



Australian Government
Australian Transport Safety Bureau

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**MARINE SAFETY INVESTIGATION
REPORT 159**

Independent investigation into the collision between the
Panama flag bulk carrier

Star Sea Bridge
and the Australian fishing vessel
Sue M



east of Evans Head, NSW
on 21 June 2000



Australian Government

Australian Transport Safety Bureau

Navigation Act 1912
Navigation (Marine Casualty) Regulations
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FIGURE 1:
Sue M



Photo supplied by Mrs C Lenard

Summary

At about 0110 on 21 June 2000, off Evans Head, New South Wales, the skipper of the prawn trawler *Sue M* and the deckhand were sorting their catch on the after deck. The trawler, on autopilot, was heading east to another fishing ground, when it was struck on the port side by a southbound ship. The skipper ran into the wheelhouse to attempt to take control of the trawler as it rolled over to starboard before capsizing.

The deckhand climbed over the side of the trawler as it capsized and jumped clear before it sank. He eventually climbed into the trawler's fibreglass dinghy which, although badly damaged, had surfaced after breaking loose from the wheelhouse roof. He was rescued the next night by another trawler.

The ship, the Panama flag bulk carrier *Star Sea Bridge*, had sailed from Brisbane on the morning of 20 June bound for Melbourne. At the time of the collision, the officer of the watch, the second mate, had been manoeuvring to avoid a northbound container ship. As the bulk carrier was resuming its original course, the second mate saw a white light, close by, to starboard. He ordered full port rudder, but the ship made contact with the white light, roughly amidships on the ship's side as its stern swung to starboard. The master of *Star Sea Bridge* was called to the bridge and the ship was turned about to search the area where the collision had occurred. After searching and finding nothing, the ship resumed its voyage south.

At Melbourne, *Star Sea Bridge* was boarded by agents of the Australian Federal Police who

initiated an investigation and, subsequently, criminal proceedings against the master and the second mate. A concurrent, but separate, safety investigation was undertaken by the Australian Transport Safety Bureau (ATSB) under the provisions of the Navigation (Marine Casualty) Regulations.

An extensive air and sea search was unable to locate the skipper of *Sue M*. On 22 June 2001, the wreck of *Sue M* was located by another trawler. A week later, divers from the NSW Water Police recovered the body of the skipper from its wheelhouse.

This report concludes that:

- The fishing vessel *Sue M* sank, with the loss of its skipper, after colliding with the bulk carrier *Star Sea Bridge*;
- The second mate and lookout of *Star Sea Bridge* were not keeping a proper lookout;
- The skipper and the deckhand on the fishing vessel, who had been busy sorting their catch under bright deck lights, were not keeping a proper lookout; and,
- The bulk carrier's navigation lights were probably not on at the time of the collision.

The report recommends that:

- Ships' masters and skippers of fishing vessels should ensure that a proper lookout is maintained at all times;
- Ships' masters, watchkeepers, fishing vessel skippers and crews take note of the limitations of radar;
- Owners, operators and skippers of fishing vessels consider the use of appropriate equipment to improve the radar detectability of their vessels.

Sources of Information

Master, second mate, third mate and lookout of mv *Star Sea Bridge*

Deckhand of fv *Sue M*

Skipper of fv *Starfish*

Second mate and lookout of mv *Ever Able*

Australian Federal Police (AFP)

Australian Maritime Safety Authority (AMSA)

Telstra Corp

The Nautical Institute

Acknowledgement

Australian Hydrographic Office

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Sue M

Sue M, NSW Reg. No. 4823, was a timber-hulled prawn trawler built in Queensland in 1982. It was 14 metres in length, with a beam of 4.5 metres and a moulded depth of 1.85 metres. It had a white hull and wheelhouse and was fitted with the booms and gear associated with a prawn trawler. On the after, or working, deck there was the trawl winch just aft of the wheelhouse and, aft of that, there was also a large rectangular ice-box on top of which was the fish-sorting tray. Just forward of the icebox, on each side, were hatches over two fish tanks (See figs 2 & 3). The wheelhouse had two doors, one on the starboard side and one aft.

In the wheelhouse, *Sue M* was well equipped with navigation aids, including a Koden radar, echo sounder, automatic pilot, marine VHF (Very High Frequency) radio and a Furuno GPS (Global Positioning System) receiver. In addition, it was fitted with a Furuno colour fish

plotter, a sonar, a UHF (Ultra High Frequency) CB (Citizens Band) radio and, at the time of the incident, carried a mobile telephone. A bracket inside the wheelhouse held an EPIRB (Emergency Position-Indicating Radio Beacon). On the wheelhouse roof, there was a small fibreglass dinghy.

Sue M's 164 kW Cummins diesel engine gave the vessel a maximum speed of approximately 8 knots.

Sue M was fitted with a white masthead light, green and red sidelights and a stern light as well as green-over-white trawl lights and 'not-under-command' lights. The port and starboard navigation lights were situated on each side of the wheelhouse roof. The stern light was fitted aft on the wheelhouse roof. The vessel was also fitted with three halogen decklights, one of which was on top of the trawler's A-frame, the other two about two-thirds of the way up the mast. These lights illuminated the sorting tray, the after deck and an area of water around the stern.

FIGURE 2:
Layout of working deck of trawler similar to *Sue M*



FIGURE 3:
Wheelhouse similar to that on *Sue M*



Sue M had been owned by the skipper for the previous 2½ years and had passed survey by NSW Waterways on 31 May 2000, three weeks before the collision. As a Class 3C fishing vessel it was limited to operating within 30 miles¹ to seaward of the coast.

The crew of two, skipper and deckhand, also happened to be father and son. The 43 year old skipper held Master Class V (Fishing) and MED III (Marine Engine Driver III) certificates. He had about 22 years experience, fishing the waters around the north coast area of NSW, while his 19 year old son had been at sea for 3 to 4 years, working on a variety of small vessels, before his father bought *Sue M*.

Sequence of events – *Sue M*

Sue M sailed from Iluka at about 1530 on 20 June in the company of two other trawlers. The boat crossed the bar at the mouth of the Clarence River and proceeded towards the north

east. Immediately after crossing the bar, the skipper, as was his custom, reportedly checked that all his navigation lights were working, considering that, if any were not, it was easier to change the bulbs in daylight. He also turned on the radar, the fish plotter and the depth sounder to check that all were operational.

Sue M made for a position about 9 miles east of Evans Head, to a point known to the local fishermen as Tony's Rock. Just on sunset, they 'shot' the port, starboard and centre nets. The vessel then fished in north-south and south-north directions, roughly parallel with the coast, in the company of several other boats. At about 2000, after the first shot, which took about 3 hours, the nets were taken in and the catch emptied onto the sorting tray. The nets were shot again before the two men sorted the catch. When the sorting was completed, the deckhand went to sleep on a bunk in the wheelhouse, while his father had the con of the trawler.

¹ All miles refer to nautical miles. One nautical mile = 1852 metres.

At about 0030, the skipper woke the deckhand as the next catch was ready to be sorted. The deckhand dressed, putting on his wet-weather gear, noticing as he did so that the ‘Letterman Show’ was playing on the television set. When he arrived on the trawl deck, they winched in the nets and the catch was emptied into the sorting tray on the icebox. The deck was illuminated by floodlights. The boat was making way, on autopilot, at about 3–4 knots to a fishing ground further east. When the nets had been emptied, the skipper let the port and starboard nets trail in the water to keep the deck clear. The centre net was hanging in loops from the gantry, with about half its length also trailing in the water, clear of the propeller.

The weather was fine, there was a slight chop from a 5–10 knot westerly breeze, a clear sky and the moon was almost full. There was no mist or haze and the visibility was good.

The two men sorted the catch for approximately half an hour, facing each other on opposite sides of the sorting tray above the icebox, the skipper on the starboard side, the deckhand on the port

side. Eight or nine other trawlers could be seen to the west, the closest about a mile away. Periodically the skipper would enter the wheelhouse to check the boat’s course.

According to the skipper of the fishing vessel *Starfish*, at that time about 2 miles west of *Sue M*, *Sue M*’s course would have been about a point ($11\frac{1}{4}^{\circ}$) south of east.

On board *Sue M*, the skipper finished sorting and, having looked out to starboard, made his way towards the port side of the vessel. As he made his way over some ropes which were lying on deck, there was a sudden violent impact. The impact lifted the port side of the trawler, causing the skipper to slip on the ropes and to fall to the deck. The deckhand, thinking momentarily that their fishing gear had fouled something on the seabed, ran to the wheelhouse, where he pulled back the engine speed and took the engine out of gear. There was much screeching of metal on metal, as the port fishing boom scraped along the starboard side of a large ship. The trawler started to roll to starboard and, looking aft through the wheelhouse door, all the

FIGURE 4:
Damaged dinghy used by deckhand of *Sue M* to stay afloat



deckhand could see was the side of a large vessel passing them at speed. As he ran out through the aft door his father pushed past him, running into the wheelhouse to try to regain control of the boat.

The deckhand ran to the port quarter. The port fishing boom was being folded inwards and the deckhand had to duck beneath it. The trawler continued to roll over slowly, onto its starboard side. As it rolled over, the deckhand climbed over the emerging hull but his right foot became briefly caught by one of the wire sweeps. Having freed his foot, he noticed that *Sue M* was sinking by the bow. The deck lights were on and the propeller was still spinning. Hanging on to the boat's port quarter, he screamed out several times to his father, but his father did not emerge from the wheelhouse.

A few moments later, the engine stopped and the deck lights went out. The deckhand pushed off hard and swam away from the boat as it sank, to avoid being dragged down with it. He had had no time to grab a life-jacket from the wheelhouse or the EPIRB from its bracket, also in the wheelhouse.

While sorting the catch, both men had been dressed in wet weather gear, over track pants, flannelette shirts and wellington boots. The deckhand struggled out of his boots and clung to two gas bottles, floating nearby. He had been clinging to the gas bottles for about half an hour or so, watching the ship's lights disappear, when he noticed the glass-fibre dinghy which had been torn from the wheelhouse roof and had surfaced. He pulled himself onto the top of the upturned dinghy, at the same time retaining a hold on the gas bottles.

His impression was that the ship had continued on its course to the south. After what seemed to him to be about an hour, he heard the noise of a ship's engine and a ship appeared, cruising slowly around the area. It seemed to be a different ship, seeming smaller than the one that had struck the trawler. It passed him and then turned towards the south again. From his position about half a mile away, he noticed the

ship's large deck cranes and a floodlight which was being directed over the side from a position on the ship's starboard quarter. It cruised up and down in what seemed to be an east-west direction but did not pick him out in the darkness. He shouted and screamed at the ship, but the ship's crew failed to hear him. Eventually he lost his voice. The ship stopped for about ten minutes, at a distance of about two miles from the deckhand. The ship's search seemed to him to last for about an hour and, by the time it left the area, he was slipping in and out of consciousness.

