Departmental investigation into the collision involving the Taiwanese bulk carrier *Cemtex General* and the fishing vessel *Tina* 30 miles east of Noosa Head on 2 February 1999

MIIU

ATSB
Australian Transport Safety Bureau

Contents

Navigation Act 1912 Navigation (Marine Casualty) Regulations

into the collision involving the Taiwanese bulk carrier

Cemtex General* and the fishing vessel *Tina

30 miles east of Noosa Head on 2 February 1999

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Investigations into marine casualties occurring within the Commonwealth's jurisdiction are conducted under the provisions of the Navigation (Marine Casualty) Regulations, made pursuant to subsections 425 (1) (ea) and 425 (1AAA) of the *Navigation Act 1912*. The Regulations provide discretionary powers to the Inspector to investigate incidents as defined by the Regulations. Where an investigation is undertaken the Inspector must submit a report to the Secretary of the Department.

It is Departmental policy to publish such reports in full as an educational tool to increase awareness of the causes of marine incidents so as to improve safety at sea and enhance the protection of the marine enviroment.

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Information relating to this report and other marine investigation reports can be located from the Marine Incident Investigation Unit's Internet homepage at our URL:
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Summary

At noon on 2 February 1999, the fishing vessel *Tina* was at anchor about 30 miles east of Noosa Head. The skipper and two crew on board were asleep in the forecastle space when, at about 1240, the skipper was awakened by the sound of a ship's whistle.

The skipper and both crew members hurriedly left the forecastle and went to the wheelhouse, from where they saw the bow of a ship going past. Immediately after this, the hull of the ship made contact with the starboard boom of *Tina*. The boom was damaged and the crew of *Tina* saw a figure on the bridge of the ship emerge from the wheelhouse and watch them through binoculars.

The skipper read the name of the ship as the stern went past and advised Brisbane Harbour of the incident, but he was not able to contact the ship, the *Cemtex General*, registered in Keelung.

Cemtex General was on a voyage from Newcastle to Hualien in Taiwan. The ship had been experiencing moderately rough seas and poor visibility in heavy rain showers. The duty officer was using radar to assist with keeping a lookout. The anchored vessel was not seen on the radar and was only seen visually about a ship length away, fine on the port bow. After the collision, *Cemtex General* continued on its voyage without stopping. The master did not advise the Australian Search and Rescue organisation, AusSAR, of the incident, or report the matter to the owners of the ship in Taiwan.

There was no other damage to the trawler apart from damage to the boom and *Tina* returned to Mooloolaba the same day, arriving there at about 1800.

The master, duty officer and the lookout of *Cemtex General* were interviewed after the vessel returned to Australia to load at Weipa on 13 March 1999.

Sources of Information

Skipper and crew of *Tina*

Master, 2nd mate and lookout, *Cemtex General*

Brisbane Harbour - Port Control

Bureau of Meteorology, Brisbane

Taipei Economic and Cultural Office

TMQ Electronics, JRC Agents (Australia)

Acknowledgement

Photograph of *Cemtex General*, U–Ming Marine Transport Corp.

Portion of chart Aus 365 reproduced by permission of the Hydrographic Office, RAN.

The Inspector acknowledges the assistance of Captain Ian Smith, Simulation Manager, Australian Maritime College in simulating the collision and for information on 3 cm and 10 cm radar performance.

Note

All references to ‘miles’ in this report refer to nautical miles. A nautical mile is 1852 metres.

Narrative

The ship

Cemtex General is a seven hold bulk carrier registered in Taiwan, of 69,703 tonnes deadweight, with an overall length of 224.95 m, a beam of 32.2 m, a moulded depth of 18.3 m and a summer load draught of 13.26 m. Delivered from the Imabari Zosen K.K. yard at Marugame, Japan in 1989, *Cemtex General* is owned by U-Ming Marine Transport Corporation in Taipei, Taiwan. The vessel is powered by a single, 6-cylinder Sulzer diesel engine of 8,091 kW and has a service speed of 12 knots.

The bridge, engine room and accommodation are located aft. The distance from the bridge front to the stem is about 190 m. The ship was equipped with the normal range of navigation equipment including two JRC radars, No.1, JMA 850 7CAII with JAS 800 CMII ARPA and No. 2, JMA 625.

All the ship's officers were from Taiwan apart from the 3rd mate, who was from the Philippines. The ratings were from both the Philippines and Taiwan and in total, there were 17 persons on board.

The master had a First Class Master's certificate issued in Taiwan. The 2nd mate had a First Class Deck Officer's Certificate issued in Taiwan, entitling him to sail as 2nd mate or 3rd mate. The lookout on duty with the 2nd mate had a certificate from the Philippines entitling him to take charge of a navigational watch.

Cemtex General had sailed from Newcastle, NSW at 2124 on 31 January 1999, after loading a cargo of coal for Hualien, Taiwan. The draught was 12.65 m forward and 13.35 m aft. The three mates maintained the traditional 4 on, 8 off sea watches, with an Able Seaman (AB) assigned to each watch for lookout duties.

