Australian Government

Australian Transport Safety Bureau

ATSB TRANSPORT SAFETY INVESTIGATION REPORT
Marine Occurrence Investigation No. 240
Final

Independent investigation into the collision between the Panamanian registered bulk carrier

Silky Ocean

and the Australian fishing vessel

Peter Crombie

off the South Australian coast

23 April 2007

Australian Government

Australian Transport Safety Bureau

ATSB TRANSPORT SAFETY INVESTIGATION REPORT
Marine Occurrence Investigation
No. 240
Final

Independent investigation into the collision between the Panamanian registered bulk carrier

Silky Ocean

and the Australian fishing vessel

Peter Crombie

off the South Australian coast
23 April 2007

Released in accordance with section 25 of the *Transport Safety Investigation Act 2003*

Published by: Australian Transport Safety Bureau
Postal address: PO Box 967, Civic Square ACT 2608
Office location: 15 Mort Street, Canberra City, Australian Capital Territory
Telephone: 1800 621 372; from overseas + 61 2 6274 6440
Accident and incident notification: 1800 011 034 (24 hours)
Facsimile: 02 6274 6474; from overseas + 61 2 6274 6474
E-mail: atsbinfo@atsb.gov.au
Internet: www.atsb.gov.au

ISBN and formal report title: see 'Document retrieval information' on page v.

CONTENTS

DOCUMENT RETRIEVAL INFORMATION

Report No.	Publication Date	No. of pages	ISBN	ISSN
240	December 2007	40	978-1-921165-53-5	1447-087X

Publication Title
Independent investigation into the collision between the Panamanian registered bulk carrier *Silky Ocean* and the Australian fishing vessel *Peter Crombie* off the South Australian coast on 23 April 2007.

Prepared by
Australian Transport Safety Bureau
PO Box 967, Civic Square ACT 2608 Australia
www.atsb.gov.au

Reference No.
Dec2007/Infrastructure 50411

Acknowledgements

The chart section in this publication is reproduced by permission of The Australian Hydrographic Service. © Commonwealth of Australia 13 October 2002. All rights reserved. Other than for the purposes of copying this publication for public use, the chart information from the chart sections may not be extracted, translated, or reduced to any electronic medium or machine readable form for incorporation into a derived product, in whole or part, without the prior written consent of the Australian Hydrographic Service.

The photographs of *Silky Ocean* are courtesy of shipspotting.com.

Abstract

On the morning of 23 April 2007, the Australian fishing vessel *Peter Crombie* was at anchor about 30 miles south of Robe, South Australia and the vessel's three crew were below decks sleeping.

The weather was fine with good visibility. There was a swell of about one metre from the east-southeast and seas of about 1.5 m. The wind was from the east-southeast at 12 to 18 knots.

At about 1150, the Panamanian registered bulk carrier *Silky Ocean* collided with *Peter Crombie*. *Silky Ocean*'s bridge watchkeeper had not detected *Peter Crombie* either visually or by radar.

After the collision, *Peter Crombie*'s skipper tried to contact the ship using his vessel's very high frequency radio. However, *Silky Ocean*'s bridge watchkeeper did not acknowledge the call and made no attempt to communicate with the fishing vessel.

While *Silky Ocean* sustained no damage as a result of the collision, *Peter Crombie*'s hull had been severely damaged and the vessel was taking on water. Fortunately, the fishing vessel's bilge pumps were able to keep up with the ingress of water.

Peter Crombie's skipper notified the vessel's owners of the collision and then set a course for Robe. By 1700, the vessel was all fast alongside the wharf in Robe.

The report identifies a number of safety issues and issues recommendations and safety advisory notices with the aim of preventing similar events.

THE AUSTRALIAN TRANSPORT SAFETY BUREAU

The Australian Transport Safety Bureau (ATSB) is an operationally independent multi-modal Bureau within the Australian Government Department of Infrastructure, Transport, Regional Development and Local Government. ATSB investigations are independent of regulatory, operator or other external bodies.

The ATSB is responsible for investigating accidents and other transport safety matters involving civil aviation, marine and rail operations in Australia that fall within Commonwealth jurisdiction, as well as participating in overseas investigations involving Australian registered aircraft and ships. A primary concern is the safety of commercial transport, with particular regard to fare-paying passenger operations.

The ATSB performs its functions in accordance with the provisions of the *Transport Safety Investigation Act 2003* and Regulations and, where applicable, relevant international agreements.

Purpose of safety investigations

The object of a safety investigation is to enhance safety. To reduce safety-related risk, ATSB investigations determine and communicate the safety factors related to the transport safety matter being investigated.

It is not the object of an investigation to determine blame or liability. However, an investigation report must include factual material of sufficient weight to support the analysis and findings. At all times the ATSB endeavours to balance the use of material that could imply adverse comment with the need to properly explain what happened, and why, in a fair and unbiased manner.

Developing safety action

Central to the ATSB's investigation of transport safety matters is the early identification of safety issues in the transport environment. The ATSB prefers to encourage the relevant organisation(s) to proactively initiate safety action rather than release formal recommendations. However, depending on the level of risk associated with a safety issue and the extent of corrective action undertaken by the relevant organisation, a recommendation may be issued either during or at the end of an investigation.

