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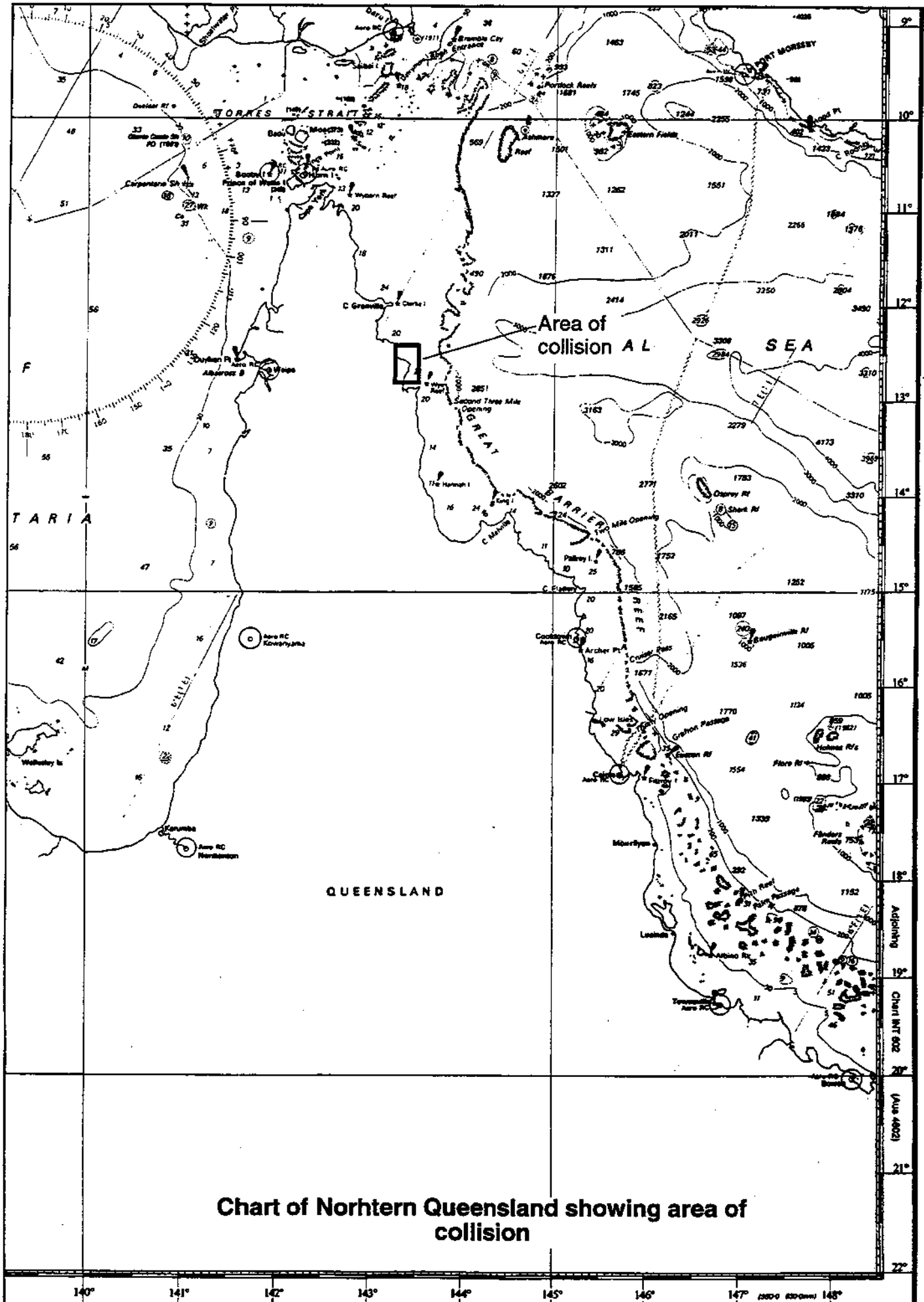

Chart of Norhtern Queensland showing area of collision

Summary

In the early morning of 3 December 1992, the fishing vessel Ronda Lene was trawling for prawns to the south-east of Middle Reef in the Great Barrier Reef. At 0220, the vessel was trawling in a north-westerly direction; one of the two deck hands was on watch while the skipper and second deck hand were sleeping below.

The Bahamas flag cargo ship Fareast, north bound through the inner two-way route, passed Restoration Rock, 12 miles south-south-east of Middle Reef on a course of 330 degrees at 0218. A qualified officer was in charge of the watch, the Master was on the bridge, and a pilot of the Queensland Coast and Torres Strait Pilot Service was resting on a settee at the back of the wheelhouse.

The weather was clear, with good visibility. The Ronda Lene and other fishing vessels could be clearly seen from the bridge of Fareast.

At about 0244, Fareast and Ronda Lene collided. No one was injured and no pollution occurred. Ronda Lene suffered damage to the port fishing boom and to the vessel's structure and fittings.

Information Sources

Ronda Lene - Skipper, Deckhand.

Fareast - Master, Second Mate, Queensland Coast and Torres Strait Pilot. As the ship was bound for an overseas port, there was no opportunity to interview the members of the ship's company. The information provided by the Master and Second Mate was in the form of statements and photocopies of documents, plus answers to questions that had been mailed to them.

Skippers of fishing vessels Boxer & Illusion.

The Inspector gratefully acknowledges the assistance provided by:-
C H Smith Marine, of Collingwood, Victoria and Sydney, NSW, in particular Mr Bob Todd, services technician;
Geodetic Operations, Australian Surveying & Land Information Group (AUSLIG);
Japan Radio Company, Tokyo.
Mr Graham Owens, Fisherman, of Coffs Harbour, NSW.

The Inspector was assisted by the Harbour Master, Cairns, who was appointed an Investigator under regulation 6 of the Navigation (Marine Casualty) Regulations.

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Sequence of events - Fareast

The Fareast, a Bahamas flag general cargo ship of 8927 gross tonnes, sailed from the port of Gladstone at 2224 on 29 November 1992, bound for Chittagong, Bangladesh. A Pilot of the Queensland Coast and Torres Strait Pilot Service had joined the ship during the late afternoon, his principal task being to pilot the ship through the inner two-way route of the Great Barrier Reef.