The fishing vessel

The fishing vessel *Tina* operates out of Mooloolaba, Queensland as a prawn trawler. At the time of the incident the vessel was owned by R F and D B Wright and was registered with Queensland Transport.

The vessel was built in Dandenong, Victoria in 1983. It has a registered length of 18.2 m, a beam of 5.6 m

and a depth of 3.3 m. The hull is of steel, painted blue and the upperworks are white. It has one deck, five bulkheads and a steel mast. The vessel has a raked stem and a transom stern. There is a single deckhouse, located forward, housing a wheelhouse, galley and messroom. The crew sleeping quarters are forward of and below the wheelhouse, accessed from a hatch in the deck of the wheelhouse. The fishing deck is aft.

The main engine is a Cummins diesel engine, type A55NT of 223.8 kW driving a single screw.

Navigation equipment included a magnetic compass, autopilot, a 72-mile range Furuno radar, Global Positioning System (GPS) and Differential Global Positioning System (DGPS), sonar, echo sounder and a navigation plotter.

Tina's certificate of survey was issued by Queensland Transport after the vessel had lodged a declaration that it was suitably equipped. The skipper of *Tina* has a Certificate of Recognition, Skipper Grade 3, issued on 23 October 1997 by Queensland Transport in recognition of a certificate of competency as master of a fishing vessel grade 1B, issued on
22 September 1987. The skipper had passed the examination for a marine engine driver (MED) certificate in 1988 and was waiting for it to be issued. Both crewmembers on *Tina* were licensed deckhands.

The vessel was normally crewed by a skipper and a deckhand, but on this occasion there was a second deckhand. The skipper's practice was to spend a number of days at sea. Trawling was carried out at night, the catch being sorted, processed, boxed and frozen. During the day the vessel would anchor. While at anchor, the crew would rest and carry out necessary repairs to nets or to the vessel.

The Incident

Cemtex General

At noon on 2 February, on passage from Newcastle to Hualien, the vessel's position was 26° 28'S, 153° 43'E, the average speed from the previous noon was 11.68 knots and the course was 358° true. At noon, the weather was logged as being overcast with rain and there was a fresh easterly breeze estimated at force 5. The sea and swell were described as being rather rough and the ship was rolling moderately.

The 2nd mate went up to the bridge for his watch at 1150. He looked at the chart and the GPS to check the ship's position and speed. The vessel was on autopilot and he checked the gyrocompass to see the course being steered.

The lookout on duty with the 2nd mate went to the bridge at 1155 and took over lookout duties from the AB on watch with the 3rd mate.

The 3rd mate left the bridge at 1155. It was raining continuously at the time and the visibility was poor, estimated by the 2nd mate to be down to about half a mile. The ship's speed was about 12 knots and the radar set on the starboard side of the wheelhouse was in use. The other radar, on the port side of the wheelhouse, to which the Automatic Radar Plotting Aid (ARPA) was fitted, was switched off.

The 2nd mate was able to see two ships on the radar, though there was a lot of clutter on the set. One ship was abeam on the port side, just over 6 miles off, going the same way. The other ship, just over 10 miles off, was about 75° to starboard on a reciprocal course. He used the sea and rain clutter controls to adjust and clear the picture. There was no indication of any other vessel.

The 2nd mate then prepared the noon report after taking the position from the GPS. The noon report took about 5 minutes to prepare. He then went back to both monitoring the radar and keeping a visual lookout. There was no improvement in the visibility.

The AB was keeping a visual watch from the port side of the wheelhouse, using the clear view screen to assist him. He did not see any ships or other vessels.

The master went to the bridge at about 1225. His first concern was to prepare telexes for the daily report to AusSAR, using Inmarsat C. The Inmarsat C was on the chart table on the port side and his visibility forward was obscured by the unit. At this time the 2nd mate was standing near the starboard radar.

At 1230, the AB was sent below by the 2nd mate to take the noon report to the 3rd engineer for the latter to complete in the ship's office, one deck below the bridge.

The master sent the telex report to AusSAR before entering data for the next day's telex. He then went to the forward bridge windows from where he noticed a small boat, the fishing vessel *Tina*, almost ahead and close to the ship. The ship's heading was 358° (gyro), the boat was bearing about 350° or 345°, about 10° on the port bow and about 300 m off.

The master immediately told the 2nd mate to change to hand steering and put the wheel hard over to port. Meanwhile the master used the whistle, giving one long blast. The 2nd mate changed from autopilot to hand steering and asked if the master wanted the wheel put over to starboard. The master repeated that he wanted the wheel put hard over to port and the 2nd mate carried out this instruction without further delay. The ship had just emerged from an area of heavy rain. The master rushed out to the port bridge wing to see if the fishing vessel was clear of the ship. He noticed *Tina's* crew on deck as the ship went past and heard them hurl abuse in his direction.

The master watched as the fishing vessel passed close to the port side of the ship. The fishing vessel was rolling as the ship went past and he was not sure if contact had taken place between the two vessels.