The ATSB has decided that when safety recommendations are issued, they will focus on clearly describing the safety issue of concern, rather than providing instructions or opinions on the method of corrective action. As with equivalent overseas organisations, the ATSB has no power to implement its recommendations. It is a matter for the body to which an ATSB recommendation is directed (for example the relevant regulator in consultation with industry) to assess the costs and benefits of any particular means of addressing a safety issue.

TERMINOLOGY USED IN THIS REPORT

Occurrence: accident or incident.

Safety factor: an event or condition that increases safety risk. In other words, it is something that, if it occurred in the future, would increase the likelihood of an occurrence, and/or the severity of the adverse consequences associated with an occurrence. Safety factors include the occurrence events (e.g. engine failure, signal passed at danger, grounding), individual actions (e.g. errors and violations), local conditions, risk controls and organisational influences.

Contributing safety factor: a safety factor that, if it had not occurred or existed at the relevant time, then either: (a) the occurrence would probably not have occurred; or (b) the adverse consequences associated with the occurrence would probably not have occurred or have been as serious, or (c) another contributing safety factor would probably not have occurred or existed.

Other safety factor: a safety factor identified during an occurrence investigation which did not meet the definition of contributing safety factor but was still considered to be important to communicate in an investigation report.

Other key finding: any finding, other than that associated with safety factors, considered important to include in an investigation report. Such findings may resolve ambiguity or controversy, describe possible scenarios or safety factors when firm safety factor findings were not able to be made, or note events or conditions which 'saved the day' or played an important role in reducing the risk associated with an occurrence.

Safety issue: a safety factor that (a) can reasonably be regarded as having the potential to adversely affect the safety of future operations, and (b) is a characteristic of an organisation or a system, rather than a characteristic of a specific individual, or characteristic of an operational environment at a specific point in time.

Safety issues can broadly be classified in terms of their level of risk as follows:

- **Critical safety issue:** associated with an intolerable level of risk.
- **Significant safety issue:** associated with a risk level regarded as acceptable only if it is kept as low as reasonably practicable.
- **Minor safety issue:** associated with a broadly acceptable level of risk.

EXECUTIVE SUMMARY

On 21 April 2007, the Panamanian registered bulk carrier *Silky Ocean* departed from Port Kembla, New South Wales. The ship was in ballast and bound for Ardrossan, South Australia.

The Australian fishing vessel *Peter Crombie* had departed Robe, South Australia, late in the evening of 17 April. The crew were fishing for school sharks in an area south of Robe and, at about 0800[1] on 23 April, they set the vessel's net and then anchored nearby. Shortly afterwards all three crew went below decks to sleep.

The weather was fine with a partly cloudy sky and good visibility. There was a swell of about one metre from the east-southeast and seas of about 1.5 m. The wind was from the east-southeast at 12 to 18 knots[2].

At 0800, when *Silky Ocean's* third mate started his watch on the bridge, the ship was making good a course of 311° (T) at a speed of about 15 knots. The ship's course remained unchanged throughout the morning and at no time did the third mate detect that *Peter Crombie* was directly ahead of the ship.

At about 1150, *Silky Ocean's* port bow collided with *Peter Crombie's* port quarter.

After the collision, *Peter Crombie's* skipper tried to contact the ship using his vessel's very high frequency radio. However, *Silky Ocean's* third mate did not acknowledge the call and he made no attempt to communicate with the fishing vessel.

While *Silky Ocean* sustained no damage as a result of the collision, *Peter Crombie's* hull had been severely damaged and the vessel was taking on water. Fortunately, the fishing vessel's bilge pumps were able to keep up with the ingress of water.

Peter Crombie's skipper used his mobile telephone to contact the vessel's owners, notifying them of what had happened. He then set *Peter Crombie* on a course for Robe before arranging for his brother, who was also a local fishing vessel skipper, to rendezvous with him and escort *Peter Crombie* into port.

The two fishing vessels rendezvoused and, by about 1700, *Peter Crombie* was all fast alongside the wharf in Robe.

The report identifies the following safety issues and issues a number of safety advisory notices to address them.

- *Silky Ocean's* master and crew did not appropriately consider the information provided by the navigational charts and publications when they planned the ship's passage from Port Kembla to Ardrossan. This led to the ship sailing through a charted fishing area and being two miles closer to the coastline than was recommended.
- During the period of time leading up to the collision, *Silky Ocean's* third mate was not keeping a proper lookout by sight and he was not appropriately using all means available, in particular the radar, to make a full appraisal of the situation and the risk of collision.

1 All times referred to in this report are local time, Coordinated Universal Time (UTC) + 9 ½ hours.

2 One knot, or one nautical mile per hour equals 1.852 kilometres per hour.

- At the time of the collision, there was no lookout being maintained on board *Peter Crombie*. The skipper had not adequately managed the crew's work/rest periods and, consequently, on the morning of 23 April, they were all tired and needed to sleep. Furthermore, the skipper did not consider it necessary to keep a lookout while the vessel was at anchor.
- *Peter Crombie* was possibly difficult to detect, either visually or by radar, because of the vessel's timber construction, paint scheme, lack of a radar reflector and the prevailing weather conditions.
- *Silky Ocean's* third mate assumed that a collision between his ship and *Peter Crombie* had not occurred. He did not immediately report the incident to the ship's master and he made no attempt to contact the damaged fishing vessel. In doing so, he disregarded his legal and moral obligations to ensure the safety of the fishing vessel's crew.