After a few hours the deckhand, still sitting on top of the upturned dinghy, realised that he would have to get into it. He managed to right the dinghy and to climb in. It had a large hole in the bottom of the centre section but was being kept afloat by the buoyancy chambers under the thwarts.

Just before sunrise he saw the lights of other prawn trawlers heading back towards Iluka, but he was unable to attract their attention. He was lying in the dinghy when, at dawn, a shark circled around him twice at a radius of about 10 metres. The deckhand kept quite still until the shark had cruised off. He sat in the dinghy for the rest of that day. At one point he saw two ships pass, but they were distant. He tried to paddle to the northwest, so that he would not drift too far out to sea. He spent most of the day paddling and baling out water. He tried to dry his clothes, but was unable to do so, lying as he was in the bow, each time he paddled, dog-paddling with his hands, he was getting covered in water.

The deckhand was cold, hungry and thirsty. He thought that, if he were to survive the next night, his only chance would be for a trawler to pick him up. After dark that evening, he saw two other trawlers to his south as they turned their deck lights on to fish. They were moving towards him and one passed him less than a mile away. Desperate to keep warm, he curled up, but he soon heard the sound of the engine of the other trawler, on the same track as the first. He could make out its navigation lights which

indicated that it was approaching him. He paddled as best he could into the line of the approaching fishing vessel, hoping to jump onto its fishing gear, as it had all its nets hanging out of the water as it moved between fishing grounds.

As the trawler 'Annalyn' approached, he recognised one of the crew, a friend of his, under its deck lights at the stern. He shouted out the man's name, over and over, until the man eventually heard him. The man ran into the wheelhouse and the trawler circled, slowly coming back towards him. Unable to see him in the darkness, the trawler was guided by the deckhand's shouted directions. The trawler crew picked him up and pulled the dinghy on board, in the position 29° 25' S 153° 46' E. By this time, it was approximately 2200, some 21 hours after the collision and he had drifted roughly 17½ miles to the south-east, to be 21 miles east of Yamba.

When landed at Yamba he was examined by a doctor and was shortly afterwards allowed to return home to recover from his ordeal.

One week after the incident, divers from the NSW Water Police in Sydney, dived on the wreck of *Sue M*. The wreck had been located and buoyed by another trawler which had been participating in the search. It was lying in 64 metres of water in the position 29°11' 10.8" S, 153° 37' 58.8" E. The divers, acting for the NSW State Coroner, recovered the body of the skipper from inside the wheelhouse of the sunken vessel.

Star Sea Bridge

Star Sea Bridge is a Panamanian flag bulk carrier of 42 717 deadweight tonnes at its summer draught of 11.35 m. It is classed with Bureau Veritas. At the time of the incident the vessel was owned by Kaisho Marine S A of Panama, and managed by Far East Transport Co

FIGURE 5:
***Star Sea Bridge* at Melbourne**



Ltd of Tokyo, Japan. Manning of the vessel was by Dolphin Ship Management of the Philippines. The ship was on charter to Star Shipping of Bergen, Norway.

Star Sea Bridge was built in 1997 by Ishikawajima-Harima Heavy Industries Co Ltd in Tokyo, Japan. The ship has an overall length of 181.5 m, a moulded breadth of 30.5 m and a moulded depth of 16.4 m. It is powered by a 6-cylinder Sulzer 6RTA48T single acting, direct reversing, 2-stroke diesel engine, of 6 990 kW. The main engine drives a single fixed-pitch propeller giving a service speed of 14.5 knots.

The vessel is of standard, geared, bulk carrier design with 5 cargo holds that are located forward of the accommodation superstructure. *Star Sea Bridge* has four cargo cranes, each of 30 tonne SWL (Safe Working Load) capacity, located on the centreline between the hatches.

The bridge is of standard design with a combined wheelhouse and chartroom, the light from the chart console being shielded by curtains at night.

At the time of the incident, the ship's complement of 21 consisted of a master and 3 mates, a chief and 3 engineers, an electrician, a boatswain and 4 deck ratings, 4 engine room ratings, 2 catering staff and a deck cadet. The mates maintained a traditional 4 hours on, 8 hours off, watchkeeping routine.

The master of *Star Sea Bridge* had been a ship's master for the previous two years and *Star Sea Bridge* was his third command. He had joined the ship in Brisbane on 19 June, about 36 hours before the incident.

The second mate, on watch at the time of the incident, had served an apprenticeship with Dolphin Ship Management from 1990 until 1991, sailing on a log carrier. From 1991 to 1994 he attended a Philippines maritime academy and had returned to sea, after graduating, serving on a woodchip carrier from 1995 to 1996. After a further two years at sea,

on a bulk carrier and a general cargo vessel, he joined *Star Sea Bridge* on 1 September 1999. He was to finish his contract on 30 June 2000. He held a second mate's licence, issued by the Republic of Panama, a radar observer's certificate, an ARPA (Automatic Radar Plotting Aid) certificate, certificates for R/T (Radio Telephone) and GMDSS (Global Maritime Distress and Safety System) and had completed a radar simulation course. *Star Sea Bridge* was the first ship to which he was appointed as second mate.

Sequence of events – *Star Sea Bridge*

Star Sea Bridge sailed from Brisbane at 0915 (local time), at a draught of 7.66 metres forward, 8.32 metres aft, on 20 June carrying a part- cargo of phosphates for discharge in Melbourne. The pilot disembarked at 1400 and the ship started its voyage south, down the east coast.

Sunset was at about 1700, an hour after the start of the mate's watch.

At 2000 that evening, when the third mate took over the watch, the vessel was approximately 17 miles north-north-east of Tweed Heads (on the Queensland/New South Wales border). According to his evidence, he checked the navigation light panel, confirming that the navigation lights were on when he took over the watch.

There were some passing rain showers during the third mate's watch, but the weather was improving. The wind was force 4 to 5. The visibility was good and there was a clear horizon in the light from the moon. A number of distant fishing vessels were visible during the first half of the watch. Apart from the fishing vessels, the third mate saw no other ships during his watch.

The master spent some time on the bridge, retiring at 2315 after he had written up his night orders. His night orders included instructions to

'keep a good and sharp look-out' and to provide a wide berth for all types of vessel 'especially meeting vessel and small craft'.

At some time between 2340 and 2350, the second mate arrived on the bridge. After checking the positions plotted by the third mate, he read some incoming messages and had a chat with the third mate. He went to the forward part of the wheelhouse and had a look around before returning to the chart table and taking over the watch at midnight. He had seen no other vessels, either visually or on radar. There was a slight sea, partly cloudy skies and the visibility was good; he estimated it at more than 10 miles. *Star Sea Bridge* was making 15 knots, with a following current, on a course of 189°(T).

The third mate, on being relieved, did not go to his cabin but stayed at the chart table where he worked on the port log and some papers which he was to submit after the voyage. According to the two officers, during the following hour, the third mate had some brief conversations with the second mate when the latter went to the chart table to check the chart.

The lookout on watch with the second mate had gone to the bridge at 2355 and had taken over his duties from the lookout who had been on watch with the third mate. The two ratings remained in the wheelhouse, talking, until 0045, when the lookout who had been on duty with the third mate left the bridge.

Just after 0045, the lookout saw a group of fishing vessels on the starboard side, which he estimated were about 7–8 miles away. There was no other traffic around at the time. At 0050, he saw a ship right ahead and, using the radar, saw that it was about 14 miles away. Using binoculars, he saw that the ship was exhibiting masthead lights and both sidelights and he reported this ship to the second mate. He also reported the fishing vessels on the starboard side to the second mate, without indicating a bearing or distance.

The second mate had been at the chart table, checking the chart and working on some safety

management checklists, when the lookout informed him that he had sighted the ship dead ahead. Checking the ARPA, the second mate observed that its distance off was about 14 miles. He was also able to observe its masthead lights and its starboard navigation light.

The second mate went back to the chart table to plot the 0100 position then, returning to the front of the wheelhouse some minutes later, he observed that the other vessel seemed to have altered course to starboard. He was now able to see only its port navigation light. When he checked its range on the radar, he saw that it was about 10 miles distant.

A few minutes later, at about 0110, he checked the ARPA once more and saw that the vessel was now 7 to 8 miles off. He did not notice the speed of the approaching ship, but the ARPA showed that its closest point of approach (CPA) was 0.4 miles. At about the same time, he noticed what appeared to be two white lights about 2 to 3 points on the starboard bow. These lights appeared to be approximately 7 miles away. Nothing in this position, however, showed on the radar.

The second mate instructed the lookout to change to manual steering and to alter course 5° to starboard, to steer 194° by the gyrocompass. He intended to increase the CPA of the other vessel.

A few minutes later, *Star Sea Bridge's* course was steady on 194°. On again checking the radar, the second mate saw that the CPA was now increasing steadily. At a CPA of about a mile, he instructed the lookout to gradually come back to the original course of 189°. While the ship was turning slowly back to its original course, the second mate noticed a white light about 3 to 4 points on the starboard bow at a distance which he initially estimated to be two miles off, perhaps less.

The lookout, at the wheel, also saw this white light on the starboard side. He was not sure of its bearing, but it was forward of the beam and appeared to him to be very dim.

FIGURE 6:
Paint scrapes on hull of *Star Sea Bridge*



The second mate could not make out what the white light was, but it was closing. He wondered how it could be getting nearer even though the ship was turning to port. According to his evidence, he sounded the ship's whistle and ordered the lookout to steer 'hard-a-port'. At this point, the white light appeared to close rapidly and, moments later, it made contact with the starboard side of *Star Sea Bridge*, adjacent to No. 3 hold.

Immediately, the second mate telephoned the master who was asleep in his cabin and informed him of the contact. The master asked him what they had contacted and the second mate replied that he was not sure. The master got up and made his way to the bridge noticing, as he did so, that the clock in his office was showing about 0115. Meanwhile, the second mate and the third mate, who had come out of the chartroom, ran out to the starboard bridge wing to look aft over the ship's side. They could see nothing. The ship, however, was still turning rapidly to port. The second mate ordered the lookout, who was at the wheel, to bring the ship

to starboard to its original course from its present heading which, by that time, was about 050°.

As the master arrived on the bridge, he saw the red sidelight and the masthead lights of another vessel on the starboard bow of *Star Sea Bridge* at a distance of about 3 to 4 miles. *Star Sea Bridge* had, by this time, started to swing to starboard. When the other vessel was about 2 points on their port bow, the master asked the second mate to explain what had happened and then took over the con. After a minute or two, when he was confident that the other ship was clear, he instructed the second mate to wake the mate, the chief engineer and the bosun. When back on the original course of 189°, he could also see some white lights, which he took to be fishing vessels, about 8 miles to starboard. At about 0145, he ordered the lookout to put the wheel to 'port 20' so as to turn onto a reciprocal course, with the intention of returning to the position of the incident to ascertain what had collided with the ship.