The master tried to check the name of the fishing boat as it went past and, once it had passed the ship, he used binoculars to confirm the call sign on *Tina's* hull and to check the condition of the fishing vessel. The 2nd mate put the wheel amidships when he thought the fishing vessel was past and *Cemtex General* resumed the previous course.

It seemed to the master that the crew of *Tina* was safe. It also seemed that there was no serious damage to the fishing vessel as any contact that may have occurred would have been slight. The master called the fishing vessel on VHF channel 16 using *Tina's* call sign but he was unable to obtain a response.

The master did not turn *Cemtex General* around to check the condition of *Tina* and her crew. He did not inform the owners of *Cemtex General* of the incident, nor did he report the matter to AusSAR. An hour or so later, he examined the ship's hull and discovered that there was some damage to the paint on the port side in way of No. 4 hatch.

Tina

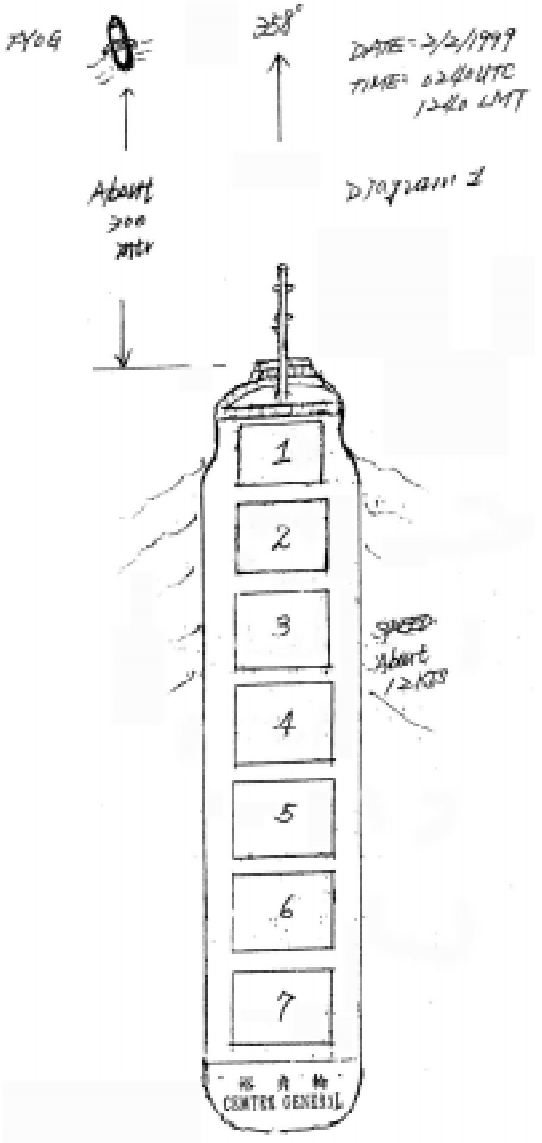
Tina sailed from Mooloolaba at about 1400 on 25 January 1999 and steamed about 27.5 miles to 26° 27.5'S and
153° 34.2'E to trawl for king prawns in depths varying from 40 to 100 fathoms. The vessel uses port and starboard booms while trawling and the booms were lowered as soon as they left the harbour.

On the eighth night, the night of
1 February, they shot away their gear at about 1850 and completed two trawls. The nets were recovered at about 0530 on
2 February and the catch was sorted and processed. The skipper anchored the fishing vessel at about 0700 and the boxed prawns were stored in the fridge by about 0830. After breakfast, the skipper and one of the crew went below to rest at 1000. The other crewmember went below for a rest at 1100.

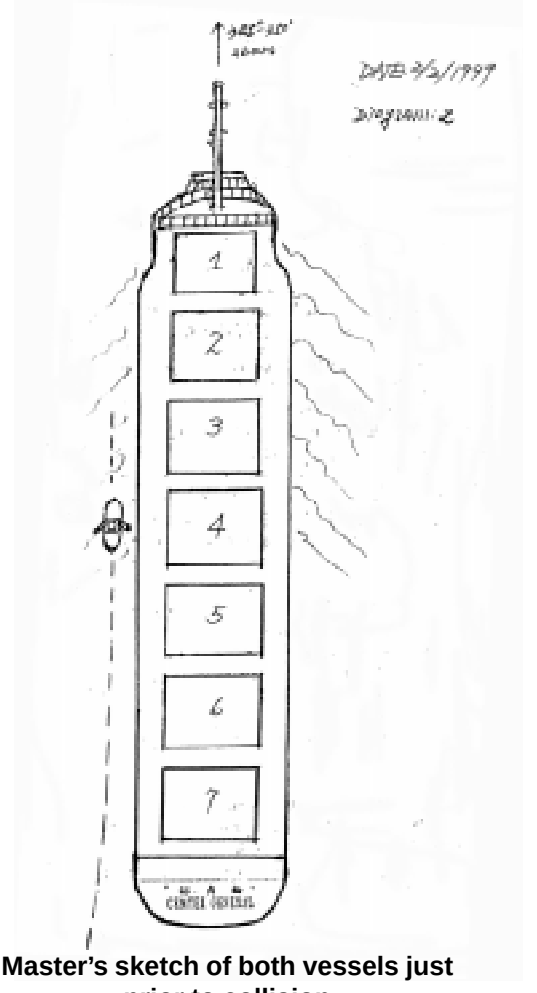
They were asleep when the skipper awakened at 1200 and, realising that it was only noon, went back to sleep. All three of them were still asleep when the skipper heard a ship's whistle nearby. The whistle sounded so close that he felt that a collision was imminent and leaped out of his bunk. He got through the hatch into the wheelhouse. He yelled to the crew to wake up and get to the after deck immediately.

