assess the situation. These two relative positions placed Malinska half a mile to the north of the recommended track.

According to the position plotted on the chart by the Third Mate at 1820, Malinska was 2.1 miles from the position of the grounding, requiring a speed of 12.1 knots to provide a grounding time of 1830. The distances to the grounding position from the "relative" positions of Malinska plotted by Iron Carpentaria at 1819 and 1822, were 1.8 miles and 1.12 miles respectively, requiring speeds of 9.82 and 8.4 knots, which was more in keeping with a gradual increase in speed from Malinska's full manoeuvring speed of 8 knots.

The Master of Malinska stated that he checked the bearing of Iron Carpentaria and that it was 259 degrees. When Malinska was steadying on the 260 degree course, at about 1826, according to the Mate, Iron Carpentaria was right ahead or very fine to port. This is supported by the fact that the Chief Officer of the Iron Carpentaria reported seeing Malinska's red side light at this time. From the plotted positions of Iron Carpentaria, these points would suggest that Malinska was even further north than as indicated by the relative positions plotted by Iron Carpentaria.

It is concluded that Malinska was set well to the north of the recommended track, and that the position plotted by the Third Mate at 1820 was not correct. It is considered possible that the Third Mate, for whatever reason, laid off a distance of 2.5 miles, instead of 2.0 miles

When visual sightings were first made of Iron Carpentaria at 1809, the in-bound ship was on a course of 195 degrees. While Iron Carpentaria maintained this course and Malinska proceeded towards "the gap", this angle slowly decreased. Iron Carpentaria was slowly crossing ahead of Malinska and, had the 195 degree course been maintained, would have been about three miles ahead of Malinska as that ship cleared the bank at about 1832.

At 1820, Iron Carpentaria altered course to 145 degrees to keep close to but south of the recommended track which runs in a 133 degree direction. However, because of the strong northerly tidal stream Iron Carpentaria made good a course of 127 degrees. Based on the relative positions of Malinska obtained by Iron Carpentaria and the observed bearing of Iron Carpentaria from Malinska, this created a situation where the Iron Carpentaria was on a steady bearing just under 40 degrees on Malinska's starboard bow: a situation where, if both maintained their course and speed, a collision could occur at about 1838, six minutes after Malinska cleared the bank at about 1832.

At 1823, when Malinska altered course to starboard, the two ships were about 3.7 miles apart.

MALINSKA - Master's actions

It is apparent that there had been created, albeit unintentionally, a situation where a risk of collision existed. Therefore, it is necessary to examine the Malinska Master's actions.

The Master had the con and had aquired the inbound Iron Carpentaria as a target on the ARPA, so as to have constant information available to him. However, he did not use the radar for navigating the ship and maintaining it on track. He relied instead on the Third Mate plotting positions on the chart. As a result of this he failed to realise not only that the position plotted by the Third Mate at 1820 was incorrect, but that the ship was experiencing a strong northerly set.

He should also have realised that the inbound Iron Carpentaria, following the recommended track in an area of limited survey, a track he himself had navigated just two days before, would have to make a broad alteration of course to port at some stage, and that a close quarters/near collision situation could be indicated.

When the ARPA indicated a collision situation had developed with Iron Carpentaria, he accepted the information at face value. His response was affected by three factors - his impression of the target distance, the ship's characteristic of being sluggish when deep laden and the agreement to pass in a port to port situation. The former resulted in a quick response to the ARPA information, the latter an alteration to starboard. In addition, there would have been the natural "conditioned" reaction under the Colregs, to alter course to starboard under such close quarters situations.

Had the Master taken a moment to consider the information provided by the ARPA, he should have realised that on a bearing of 259 degrees and on a course of 070 to 075 degrees, Iron Carpentaria would have been presenting a completely different, fine starboard bow aspect. Visual observation of Iron Carpentaria and consideration of the chart should have indicated to the Master, that although Iron Carpentaria had in fact made a considerable alteration to port, it had not done so to the extent indicated by the ARPA. Also, had he checked the relative position of 259 degrees 1.9 miles from his estimated 1823 position, he would have seen that that placed Iron Carpentaria just four cables south of Burley Shoal, instead of on the recommended track 2.3 miles west of the Shoal.

The ARPA was providing incorrect information, the course given for Iron Carpentaria was wrong and the distance between the two vessels at 1822 was about 3.75 miles. However, it is possible that the 1.9 miles distance provided by the ARPA was the distance to the collision point (actual about 2.2

miles) and mistaken by the Master to be the target distance.