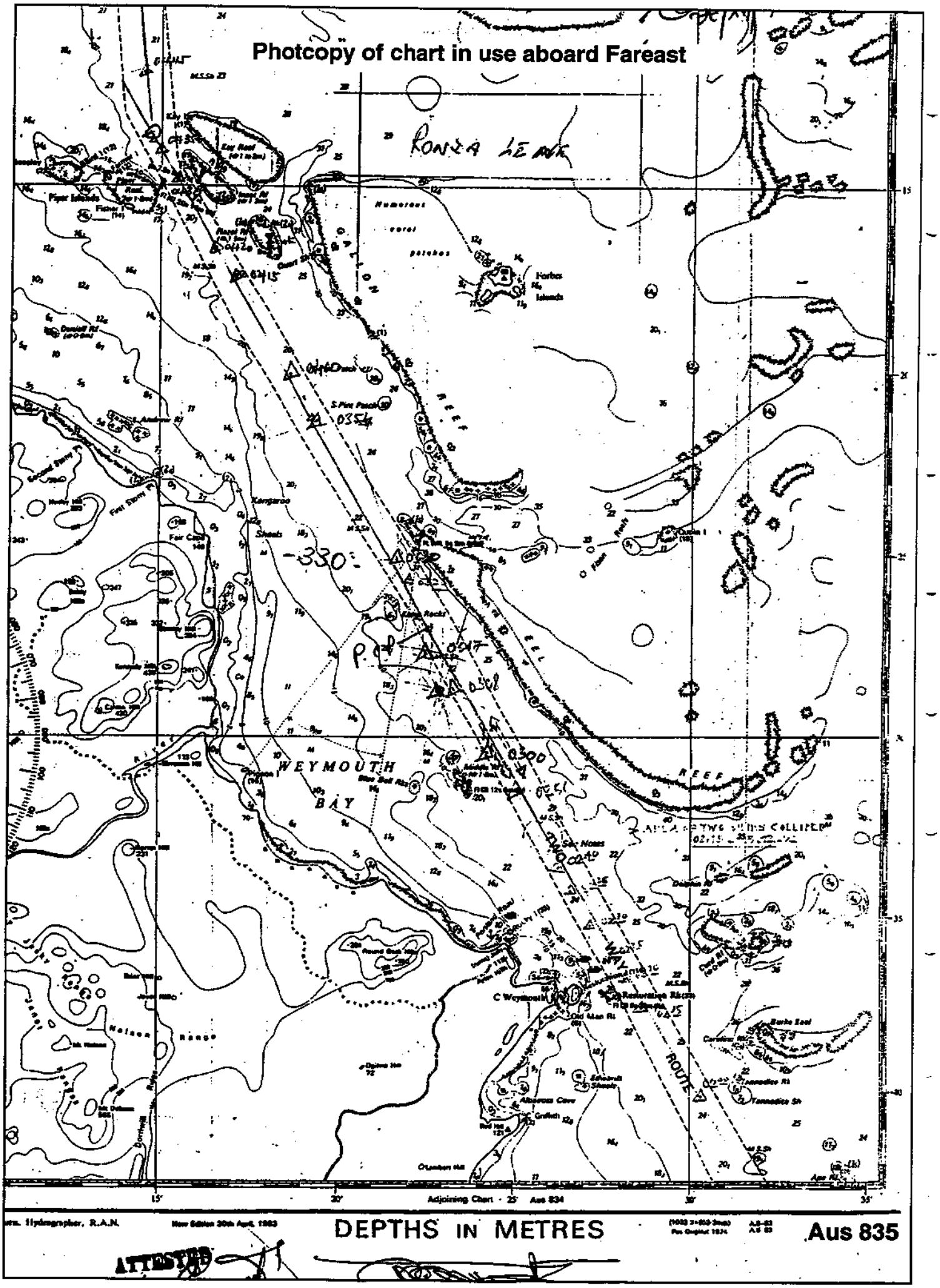
After the ship had cleared the Gladstone Fairway Buoy, the Coastal Pilot laid the courses on the charts, to take the ship north to the inner route. Between Gladstone and Fitzroy Island, off Cairns, the Pilot played a passive role, monitoring the ship's progress, assessing the ship's handling characteristics and assessing the competence of the ship's officers. The Pilot noted that if the Master was on the bridge he would check the ship's position frequently, but left the officer of the watch in charge.

Very little shipping was seen on the passage towards the inner route and no fishing vessels were encountered until the morning of 3 December. The Pilot was therefore unable to assess how the officers conducted themselves in ship-encounter situations.

During discussions the Master, who had been at sea for 33 years, 18 years as Master, told the Pilot that his government's instructions were that the Master was to be on the bridge when under pilotage. The Pilot explained that it was a long pilotage and that it was up to the Master whether or not he remained on the bridge, but that it was not really necessary for them both to be there. He also explained that he would be taking rests at certain times, conditions permitting, and that he would appreciate the Master being on the bridge during those times.

Fitzroy Island was passed at 2200 on 1 December 1992, the Pilot actively taking the con from about 2100. Taking advantage of clear stretches to get some rest, the Pilot was able to go to his cabin for one and a half hours after passing Low Isles at 0124 2 December, for a further one and a half hours after passing Rocky Point at 0530, and for an hour between King Island and Eden Reef (between 1600 and 1800), in Princess Charlotte Bay. After Princess Charlotte Bay the Pilot's next available rest period, when he could go down to the cabin, would be after passing Clerke Island, after about 0600 on 3 December.

The Second Mate, who had been at sea for 20 years, which included six years experience as Second Mate, on 2 December, following


Photcopy of chart in use aboard Fareast
RONZA LEAK
WEYMOUTH BAY
REEF
ROUTE
DEPTHS IN METRES
Aus 835
ATTESTED

his normal daily routine, went to bed at 1900. He was called for his Watch at 2345 and when he arrived in the wheelhouse at 2350, he noted the Master was on the bridge. Having taken over the watch from the Third Mate, he went about his duties, plotting the ship's position at regular, five and ten minute, intervals. The ship at this time was steering a course of 360 degrees true and making good a speed of 12 knots. The night was clear, with good visibility.

At 0046 on 3 December, Chapman Island was abeam and at 0110, when Wye Reef was abeam to starboard, course was altered to 330 degrees true, a course that would take the ship through to Piper Reef.

Tannadice Rock was abeam at 0200, at which time the Pilot noted the loom of a number of fishing vessels' lights ahead, about half a point to starboard and between half and one point to port. The wind at this time was recorded in the Deck Log Book as being "NW3". The Pilot made himself a coffee and told the Master and the Second Mate that he was going to sit down for a while on the settee in the aft, port side area of the wheelhouse. He showed them a position he had marked on the chart, "PCP", one mile before Kemp Rocks, saying that they should let him know when the ship reached that position, expecting this to be at around 0310.

At 0215, the Second Mate plotted the ship's position on the chart, after which the Pilot stood up to have a look around, noting that Restoration Rock light was abeam to port. The working lights of two fishing vessels were clearly visible on the starboard bow, the finest being about 10 degrees on the bow, and the lights of two others broader on the port bow and which the Pilot considered to be headed in a southerly direction. The Pilot estimated the fishing vessels were at about 5 miles distance and, satisfied that they were all passing clear, returned to sit on the settee. Before doing so, he instructed the Second Mate to keep a close watch on the fishing vessels and to call him if any of them started to close the ship's course line. The tide was flooding, high water being at 0600, so the Pilot warned the Second Mate that the ship may be set to the west, in towards Weymouth Bay.

During the minutes that followed, the Pilot was aware of the Second Mate going to the chart table at regular intervals to plot the ship's position, and of the occasional click of the radar range selector switch. All was otherwise peaceful and quiet and he was satisfied that everything was proceeding smoothly.

At 0220, with Restoration Rock just abaft the port beam, the Second Mate checked the radar bearing and distance of the fishing vessel finest on the starboard bow and noted them as being 338 degrees and 2.7 miles respectively. He noted the other fishing vessel on the starboard bow as being

350 degrees at 2.2 miles, and the fishing vessel finest on the port bow as being 328 degrees at 6.5 miles. He then maintained a radar check on the fishing vessel finest on the starboard bow, using the off-centre electronic bearing cursor, and established that the closest approach would be three cables.

At a time said by the Master to be 0240, when the fishing vessel on the starboard bow was bearing 347 degrees at a distance of one mile, being satisfied that it was safe to do so, he left the bridge to go to the lavatory. About three minutes later, the Second Mate observed the fishing vessel suddenly alter course towards the Fareast. He immediately ordered the helmsman to put the wheel hard to port, sounded one long blast on the whistle then ran over to call the Pilot.