1 FACTUAL INFORMATION

1.1 *Silky Ocean*

Silky Ocean is a Panamanian registered geared bulk carrier (Figure 1). It is owned by Lucretia Shipping, Panama, managed by Santoku Senpaku, Japan and classed with ClassNK.

The ship was built in 1995 by Tsuneishi Shipbuilding, Japan. It has an overall length of 185.74 m, a beam of 30.40 m, a depth of 16.50 m and a deadweight of 45 665 tonnes at its summer draught of 11.62 m.

Propulsive power is provided by a six cylinder Mitsui MAN B&W 6S50MC, single acting, direct reversing, two-stroke diesel engine delivering 7171 kW. The main engine drives a single fixed pitch propeller which gives the ship a service speed of about 14 knots.

Figure 1: ***Silky Ocean***

Silky Ocean was equipped with navigational equipment consistent with SOLAS[3] requirements. This included two x-band radars; a Furuno FAR-2822 and a Furuno FAR-2117. The FAR-2117 radar was new and had been fitted in Port Kembla. The bridge was also fitted with an echo sounder, a global positioning system (GPS), an automatic identification system (AIS) and global maritime distress and safety system (GMDSS) equipment.

At the time of the incident, *Silky Ocean* had a crew of 20 Filipino nationals. While at sea, the mates maintained a watchkeeping routine of four hours on, eight hours off. During the hours of darkness, a seaman was also posted on each watch as a lookout.

The master had 30 years of seagoing experience. He held a master's certificate of competency that was first issued in 2000, in the Philippines. He was completing his first assignment on board *Silky Ocean* and had been on board the ship for about eight months.

3 The International Convention for the Safety of Life at Sea, 1974, as amended.

The third mate, the eight to twelve bridge watchkeeper, held a third mate's certificate of competency. He had seven years of seagoing experience and at the time of the incident had been on board *Silky Ocean* for about two months. It was his second, nine month, assignment as a third mate.

1.2 *Peter Crombie*

Peter Crombie is a 16.62 m timber fishing vessel (Figure 2). It has a beam of 5.56 m, a depth of 2.29 m and a gross tonnage of 48.1.

The vessel was registered with Transport SA (South Australia) as a class 3B vessel. It was owned by Southern Sea Eagles and E & Z Toumazos Family Trust and operated predominantly out of the port of Robe, about 300 km south-southeast of Adelaide, South Australia (Figure 3).

Figure 2: *Peter Crombie* in Robe

The vessel was built in 1977, in Ballina, New South Wales and was constructed of hardwood planks over hardwood frames. The hull and wheelhouse were painted white with blue trim and the decks had been sheathed with glass reinforced plastic.

Peter Crombie is typical of many timber fishing vessels built in Australia during the 1970s, with the wheelhouse located forward of a large working deck. The helm, engine controls and navigation equipment are located on the starboard side of the wheelhouse. A small saloon area is located in the centre of the wheelhouse with a galley area located to port. A central companionway leads from the wheelhouse to sleeping accommodation located beneath the forecastle deck, forward of the wheelhouse. The wheelhouse has two access doors leading to the deck; one on the starboard side, adjacent to the helm position, and one at the aft end.

Figure 3: Section of navigational chart Aus 4060 showing SE Australia

The vessel was fitted with a range of navigation equipment, including a radar, a chart plotter, a depth sounder and an autopilot. The vessel was also fitted with high frequency (HF), very high frequency (VHF) and ultra high frequency (UHF) radios.

Propulsive power was provided by a single Gardner diesel engine that develops 150 kW. The engine drives a single propeller, giving the vessel a service speed of about six knots.

Retractable stabiliser outriggers were fitted on the port and starboard sides of the vessel's working deck. A hydraulically operated drum containing 4200 m of lead weighted gill net was also fixed to the aft end of the working deck. The drum was used to feed out, and retrieve, the fishing net.

At the time of the incident, *Peter Crombie's* three crew members were fishing for school sharks.

The skipper was an experienced fisherman and had been fishing in the waters off Robe since the early 1970s. He held a master class five certificate of competency, which was first issued in 1986. He also held a marine engine driver grade two certificate of competency. He had been *Peter Crombie*'s skipper for about one year.

One of the deck hands had been fishing for about two years, with all of that time spent on board *Peter Crombie*. The other deck hand was completing his first voyage as a fisherman and had been on board the vessel for about five days.

1.3 The incident

1.3.1 *Peter Crombie*

Peter Crombie departed Robe late in the evening of 17 April 2007. The crew had stored the vessel with enough provisions for a voyage of 14 days but they expected to return to port after about 10 days.

By 0500 on 18 April, the vessel was about 14.5 miles southwest of Robe, in an area with a water depth of about 70 m. By about 0540, the net had been shot (laid out) and the skipper anchored the vessel near the end of the net. At 1100, the crew started hauling in the net, gutting the catch and packing it into the hold. By 1330, they had finished recovering the net.

The skipper moved the vessel a little to the southeast and, at 1500, the net was shot again. This process of completing a shot and then shifting the vessel to the southeast before shooting the net again was repeated over the following few days, with the net being shot about three times a day.