Malinska was slowly increasing speed, Iron Carpentaria was reducing speed and had just altered course, all of which can result in ARPA providing erroneous information. The Master of Malinska does not appear to have appreciated the limitations of ARPA and to have placed too much reliance on the information it provided.

The Master further stated that he checked to ensure that it was safe to come around on to the 260 degrees course and considered that he had sufficient sea room to carry out the evasive action manoeuvre. Had the information that he was using - ship's own position and target relative position - been correct, then his decision would not have been unreasonable, although it would have required an alteration of course to port, to around 215 degrees, after five minutes, to make "the gap". However, the information was not correct, and he failed to verify the validity of the information before acting upon it.

As the Master's actions resulted in the ship grounding, it is appropriate to consider whether there were any factors that may have been affecting his judgement.
All of the crew on board Malinska must have had grave concerns for the safety of family and friends at home in Croatia, as a result of the civil war following the partition of what was Yugoslavia. However, the Master lived in the northern part of Croatia, away from the areas of fighting and he had spoken by telephone with his wife over the weekend, learning that all was well at home. Although concern must always be present under such circumstances, in the Master's case it should not have been such as to affect his judgement.

The Harbour Master stated he had concerns about the Master's state of sobriety prior to the ship sailing. Although he could not recall the Master drinking, there was whisky on the table and the Master's actions were such as to give the Harbour Master the impression that he may have been under the influence of alcohol.

The evidence on certain activities provided by the Master and Third Mate conflicted with that provided by the Harbour Master and others.

When interviewed, the Master stated that there was only one person in his cabin before sailing, a man of Croatian origin, who had made himself known to him. According to the Harbour Master and to a guest who made a Statutory Declaration, there was a whole group of people, including adults and children. Following the Master receiving a draft of this report, he submitted that there were, in fact, more people in his cabin, however the stress of the interview confused him.

The Master also stated that he had been in his cabin between the

Harbour Master going to the bridge and his going there himself about 15 minutes later. Also, the Third Mate stated to the investigation, that he didn't know where the Master had been between stations being called at 1730 and his arriving on the bridge about fifteeen minutes later. However, according to the Harbour Master, when he had asked the Third Mate where the Master was, the Third Mate had indicated the Master was on the Wharf.

The farewells on the wharf, while the crew were singling up, were reportedly very emotional, and the whistle blowing more than customary. There is nothing wrong with these actions in themselves, but when interviewed, the Master and Third Mate evaded the issues and there was an apparent determined cover-up of the Master's activities.

There was also a conflict of evidence as to what information was passed to Malinska regarding the passing situation with Iron Carpentaria.

The Harbour Master stated he advised the Master, and repeated to the Third Mate, not only that Iron Carpentaria would pass "red to red", but that it would keep clear of Malinska, would keep to the south. The Master of Iron Carpentaria stated he reaffirmed that he would keep clear, by keeping to the south if necessary, when he spoke to Malinska by VHF, and that his full message was repeated back to him.

Both the Master and Third Mate of Malinska said they were only requested to pass red to red, that nothing else was said, either by the Harbour Master or the Master of Iron Carpentaria. It is possible that there may have been difficulties in understanding what was said or its meaning. However, no pronounced language difficulties were evident to the investigator during interview, all the officers exhibiting a good command of the English language.

Having disembarked from Malinska a little after 1800, the Harbour Master called Malinska a number of times on VHF. The Master chose not to reply, stating that he was too busy, initially in manoeuvring to avoid collision and later, trying to refloat the ship. Having failed to refloat the ship, the Master decided to wait until the next high water before making further attempts, and went to bed. He did not call the Harbour Master, or other Australian or flag Authority, to advise of the situation or of his intentions, nor did he try to make contact with the ship's owners. It is unusual for a ship's master not to have shore management after hours numbers, for use in emergency.

The Master stated that he never drank alcohol. The Master's adult male guests were requested to provide information to the investigation. One declined to cooperate, while the other said he had only seen the Master drink what he thought might have been

fruit juice, but he had not been on board the whole time, having left and then returned to collect his children.

The Inspector is satisfied that the version of events as told by the Harbour Master is correct. Therefore, owing to the inconsistencies in the evidence given by the Master and Third Mate of the Malinska, he considers that he cannot fully rely on their account of the events.

On the available evidence, particularly the actions and reported actions of the Master, it is considered that alcohol cannot be totally ruled out as having been a possible influence on the Master's judgement.