At about 0154, when *Star Sea Bridge* had turned onto a reciprocal course, the master ordered the mate to take some seamen and to check the ship's starboard side shell plating. By this time, most of the crew had been called and there were extra lookouts on the bridge. The chief engineer was also on the bridge, at the engine telegraph. The ship was manoeuvred as necessary to assist with the search.

The second mate had plotted the approximate position of the incident by dead reckoning in relation to the earlier fix of the vessel's position at 0100. He had not, however, pressed the 'man overboard' on the GPS, to record the exact position.

Star Sea Bridge maintained the reciprocal course, searching, for about 30 minutes. After this time, the master, thinking of the East Australian current, believed that anything that they had hit would be drifting south. At about 0229, he altered back to the ship's original course of 189°. There was a bright moon, but their search revealed nothing. The master, having heard from the third mate that he had seen nothing and from the second mate that he thought they had hit a buoy, such as a weather or fishing buoy, decided to continue with the voyage. He had also received a report from the mate and the bosun that there appeared to be no damage to the starboard shell plating.

At about 0235, after resuming the voyage, the master telephoned the vessel's managers in Japan to inform them of the incident. The managers, on hearing the master's report, instructed him to turn back again and conduct a further search of the area where the incident had occurred. They also told him to stop at the position of the incident. Accordingly, *Star Sea Bridge* was again turned back onto a reciprocal course.

At about 0318, the vessel reached the position of the incident, which had been recorded by the second mate and the engine was stopped. The deck lights and bridge wing floodlights were turned on and a further search of the area was carried out. While the vessel was stopped, a

ladder was rigged over the starboard side and the master, the mate and the bosun conducted a second examination of the shell plating. Portable cargo lights were rigged over the ship's side to provide illumination. During this examination, they again did not detect any damage to the ship's side.

At 0420, having found no flotsam and no damage to its starboard shell plating, *Star Sea Bridge* resumed its voyage to Melbourne.

Sequence of events – *Ever Able*

The northbound vessel which *Star Sea Bridge* had encountered off Evans Head was the 14 807 gross tonne Panama registered containership *Ever Able*, on passage from Melbourne to Brisbane.

At 0100 on 21 June, *Ever Able* was approximately 11 miles south east of Evans Head, making good a speed of 17 knots on a course of 011°(T). On the bridge of *Ever Able* were the second mate and the lookout, an able seaman. The second mate had been at sea for 18 years and had obtained his second mate's qualification in 1990. He had held this position aboard *Ever Able* for the previous nine months.

To the north-north-west of *Ever Able*, the lights of a number of fishing vessels were visible. On checking the radar, the second mate noted that they were approximately 7 miles distant.

Also visible on the radar was a ship approximately 16 miles north of *Ever Able*. The ARPA indicated that its speed was about 15 knots, its course 191° (T). He told the lookout to watch it through binoculars. The southbound vessel, the *Star Sea Bridge*, was soon visible in the moonlight to both the second mate and the lookout aboard *Ever Able*. The lookout, using binoculars, tried to identify the navigation lights of the oncoming vessel, but was unable to see any. When he told the second mate that it seemed to have no navigation lights, the second mate watched the vessel with binoculars but he too, was unable to distinguish any navigation lights.

When the two ships were about 8 miles apart, the second mate altered the course to 025°. This increased the CPA to 2.8 miles. As the southbound ship drew closer, he determined that the ship was, indeed, not displaying any navigation lights.

At about this time, the second mate observed the deck lights of a fishing vessel, close to the starboard bow of the southbound ship. When he checked the radar, he could see the fishing vessel as an occasional, weak, echo.

Soon after he had seen the fishing vessel, he saw, on radar, the southbound *Star Sea Bridge* make a sharp turn to port through approximately 90°. Seeing this, he ordered the lookout to the helm, telling him to change to manual steering and to steer 050°. *Star Sea Bridge* was, by this time, about 4 miles north of *Ever Able* and they were closing at a relative speed of nearly 32 knots.

The second mate on *Ever Able* was increasingly concerned about the manoeuvres of the other ship and the fact that it was showing no lights. He intended to alter course further to starboard to give his ship more searoom.

At 0121, the second mate called the oncoming ship on VHF channel 16, quoting its position and its distance of 3.2 miles to his north, but this call was not answered. He followed this with a request for the vessel to switch on its running lights. Again, however, his call went unanswered. From the starboard side of the bridge, he collected the Aldis lamp and flashed it several times towards *Star Sea Bridge*. As he started to walk back to the VHF, the lookout exclaimed that the other ship had just switched on its running lights. He could see the other ship's port navigation light, indicating that the two ships were now port-to-port. Soon afterwards, the two ships passed at a distance of about 2 miles. As they passed, the second mate tried unsuccessfully to identify the other ship through his binoculars. All he could see, however, was that the ship had four deck cranes and its accommodation aft. He made a notation of the position on the chart with a note that the ships had passed at 0145.

With his concentration absorbed by the apparently erratic manoeuvres of the other ship and its lack of navigation lights, the second mate was unaware that the radar echo of the fishing boat, which he had earlier seen close to the starboard bow of the other ship, had disappeared.

Search and rescue

At 2206 on 21 June, AusSAR, the Australian search and rescue organisation, was alerted to the incident by the Sydney Water Police, advising them that one of the crew of *Sue M* had been recovered, but one man was still missing. The police undertook the co-ordination of the search.

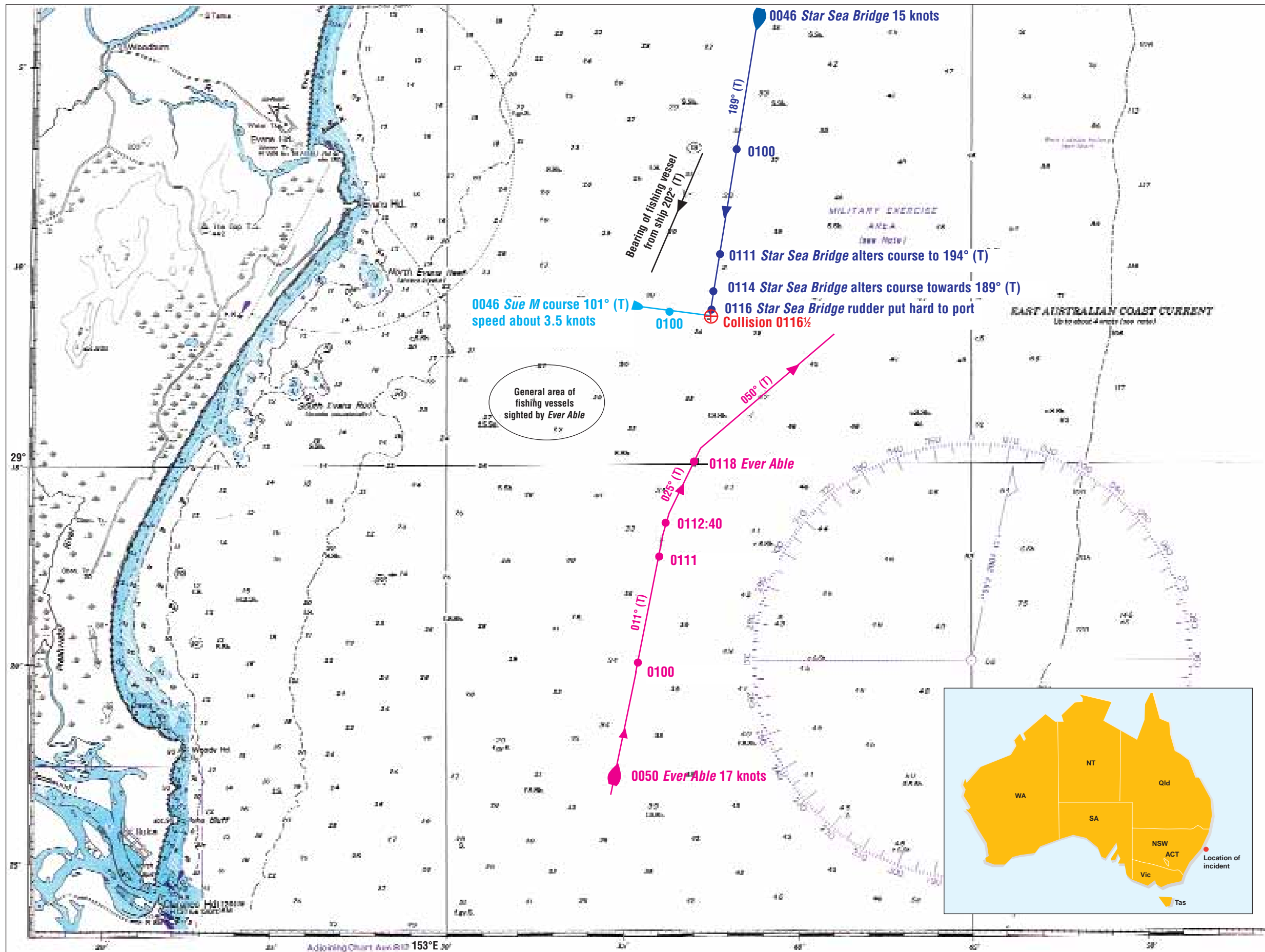
The duty officers at AusSAR immediately consulted the Australian Ship Reporting System (AUSREP) surface plot (SURPIC) for 20 June and identified two ships, *Dixie Monarch* and *Star Sea Bridge*, that may have been in the area at the time of the incident. At about 2230 on 21 June, messages were sent to both ships asking for their positions at the time of the incident, as reported by the survivor, and if either ship had experienced any unusual activity during the night of 20 June.

The master of *Dixie Monarch* responded with his ship's position, which had been 16 miles south-east of the position estimated for the collision.

At 0015 on 22 June, a duty officer from AusSAR contacted *Star Sea Bridge* by telephone, where the officer of the watch confirmed that they had just received the message and that the Captain was being called. At 0135 a message was received from the master of *Star Sea Bridge*, which read:

AT ABT 0110LT/21 JUN, AT 20087S/153378E THE SECOND OFFICER CALLED ME UP N INFORMED THAT UNIDENTIFIED LIGHT MADE CONTACT WITH OUR STBD SIDE MIDSHIP. WE TURNED BACK TWICE AND EVEN STOPPED TO THE ABOVE POSITION TO INVESTIGATE WHAT IT WAS BUT WE FOUND NOTHING. AT AROUND 0420LT/21 JUN WE RESUMED NORMAL VOYAGE.

FIGURE 7:
Portion of chart Aus 813 showing tracks of *Sue M*, *Star Sea Bridge* and *Ever Able*



At 0230 AusSAR notified the police of the reply from *Star Sea Bridge*. The police confirmed that, at this time, 20 trawlers were currently searching the area and that fish tubs, a bottle of milk and gas bottles had been found.