At 0730 on 23 April, the net was once again shot and, at about 0800, the skipper anchored *Peter Crombie* near the end of the net, in position 37° 38.10'S, 139° 42.55'E (Figure 4). The skipper recalled that the weather was fine with some cloud cover and good visibility. The wind was from the east-southeast at 12 to 18 knots. There was a swell of about one metre from the east-southeast and seas of about 1.5 m.

The skipper and the deckhands had a hot drink before the deckhands went below to sleep. The skipper checked that no ships were visible on the radar and then switched it off. He then completed some paperwork and, at about 1030, he too went below for a rest.

1.3.2 *Silky Ocean*

At 0630 on 21 April, *Silky Ocean* sailed from Port Kembla, New South Wales, bound for Ardrossan, South Australia. The ship was in ballast and its draughts were 4.14 m forward and 6.44 m aft.

Over the following days, the ship's crew carried out routine maintenance tasks, including painting the ship's accommodation superstructure, as well as completing their normal watchkeeping duties.

On the morning of 23 April, the boatswain continued painting the ship's accommodation superstructure. He was assisted by the eight to twelve seaman and two ordinary seamen. The four men planned to paint the hand railings and bulkheads around the bridge deck.

At 0800, when the third mate relieved the chief mate on the bridge, the weather was recorded in the log book as; east-southeast force five[4] with about twenty percent cloud cover. *Silky Ocean* was on a course of 311° (T) and making good a speed of about 15 knots.

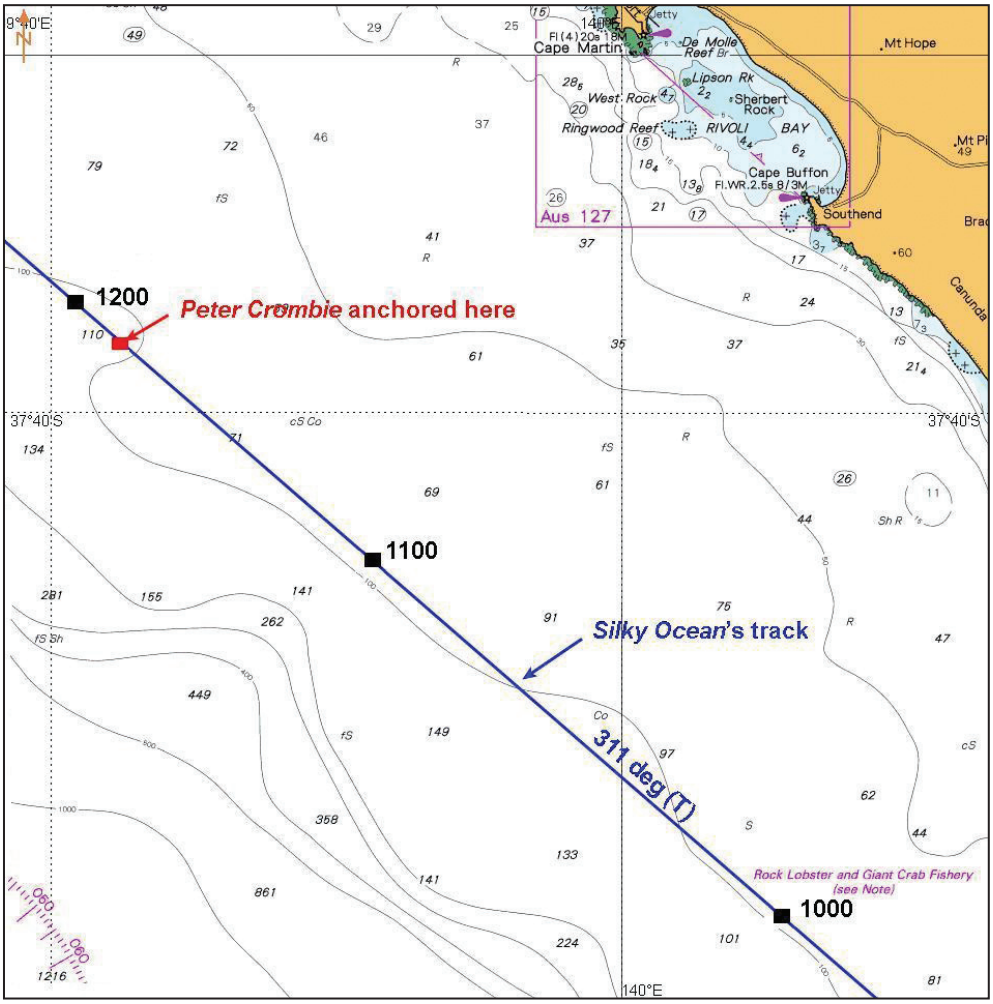
4 The Beaufort scale of wind force, developed in 1805 by Admiral Sir Francis Beaufort, enables sailors to estimate wind speeds through visual observations of sea states. Force 5 is described as a fresh breeze (17–21 knots) and moderate longer waves (2 m) with breaking crests.

Unbeknown to the third mate, *Peter Crombie* had just anchored about 60 miles directly ahead. At the ship's current speed, the next planned course alteration was due at about 1230, well after the time when *Silky Ocean* would encounter *Peter Crombie*.

The third mate plotted the ship's GPS position on the chart at 0900, 1000 and again at 1100 (Figure 4). All of these position fixes confirmed that the ship was following the charted track.