The Pilot was roused by the Second Mate calling out to him. He stood up, looked out of the wheelhouse windows and saw a fishing vessel, about two trawler lengths off the starboard side, showing its red sidelight and headed about 60 degrees across the Fareast's track, slowly closing. The Fareast was swinging slowly to port, so he ordered "hard to port" and "stop engines" and ran to the starboard bridge wing, noting the buzz of the electric engine telegraph as the Second Mate responded to his orders.

The fishing vessel struck the starboard side of the ship, abreast of No.2 hatch and the Pilot ordered "hard to starboard", to swing the stern clear. At this stage the Pilot was aware of everything going quiet on the bridge. As the fishing vessel passed down the starboard side its port fishing boom swept along the ship's deck, removing a length of ship's side-rail.

The Master heard the whistle, the sound of running feet, the sound of the engine telegraph and felt the ship altering course. He hurried to the bridge, arriving in time to see a fishing vessel passing very close, but clear, down the starboard side just abaft the bridge wing.

Fareast had swung through about 45 degrees, putting Middle Reef light at least two points on the starboard bow and the ship was headed towards other fishing vessels. The Pilot's immediate concern was to bring the ship back onto a safe course. An inital abusive call from an unidentified source, and a subsequent call from Ronda Lene of a high pitched voice over the VHF saying excitedly "you have hit me, you have hit me" were ignored by the Pilot.

As soon as the Fareast was back on the correct, 330 degree heading, the Second Mate plotted the ship's position on the chart, the time being noted as 0245.

A calmer, quieter voice then came over the VHF, the Ronda Lene skipper calling the ship that had hit him. Satisfied that the ship was in a safe situation, the Pilot answered, identifying the Fareast.

The skipper of the Ronda Lene advised the Pilot that he didn't know what had happened, that he had been below sleeping and had been called by the deck-hand just in sufficient time to be able to go hard to starboard before they hit. The Pilot asked the skipper what damage had occurred, whether they were taking water and whether they were safe. After a while the skipper advised the Pilot that they were OK, that they were not taking water, but that the Fareast had wiped out the port boom and that his nets had buried themselves in the bottom. The Pilot asked the skipper if they needed assistance from the Fareast, the skipper replying that they did not require his assistance, that another trawler was on its way to them.

After further discussion and agreement that both vessels would report the collision to the Cairns Harbour Master, the Fareast was cleared by the Ronda Lene to continue its voyage. The Pilot and Master then sent a message to the Maritime Rescue Coordination Centre, Canberra, advising them of the incident.

Later that morning, in daylight, the Pilot went along the deck to look for signs of the collision. He noted a one-metre score mark on the ship's side plating, abreast of No.2 hatch, and another score mark about 27m further aft. About 27m of ship's side-rail had been removed at deck level, a 5m length remaining lying on the deck, the remainder having gone overboard. The passage through the inner route and through the Torres Strait was completed without further incident, the Pilot disembarking off Booby Island at 1756 on 3 December.

Sequence of events - Ronda Lene

At the beginning of December 1992, the Ronda Lene, a 17.68m wooden vessel, was on a fishing voyage out of Cairns, trawling for prawns, crewed by the owner/skipper and two deck hands neither of whom held any marine qualifications. Prawn trawling is conducted at night, day times being spent at anchor while the crew catch up on their sleep.

The vessel's navigation equipment included a radar, a JRC JRL-4200 Global Positioning System (GPS) satellite navigator and a JRC NWU-53 electronic plotter, an electronic chart system with track memory capability in disc form. The GPS is connected to the plotter, providing constant display of the vessel's position. The equipment provides for the selection of a plotting interval of between one second and 90 minutes. The skipper's normal practice was to leave the plotting interval set at one minute.

On 2 December the crew roused at about 1700 and got the vessel under way in time to start fishing at about 1900. On this occasion the skipper decided to fish to the south-east of Middle Reef, running generally in north-westerly and south-easterly directions, close to and in the recommended inner two-way shipping route.

While fishing, the Ronda Lene exhibited the navigation lights prescribed by the International Regulations for Preventing Collisions at Sea for a vessel of less than 50m in length engaged in trawling - green and red sidelights, white stern light and the fishing signal of an all-round green light over an all-round white light. In addition, the vessel carried powerful working lights - two quartz halogen lights over the trawls and two horizontal mercury vocus directed over the aft deck - for handling the catch, these lights being left on at all times.

As soon as the gear was deployed for the first "shot" the crew had tea, after which the two deck hands went to bed, to sleep until called for hauling nets at the end of the first shot. The nets were winched up at 2100, after which the two deck hands cleaned and packed the prawns into the freezer, before going back to bed to await the next call-out.

The second shot completed at midnight, the two deck hands again being called for bringing in the nets, cleaning and packing the catch. With the third shot in progress, on a north-westerly heading and the second catch stowed, the skipper handed over the watch to one of the deckhands at about 0120, so as to be able to go below and sleep. The deckhand

had 14 years experience on trawlers and had the skipper's complete trust to be in charge of the watch while the skipper was asleep. When handing over to the deckhand, the skipper told him to run parallel to, but a little to the west of, the previous track (on the plotter) and to call him at 0255. The sea was flat calm and the visibility "perfect". The VHF set was set to "cure watch", a dual watch system on channels 16 and 68.

According to the deck hand, he carried out his duties by keeping the vessel's track, as marked on the electronic navigation plotter by fixes automatically fed in from the GPS satellite navigator, parallel to the previous, south-easterly track. Although the radar was operating, he did not refer to it very often to check for other shipping, and was aware only of a number of other fishing vessels in the vicinity.

From the information provided by the GPS and the plotter, the Ronda Lene was making good a course of about 320-325 degrees at a speed of between 2.8 and 3.2 knots. The deck hand would alter the course a few degrees, now and again, so as to maintain the parallel track.

At about 0245, as Ronda Lene approached the end of the run, another fishing vessel, Boxer, was approaching off the port bow. According to the deck hand, he decided to delay the turn to port, on to the next south-easterly run, until after Boxer had passed and went to the after end of the wheelhouse to make some tea. Looking out of the after window he saw the green sidelight of a ship, seemingly right beside the deck-house, on the port side. He yelled for the skipper and swung the wheel to starboard.

The skipper scrambled back into the wheelhouse and asked what was wrong, the deckhand saying "the ship is nearly on us". The skipper looked out of the portside door, could see nothing, so went to the starboard door, at the after end, and saw a single green light. He turned to the deck hand, asked him if he was hard to starboard, received an affirmative response, immediately after which the Ronda Lene collided with the ship. There was a screeching of metal, the Ronda Lene listed dangerously to starboard and the skipper, fearing his vessel was going to overturn, raced to the after end. As he left the wheelhouse he heard the Boxer calling the north-bound ship. Once the ship had passed clear, passing up the port side of the Ronda Lene, the Ronda Lene righted itself. As a result of the wheel having been put hard to starboard and the effect of the collision, Ronda Lene had been spun around so as to be headed in a south-easterly direction.