At 0619 on 22 June, AusSAR arranged for broadcasts to be made at regular intervals alerting vessels transiting the area to maintain a sharp lookout. A request was also passed to the police to arrange a similar broadcast through volunteer marine rescue bases, port authorities and fishing companies in the area.

At 0915 on 22 June, at the request of the NSW Water Police, AusSAR assumed responsibility for the air search for the missing crew member from *Sue M*. Co-ordination of the surface search, by some 20 trawlers, remained with the police at Grafton.

AusSAR co-ordinated the air search, of an area of 800 square miles, using 6 helicopters and

3 fixed-wing aircraft, one of which was used as a communications relay aircraft. The first helicopter left its base at Maroochydore in Queensland at 0956 and was at the search area at 1205 on 22 June. Another helicopter, however, had arrived first at the search area, at 1148, having left its base at Archerfield at 1007. Search conditions were ideal with very good visibility, light winds and seas. At 1720 on 22 June, AusSAR returned the search coordination to the Sydney Water Police.

Numerous items of debris, located in the search area, were identified as belonging to the lost vessel. An oil slick was also observed. Datum buoys were dropped to check the drift. The search was suspended at last light pending further intelligence from the NSW Water Police. It was considered that, if the missing man had survived, he would have been in the water for 54 hours by the next morning, with a negligible chance of survival.

FIGURE 8:
Debris recovered from *Sue M*



Comment and analysis

Evidence

On 22 June 2000, the ATSB was informed by AusSAR that a collision involving a merchant ship and a fishing vessel, *Sue M*, had occurred off the northern New South Wales coast early the previous morning. A survivor had been rescued but a crewmember was missing from the fishing vessel and Sydney Water Police, with assistance from AusSAR, were coordinating a search for him. The survivor from the fishing vessel had stated that a ship had been in collision with *Sue M* at about 0300 the previous day.

The bulk carrier *Star Sea Bridge* was identified by AusSAR as being in the area at the time. The

master of this vessel confirmed that an unidentified light had made contact with the starboard side, amidships, of the bulk carrier. The master also informed AusSAR that the time of the incident was about 0110 local time on 21 June and that the position was 29° 08.7' S, 153° 37.8' E. His message to AusSAR stated that the bulk carrier had turned back twice and had stopped at the position of the collision but, finding nothing, had resumed its voyage south.

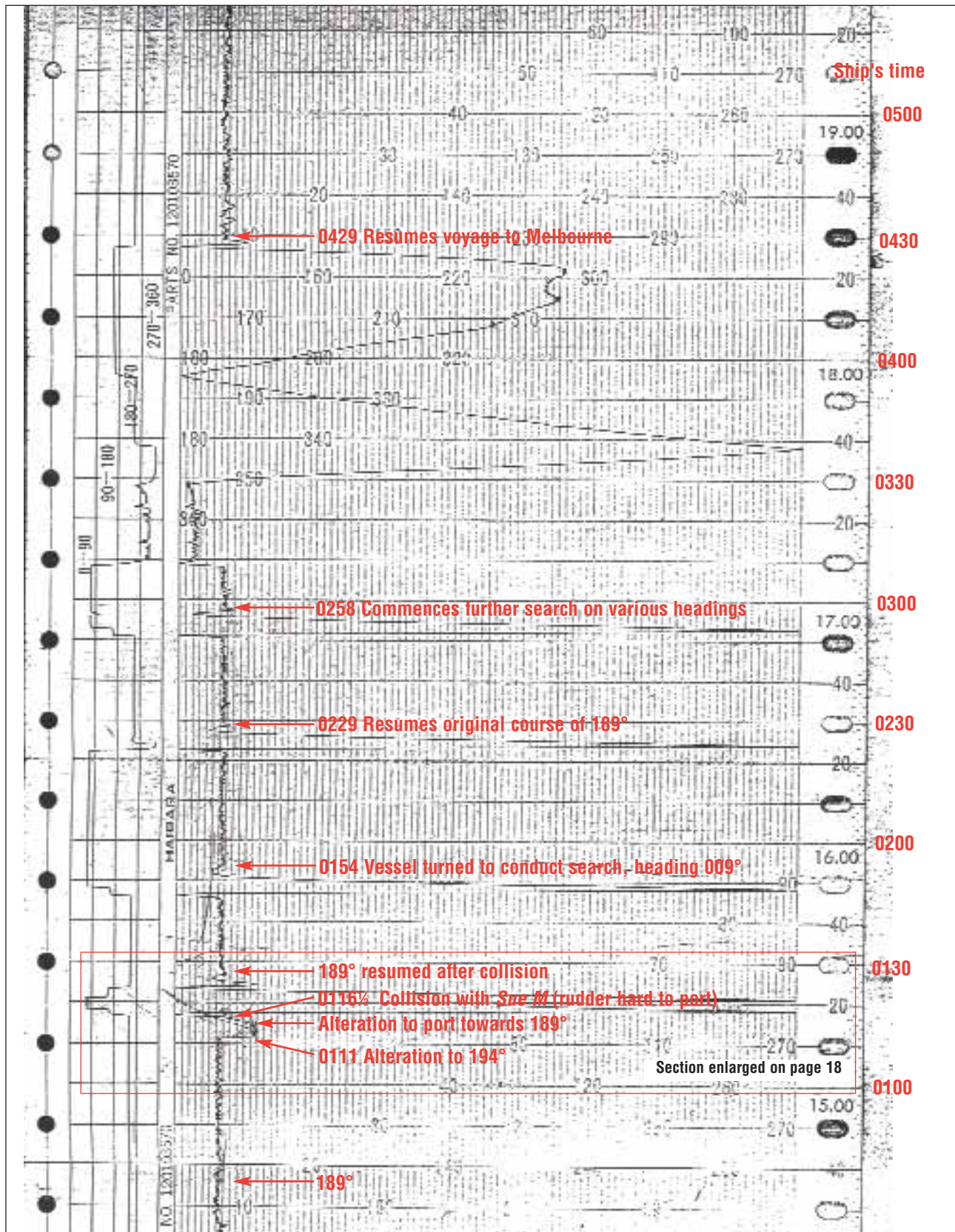
AusSAR thanked the master of *Star Sea Bridge* for his report. They also advised the master to secure his logs, charts and other documents as he would be required to submit a full report on the incident on his vessel's arrival at Melbourne, where he was likely to be visited by police and other authorities.

The ATSB interviewed the survivor from the fishing boat at his family's home in Iluka, NSW, on 22 June. The 19 year old survivor, the deckhand, described events leading to the collision, the sinking of the trawler with his

FIGURE 9:
Lifting paint samples from *Star Sea Bridge*



FIGURE 10:
Star Sea Bridge: Course recorder trace (2½° low on actual course)



father apparently still on board and his own rescue. However, he was not sure of the fishing vessel's course and speed. Neither was he sure if the fishing vessel's radar was on. There had not been sufficient time after the collision for him to consider using the EPIRB that was mounted inside the wheelhouse of *Sue M*.

The ATSB also interviewed the skipper of the fishing vessel *Starfish*. He had been fishing about two miles west of *Sue M* after midnight on the night of the collision, when he observed two ships on his radar. It had seemed to him that both ships were heading south about 3–4 miles apart and he had heard a short VHF transmission on channel 16. The transmission, repeated twice, seemed to mention the possibility of an impending collision. The skipper of *Starfish* was of the opinion that *Sue M*'s course would have been the same as his own, about a point south of east.

On 22 June, after conducting a search for the missing fishing vessel, the skipper of *Starfish* had located and buoyed the wreck of *Sue M* in about 64 metres of water at 29° 11' 10.8" S, 153° 37' 58.8" E.

AMSA considered the incident to be a very serious prima facie breach of the International Regulations for the Prevention of Collisions at Sea and decided to initiate a prosecution. The AFP, on behalf of AMSA seized documents from the ship and interviewed the master and other crew under caution. The ATSB conducted separate interviews and was provided with copies of the necessary documents by the AFP.

Paint samples from the ship's side, from areas considered to have been in contact with the fishing vessel, were taken by the AFP for analysis by their Forensic Services division in Canberra.

The skipper of *Starfish* had seen two ships on his radar east of *Sue M*. One of those ships was *Star Sea Bridge*, southbound. The other was later identified as the container ship, *Ever Able*, northbound. After the collision, AMSA sent the master of *Ever Able* a questionnaire on the

incident. When *Ever Able* returned to Australia in July 2000, the ATSB interviewed the second mate and the lookout who had been on the bridge at the time of the incident.

Analysis of paint samples

Paint samples taken from the hull of *Star Sea Bridge* by the AFP were analysed by the Scientific Unit, Forensic Services, of the AFP to determine if *Star Sea Bridge* had been in collision with *Sue M* (see Annex 2).

As paint samples were not recovered from *Sue M*, samples from cans of paint recently used on the fishing vessel were examined.

The Scientific Unit concluded from their analysis that the evidence supported the proposition that:

Star Sea Bridge had collided with the fishing vessel *Sue M*.

However, the Scientific Unit also noted that:

... it is important to appreciate that it is not possible to preclude other possibilities such as a collision with another object that had been painted with similar paints.

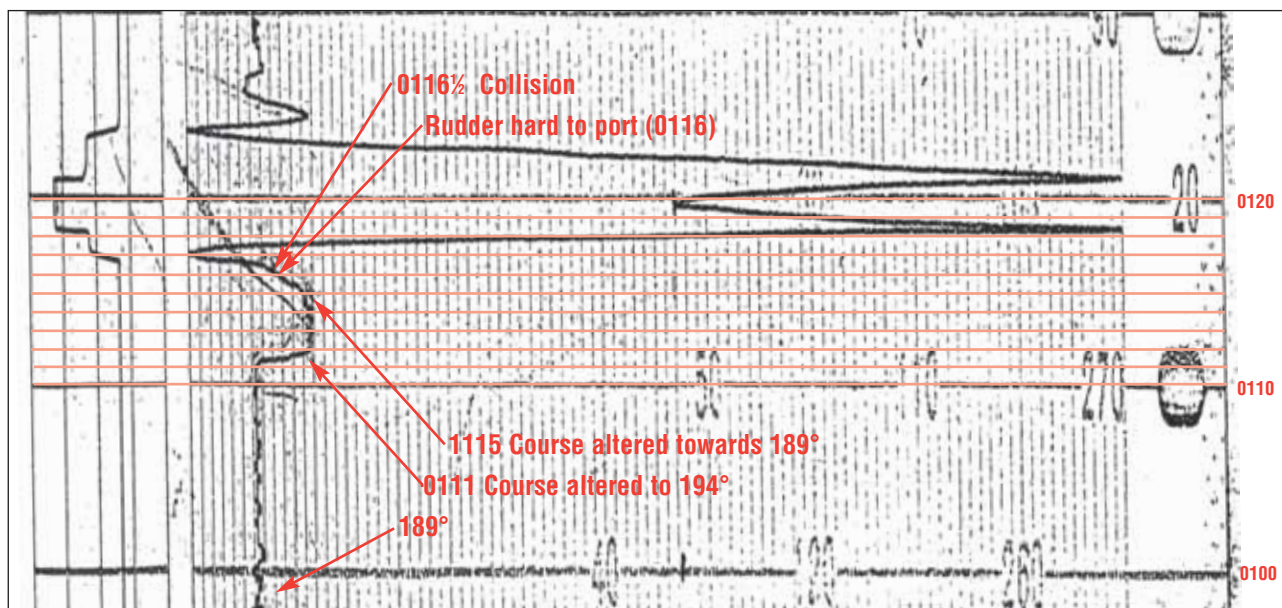
The ship's course recorder

Using the charted positions of *Star Sea Bridge*, the ship would have altered course at around 2300 (ship's time) from 176° (T) to 189° (T) off Cape Byron.