The third mate was alone on the bridge and he stated that he was keeping a lookout both visually and on radar and was monitoring channel 16 on the ship's VHF radio. He recalled that, at about 1140, he could not see ahead of the ship because of the glaring sunshine that was five degrees on the starboard bow. He moved to the operating radar display, on the port side of the bridge, and checked for any targets. The radar did not indicate, to him, that there were any vessels in the area. The third mate remained at the radar and, at this point in time, had not seen *Peter Crombie*.

Figure 4: Section of navigational chart Aus 348



1.3.3 The collision

At about 1150, *Silky Ocean*'s port bow collided with *Peter Crombie*'s port quarter.

Silky Ocean

Silky Ocean's third mate did not see *Peter Crombie* until after the collision, when the fishing vessel was abeam of the ship's number one cargo hold. He estimated that the fishing vessel was between 10 and 15 m from the port side of the ship. He used his binoculars to get a better look and determined that the distance between the fishing vessel and the ship was neither opening nor closing, so he decided not to alter the ship's course.

The four crew members painting the ship's accommodation superstructure first noticed the fishing vessel when it was abeam of the ship's bridge. They could clearly see one of the fishing vessel's crew members putting on his clothes as he stood in the vessel's aft wheelhouse doorway. The fisherman made no gestures towards the ship's crew nor did he shout out. Between themselves, the four men discussed the fact that the fishing vessel was so close to their ship but they assumed that the third mate had seen it and thus did not bring it to his attention.

The third mate had not seen or felt the collision. Consequently, he considered that the ship had only passed close to the fishing vessel. He did not hear any VHF calls on channel 16, he did not attempt to contact the fishing vessel and he did not record the incident it in the bridge log book or call the master.

At about 1215, when the second mate relieved the third mate on the bridge, they discussed what the third mate described as a close quarters situation with a fishing vessel.

At about 1400, after the third mate had eaten his lunch, he reported the incident to the master. The master accepted the third mate's explanation and took no further action.

Peter Crombie

The impact of the collision woke *Peter Crombie*'s skipper. He rushed to the wheelhouse and, when he looked out, he could see that the ship was less than a metre away from his vessel's, extended, port side stabiliser arm. One of the deckhands joined him in the wheelhouse and the two men watched as the ship passed down the port side of their vessel.

When *Peter Crombie* had cleared the ship's stern, the skipper recorded the ship's name and registry. He then attempted to call *Silky Ocean* on VHF channel 16 but he received no reply.

The skipper woke the second deckhand and together the three men began assessing the damage to their vessel. The stern had been seriously damaged (Figure 5). A number of planks had sprung and the vessel was taking on water at an alarming rate. The skipper started the fixed bilge pumps and a portable submersible pump was set up in the engine room. Together the pumps appeared to be keeping up with the ingress of water.

Figure 5: *Peter Crombie*'s damaged port quarter

The skipper decided to weigh anchor and set a course for Robe. He used his mobile telephone to contact *Peter Crombie*'s owners, notifying them of the incident. He then telephoned his brother, who was also a local fishing vessel skipper, and asked him to rendezvous with *Peter Crombie* and escort the damaged vessel into port.

The two vessels rendezvoused and, by about 1700, *Peter Crombie* was all fast alongside the wharf in Robe.

2 ANALYSIS

2.1 Evidence

On 24 and 25 April 2007, two investigators from the Australian Transport Safety Bureau (ATSB) attended *Silky Ocean* in Ardrossan. The master and directly involved crew members were interviewed and they provided accounts of the incident. Photographs of the ship and copies of relevant documents were obtained, including log books, charts, procedures and statutory certificates.

On 26 and 27 April, the ATSB investigators attended *Peter Crombie* in Robe. The skipper was interviewed and he provided his account of the incident. Photographs of the vessel and copies of relevant documents were obtained, including log books, charts and procedures.

On 27 April, the investigators also attended the offices of *Peter Crombie*'s owners in Adelaide, where copies of the vessels statutory certificates were obtained.

2.2 Passage planning

All ships are required to prepare a berth to berth passage plan for their intended voyage. According to the Bridge Procedures Guide[5], the aim of the passage plan is to:

> …establish the most favourable route while maintaining appropriate margins of safety and safe passing distances offshore.

The guide also states that:

> …the charts, publications and other information appropriate for the voyage will need to be gathered together and studied.

Silky Ocean's second mate prepared the passage plan for the ship's voyage from Port Kembla to Ardrossan and, as was the normal routine, it was then checked and approved by the master. As part of the planning process the ship's intended track was marked off on the appropriate navigational charts.

Both the navigational chart Aus 348 and the Australia Pilot[6] contain similar warnings relating to fishing vessels in the area off Robe. The warning on the navigational chart states:

> During the period November to June extensive lobster fishing takes place on the continental shelf between Cape Jaffa and Cape Nelson in shore of the 150 m (80 fm) isobath. Mariners are requested to pass at least 10 miles to seaward of Cape Banks.