Returning to the wheelhouse, the skipper knocked the engine out of gear and called the ship on the VHF, but received no reply. He called a second time and was eventually answered, being advised that the ship was the Fareast. The skipper was asked if he needed any

assistance and within a couple of minutes he was able to advise the Fareast that they were not making a great deal of water, that they were in no danger. As two other fishing vessels had indicated they were on their way to him, he advised the Fareast that he did not require assistance from the ship. The Pilot aboard the Fareast then said that the Fareast would continue on its voyage and that he, the Pilot, would be disembarking at Thursday Island.

The skipper noted the position as indicated by the GPS and the navigation plotter, 12° 32.405'S 143° 25.398'E and wrote it in the desk diary he used as a log book.

Inspecting his vessel the skipper found that the collision had caused considerable damage. The port fishing boom was badly buckled and the solid metal forestay had carried away; the metal anchor fairlead had been ripped off the bowsprit; the port side bulwark was badly damaged from the bow to mid length; hull planking had been sprung on both sides, allowing ingress of water; the port sidelight had been removed; the air-conditioning unit on top of the wheelhouse was demolished and the stern of the dinghy stove in. It was also found that the fishing hawsers had become fouled.

The fishing vessels Illusion and Riverina arrived and assisted the Ronda Lene crew in retrieving the nets and securing the damaged gear, which took about 30 minutes. Ronda Lene was then towed by Riverina to anchorage in Portland Road, where the crew made temporary repairs so the vessel could proceed back to Cairns.

Comment

Responsibilities

Both vessels were proceeding in a north-westerly direction, the Fareast at 12 knots and the Ronda Lene at 3 knots, the Fareast overtaking the Ronda Lene. No fishing signals were observed by those on the Fareast, but because of the bright working lights the Ronda Lene was assumed to be engaged in fishing and that the Fareast therefore had the responsibility of keeping clear of the other vessel.

Regardless of whether or not the Ronda Lene was engaged in fishing, the Fareast, as the overtaking vessel, had the duty to keep clear of the Ronda Lene.

As the vessel being overtaken, the Ronda Lene had a duty to maintain its course and speed until the Fareast had passed and was clear.

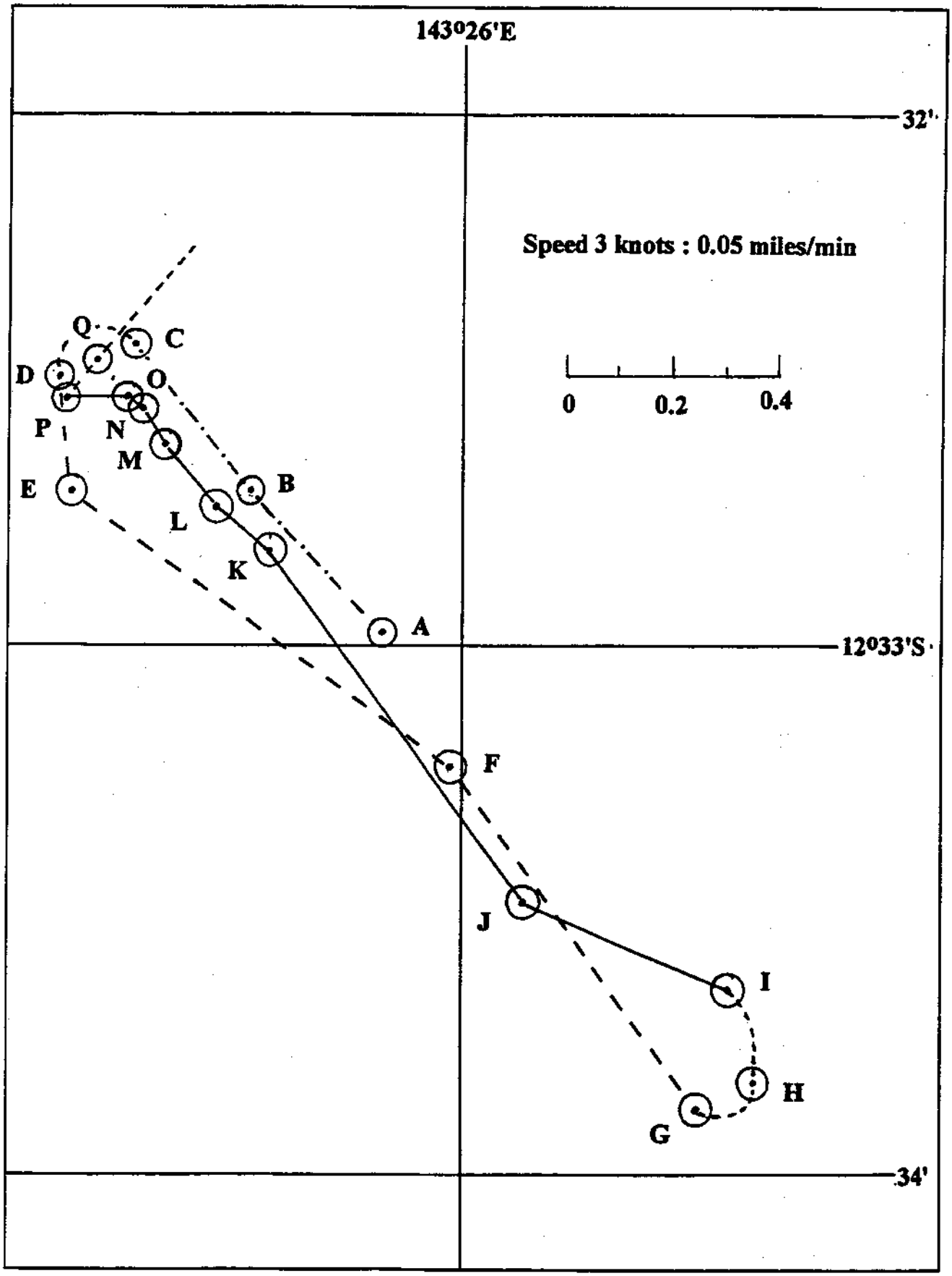
Reconstruction

The Fareast is not equipped with a course recorder, therefore it is necessary to look to the navigation chart in use at the time and the deck log book for evidence of the ship's courses. The positions plotted on the navigation chart indicate that between 0200 and 0215 the ship made good a course of 325.5 degrees, experiencing a slight westerly set, as anticipated by the Pilot, and from 0215 to 0240 made good a course of 330 degrees. There are no indications of any major alteration of course to starboard prior to 0240 and the Master and Second Mate both stated that they maintained a steered course of 330 degrees.

On being called, just before the collision, the pilot noted only that the ship's head was swinging slowly to port, he did not note the compass heading.

Shortly before the collision, the Pilot ordered "stop engines" and was aware of an electric buzzer sounding, indicating that the Second Mate had rung the engine telegraph. Almost immediately after the initial impact, the Pilot was aware of everything going quiet on the bridge, indicating that the engine telegraph had been answered. The time of "stop engine" recorded in the engine room logbook, the time that the engineer answered the telegraph, is 0244. The time noted for the position on the chart, once the Fareast was safely back on course, was 0245. It is therefore considered that the time of the collision was 0244 and the position 12° 33.2' S 143° 26' E.

It is evident that the time of stop engines on the certified photocopy of the engine room logbook has been over-written in pencil, in a different hand than that of the original entry. However, it is considered that this over-writing



Positions taken from Ronda Lene's Navigation Plotter

was for the purpose of clarifying an indistinct photocopy, rather than changing the time.

The deck hand of the Ronda Lene was not steering a particular course, rather he was endeavouring to maintain a track parallel to the previous track, as recorded on the electronic plotter. However, he recalled the course as being indicated on the navigation plotter as being 320-325 degrees.