The skipper looked out of the wheelhouse door on the starboard side and saw the bow of a ship and what looked like a wall of steel go past the fishing vessel. It appeared that the ship was only about 2 m away from *Tina.* The ship seemed to swing towards the fishing vessel and they watched as the starboard boom made contact with the ship and then scraped along the ship's side.

The skipper ran to the aft wheelhouse door and noticed that the two vessels were parallel to each other. When he was awakened by the ship's whistle, he feared that they would be struck amidships, but when he



Master's sketch showing both vessels when fishing boat was first sighted



Master's sketch of both vessels just prior to collision

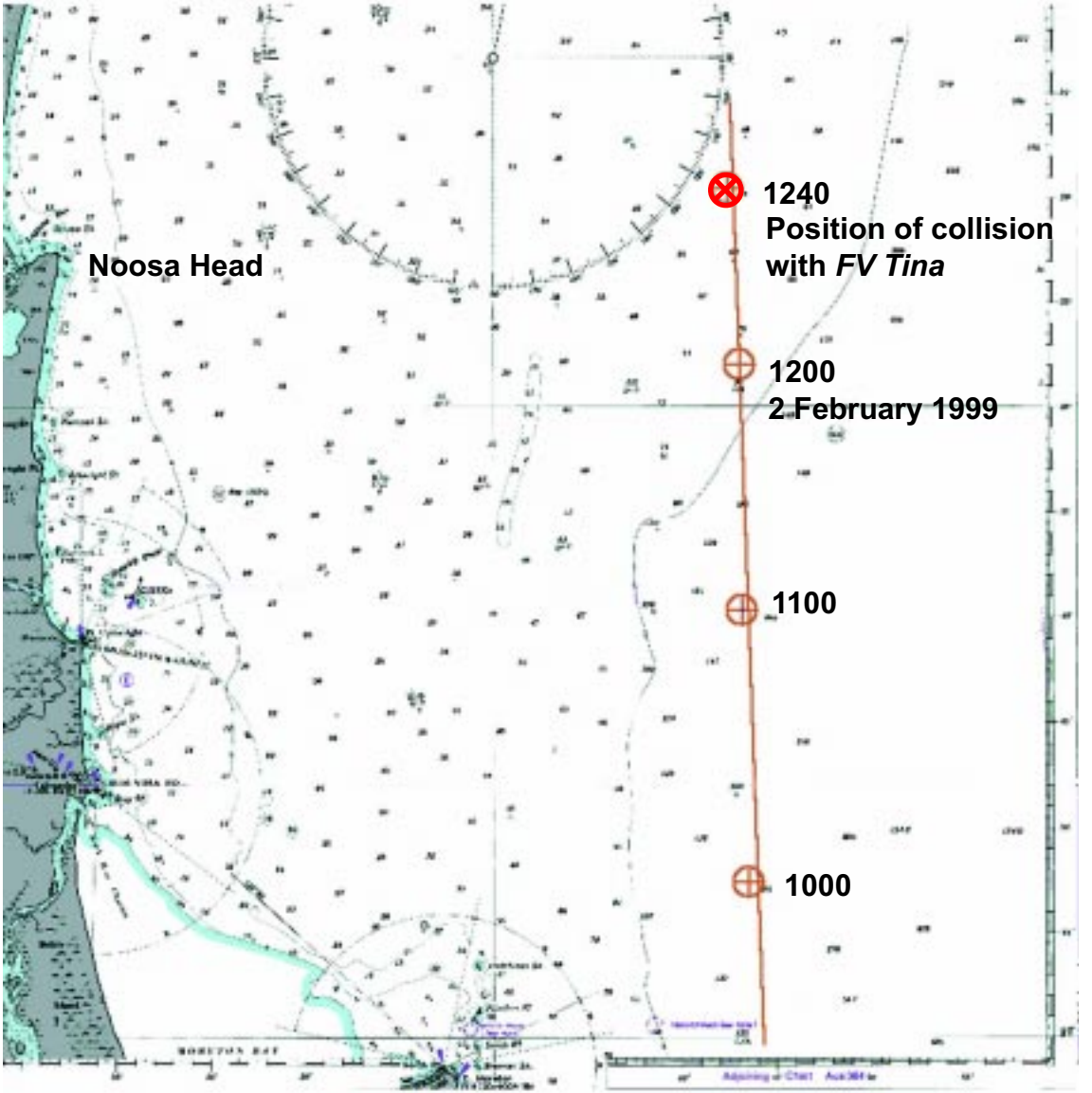
saw the relative positions of the two vessels he realised that they would survive. Nevertheless, he was apprehensive as the starboard boom of the fishing vessel scraped along the ship's hull. He feared that *Tina* would be dragged by the ship if the boom was caught on the ship's rails. This did not happen and the trawler was pushed off the side of the ship by the boom as the ship went past. The boom was damaged by the impact.