Bridge procedures

No detailed passage plan had been drawn up, prior to departure, to indicate tidal flow or clearing distances to ensure safe passage to and through "the gap".

The Master had been given the tide and current information for Connexion and Warwick Channels, which indicated that the ship was likely to experience a northerly set on the run to "the gap". However, he does not appear to have taken this information into account for the departure.

Although the Master had attended a radar and ARPA course, which included parallel indexing methods, he did not adopt this method of navigation, or instruct his officers to do so.

Had the Master used the radar to full advantage and used parallel indexing techniques, he would immediately have been aware of the northerly set and the proximity of Burley Shoal. Had the range rings been switched on, these would have provided some indication that the ship was closer to Connexion Island than expected and therefore closer to Burley Shoal. As it was, the Master placed full reliance upon the position as plotted on the chart at 1820 by the Third Mate.

This failure to establish that the ship was being set to the north was a major navigational error. Not only did it result in the Master thinking that an alteration to starboard was safe, but even without the alteration of course to 260 degrees, the set experienced may well have resulted in the ship grounding on the 9.7m patch immediately south of Burley Shoal.

After the Harbour Master had disembarked at a little after 1800, the Third Mate's role appears to have been purely that of plotting the ship's position. He does not appear to have concerned himself

about checking the position of the Iron Carpentaria, or whether or not the course of 260 was in fact safe. The Master does not appear to have asked him to check the bearing of the other ship, or to discuss the other ship's alteration of course with him.

Only one radar had been switched on for departure and was being used by the Master for conning the ship and periodically by the Third Mate to fix the ship's position. Had the second radar been in operation, the Third Mate would have been able to monitor events more easily. However, the Iron Carpentaria had been fully visible for about fourteen minutes before the course alteration was made, yet no visual bearings at all were taken. The more experienced Mate arrived on the bridge only after the Master had ordered the course alteration and as the ship was coming on to the new course. His assuming responsibility for his watch, after taking over from the Third Mate, was too late to have any effect on the outcome - he did go to check the ship's position, but the ship grounded immediately afterwards.

Had the Mate been stationed on the bridge for departure, a not uncommon operational procedure, instead of, as more traditionally, on the forecastle, the incident may have been approached with greater awareness and possibly avoided.

It is considered that the bridge procedures aboard Malinska were lax, with no bridge management structure and no proper passage planning.

Iron Carpentaria

As soon as the Master of Iron Carpentaria became aware of Malinska's departure he decided he would give Malinska priority and cross the bank south of "the gap" if necessary. He requested the Harbour Master to advise the Malinska's Master of this, and did so himself by VHF after visual contact had been made.

In order to assess the situation and so as to be able to determine his actions, the Master plotted the relative position of Malinska on the chart. Arriving at the point where it was necessary to alter course to 133 degrees, he altered to 145 degrees, intending to take Iron Carpentaria south of the track, in keeping with the arrangement to pass Malinska port to port.

As soon as the extent of the northerly set was established, Iron Carpentaria made a substantial alteration of course to the south, in ample time to avoid hindering Malinska. However, Malinska had already altered course to starboard by that time.

It is considered that the actions of the Master of Iron Carpentaria were correct and not inappropriate.

Local information

The Master had been provided with all available information on the local tides and currents, which consisted of hourly height predictions for the berth area and hourly current rate and direction predictions for the berth area, Connexion Channel and Warrick Channel. Although this was quite sufficient to inform the Master that he could expect a northerly set while proceeding towards "the gap", and although he may have appeared to be aware of this by his instructions to the helmsman, it is considered that before he disembarked, the Harbour Master should have reminded the Master of this and warned him against being set towards Burley Shoal.

There are no navigational aids, such as buoys or beacons, indicating either Burley Shoal, or delineating the width of "the gap".

The Master commented that had there been a marker buoy he would not have run Malinska aground. It is considered that the Master's views on this point are perfectly valid, that a navigation aid marking either Burley Shoal or the 11.5m sounding on the north side of "the gap" would have provided means for orientation.

Had there been such a navigation aid, the Master would most probably have been alerted to the fact that Malinska was being set considerably to the north and that Iron Carpentaria was still well to seaward of "the gap".

Where an inbound vessel is to encounter a loaded outbound vessel in the vicinity of "the gap", it is considered that it would be appropriate for the inbound vessel to stand off, so as to allow the outbound vessel to clear "the gap", before making the final approach.

Conclusions

It is concluded that:

1 While proceeding towards "the gap", Malinska experienced a strong northerly set, and the position plotted on the chart by the Third Mate at 1820 was incorrect.