Neither the master nor the second mate appropriately considered all of the warnings noted on the charts, or in the Australia Pilot, when they planned for an intended track that would see the ship passing only eight miles to seaward of Cape Banks

5 International Chamber of Shipping, Bridge Procedures Guide, Third Edition 1998.

6 Admiralty Sailing Directions, Australia Pilot, the United Kingdom Hydrographic Office.

If *Silky Ocean*'s passage plan had been prepared so that it took into account these warnings, the ship would have passed at least two miles to seaward of *Peter Crombie*'s position. Furthermore, had the third mate been more aware of the likelihood of encountering fishing vessels in the area, he may have been more alert to their presence.

2.3 The lookout

The International Regulations for the Prevention of Collisions at Sea, 1972 as amended (COLREGS) '…apply to all vessels upon the high seas and in all waters connected therewith navigable by seagoing vessels.'

The COLREGS contain specific requirements for keeping a lookout and actions to avoid collision. Rule 5 'Lookout' states:

> Every vessel shall at all times maintain a proper lookout 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 the risk of collision.

In the case of the collision between *Silky Ocean* and *Peter Crombie*, the crew members on board both vessels were obliged to maintain a proper lookout and thereby avoid a collision. However, the crew of neither vessel appropriately met this basic navigational requirement.

2.3.1 *Peter Crombie*

At about 0830 on 23 April, after anchoring *Peter Crombie* and having a hot drink, the two deck hands went below to sleep. The sleeping accommodation had no portholes and was located beneath the forecastle deck.

The skipper remained in the wheelhouse and kept a lookout while he completed some paper work. The vessel's generator was not running, therefore, the radar and the radios were operating on battery power. At about 1030, the skipper switched off the radios and the radar, in an attempt to maintain the charge in the batteries, and then went below for a rest.

Therefore, from 1030 onwards, *Peter Crombie* was lying at anchor without a lookout by sight or any other means. While this action is contrary to good seamanship and the requirements of the COLREGS, it is a practice that is not uncommon amongst the Australian coastal fishing fleet.

The two deck hands held no formal marine qualifications. Therefore, it is likely that they had little knowledge of the COLREGS. However, the skipper held a master class five certificate. Therefore, he should have been aware of the regulations and his obligations as skipper of *Peter Crombie*.

When *Peter Crombie*'s crew shot the net at 0730 on 23 April, it was the thirteenth time it had been shot since the vessel departed Robe, in the evening of 17 April. They had been working long and quite labour intensive days with very little rest. In fact, the skipper stated that he had not slept since the vessel had departed Robe. It is likely that, on the morning of 23 April, the crew were tired and needed sleep.

With a crew of three on board the fishing vessel it should have been possible for the skipper to organise a roster whereby either himself or one of the deck hands kept a lookout while the other two rested. However, he had not adequately managed

the crew's work/rest periods and he did not consider it necessary to keep a lookout while *Peter Crombie* was at anchor.

The skipper was aware of the warnings on navigational chart Aus 348 and he knew that ships regularly disregarded it. However, he thought that ships should follow the 'steamer lanes' further out to sea. Furthermore, he stated that he did not believe that it was his responsibility to keep a lookout to ensure that a ship did not collide with his vessel while it was at anchor. It was his opinion that large ships had more crew members, more navigational equipment and more money. Therefore, it was their responsibility to avoid a collision.

The skipper was not aware that there are no 'steamer lanes' in the area and he did not consider the fact that a ship's lookout might be ineffective. Furthermore, he was not aware of the limited effectiveness of a ship's radar in detecting small timber vessels, like *Peter Crombie*, particularly when the weather conditions deteriorate.

2.3.2 *Silky Ocean*

When the third mate took over the bridge watch at 0800 on 23 April, after an eight hour period of rest, he recorded the weather conditions, in the log book, as force five[7] with twenty per cent cloud cover and good visibility. He was the sole person on the watch, as was normal shipboard routine during daylight hours.

While the third mate was not yet aware of it, *Peter Crombie* had just anchored about 60 miles directly ahead of *Silky Ocean*.

Silky Ocean remained on an unchanged heading throughout the morning and the third mate plotted the ship's GPS position on the chart at 0900, 1000 and 1100. These positions confirmed, to him, that the ship was following the intended track.

The third mate stated that, at about 1140, he could not see ahead of the ship because of the glaring sunshine that was five degrees on the starboard bow. Because he could not see ahead, he moved to the new x-band radar display, on the port side of the bridge, and checked for any targets. The radar did not indicate, to the third mate, that there were any vessels in the vicinity. He remained at the radar and did not see *Peter Crombie* until after the collision, when the fishing vessel appeared off the port side of *Silky Ocean*'s number one cargo hold.

On the morning of 23 August, *Silky Ocean* was on a course of 311° (T), almost on a north-westerly heading. At 1140, the sun would have been at an altitude of 39° 48' and at a bearing of 55°15' on the ship's starboard bow. Therefore, there would have been no glare from the sun ahead of the ship. Furthermore, in the prevailing force five sea conditions, the sea would have been quite choppy and it is unlikely that there could have been any sunlight reflecting off it.

While it is likely that the third mate was simply not keeping an effective lookout and his account of 'glaring sunshine' is inaccurate, there are a number of factors that may have made it difficult for him to detect *Peter Crombie* either visually or by radar.