As the ship went past, the skipper and crew read the name and port of registry on its stern, identifying the ship as the *Cemtex General* from Keelung. Someone on the ship came out on the port bridge wing and looked at them through binoculars for about five minutes.

There were showers of rain in the area at the time, but *Tina* was in a clear patch. The skipper and crew watched the ship as it continued on its way. The skipper estimated that he was able to see the ship up to a distance of five miles after the incident.

Five or six minutes after the collision, the skipper contacted Brisbane Harbour on VHF channel 12 to advise them of the incident and of weather conditions and visibility at the time. The position reported by the skipper for the collision was 26° 19.6'S 153° 42.4'E. He called *Cemtex General* on the VHF using the same channel, but there was no reply to his call. He then called the manager of *Tina* and informed him of the incident.

The damage to the trawl boom could only be repaired in port and the skipper thought it best to return to Mooloolaba. He and the crew checked the boat for other damage but found none. *Tina* weighed anchor and returned to Mooloolaba at 1800 the same day.



Portion of chart Aus 365 showing *Cemtex General's* track

Comment and analysis

Evidence

Cemtex General and *Tina* collided at 1240 local time on 2 February. Shore-based radar pictures from the Bureau of Meteorology at Brisbane indicate shower activity in the area. The fishing vessel and the ship confirmed that there were heavy showers around at the time. The ship had reportedly just emerged from heavy rain and the master had seen the fishing vessel when it was estimated by him to be about 300 m off, about ten degrees on the port bow.

The owners of *Cemtex General* were informed of the incident by the Marine Incident Investigation Unit (MIIU) and were asked to provide the Unit with statements from the master, the officer on watch and the lookout. They were also asked for copies of the navigation chart in use at the time, the course recorder trace and log entries relating to the incident.

Cemtex General was not equipped with a course recorder. A statement and copies of the navigation chart and log entries were sent to the MIIU by solicitors appointed by the owners. *Cemtex General* returned to Australia in March to load a cargo of bauxite from Weipa. The master, 2nd mate and rating on duty at the time of the incident were interviewed at Weipa on 13 and 14 March.

At interview on 3 February, the skipper and crew members of *Tina* provided their accounts of the trip and of the incident from the time that they were roused by the sound of *Cemtex General's* whistle.

A tape recording of the conversation between the skipper of the fishing vessel and Brisbane Harbour after the collision was obtained from Brisbane Harbour by the MIIU.

Cemtex General and *Tina*

All vessels have an obligation to observe and conform to the International Regulations for Preventing Collisions at Sea, 1972, as amended from time to time (the Colregs). This is regardless of the vessel's size, or function, or the navigation aids in operation.

Tina was not engaged in fishing at the time of the incident and was therefore a 'power driven' vessel under the provisions of the Colregs.

Bridge organisation on *Cemtex General*

The collision with the fishing vessel *Tina* occurred within 45 minutes of the change of watch at noon. Visibility was reduced to less than one mile, estimated by the 2nd mate to be about half a mile (900 to 1000 m). About five minutes before the collision the rating keeping a visual lookout was sent from the bridge. The 2nd mate, mainly relying on radar, was the only lookout. Two other ships had been detected on the 12 mile range, but no other targets were seen on the radar screen or visually.

Tina was first seen by the master, when he went to the bridge front as the ship emerged from a band of rain. The master's recollection of the angle on the bow is probably an overestimation as at about 500 m from *Cemtex General's* bridge front (300 m from the bow), at an angle of 10°, the fishing vessel should have passed clear by over 50 m. The master estimated that *Tina* was about 300 m from *Cemtex General's* bow, which would mean that there would have been about 48 seconds before contact between the two vessels.

When the master first sighted *Tina,* he had the impression that the fishing vessel was making way on a near-reciprocal course. He could not see any signal to indicate the vessel was at anchor and the fishing vessel was too close for him to be certain that it would pass clear. The master's immediate impression was that any alteration to starboard would swing the bulk carrier's stern into the fishing vessel.

To avoid hitting the fishing vessel, the master ordered the 2nd mate to change from autopilot to hand steering and to put the rudder hard over to port. The master's intention was that as the bow of *Cemtex General* cleared the fishing vessel, the stern would also swing clear. There was a delay when the 2nd mate asked if the rudder should be put hard-a-starboard. The master repeated the order for the wheel to be placed hard-a-port whereupon the 2nd mate complied with the order. The time taken for the 2nd mate to query the order, and for the master to confirm it, could have resulted in a delay of between five and ten seconds before the rudder started to move to port.