2 The Master of Malinska failed to use the radar to best advantage, failed to use parallel indexing or other radar monitoring method, and so was unaware that the ship was being set to the north.

3 The Master failed to fully assess the situation before altering course to starboard, placing undue reliance on the ARPA, mis-reading or misinterpreting the distance to the collision point, and failing to check the ship's position.

4 When Iron Carpentaria altered course to 145 degrees, to take the ship south of the recommended track, due to the strong tidal effect, a developing collision, or near collision, situation was created.

It is further considered that:

5 Even had Malinska not altered course to starboard and had maintained a heading of 232 degrees, because it had been set to the north, there was a strong possibility of the ship grounding on the bank to the south of Burley Shoal.

6 The bridge procedures on board Malinska were lax, in that there was no bridge management structure and no passage planning had been carried out.

7 Had the Mate been on the bridge for departure, instead of, as more traditionally, on the forecastle, the incident may have been approached with greater awareness and possibly avoided.

8 Alcohol cannot be totally ruled out as a factor that might have affected the Master's judgement.

9 The Master of Iron Carpentaria intended to keep clear of Malinska, to give that ship priority.

10 The actions of the Master of Iron Carpentaria were correct and not inappropriate.

11 Where an inbound vessel is to encounter a loaded outbound vessel in the vicinity of "the gap", it would be appropriate

for the inbound vessel to standoff, so as to allow the outbound vessel to clear "the gap", before making the final approach.

12 A navigation aid, located either on Burley Shoal or on the northern side of "the gap", would have provided a visual reference for the Master, alerting him to the fact that the ship was being set to the north and that Iron Carpentaria was still to seaward of "the gap".

13 Before disembarking, the Harbour Master should have drawn the Master's attention to the northerly setting current and warned him of the danger of being set towards Burley Shoal

Subsequent Action

Following discussions between the Australian Maritime Safety Authority and BHP, engendered by the findings of the investigation, a South Cardinal buoy is to be located on the 11.5m bank to the north of "the gap". Installation of the buoy is anticipated to be completed by May 1994.

Submissions

Under sub-regulation 16(3) of the Navigation (Marine Casualty) Regulations, if a report, or part of a report, relates to a person's affairs to a material extent, the Inspector must, if it is reasonable to do so, give the person a copy of the report or the relevant part of the report. Sub-regulation 16(4) provides that any such person may provide written comments or information relating to the report.

The report was sent to the Master, Chief Mate and Third Mate of Malinska, the Master of Iron Carpentaria and the Harbour Master/Pilot at Groote Eylandt. Comments and information were received from the Masters of the two vessels and the Harbour Master/Pilot at Groote Eylandt. The submissions have been carefully considered and, where appropriate, the text has been altered to reflect the facts of the incident. Where the Inspector cannot accept the argument of a submission, the issues are outlined below.

Malinska

The Master of Malinska submitted that he was under considerable stress at the time he was interviewed, inferring that his thoughts and memory recall were not strictly marshalled. He submitted that before proceeding to the bridge for departure, he did in fact escort his guests to the gangway, assisting the women and children on to the wharf.

The Master's accompanying his guests to the gangway is accepted as a normal action. However, the fact that this and other important matters, although pressed during interview, were "forgotten", and this and other factors were also "concealed" by the Third Mate, indicates ulteriorally motivated defensive actions.

Iron Carpentaria

The Master of Iron Carpentaria submitted that he had boarded Malinska, in company with the Pilot, the day after the grounding, but did not identify himself. He made a number of observations on what he had seen and on what he had been told by members of Malinska's crew.

As he did not make his true interests in the incident known, the Inspector feels that his unsubstantiated observations cannot be utilised in the report.

Details of ship

Name:	Malinska
Lloyds Number:	8505848
Ship type:	geared bulk carrier
Flag:	Maltese.
Owner:	Treacle Maritime Ltd, Valletta, Malta.
Disponent Owner:	Croatia Line, Rijeka, Croatia.
Crew:	22, Croatian.
Year of build:	1987.
Yard:	R O Brodogradiliste, Rijeka.
Main engine:	Sulzer 6TRA, 9660kW.
Gross tonnage:	23306
Nett tonnage:	11292
Summer deadweight:	35532
Length overall:	222.425m.
Beam:	23.08m.
Depth moulded:	14.747m.
Summer draught:	9.881m.
Number of holds:	7
Classification Society:	Lloyd's Register of Shipping