The track of Ronda Lene was recorded on the vessel's electronic plotter, from continuous direct input from the GPS Navigator, and was retained on disc. However, there is no time-base. Positions shortly before and after the collision (K - Q in diagram), positions of where the vessel had altered course on to reciprocal courses (A - D and G - I in diagram) and two intermediate positions (F and J in the diagram), were noted so that these could be transferred to the appropriate navigation chart. To agree with the navigation chart these positions, based on the World Geodetic System 1972 Datum, all had to be adjusted 0.09 minutes southward and 0.06 minutes westward. Even so, the position of the collision as recorded by Ronda Lene was about 1.1 miles north-west of the position as recorded by Fareast.

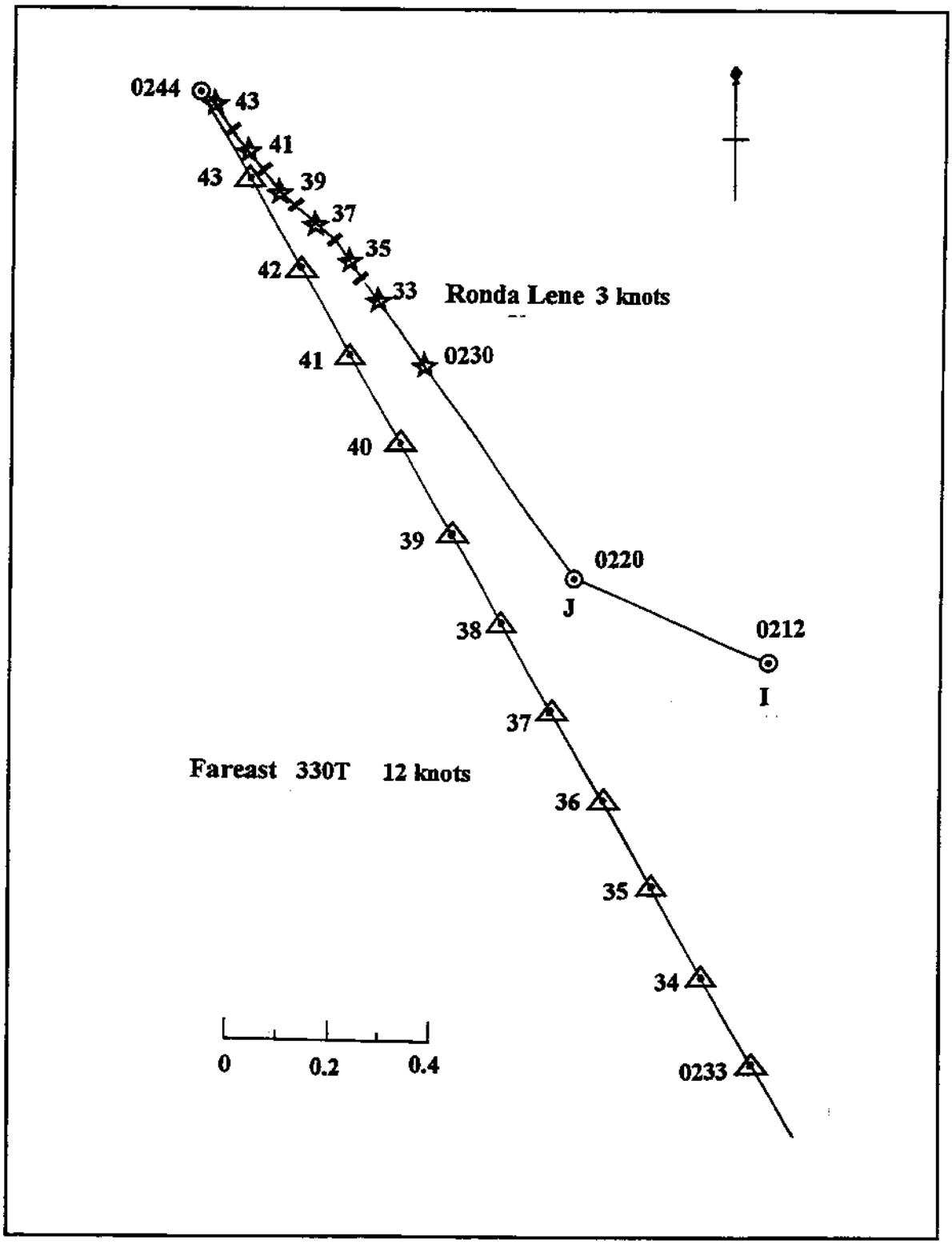
The Inspector considers that given the regular plotting by Fareast's deck officer, the position relative to the land is more accurate and to achieve a common datum at 0244, all the Ronda Lene positions have been moved 1.1 miles in a south-easterly direction.

From the transposed positions it is apparent that Ronda Lene was making north-west and south-east runs of about 1.8 miles.

Working back from the collision position, Ronda Lene appears to have altered from a north-westerly to a south-easterly course between about 0116 and 0122, between positions C and D, and then to have been trawling in a south-easterly direction between about 0125 and 0200. At about 0200 the vessel altered course to port, to the east, to come around to a north-westerly heading and apparently adjusting to position west of the previous track (position J).

Between positions J and K, Ronda Lene made good a track of 324 degrees, between K and L a track of 310 degrees, between L and N a track of 323 degrees, and then, shortly after, a track of 310 degrees to position O. The track then shows a marked alteration of course to port at position O, to proceed in a westerly direction for 1.3 cables (240m), and then an abrupt change (at position P) to a north-easterly direction.

The Second Mate of Fareast stated that the fishing vessel altered course towards the ship. The Pilot stated that when he stood up, the fishing vessel was about two trawler lengths off the starboard side, headed in towards Fareast,