The course recorder trace confirmed that the course was altered at 2300 from about 173½° to about 186½°. The time on the course recorder trace can therefore be considered to be correct to ship's time. However, in terms of the course itself, the trace appeared to indicate 2½° lower than the course that was being steered.

From midnight until 0110 ship's time, the course recorder trace was steady. At 0110, the second mate of *Star Sea Bridge* switched the steering from autopilot to manual, ordering an alteration of course of 5° to starboard to clear *Ever Able*. The course recorder showed that this alteration of course was made at about 0111.

FIGURE 11:
Portion of course recorder chart expanded



The trace shows that the new heading, 194°, was maintained for about three minutes before the course was altered gradually towards the original course of 189°. Just before returning to 189°, the trace started to change rapidly to port. This is likely to have occurred when the second mate ordered the rudder hard-over to port to avoid *Sue M*.

Judging by the trace, full port rudder would appear to have been applied at about 0116 and maintained thus for about four minutes, to avoid the collision. The ship reached a heading of 050°, before turning to starboard towards the original course of 189° at which point the master arrived on the bridge. At 0127, the vessel resumed a course of 189°.

The trace then indicates that the bulk carrier turned to port, to a heading of 009° at about 0154, which heading it maintained for about half an hour, before resuming its original course of 189° at 0229. This is consistent with the master’s statement that he had turned the vessel about to conduct a search. Between 0154 and 0229, the crew of the bulk carrier searched for the object with which they had collided, but found nothing.

From 0229 until 0251, the bulk carrier resumed its original course of 189° before turning

northward again. This is consistent with instructions from the ship’s managers to the master to conduct a second search for the fishing vessel. The course was altered to port, to 009° at 0258 to resume the search. At 0310, the ship was steadied on 000° until 0329. From 0329 until 0415, the vessel was turned to port from a heading of 000°, through west and south to about 130°. This heading was maintained from 0415 until 0422, before the course was gradually altered to starboard, to 189°, at 0429, when the voyage to Melbourne was resumed.

The time of the collision

The master of *Star Sea Bridge*, in a message to the RCC, stated that contact between the two vessels had occurred at about 0110 local time on 21 June.

The survivor from *Sue M* had reported, after his rescue, that the collision had occurred at approximately 0300 on 21 June. However, based on his other evidence and the fact that the ‘Letterman Show’ was on TV, he is likely to have been awakened by his father at around 0030 and the collision would have occurred about 45 minutes later.

Shortly before the collision, *Star Sea Bridge* had been altering course from 194° to 189°. When

the second mate observed a white light close to the bulk carrier's starboard side, he ordered full port rudder to avert a collision. From the slope of the trace of the course recorder, it appears that the rudder was put hard to port at about 0116. The collision was reported to have occurred just after this and the best estimate of the time at which it occurred would be 0116½.

Weather at the time of the collision

The survivor from the fishing vessel described the weather at the time of the collision as 'OK'. There was a slight chop on the sea from a westerly breeze of about 10 knots, the sky was clear with a near full moon. He was not sure of the visibility at the time, as the deck lights on the trawler had been turned on before he was awakened. The bright lights under which he was working made it difficult for him to estimate the visibility.

The master of *Star Sea Bridge* had described the visibility as 'very good'. His statement and a statement on the excellent visibility from *Ever Able* are consistent with information received from the Bureau of Meteorology.

These conditions indicate that the weather was not a significant factor in the collision.

Responsibilities of both vessels

Under Rule 5 of the International Regulations for Preventing Collisions at Sea, 1972, as amended (the Colregs), (see Annex 1 to this report), both *Sue M* and *Star Sea Bridge* were obliged, at all times, to keep a proper look-out by sight, hearing and by all available appropriate means.

Under Rule 7 of the Colregs (Annex 1);

- (a) Every vessel is obliged to use all available means appropriate to the prevailing circumstances and conditions to determine if risk of collision exists.
- (b) Proper use shall be made of radar equipment if fitted and operational...

For crossing vessels, Rule 15 of the Colregs states;

When two power-driven vessels are crossing so as to involve risk of collision, the vessel which has the other on her own starboard side shall keep out of the way and shall, if the circumstances of the case admit, avoid crossing ahead of the other vessel.

With *Sue M* apparently on a course of about 100° (T) and *Star Sea Bridge* on 189° (T), the bulk carrier was obliged to keep out of the way of the fishing vessel.

Lights on *Sue M* and *Star Sea Bridge*

Rule 22 of the Colregs prescribes the visibility of lights that are required to be displayed by both vessels, in terms of minimum ranges. The bulk carrier's masthead lights were required to be visible at a distance of at least 6 miles, the sidelights and stern light for at least 3 miles.

For a vessel the length of *Sue M*, the white masthead light was required to be visible at a distance of at least 3 miles, the sidelights and sternlight for at least 2 miles. *Sue M* was not 'engaged in trawling' as defined in the Colregs and she should, theoretically, have been displaying the appropriate lights for a power-driven vessel of her length. It could not be determined whether or not *Sue M* was, at the time of the collision, displaying green-over-white all-round lights for a vessel engaged in trawling. Whatever the case, these all-round lights were required to be visible at a distance of at least 2 miles.

Evidence from the deckhand on *Sue M* was that the fishing vessel was showing its sidelights and that the deck floodlights were also on, the latter confirmed by the second mate on *Ever Able*.

According to the second mate and lookout on *Star Sea Bridge*, the only light seen in the vicinity of their ship immediately before the collision was 3–4 points on the starboard bow, initially estimated by the second mate at a

distance of about 2 miles. Either the estimations of the two men were seriously in error, or the light seen was that of another fishing vessel further west. At this time, *Sue M* would have been about 10–12° on the starboard bow of the ship.

With regard to the navigation lights on *Star Sea Bridge*, the evidence from *Ever Able*, supported by recordings of the radio traffic between the two vessels, is that *Star Sea Bridge* was not exhibiting any navigation lights.

Telstra, the telecommunications company monitoring coastal radio traffic at the time of the incident, supplied the ATSB with a transcript of communications recorded on VHF channel 16. The recording of communications from *Ever Able* to *Star Sea Bridge*, reproduced below, was made on 20 June at times listed in Universal Coordinated Time (UTC).

1521z Vessel in 2910.8s 15238e this is northbound vessel 3.2 miles

I cannot see particular running light

1523z Vessel in position 2911.1s 15338.5e please switch on running light

1523z Thanks very much for switching on running light

1521 UTC corresponded to ship's time of 0121 on 21 June on board *Star Sea Bridge*.

Navigation lights were not exhibited by *Star Sea Bridge* until about 0123, some six and a half minutes after the collision with *Sue M*.

The usual procedure on *Star Sea Bridge* was to switch on the navigation lights when departing from a port and to put off the lights after arrival at the next port. It is probable that, on this occasion, despite the third mate's evidence, the navigation lights had not been turned on when the bulk carrier had sailed from Brisbane on 20 June 2000.

Fishing vessels in the vicinity

The second mate of *Ever Able* was unable to recall the number of fishing vessels that were in

the vicinity of the *Star Sea Bridge*. He had been able to detect some fishing vessels at a distance of about 7 miles, most of which were, according to him, exhibiting deck lights.

With respect to movements of the fishing vessel near the starboard side of *Star Sea Bridge*, the second mate of *Ever Able* was unable to state what its course was, because its radar echo was weak. He had sighted the deck lights of this fishing vessel when it was 8 miles or more away, then had detected it on radar at a distance of about 7 miles as a weak echo. Given its proximity to *Star Sea Bridge*, this was in all probability *Sue M*.

The watch on *Ever Able* had not seen any light or object, visually or on radar, astern of the southbound vessel *Star Sea Bridge* after that vessel had turned to port. They had however, just before *Star Sea Bridge* turned to port, observed a vessel very close to the southbound ship.

On *Star Sea Bridge*, the fishing vessel *Sue M* was sighted only moments before the collision. Neither the second mate nor the lookout on the bulk carrier detected the fishing vessel on radar.

Lookouts on *Star Sea Bridge* and *Sue M*

Despite the fact that the lookout on duty with the second mate on *Star Sea Bridge* was supposed to have been maintaining a watch for other vessels, he did not notice *Sue M* until he was at the wheel, altering course for *Ever Able*. He had been talking to the lookout, who had been on duty with the third mate, until 0045 and this could well have distracted him from keeping a proper lookout. Just after this, he observed fishing vessels on the starboard side, which he reported to the second mate. By this time, however, *Ever Able* was visible and the attention of both the second mate and the lookout was then directed solely to that vessel.

It is difficult to explain why *Sue M*, with its after deck illuminated, was not noticed by either the second mate or the lookout on board *Star*

Sea Bridge. On a near-easterly course, it would have presented the same, or similar, aspect to both *Star Sea Bridge* and *Ever Able*. Its deck lights were visible to the second mate on *Ever Able* at a distance of about 8 miles.

The second mate on *Star Sea Bridge* would have been aware of the presence of the third mate's lookout on the bridge after midnight, but he did nothing about it. He spent some time at the chart table with the third mate, which suggests that he was distracted and omitted to ensure that a proper lookout was maintained. After *Ever Able* was sighted, he became engrossed in ensuring that its CPA was adequate, but he paid no attention to what appeared to him to be two white lights on the starboard bow of his own ship. It is possible that these lights were those of the fishing vessel *Sue M*, but it was only when a collision was imminent, that he noticed a 'white light' close to the bulk carrier and attempted to take avoiding action. According to his evidence, he sounded the whistle at this time, but the deckhand on the fishing vessel did not hear it.

After the collision, the second mate and third mate of *Star Sea Bridge* went to the starboard bridge wing, looking aft in an attempt to see what the ship had hit. By then, however, the bulk carrier was turning rapidly to port. If they had gone to the port bridge wing, they might have seen *Sue M* sinking.