Given the information available to the master and the ship's speed, he probably took the best course of

action. Contact was minimal and damage to the fishing vessel was confined to the boom. However, given that the visibility was restricted by rain, the speed at which *Cemtex General* was operating is an important factor.

Navigating in reduced visibility

Although *Cemtex General* was navigating in heavy rain for much of the morning until moments before the collision, the vessel was not observing the relevant rules of the Colregs. The bulk carrier's speed at the time could not be considered safe for the prevailing weather conditions.

Rules 6 and 19 of the Colregs (reference Appendix 1) make provision for safe speed at all times and the conduct of vessels in restricted visibility.

The bridge of a motor vessel with its engine at or near full load, combined with the wind effect is a noisy place. Also, as the watch/lookout was being maintained inside the wheelhouse, there was little possibility of hearing any fog signals of other vessels, particularly of a small craft such as a fishing vessel.

No whistle signals were being sounded by *Cemtex General.* There was no compliance with the requirements of Rule 35 of the Colregs, (ref. Appendix 1) dealing with sound signals in restricted visibility.

According to Annex III of the Colregs, the audibility of a whistle for a vessel of length of 200 m or more is required to be 2 miles. (Annex III also states that '*In practice the range at which a whistle may be heard is extremely variable and depends critically on weather conditions; the values given can be regarded as typical but under conditions of strong wind or high ambient noise level in the listening post the range may be much reduced.'*).

It cannot be determined whether or not those on board *Tina* would have heard any whistle signals before *Cemtex General* emerged from the rain belt. Nor is it known if those on *Tina* would have heard whistle signals in time to take avoiding action. However, the fact that the whistle was not being sounded aboard the bulk carrier removed one possible defence or safety measure, that might have been effective.

Use of radar aboard *Cemtex General*

In accordance with Solas Regulations reproduced in Appendix 2, *Cemtex General* was equipped with two radars. When the master was interviewed at Weipa on 13 March 1999, he stated that the vessel was equipped with a 10 cm (3 GHz) radar with ARPA and a 3 cm (9 GHz) radar. He confirmed that the 3 cm set was in use at the time of the collision.

On 25 May 1999 the master sent the MIIU a facsimile message correcting his statement, saying that both sets on board the *Cemtex General* were 3 cm radar. The JRC service agency in Australia confirmed that No.1 radar (JMA 850) could be fitted as either 10 cm or a 3 cm unit and No. 2 radar (JMA 625) is a standard 3 cm set.

Performance standards for radar are also quoted in Appendix 2. Range performances in the standard state what the radar equipment should be capable of detecting, in the absence of clutter.

According to the Radar Handbook;

'*Radar signals are attenuated by fog and raindrops, but raindrops also return clutter, which can saturate the receiver and mask all targets that are enveloped by rain. Sea waves and spray also return random signals similar to noise and this can have the same masking effects as rain if the receiver becomes saturated.*

There are methods for reducing the effects of these signals so that they appear on the radar display at levels no higher than the normal background noise. If the wanted target returns a signal above the clutter level, it can be seen on the display against the clutter background. If the target signal drops below the noise or clutter level because of attenuation or because rain or the sea surface returns greater signals than the target, saturation reduction techniques do not help.

The effects of rain clutter, rain and atmospheric attenuation in marine radars have been assessed for 3 cm wavelength radar. For ship's radar mounted at 17 metres in height, a small ship in clear weather might be visible at 8 nm, reducing to about 3 miles in heavy rain. The reflected signal from the rain around a target is the main factor in limiting the range of detection, not attenuation on the path.

Crudely put, the echoing area of rain with 3 cm wavelength is about 100 times its value at 10 cm, but, since 10 cm radar illuminates three times as much rain (three times the bandwidth), the factor is reduced to 30.[1]

It is not unusual for small vessels, whether of steel construction or not, to be lost in heavy clutter, either sea clutter or rain clutter. Manipulating the clutter control to the correct level without some known object to act as a control is not easy. It is possible that the 2nd mate, in adjusting clutter controls manually to clear the radar picture, suppressed the clutter to an extent where a weak target, such as from a fishing vessel, would not be displayed on the PPI.

Cemtex General was fitted with two 3 cm radars and did not have the option of using 10 cm radar. Had the option existed, 10 cm radar might have provided the ship with a warning of the fishing boat on the PPI.

The chief scientist of one radar manufacturer has stated:

'*If there is heavy rain and severe sea clutter, but one needs maximum warning of other traffic, choose 10 cm radar. Do not however expect to see low targets beyond a few miles range.*'

Too much reliance was placed upon radar navigation without appreciation of its limitations.

The fishing vessel *Tina*

Rule 5 of the Colregs states:

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

There was no one on watch on *Tina* at the time of the incident and the skipper and crew were asleep. The skipper's habit was to anchor near the area where he trawled. To anchor in open waters in, or close to, sealanes approaching a major port, such as Brisbane, without a proper lookout exposes the trawler to unnecessary danger. This danger to *Tina* was significantly increased as rain in the area reduced visibility to less than one mile.