Collision at O on Ronda Lene's track

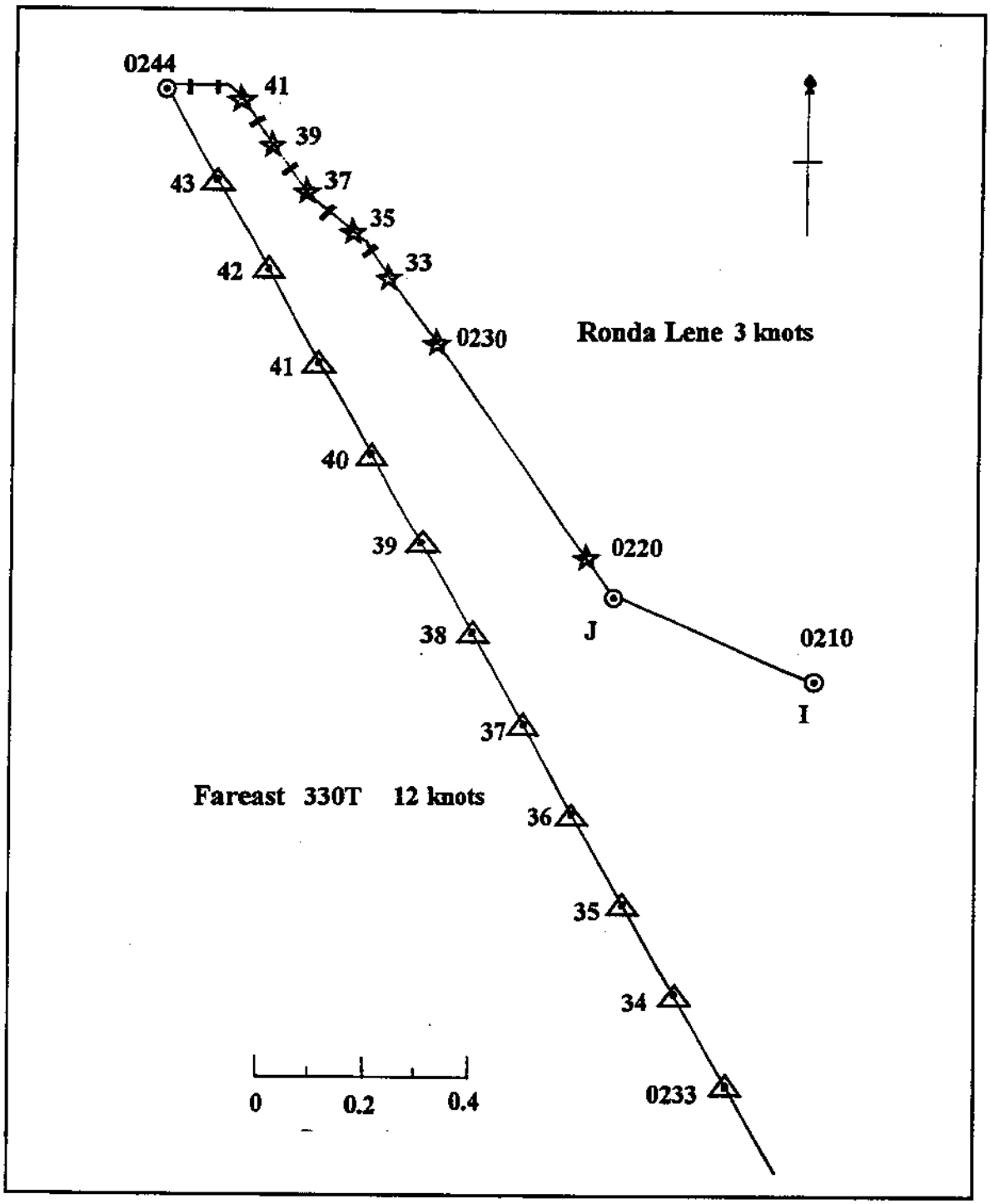
about 60 degrees across the track, the port side light being clearly visible. As Fareast was steering 330 degrees, this would equate to a heading for Ronda Lene of 270 degrees, as indicated on Ronda Lene's plotter. The Pilot's estimate that Ronda Lene was two trawler lengths off would place the fishing vessel about 15 degrees on the starboard bow, on a bearing of 345 degrees. On such a bearing, for the red sidelight to be visible to the Pilot, Ronda Lene had to be heading between 165 degrees and 277.5 degrees. Had Ronda Lene been on a more northerly heading, the red sidelight would not have been seen. This would all tend to indicate that Ronda Lene did alter course to 270 degrees at point O and that the collision occurred at point P.

However, the Ronda Lene's deckhand is adamant that he did not alter course to port and according to Ronda Lene's skipper, the point where the track changes to a westerly direction (O) denotes the collision position and a loss of signals from the satellites.

Analysis

Comparing the tracks of the two vessels, on the basis that the collision occurred at point O, at 0200, Ronda Lene would have been right ahead of Fareast at a distance of about 6.38 miles. As a result of the combined effects of the westerly set experienced by Fareast and Ronda Lene altering on to a reciprocal course through east, Ronda Lene would have opened out to starboard to a maximum bearing of about 334.5 degrees, or just 4.5 degrees on Fareast's starboard bow, at 0210. Over the next 10 minutes, to 0220, as Ronda Lene moved to position J, the bearing would have decreased to 332.5. At this time, Ronda Lene would have been just 1.65 cables eastward of Fareast's track line. After this, the bearing would have slowly increased again to 334 at 0236, but would have then decreased again over the next three minutes to 333 degrees, when Ronda Lene would have been 0.76 miles from Fareast and only 0.38 cables eastward of Fareast's track. The bearing would have continued to decrease to 332 degrees at 0241, but would have then started to open, although Ronda Lene would by this time have been only 4.5 cables from Fareast and within 0.2 cables of Fareast's track. With Ronda Lene on the course of 310 degrees from just after 0243, although the alteration of course to port would have been noticeable to those on the Fareast's bridge, Ronda Lene's port sidelight would not have been visible to them.

On the basis the collision occurred at point P, at 0200 Ronda Lene would have been bearing about 331 degrees, one degree on Fareast's starboard bow, at a distance of 6.3 miles. The bearing would have then increased quite quickly to 336 at 0210, but would have then decreased again to 334.5 at 0220, at



Collision at point P on Ronda Lene's track

which time, Ronda Lene would have been 2.65 cables eastward of Fareast's track. The bearing would have then increased again slowly to 337 at 0234, after which it would have remained steady for about three minutes (0234 - 0237), before continuing to open out to 342.5 degrees at 0241, when Ronda Lene would have been 4.25 cables from Fareast and 1.15 cables eastward of Fareast's track line. From about 0242 Ronda Lene would have remained on a steady bearing of 345 degrees, 15 degrees on Fareast's starboard bow, until the collision.

The tracks and relative positions based on a collision at point P are more in keeping with the evidence provided by those on Fareast.

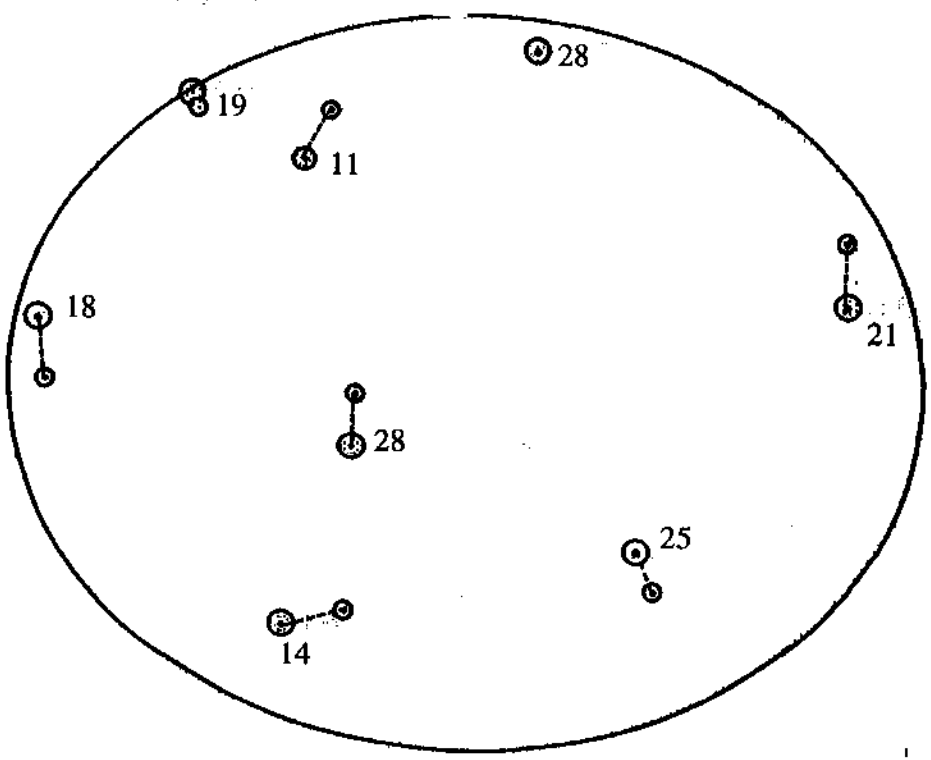
GPS/Electronic Plotters

Japan Radio Company, the manufacturer of the navigation equipment aboard Ronda Lene, advises that the equipment is designed to withstand shock to 40G (40 times the acceleration force of gravity of 9.81m/sec^2), but where a vessel heels excessively for any reason, the GPS will not receive the signals from the satellites. Even if signal reception is restored immediately, one minute will elapse before position fixing and plotting are resumed.