Aboard *Sue M*, it is not certain if the radar was on and, if it was, neither the skipper nor the deckhand seemed to have used it to assist with keeping a lookout. According to the deckhand, just before the collision, the skipper of *Sue M* had scanned out to starboard and was on his way to the port side of the fishing vessel, probably to look out to that side, when the collision occurred. The skipper and the deckhand had been busy sorting their catch on deck under bright lights and they would have had found it difficult, if not impossible, to see any approaching vessel, particularly if that vessel was displaying no lights.

With reference to the trawler crew, who had been working under bright lights, a specialist in aviation medicine, contracted by the ATSB for an earlier, similar, collision at night involving a trawler and a ship (Report No. 151), had stated that:

Given their working environment under high intensity lighting on the night of the collision, it is highly probable that the crew would have been significantly night vision impaired due to the combined effects of retinal bleaching (causing complete loss of dark adaptation) and working close-in on the back of the trawler. By working under bright lights, the photo-chemicals essential for night vision... would have been totally inactivated. To be re-activated,... several hours of 'dark adaptation' in a completely dark or very low-light environment must elapse to enable regeneration of the... photo-chemicals. This is not possible... whilst working under the floodlighting on the back of the boat. These lights would need to be extinguished completely (and remain so) to enable the dark adaptation process to begin.

It would not be possible for a crewman working under floodlighting on a trawler to walk to the side of the vessel to look into the darkness and to expect to safely detect a poorly illuminated object quickly...

It is also likely that the close-in nature of the work on the back of the trawler would have caused a degree of 'accommodation' fixation to the crew. This means that when they did walk to the side of the vessel and looked out into the darkness where there was no point of fixation, then the eye's natural tendency to accommodate to a point in space about 1–2 metres away ('empty field myopia', a form of induced short sightedness) would have occurred. This form of myopia (short-sightedness) would seriously reduce the likelihood of a crewman acquiring a night target quickly unless he had been on watch for some time in the darkness and had been forcefully looking for objects in the distance...

Given the physiology of sight, even had *Star Sea Bridge* been exhibiting its navigation lights, as required by the Colregs, the chances of the fishing vessel's crew seeing the approaching bulk carrier, other than on the radar, was significantly reduced.

In the opinion of the Inspector of Marine Accidents (the Inspector), there was no proper lookout being maintained either on *Star Sea Bridge* or *Sue M*.

Aboard *Star Sea Bridge*, the second mate had spent significant amounts of time at the chart table and had kept only a cursory lookout. The rating did not seem to have his mind on the job.

On *Sue M*, the skipper and deckhand had been concentrating on sorting their catch under bright lights, severely reducing their ability to maintain any sort of lookout.

Minimal manning levels on fishing vessels has led to the inability of their crews, while engaged in fishing operations, to keep a proper lookout.

Visibility from the wheelhouse of *Star Sea Bridge*

Star Sea Bridge was fitted with four cranes on the centreline of the vessel and the possibility that the cranes might have prevented *Sue M* from being seen from the wheelhouse was investigated.

To a lookout stationed at the centre of the wheelhouse, the nearest crane would have had the effect of obscuring, at most, an arc of about 7° on either side from ahead. However, *Sue M* was at least a point on the starboard bow, so it would have been visible from the centre of the ship's wheelhouse.

The only positions from which *Sue M* would not have been visible from the bulk carrier's wheelhouse would have been if both the lookout and the second mate had been standing 4 or more metres to port of the centre of the wheelhouse. The aftermost crane could then have prevented them from seeing the fishing vessel but this scenario is highly unlikely.

The lookout on the bridge of the bulk carrier sighted *Ever Able* 'right ahead' and he had observed a number of fishing vessels to starboard. His evidence, too, was that he had moved to the bridge wings to check the

navigation lights and it is unlikely that the cranes would have interfered, for any length of time, with his looking out.

Radar detectability

To detect small vessels or those constructed of material giving a poor radar return, it is essential for radars to be correctly tuned and for clutter controls to be adjusted for optimum performance.

A supplement to the journal of The Nautical Institute, *Seaways*, of January 1994 comments on radar detectability and collision risk. The article warns:

There are essential elements to be imprinted in every watchkeeper's mind. They are:

- Weak echoes can only be detected at limited range and are likely to be lost close in due to clutter.
- Due to the properties of propagation, 'phase out' may occur and weak echoes can be lost for a significant period of time in certain conditions.
- Radar reflectors do not enhance radar, but do assist in the detection of a small target.

A table in the article on the average radar visibility of small vessels in moderate seas shows that from a vessel of about 40 000 tonnes (the deadweight of *Star Sea Bridge*), a 50 foot wooden vessel (*Sue M* was almost 50 feet in length) might be visible at about 6 miles. However, such targets are often lost or are seen sporadically when sea clutter interferes with their detection, especially at the centres of radar screens. [Two safety bulletins, Nos. 01 and 02, issued by the ATSB in 2002 and sent to the International Maritime Organization (IMO), refer to the limitations of radar and to the problems of radar detection of small vessels].

With reference to the term 'phase out', transmissions from radar to a target arrive directly as well as via reflections off the intervening sea surface. If the difference in path lengths is exactly half a wavelength or multiples

thereof, 1½, 2½, 3½, etc., wavelengths, the signals cancel and no return transmission is possible. The zones in which the target may not be seen are named Fresnel Zones³.

There is also the issue of multiple reflector targets. Small vessels, particularly those of wood or non-metallic construction are made up of a number of separate reflectors such as masts, A-frames, gallows and other metal structures, each at different distances from the radar antenna. If the path length between the reflecting surfaces is a full wavelength or a multiple thereof, the radar return signal will be enhanced. Where path lengths are not full wavelengths or multiples of the wavelength, the return signal will be out of phase and the signals will subtract from one another. If the difference in path length is exactly half a wavelength, the signals will cancel each other out.

While *Ever Able's* radar detected *Sue M* as a weak echo, according to the second mate and the lookout on *Star Sea Bridge*, the fishing vessel was not detected on the bulk carrier's radar. It is possible that the second mate and the lookout on *Star Sea Bridge* were concentrating on *Ever Able* to the extent that they missed seeing any echoes of *Sue M* on radar. It is also possible that, with no radar reflector on the fishing vessel, there were only irregular radar echoes from it. Also, after *Star Sea Bridge* had berthed at Melbourne, it was noted that the sea clutter controls on both radars were set at about 40 per cent of their full scale. If the clutter controls were at these positions at the time of the collision, it is possible that any echoes of the *Sue M* were lost on the radar as the two vessels closed.

Safety equipment

Fishing is recognised internationally as a most dangerous profession and the requirements for the provision and stowage of life saving appliances for fishing boats should reflect that fact. A report released on 25 January 2001 in Rome, Italy, by the United Nations Food and Agriculture Organization has stated that the

fatality rate among fishermen in Australia is 143 per 100 000, compared with the national average of 8.1 for other occupations.

Sue M was a class 3 C seagoing fishing vessel for use in all operational areas up to and including restricted offshore operations within 30 nautical miles to seaward of designated smooth waters. As such, under the provisions of the Uniform Shipping Laws Code (USL Code), the vessel was required to be equipped with distress signals, lifejackets, an EPIRB and either a coastal liferaft or a dinghy.

Sue M was equipped with a manually launched dinghy, which was required to be equipped with two oars, a painter, a bucket or bailer and means to enable persons to cling to the boat if upturned. The dinghy was secured to the wheelhouse top. It is probable that the deckhand would not have survived had the dinghy not fortuitously broken away when *Sue M* sank. In breaking away the dinghy was holed, but remained afloat on its in-built buoyancy. The oars and bailer, if stowed with the dinghy, were probably lost as it came to the surface inverted.

The requirements for a coastal inflatable liferaft include the following:

- provision to enable the liferaft to float free in the event of the vessel sinking
- the provision of, among other items, a cover for shelter from the elements, a sea anchor, water, rations, distress flares and an orange smoke signal.

While a dinghy is useful for fishing related operations, a liferaft would be infinitely superior as the preferred safety option. A float-free liferaft would have afforded shelter to the deckhand from *Sue M* and the opportunity to use distress signals to draw attention to his plight.

Key safety equipment was stowed within the wheelhouse or accommodation, places dangerous to access in the event of the vessel sinking. The lifejackets were not available on

³ After Augustine Jean Fresnel who first investigated them.

deck and the opportunity of using this important life saving appliance was denied to the crew.

The EPIRB was also mounted within the wheelhouse and, therefore, could not be reached before the vessel sank. While fishing vessels are at sea, EPIRBs should be mounted outside the wheelhouse, where they are more accessible in an emergency.

This is the third incident investigated by the Commonwealth, under the Navigation (Marine Casualty) Regulations, involving the loss of a fishing vessel where emergency equipment could not be reached by the crew when their vessel sank. Report numbers 88 (fv *Jay Dee*, Aug 1996) and 185 (Dec 2003), on the loss of the pleasure craft *Tamara*, identify the dangers of stowing the EPIRB in the wheelhouse.

The ATSB report on *Tamara* recommended that consideration be given by owners, operators and authorities to the issue of fitting float-free EPIRBs to commercial fishing vessels.

Fatigue and alcohol

In the opinion of the Inspector, neither fatigue nor alcohol was likely to have been a contributory factor for the collision.

An ATSB-organised dive

Prior to the police dive on *Sue M*, the ATSB had requested that the divers obtain evidence from the wreck such as paint samples, the positions of the light switches and the switches on the radar. The divers agreed to assist with the evidence, but they stipulated that their primary objective was to locate and recover the body of the skipper. Though the divers were able to recover the skipper's body, they were unable to obtain any evidence for the ATSB, due to 'bottom time' limitations while diving using compressed air equipment.

The ATSB then made arrangements for another dive on *Sue M*, which, after some delays due to weather, was scheduled for 4 September.

Information on currents in the vicinity of the wreck indicated that currents of up to one knot could be expected. However, when the dive was carried out on 5 September, sub-surface currents in the vicinity proved to be so strong that there was the danger that the diver, diving on oxy-helium, surface supplied, would be dragged away and the dive had to be aborted.

A recording from a video camera that was lowered to the wreck showed that the vessel was on a southerly heading, keel down, lying over to starboard at an angle of about 15°. The video showed the disposition of the trawl gear, the after working deck and the location of lighting for that deck. It also showed a build-up of sand on the south side of the wreck, on top of the wheelhouse and the after deck, an indication that, in time, sand would cover the trawler.