The Colregs require a vessel to display a signal when at anchor. From sunrise to sunset the prescribed signal is an anchor ball.

According to Queensland Transport, the Certificate of Registration for *Tina* classes the vessel USL Class 3B. USL refers to the Uniform Shipping Laws Code.

In accordance with Section 13 of the Code,

'All vessels shall be provided with at least a full set of such navigation lights, shapes and sound signal appliances as are required according to type, size and special purpose to ensure compliance with the International Collision Regulations.'

To comply with the Colregs, the fishing vessel *Tina,* as a vessel 12 m or more in length, should have been equipped with a whistle and a bell for sound signals and a ball to be displayed by day when the vessel was anchored. Although *Tina* held a current survey certificate, it was equipped with a gas-operated horn, but not with a bell.

There was no anchor ball aboard the fishing vessel and there was no indication that the fishing vessel was at anchor.

Under the Colregs, *Tina* should have been using the sound signal for a vessel at anchor. *Tina* could also have used the optional signal of one short, one long and one short blast to warn other vessels of her position and of the possibility of collision to an approaching vessel. It is doubtful if the sound signal would have been audible on board the bulk carrier proceeding at speed. However, the signal might have been audible to another fishing vessel or to a vessel navigating at slow speed and maintaining a careful lookout.

The fishing vessel was not sounding any of the signals prescribed by Rule 35.

The skipper stated that though there was no anchor ball up, there were three 240 W deck lights on all the time abaft the mast, directed aft, and that those lights should have been visible to other vessels even in rain. He also stated that the vessel had an all-round white light on at the mast, serving as an anchor light, at the time of the collision. At the time of the collision, the fishing vessel was anchored, lying towards the

north. As it was daylight, the single white light would have had no effect and the working lights could have reinforced the perception that the vessel was underway.

On *Tina,* the crew slept by day after working through the night. There was no one to alert the crew of *Tina* to the impending collision and there was only a single prolonged blast on the bulk carrier's whistle sounded less than a minute before the collision.

Given the rain and reduced visibility prevailing at the time, those on board *Tina* were dependent for their safety on other vessels observing the Colregs. They should instead have relied on maintaining a good lookout. *Tina* had the same obligation to obey the Colregs as *Cemtex General.*

Communications from the two vessels

Cemtex General was maintaining a VHF watch on channel 16. After the incident, the master attempted to contact the fishing vessel on this channel, but he was unable to do so. This transmission from the bulk carrier on channel 16 was not recorded by Brisbane Harbour.

The skipper of *Tina* stated that the ship might not have been able to contact him because he was using channel 12 on his VHF.

After the incident *Tina* contacted Brisbane Harbour on channel 12 on VHF to report the incident. The call was answered and taped and the time of the call from *Tina* was logged at 1247:16.

Collisions involving ships and fishing vessels

This incident is the eleventh investigation conducted by the Unit since June 1995 into collisions involving a trading ship and an Australian fishing vessel. *Tina* is the fourth fishing vessel to be struck while at anchor.

In only two of the 11 incidents were vessels actually engaged in fishing. In nine of the incidents, the fishing vessel was a 'power driven' vessel, to which no special rule applied.

With respect to the other ten incidents,

- Two involved fishing vessels engaged in fishing.
- Five involved fishing vessels not engaged in fishing, but en route between fishing grounds.
- Three involved fishing vessels anchored in open water.

In addition to any failure on the part of the trading ship to keep a proper lookout,

- In nine incidents, the fishing vessel failed to maintain a proper lookout.
- In four of the incidents, a contributory factor has been that the person keeping watch on the fishing vessel had no training, did not understand the obligations placed on a fishing vessel by the Collision Regulations and did not understand how to use the radar.
- On two of the three vessels at anchor, no lookout was maintained and the crew members went to bed despite being anchored in open waters.
- The number of crew typically employed on fishing boats was two or three, which, for a sustained 24-hour operation, is insufficient to fish and maintain a proper lookout required by the Collision Regulations.

It is fortunate that no fatalities have occurred as a result of these collisions. Figures from the United Kingdom show that since 1991, 19 fishermen are known to have died as a direct result of collision. In 1998, five fishermen were killed in four collisions involving merchant vessels and British registered fishing vessels.

Despite reports on incidents involving fishing vessels being published and distributed to the shipping community, disregard or ignorance of the basic Colregs by some fishermen is an endemic problem.

Conclusions

These conclusions identify the different factors contributing to the incident and should not be read as apportioning blame or liability to any particular organisation or individual.

- The speed of *Cemtex General* was not safe given the factors that should have been taken into account under Rule 6 of the Collision Regulations.
- There were no whistle signals being sounded aboard *Cemtex General* as required by the Collision Regulations, despite the rain and restricted visibility prior to, and at the time of, the collision.
- Those navigating *Cemtex General* placed too great a reliance on radar navigation without appreciating the limitations of radar.
- The lookout on *Cemtex General* was inadequate.
- No lookout was being kept aboard *Tina.*
- *Tina* was anchored in busy shipping lanes.
- *Tina* was not displaying the signals required by the Collision Regulations for a vessel at anchor. The absence of such signals contributed to the master's immediate impression that *Tina* was making way.