Advice provided by C H Smith Marine, the main Australian suppliers of JRC plotters, is where, for any reason, signals from the satellites are lost, there will be no further positions marked on the plotter until such time as signal reception is regained. Three satellites are required for position fixing purposes, if less than three are available the fixing and plotting functions will both cease.

As soon as signals resume, the plotter will automatically resume plotting the position. The last position before the signal loss will be joined to the first of the resumed positions by a straight line. If, after the break in reception, the GPS locks on to a different configuration of satellites, then a "jump" of up to 200m in position is possible, the accuracy of GPS being plus or minus 100m. The GPS is likely to remain locked on to the new configuration. However, should the GPS revert to the original configuration of satellites used, then the position on the plotter is likely to "jump" again. If there has been no movement since the original signal loss, then the position should return to the position at signal loss.

From information provided by AUSLIG Geodetic Operations Section, eight satellites were indicated as being above the horizon at the time of the incident, but four of these were at very low altitude - three at five degrees and one at nine degrees. At low altitudes satellite signals can be distorted, thus Ronda Lene's equipment was most probably utilising three of the four "suitable"



SV	11	14	15	18	19	21	25	28
GMT	EL:AZ	EL:AZ	EL:AZ	EL:AZ	EL:AZ	EL:AZ	EL:AZ	EL:AZ
16:30:00	28:328	20:212	61:232	3:283	-	12: 77	39.138	8: 8
16:45:00	22:334	24:207	66:246	5:277	0:324	9: 71	33:142	5: 13
17:00:00	17:339	29:203	68:265	7:271	4:322	6: 65	27:144	3: 18

Satellite configuration at time of Collision

satellites, numbers 11, 14, 15 and 25.

From all of the advice received it is considered possible that at the time of the collision, either owing to the heel caused by the impact or the screening by Fareast, satellite signal reception could have been temporarily interrupted aboard Ronda Lene. If an interruption did occur, then dependant upon which three satellites were used for position fixing on resumption, it is also possible that a "jump" could have occurred.

The skipper submitted that such loss of satellite signals was not unusual, occurring as much as once or twice a night. That on loss of signal the plot "jumps" away and then "jumps" back, rejoining further along the correct track and in doing so forming a triangle. He submitted this occurred at the time of the collision, that the plot "jumped" from O to P on loss of satellite signals, then back to Q on resumption of signals and plotting.

Ronda Lene had been turned through 180 degrees and then remained stopped at the collision position for at least 30 minutes, until the gear had been sorted out and hauled from the bottom. No other movement should have occurred, apart from a possible slow drift due to wind/current, to account for the track movement to position Q, until Ronda Lene moved off under tow of Riverina.

Further considerations

It is considered of relevance that position O is within 150m of the turning point at the end of the previous north-westerly run. It would be a reasonable point at which to alter course to start the next south-easterly run. Also, the tide was flooding in a northerly direction. When altering to a reciprocal course and running with the tide, it is necessary for a trawler to make a bold alteration, to avoid being held downstream of the trawl. An alteration to 270 degrees would be consistent with such an operation.

At a speed of 3 knots, Ronda Lene travelled 0.5 cables (93m) per minute, thus requiring just over 2.5 minutes to travel between points O and P.

Although the deckhand was adamant that he did not alter course, the visual impression of the Pilot and Watch Officer aboard Fareast was that Ronda Lene was headed across/into Fareast, which was supported by the sighting of the port sidelight. The bright working lights exhibited by the fishing vessels make the details of the vessels clearly visible from as much as half a mile distant.

The damage sustained by Ronda Lene is consistent with the contact damage on the Fareast and an initial bow contact, followed by the port fishing boom passing through

Fareast's starboard shipside rail after Ronda Lene had bounced off and swung to starboard under starboard helm.

Had Ronda Lene been on a heading of 310 degrees, the course made good between points N and O, initial contact could be expected to have been either on Ronda Lene's port quarter or with the port fishing boom, particularly as Fareast had already started turning slowly to port when the Pilot ordered hard to port.

Taking all the evidence, it is considered that, as Ronda Lene had virtually arrived at the end of the north-westerly run, the deck hand commenced the turn to port, at about 0241, to come around to the south-east, and that the collision occurred at point P.

Fareast

The Second Mate stated that after checking the bearing of Ronda Lene at 0220, he monitored the fishing vessel on the radar and assessed that the passing distance would be three cables. From the reconstruction, at 0220, Ronda Lene was about 2.65 cables to the east of Fareast's track and at 0233 1.96 cables. However, the actual track between positions J and K is not known, but it is possible that Ronda Lene ran more or less parallel to Fareast during the period that the Second Mate actually monitored the vessel. Had the Second Mate continued the monitoring, it should have been obvious by 0230 that Ronda Lene was in fact converging.

It is considered that the Second Mate, having made an assessment using the radar, failed to continue to monitor the situation properly, and so failed to realise that Ronda Lene was on a converging course and would pass much closer than anticipated.

The Second Mate was diligently plotting the ship's position every five minutes. This would have distracted his attention from maintaining a watch on Ronda Lene, particularly at the time when it was close, and it is most probable that he was at the chart table, plotting the 0240 position, when Ronda Lene altered course.

The Master of Fareast stated that he went down at 0240, when the bearing and distance of Ronda Lene were 347 degrees and one mile respectively. However, at 0240, the bearing and distance of Ronda Lene would have been 341 degrees and 5.5 cables respectively. The vessel would have been one mile distant at 0237.5, on a bearing of 338 degrees. This would indicate that the Master was away from the bridge for a slightly longer period than stated.

The Master also stated that before leaving the bridge he was satisfied that Ronda Lene was passing clear, that a safe situation existed. However, it is considered that he

also had failed to appreciate that Ronda Lene was on a converging course. It is also considered that as the Pilot had suggested his presence on the bridge while he took a rest, the Master should have advised the Pilot that he was leaving the bridge, albeit for only an intended short period.

The Pilot

The Pilot considered that at 0200 Ronda Lene was about half a point, or about 5.5 degrees, on the starboard bow and at 0215 about 10 degrees on the bow at about 5 miles distance.

The Pilot had over-estimated the distance of Ronda Lene, but the relative bearing had increased about five degrees in the 15 minutes between his observations of the fishing vessel's lights. This increase in relative bearing lead him to believe that Ronda Lene was passing clear. Even so, before returning to the settee, he made a point of warning the Second Mate to keep an eye on the fishing vessel, being well aware from past experience that such vessels are liable to alter course.

The Pilot had advised the Master that he would probably take a rest during that phase of the passage, but on the bridge, not in the cabin, and the Master had gone to the bridge to allow the Pilot to do so. Given that the Master was on the bridge and the ship was on a steady course, the Pilot's taking a rest at that point, after taking the appropriate precautions, is considered to be not unreasonable.