7 Force five is described as a fresh breeze (17–21 knots) and moderate longer waves (2 m) with breaking crests.

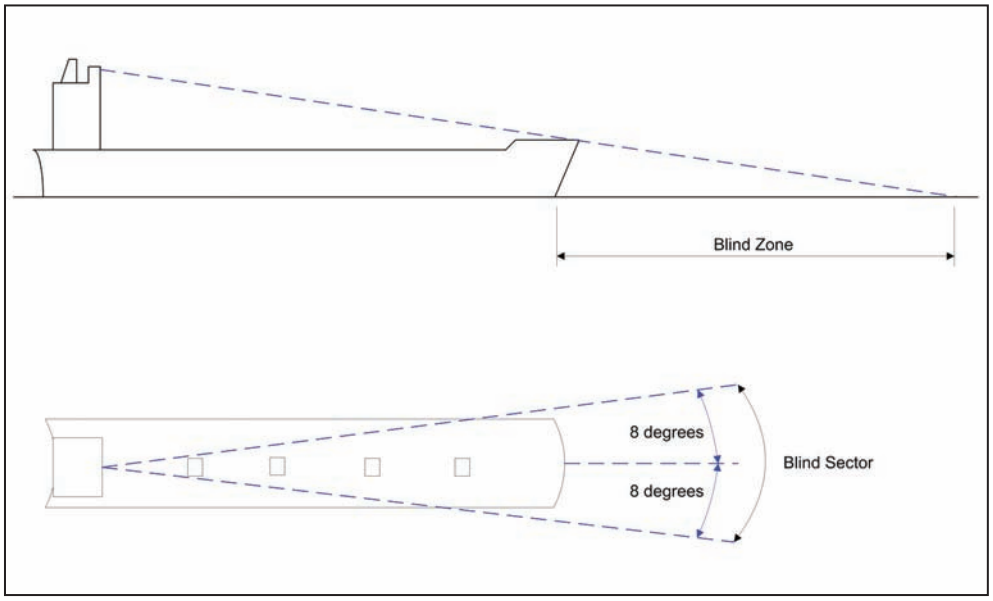
2.3.3 Visibility

In relation to visibility from a ship's bridge, SOLAS states that:

> The view of the sea surface from the conning position shall not be obscured by more than two ship lengths, or 500m, whichever is the lesser, forward of the bow to 10° on either side under all conditions of draught, trim and deck cargo.

Since *Silky Ocean* was not carrying any deck cargo on 23 April, the only areas of obstruction to the bridge watchkeepers field of vision were the 'Blind Sector' (Figure 6) created by the four cargo cranes mounted on the ship's centreline and the 'Blind Zone' forward of the ship's bow.

Figure 6: Visibility diagram



When standing at the centre of the ship's bridge, the cargo cranes have the effect of obscuring, at most, an arc of about eight degrees on either side of ahead. It is normal practice for watchkeepers to move from side to side, across the bridge, to negate this blind sector.

Peter Crombie was almost directly ahead of *Silky Ocean* as the ship approached the anchored fishing vessel and the third mate stated that 'because of the glare from ahead' he had stationed himself at the radar, on the port side of the bridge. If this was the case, the ship's cargo cranes should not have obscured his view of the fishing vessel.

Theoretically, *Peter Crombie* should have been visible to *Silky Ocean*'s third mate at a distance of about 13 miles[8], about 50 minutes before the collision.

Allowing for *Silky Ocean*'s ballast condition on 23 April, the blind zone ahead of the ship would have extended about 175 m forward of the bow. Therefore, once *Silky Ocean* had closed to within 175 m of *Peter Crombie*, the third mate would not have been able to see the fishing vessel. It would have taken *Silky Ocean* about 23 seconds to travel 175 m.

8 Norries Nautical Tables, Extreme Range Table, Page 490, 1983 Edition.

Therefore, the third mate had a period of in excess of 49 ½ minutes (50 minutes minus 23 seconds) in which to see *Peter Crombie*.

The top of *Peter Crombie*'s wheelhouse was about three metres above the vessel's waterline and, while this is not unusually small for a vessel of its size, it is relatively small in comparison with a ship. Furthermore, the fishing vessel was painted predominantly white, with blue trim (Figure 2). While this is a common colour scheme for both fishing vessels and pleasure boats, it is not one that made the vessel easier to see from the bridge of a ship.

In the prevailing force five sea conditions, the crests of the waves would have been breaking (white caps) and the relatively small, low, white and blue vessel may have been difficult to see against the backdrop of blue and white sea, particularly as, at times, the fishing vessel would have been partially disappearing in the troughs of the waves.

2.3.4 Radar detectability

For a ship's radar to detect a small timber vessel, like *Peter Crombie*, it is essential for the radar to be correctly tuned and for its gain and clutter controls to be adjusted for optimum performance.

In the prevailing force five sea conditions, *Peter Crombie* should, in theory, have been visible to *Silky Ocean*'s radar at a range of about six miles[9]. However, such targets are often lost or seen intermittently when sea clutter interferes with their detection, especially at the centre of a radar screen.

With respect to a ship's radar, it is essential for fishing vessel skippers and bridge watchkeepers to understand that:

- Small vessels, issuing weak echoes, can only be detected at a 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.

With reference to the term 'phase out', radar transmissions to a target arrive directly as well as via reflections off the intervening sea surface. If the difference in the direct and reflective path lengths is exactly half a wavelength or combinations thereof (i.e. 1 ½, 2 ½, 3 ½, etc) the signals may cancel each other out and no return transmission is detected.