Charges laid against the master and second mate of *Star Sea Bridge*

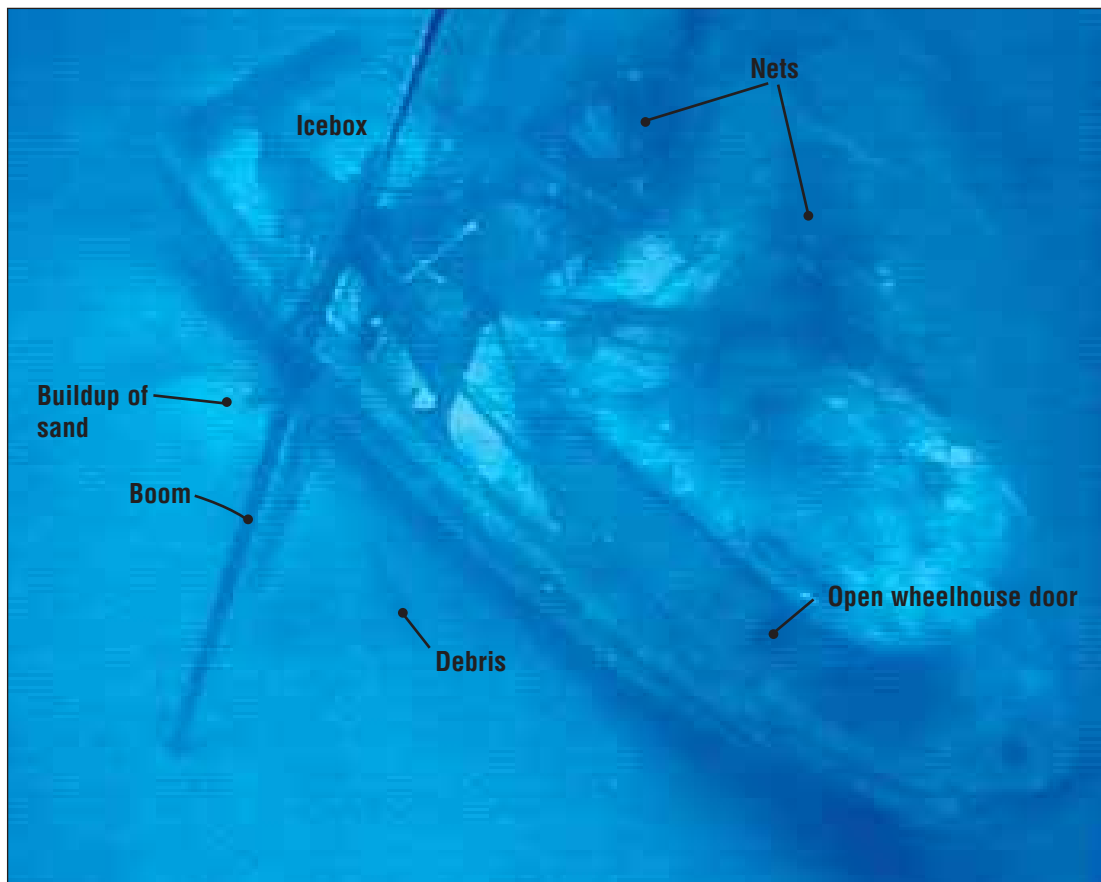
The master of *Star Sea Bridge* had not informed AusSAR of the collision until AusSAR asked if his vessel had experienced any unusual activity on the night of 20 June.

He was tried, and pleaded guilty, in the Melbourne Magistrates Court on 31 May 2001 on a charge of failing to report an accident. He was fined Aus \$1 500 and was also ordered to pay Aus \$10 000 in costs.

On 10 November 2003, the second mate appeared in the County Court of Victoria in Melbourne charged with:

- failing to 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;
- failing to use all available means appropriate to the prevailing circumstances and conditions to determine if risk of collision existed;

FIGURE 12:
Frame taken from a video recording of the wreck of *Sue M*



- failing to keep out of the way of a vessel engaged in fishing;
- failing to display prescribed lights on the vessel from sunset to sunrise;

resulting in a collision at sea, between *Star Sea Bridge* and *Sue M*.

On 27 November 2003, however, charges against the second mate were dismissed by the judge on a point of law, raised by the defence, relating to the validity of certain sections of the Navigation Act 1912.

The ATSB report

To avoid any possible influence on a jury, release of this report was withheld pending the trials of the master and the second mate. After the trial of the master and the dismissal of charges against the second mate, the draft report was sent out for comment to Directly Involved Parties.

Conclusions

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

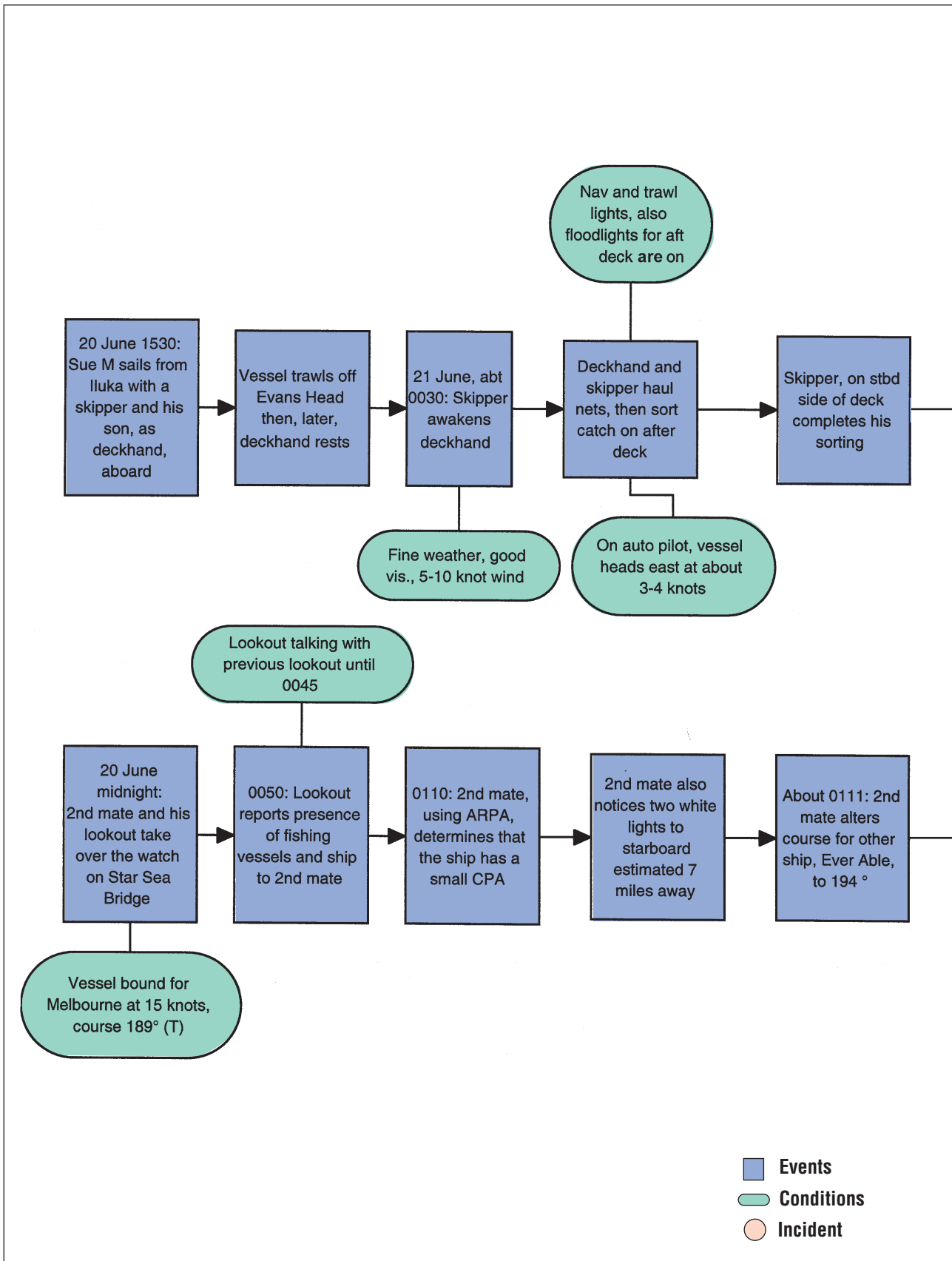
Based on the evidence available, the incident occurred because of a combination of the following factors.

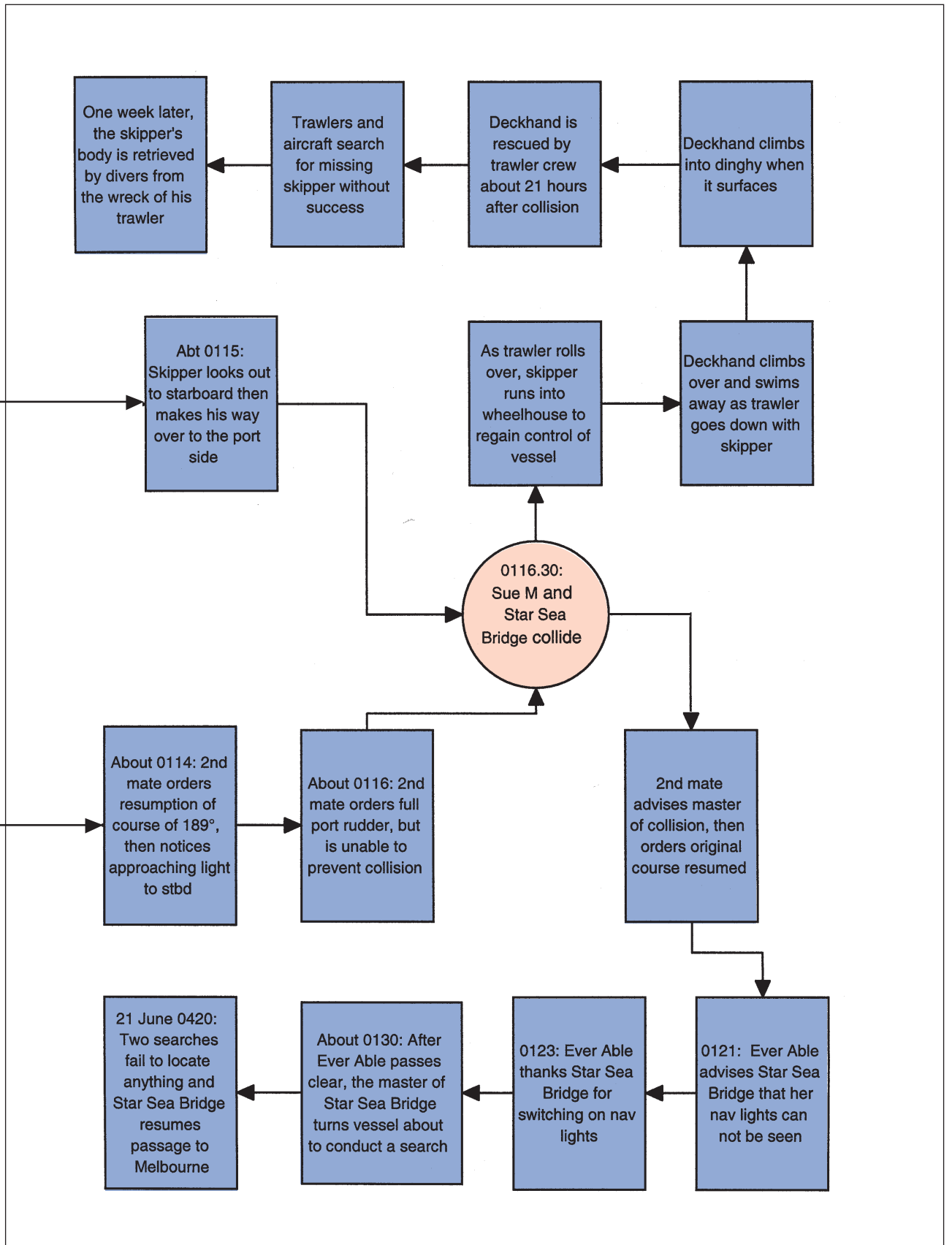
1. The fishing vessel *Sue M* sank, with the loss of its skipper, after a collision with the bulk carrier *Star Sea Bridge*.
2. The second mate of *Star Sea Bridge* was not keeping a proper lookout, either visually or by radar, nor did he ensure that the lookout on duty with him was keeping a vigilant watch.
3. On board the bulk carrier, the lookout on duty with the second mate was not keeping a proper lookout. Consequently, it is likely that he had not realised that one of the fishing vessels he had seen, *Sue M*, was closer than he thought.
4. Both the skipper and the deckhand on the fishing vessel had been busy sorting their catch and had not been keeping a proper lookout.
5. The skipper and deckhand on *Sue M* were working under bright deck lights. Under these conditions, they would not have been able to visually detect approaching vessels, least of all one not displaying navigation lights.
6. The navigation lights on *Star Sea Bridge* were probably not on at the time of the collision.
7. The second mate on *Star Sea Bridge* was informed of the presence of fishing vessels by his lookout, but focussed instead on the approaching ship to the extent that he only became aware of the presence of *Sue M* when a collision was unavoidable.
8. It is not possible to determine if the radar on the fishing vessel was in use. If it was, there is no evidence to suggest that it was being used to assist with keeping a lookout by tracking approaching vessels.
9. There is a significant probability that, on *Star Sea Bridge*, the sea clutter controls on both radars were set at levels that prevented echoes from *Sue M* being displayed.