When called by the Second Mate, the Pilot stood up and straight away saw the Ronda Lene, about two trawler lengths off the starboard side, showing its red sidelight and slowly closing. At such close proximity collision was virtually unavoidable. In immediately going hard to port, the Pilot lessened the impact, and in stopping the engine and going hard to starboard at impact, he reduced the possibility of the stern and, more importantly, the propeller making contact with Ronda Lene.

Once Ronda Lene had passed astern, with Middle Reef and other fishing vessels in close proximity, the Pilot correctly concentrated on manoeuvring Fareast into a safe situation before responding to calls from Ronda Lene. Once the situation was stabilised, he made contact with Ronda Lene, exchanged names and other relevant information with the skipper and ascertained that Ronda Lene was in no immediate danger and did not require assistance from Fareast. He then sent advice of the incident to the Australian Maritime Safety Authority Maritime Rescue Coordination Centre in Canberra.

It is considered that the Pilot acted correctly to minimise the collision and fulfilled his obligations following the collision.

Ronda Lene

The deck hand, concentrating on the electronic plotter in order to keep Ronda Lene on track, failed to keep a proper lookout, he neither looked around the horizon, nor looked at the radar screen to establish the presence of other shipping. He only became aware of the Fareast just before the collision.

The skipper had handed over the navigational and safety responsibility for the vessel to the deck hand sometime between midnight and 0100, at which time Ronda Lene was heading in a north-westerly direction. The skipper was therefore unaware of what occurred during the minutes leading up to the collision. The deck hand, to whom this responsibility was given, had no maritime qualifications or knowledge of the International Regulations for Preventing Collisions at Sea (Colregs).

General

This was the fourth collision in three years, involving an Australian fishing vessel and occurring in the early hours of the morning, where the skipper had left an unqualified deck hand in charge of a watch, although they had reportedly rested during the day. The relatively close approach of large ships to vessels fishing in, or near, the recommended two-way route is well known, unavoidable and should therefore be anticipated.

The practice of skippers handing over to a deck hand during the course of the night, in order to go below to get some sleep, is common practice within the fishing industry. Such a practice, when fishing near main shipping lanes, would appear to be not only an imprudent practice, but a failure in responsibilities.

The need to keep a proper watch, including a lookout, which means using all available means appropriate to the circumstances, so as to make a full appraisal of the situation and the risk of collision, is recognised as essential for safety of life at sea. It is incumbent upon all users of the sea, not just large ships, to ensure that the wheelhouse is properly manned and a proper lookout is maintained at all times.

The bright working lights carried by prawn trawlers are regulated by the Commonwealth "Export Control (Fish) Orders", which prescribe a minimum luminosity for processing the catch for export market. However, as soon as the catch has been sorted and stowed, these lights should be switched off, as they are in contravention of the International Regulations for Preventing Collisions at Sea, in that the glare from these lights conceals the lower intensity navigation and fishing signal lights. The glare also interferes with the keeping of a proper lookout astern, by any

person in the fishing vessel's wheelhouse. If working lights are required at other times for any reason, directional spot lights should be used.

It is also apparent that in calm seas, particularly within the Great Barrier Reef, the brightness of these lights, especially the fluorescent type, makes visual estimation of distance extremely difficult. There appears to be a tendency for mariners to over-estimate the distance of fishing vessels displaying these working lights. In this incident the experienced Reef Pilot over-estimated the distances, as apparently did both the Master and the Second Mate.

Pilotage

The pilotage through the inner two-way route and Torres Strait, from Low Isles in the south, to Thursday Island in the north, is 500 miles. Whereas only one pilot is assigned to each ship, it is too much to expect the one pilot to have the conduct of the ship for the full 500 miles. It is the practice for pilots take a rest in certain areas, where there are no hazards to navigation and the ship is proceeding on one course throughout the period.

However, five incidents have occurred where the pilot engaged to conduct the ship through the Great Barrier Reef was resting, and not in immediate charge of the navigation. On each occasion, the pilot had left the bridge in charge of a qualified officer, the ship was proceeding on a straight course, the only concerns being the maintaining of the intended course and avoidance of fishing vessels. As the area between Low Isles and Cape York is one of compulsory pilotage, it may be appropriate for the authority governing pilotage in the Great Barrier Reef to formalise the conditions governing pilot rest periods.

Conclusions

It is considered that the collision occurred as the result of a number of factors:

1 Fareast had a duty to keep clear of Ronda Lene, but failed to maintain a careful watch on the fishing vessel.

2 The Second Mate of Fareast failed to use the radar to full advantage, or other means, to ascertain that Ronda Lene was proceeding on a converging course. He therefore failed to either call the Pilot, or give Ronda Lene a wider berth.

3 The deck hand aboard Ronda Lene failed to keep a proper lookout and was unaware of the presence of Fareast until just before the collision.

It is further considered that:

4 The Pilot taking a rest at that point, given that the Master was on the bridge and the vessel was on a steady course, was not unreasonable.

5 The Master, finding it necessary to leave the bridge, albeit for an intended short period, should have advised the Pilot that he was doing so.

6 The deck hand held no marine qualifications and did not understand the International Regulations for Preventing Collisions at Sea, therefore should not have been left in charge of the watch.

7 The exhibiting of the powerful deck lights when they were not needed was in contravention of the International Regulations for Preventing Collisions at Sea, in that the glare obscured the navigation and fishing signal lights and interfered with the keeping of a proper lookout.

8 The glare of the powerful working lights, particularly those of the fluorescent type, required for processing the catch, appears to cause difficulty in visual assessment of the distance of fishing vessels showing them.

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, Second Mate and Pilot of Fareast and to the skipper and deckhand of Ronda Lene. Where comments and information were received, they have been carefully considered and where appropriate, the text has been altered to reflect the facts of the incident.

The skipper and deckhand of Ronda Lene provided a submission in which they were adamant the deckhand did not alter course to port and, that as the nets were due to be hauled, course would not have been altered 10 minutes before that operation.

The skipper submitted that the collision occurred at point "O", that the "O-P" line was jagged, indicating a jump of the plotting position in one fast movement, not from the Ronda Lene travelling to "P", that Ronda Lene was never at "P". He submitted that the plotter stopped plotting at "O" and regained true fixing at position "Q", which is in line with M-N-O-Q, and that the gear was recovered from between "O" and "Q". The Inspector is of the opinion that this aspect has been satisfactorily covered in the analysis section of the report.

Vessel details

Ronda Lene

Type:	wooden hulled trawler
Home Port:	Cairns, Queensland
Length:	17.68m
Beam:	5.54m
Depth:	2.23m
Engine:	V8/92 GM 223.71kW
Built:	Yamba
Crew:	3 Australian

Fareast

Ship type:	General cargo
IMO No:	8102086
Port of Registry:	Nassau, Bahamas
Owner:	Brightway Navigation Inc., Nassau
Year of Build:	1982
Builder:	Austin Pickersgill, Sunderland, UK
Length over-all:	144.02m
Beam:	20.45m
Moulded depth:	11.76m
Summer draught:	8.867m
Gross tonnage:	8927
Nett tonnage:	6458
Summer deadweight:	15175
Main engine:	Sulzer 5590 kW
Speed:	15 knots
Crew nationality:	Vietnamese
Classification Society:	Lloyd's Register of Shipping