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 that person a copy of the report or the relevant part of the report. Sub-regulation 16(4) provides that such a person may provide written comments or information relating to the report.

The final draft of the report, or part of the report, was sent to the following:

The skipper of *Tina*

The master and 2nd mate, *Cemtex General*

The owners of *Tina*

Solicitors for the owners of *Cemtex General*

The master acknowledged receipt of the report but he had nothing further to add.

International Regulations for Preventing Collisions at Sea 1972 (the Colregs)

Rule 5:

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

Rule 6:

'Every vessel shall at all times proceed at a safe speed so that she can take proper and effective action to avoid collision and be stopped within a distance appropriate to the prevailing circumstances and conditions.

In determining a safe speed the following factors shall be among those taken into account:

(a) By all vessels:

(i) the state of visibility;

(ii) the traffic density etc.;

(iii) the manoeuvrability of the vessel with special reference to stopping distance and turning ability in the prevailing conditions;

(iv) at night the presence of background light etc.;

(v) the state of wind, sea and current etc.;

(vi) the draught in relation to the available depth of water.

(b) Additionally, by vessels with operational radar:

(i) the characteristics, efficiency and limitations of the radar equipment;

(ii) any constraints imposed by the radar range scale in use;

(iii) the effect on radar detection of the sea state, weather and other sources of interference;

(iv) the possibility that small vessels etc. may not be detected by radar at an adequate range;

(v) the number, location and movement of vessels detected by radar;

(vi) the more exact assessment of the visibility that may be possible when radar is used to determine the range of vessels or other objects in the vicinity.'

Rule 19: 'Conduct of vessels in restricted visibility

(a) This Rule applies to vessels not in sight of one another when navigating in or near an area of restricted visibility.

(b) Every vessel shall proceed at a safe speed adapted to the prevailing circumstances and conditions of restricted visibility. A power-driven vessel shall have her engines ready for immediate manoeuvre.'

Rule 35:

'In or near an area of restricted visibility, whether by day or night, the signals prescribed in this rule shall be used as follows:

(a) A power-driven vessel making way through the water shall sound at intervals of not more than 2 minutes one prolonged blast."

(g) A vessel at anchor shall at intervals of not more than one minute ring the bell rapidly for about 5 seconds.'

Carriage of radar and radar performance

- Solas Chapter V, Safety of Navigation,

  Section 12 (g):

'Ships of 500 gross tonnage and upwards constructed on or after 1 September 1984 and ships of 1,600 gross tonnage and upwards constructed before 1 September 1984 shall be fitted with a radar installation. From 1 February 1995, the radar installation shall be capable of operating in the 9 GHz frequency band. In addition, after 1 February 1995, passenger ships irrespective of size and cargo ships of 300 gross tonnage and upwards when engaged on international voyages shall be fitted with a radar installation capable of operating in the 9 GHz band.'

  Section 12 (h):

'Ships of 10,000 gross tonnage and upwards shall be fitted with two radar installations, each capable of being operated independently of the other. From 1 February 1995, at least one of the radar installations shall be capable of operating in the 9 GHz band.'

- IMO Resolution A. 477(XII) contains performance standards for radar equipment and states, in the annex to the resolution, that the:

'radar should provide an indication, in relation to the ship, of the position of other surface craft and

obstructions and of buoys, shorelines and navigational marks in a manner which will assist in navigation and in avoiding collision.'

The same Resolution states that all radar installations should comply with the following minimum requirements:

'Range performance: The operational requirement under normal propagation conditions, when the radar antenna is mounted at a height of 15 metres above sea level, is that the equipment should, in the absence of clutter, give a clear indication of;

Coastlines- At 20 nautical miles when the ground rises to 60 metres and at 7 nautical miles when the ground rises to 6 metres.

Surface objects- At 7 nautical miles a ship of 5000 tons gross tonnage, whatever her aspect and at 3 nautical miles, a small vessel of 10 metres in length.'

Details of *Cemtex General*

IMO No.	8818881
Flag	Taiwan
Classification Society	NK
Ship type	Bulk Carrier
Owner	U-Ming Marine Transport Corp.
Year of build	1989
Builder	Imabari Zosen K.K.-Marugame, Japan
Gross tonnage	36,284
Net tonnage	23,033
Summer Deadweight	69,703
Length overall	224.95 m
Beam	32.22 m
Draught	13.26 m
Main engine	6 cylinder Sulzer diesel
Engine power	8,091 kW
Crew	17 (Taiwanese and Filipino)

Details of *Tina*

Registered No.	4567 QB
Flag	Australian
Owner	RF& DB Wright, Mooloolaba, Qld.
Length overall	18.2m
Beam	5.6m
Construction	Welded steel
Engines	Cummins diesel engine, type A55NT of 223.8 kW.
Crew	3 Australian