In addition, based on the issue of night vision when working under bright lights, the Inspector considers that it is unlikely that the failure of *Star Sea Bridge* to exhibit its navigation lights before the collision was a causal factor in the collision itself.

The risk to the deckhand of *Sue M* not surviving a sinking at sea was increased significantly by the stowage of the EPIRB and lifejackets within the wheelhouse and the absence of readily available distress signals on deck.

FIGURE 13:
Star Sea Bridge and Sue M: Events and causal factors chart





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 relevant parts thereof, was sent to;

The deckhand of *Sue M*,

The master, second and third mates and the lookout of *Star Sea Bridge*,

The managers of *Star Sea Bridge* and,

The Australian Maritime Safety Authority

Recommendations

The Inspector recommends that, since fishing vessels may be encountered anywhere off the Australian coast at any time of the year:

MR20040001

Ships' masters and skippers of fishing vessels ensure that, in accordance with the Collision Regulations, a proper lookout is maintained at all times;

MR20040002

Ships' masters and watchkeepers, skippers and crews of fishing vessels take note of the limitations of radar and the fact that radar detection of small wooden vessels is likely to occur at smaller ranges than for similar vessels with steel hulls; and

MR20040003

Owners, operators and skippers of fishing vessels consider the use of appropriate equipment to improve the radar detectability of their vessels.

The Inspector also recommends that:

MR20040004

Fishing vessel owners and operators note that low manning levels of their vessels can lead to crews being unable to keep a proper lookout;

MR20040005

The National Marine Safety Committee in conjunction with State marine authorities consider making IMO approved types of radar reflectors mandatory on commercial fishing vessels; and

MR20040006

EPIRBs and other lifesaving equipment on fishing vessels and small craft be carried outside the wheelhouse, readily available for use when at sea.

Annex 1

Rule 5 of the International Regulations for Preventing Collisions at Sea, 1972, as amended (the Colregs), on look-out, states that:

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 7(a) states that:

Every vessel shall use all available means appropriate to the prevailing circumstances and conditions to determine if risk of collision exists.

Rule 7(b) states that:

Proper use shall be made of radar equipment if fitted and operational to obtain early warning of risk of collision.

Annex 2

Analysis of paint samples

Extracts from the report on the analysis by the Scientific Unit, Forensic Services of the Australian Federal Police follow:

1.0 Custody of Items

1.1 Receipt

1.1.1 On Wednesday 28 June 2000, the following items were received from the Marine Incident Investigation Unit:-

A sealed polythene bag, containing nine sealed plastic bags labelled in part "Control samples from the hull of the ship",

A sealed polythene bag, containing eight sealed plastic bags labelled in part "Items 1-8 starboard side of *Star Sea Bridge*".

The packaging of these items were inspected and found to be in good condition. Photographs were taken to record their appearance.

1.1.2 On Wednesday 5 July 2000, an envelope was received by mail from Senior Constable Sid Hill of the NSW police at Iluka. This envelope enclosed a slip of paper inscribed "Sue M-paint samples wheel house door" and a plastic clip lock bag which contained grey and white paint chips.

1.1.3 Thursday 27 July 2000, a locked yellow security trunk and a sealed cardboard box were received from Ansett couriers. These boxes were inspected and found to be in good

condition. Photographs were taken to record their appearance. Contained within the security trunk were the following:-

- A four litre can of International Interlac 172 undercoat white. CA71GPC made by Akzo Nobel Pty Ltd (AFP exhibit 0003982);
- A four litre can of Pascol high gloss enamel-white. The word "Pewter" was written in black text down the side. (AFP exhibit 0003984);
- A four litre can of Wattyl marine Coatings Sigmachlor Primer Sealer – grey. (AFP exhibit 0003986);
- A four litre can of International Interprime 82 Timber Primer-grey. (AFP exhibit 0003897);
- A two litre can of Pascol high gloss enamel-black. (AFP exhibit 0003987).

Contained within the sealed cardboard box were the following:-

- A four litre can of International Interlac finish – white (AFP exhibit 0003981);
- A four litre can of International Interlac Longlife Antifouling (AFP exhibit 0003983);
- A four litre can of International Interprimer 82 – timber primer – grey (AFP exhibit 0003885).

1.2 Custody

Members of the Australian Federal Police Criminalistics Team examined the items listed above. This laboratory specialises in the analyses of trace material and operational procedures are in place to maintain the integrity of exhibits. At all times after receipt, the items

were either in a secure exhibit store, under the direct control of the examiner, or secured within a search room in the laboratory.

2.0 Examination

- 2.1 The examination commenced on Thursday 27 July 2000. This involved viewing the control samples of the surface coatings from the ship in order to recognise any material that may be from another source.
- 2.2 The microscopical examination of the samples taken from the damaged surface on the starboard side of the ship “Star Sea Bridge” revealed the presence of black and white particles. It was apparent that the ship had been in collision with a black and white painted object. These particles of apparent paint were isolated for further testing by infra-red and x-ray fluorescence spectrometry.
- 2.3 The cans of paint described in 1.1.3 were sampled by excising small sections from drip lines that were on the exterior surface of the cans. This was done in order to obtain dried samples that had been exposed to a similar period of oxidation as the paint on the fishing vessel. The infra-red spectrum for each sample was recorded.

The chips of paint labelled “Sue-M – wheelhouse door” were also viewed under the microscope and analysed using infra-red spectroscopy.

- 2.4 The chips of paint labelled “Sue-M – wheelhouse door” were also viewed under the microscope and analysed using infra-red spectroscopy.

3.0 Results

- 3.1 The infra-red spectrum of the black paint contained in the snap seal bag labelled “Control # 8” exhibited significant differences to the black particles that were recovered from the scrape marks on the starboard hull of the ship, and the can of Pascol black paint with AFP exhibit 0003898. This means that the source of the black particles from the scrape marks was

not the same as the black paint from the ship where “Control # 8” was collected.

- 3.2 Strong similarities were observed in the infra-red spectra of the Pascol black paint and the questioned black particles recovered from the ship (Item 6 and others). Differences in the infra-red spectra, while present, were subtle and may well be due to environmental effects such as ultra-violet degradation.
- 3.3 White material with a granular matrix was observed adhering to the black paint from the tape lifts. This had the microscopical appearance and properties of an undercoat. It was compared against the International Interlac 172 white undercoat, AFP exhibit 0003982. The comparison of their infra-red spectra did not reveal any significant differences. Similarly, the x-ray fluorescence spectra revealed a similar elemental composition.

4.0 Conclusion

- 4.1 The comparison of black paints revealed sufficient similarities to conclude that the black paint from the damaged area of the ship could have come from the can of Pascol paint (AFP exhibit 0003898), or another paint of similar formulation.
- 4.2 The comparison of white paints revealed a very strong correlation in microscopical appearance, physical texture, infra-red absorption spectra and elemental composition. This means that the white particles from the scrape marks on the ship could have come from the can of Interlac 172 (AFP exhibit 0003982) white undercoat or another paint of similar formulation.
- 4.3 This evidence supports the proposition:-
“that the ship *Star Sea Bridge* had collided with the fishing vessel *Sue M*”, however it is important to appreciate that it is not possible to preclude other possibilities such as a collision with another object that had been painted with similar paints.

Star Sea Bridge

IMO Number	9168269
Flag	Panama
Classification Society	BV
Ship Type	Bulk Carrier
Builder	Ishikawajima-Harima Heavy Ind Co Ltd, Tokyo
Year Built	1997
Owner	Kaisho Marine S A, Panama
Gross Tonnage	24 953
Net Tonnage	13 547
Summer Deadweight	42 717 tonnes
Length overall	181.50 m
Breadth, moulded	30.50 m
Depth, moulded	16.40 m
Summer Draught	11.37 m
Engine	Sulzer 6RTA48T
Speed, service	14.5 knots
Crew	21

Sue M

Registration number	4823
Survey authority	Waterways Authority of NSW
Vessel type	Fishing boat, class 3C
Owner	Scott Lenard
Year of build	1982
Construction	Timber
Length	14.0 m
Moulded breadth	4.5 m
Moulded depth	1.85 m
Engine	Cummins Diesel, 164 kW
Crew	2

**Independent investigation into the collision between the
Panama flag bulk carrier *Star Sea Bridge* and the fishing vessel *Sue M***

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