Furthermore, small vessels, particularly those of non-metallic construction, are made up of a number of small separate reflectors; such as masts, A-frames, stabiliser arms and other metal structures, each at different distances from the ship's 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. However, when the 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 may cancel each other out altogether.

9 Supplement to the Nautical Institute, *Seaways*, January 1994 – Radar detectability and collision risk.

Small vessel owners should, in an attempt to improve their vessel's radar detectability, fit a radar reflector. These can be a simple and inexpensive passive reflector that acts to improve a vessel's radar reflection or an active reflector (radar transponder) that transmits a pulse, when activated by an incoming radar signal, which is detected by radar.

Peter Crombie was not equipped with a radar reflector. The vessel's owners, and skipper, were aware that other fishing vessels could be detected by *Peter Crombie*'s radar and, therefore, thought that *Peter Crombie* would be easily detected by a ship's radar.

While *Silky Ocean*'s third mate stated that he did not detect *Peter Crombie* on the ship's radar, he also demonstrated a lack of understanding of the radar's gain and clutter controls. Furthermore, it is unlikely that he fully understood the difficulties the radar had in detecting small timber vessels.

It is probable that, in the prevailing conditions, *Silky Ocean*'s radar only detected irregular radar echoes from *Peter Crombie*. It is also possible that the incorrect setting of the ship's radar gain and clutter controls aided in *Peter Crombie* being lost in the clutter as the two vessels closed.

2.3.5 Automatic identification system (AIS)

Vessel traffic services (VTS) and ships use AIS for identifying and locating nearby ships. The system helps to resolve the difficulty in positively identifying ships by providing them with a means for exchanging identification, position, course, speed and other ship data.

The system works by integrating a VHF transceiver with an electronic navigation system, such as a GPS, and other on board navigational equipment.

While it is not a requirement for small fishing vessels to be fitted with an AIS unit, it is a SOLAS requirement that an AIS unit is fitted on board all ships of 300 or more gross tonnes, and all passenger ships regardless of size.

Had *Peter Crombie* been fitted with an AIS unit, the vessel would probably have been positively identifiable on board *Silky Ocean*. It is likely that, armed with this information, *Silky Ocean*'s third mate would have been in a position to take appropriate action to avoid the collision.

2.4 Actions after the collision

Article 98 of the United Nations Convention of the Laws of the Sea (UNCLOS) clearly outlines the responsibilities of a ship's master following a collision at sea. It states that:

> Every state shall require the master of a ship flying its flag, in so far as he can do so without serious danger to the ship, the crew or the passengers, after a collision, to render assistance to the other ship, its crew and its passengers and, where possible, to inform the other ship of the name of his own ship, its port of registry and the nearest port at which it will call.

As the master's delegate on the bridge, the third mate was responsible to ensure that his standing orders were followed. It was also his responsibility to ensure that all the appropriate rules and regulations were followed.

Silky Ocean's third mate did not see, feel or hear the collision between his ship and *Peter Crombie*. Therefore, he surmised that the two vessels had merely passed close by one another. He did not immediately report the incident to the ship's master and he made no attempt to contact the fishing vessel's crew to see if they required assistance. Furthermore, he made no attempt to determine if the fishing vessel had been damaged. Consequently, he disregarded his legal and moral obligations to ensure the safety of the fishing vessel's crew.

Peter Crombie's skipper stated that he attempted to call *Silky Ocean* after the collision using his vessel's VHF radio set to channel 16. However, he also stated that had been experiencing difficulties transmitting on the VHF radio over the preceding days.

Silky Ocean's third mate denied hearing any channel 16 transmissions after the collision.

It is possible that, when *Peter Crombie*'s skipper tried calling *Silky Ocean* on VHF channel 16, after the collision, that the equipment failed to transmit.

2.5 Previous collisions

Since 1982, there have been 56 collisions or near misses involving ships and small vessels that have been investigated by the ATSB or its predecessor, the Marine Incident Investigation Unit.

The ATSB has published a number of safety investigation reports covering ship/small vessel collisions and, in an effort to further highlight the ongoing dangers and similar contributing factors in these incidents, has also published a number of safety bulletins.

Copies of the safety investigation reports and safety bulletins can be downloaded from the website www.atsb.gov.au.

3 FINDINGS

3.1 Context

At about 1150 on 23 April 2007, the Panamanian registered bulk carrier *Silky Ocean* collided with the Australian fishing vessel *Peter Crombie*.

At the time of the collision, *Peter Crombie* was at anchor and its three crew members were below decks resting. The weather was fine with a partly cloudy sky and good visibility. The wind was from the east-southeast at 12 to 18 knots, there was a swell of about one metre from the same direction and seas of about 1.5 m.

While *Silky Ocean* sustained no damage as a result of the collision, *Peter Crombie* was taking on water. Fortunately, the fishing vessel's bilge pumps were able to keep up with the ingress of water and the vessel returned safely to port.

From the evidence available, the following findings are made with respect to the collision between *Silky Ocean* and *Peter Crombie*. The findings should not be read as apportioning blame or liability to any particular organisation or individual.

3.2 Contributing safety factors

1. *Silky Ocean*'s master and crew did not appropriately consider the information provided by the navigational charts and publications when they planned the ship's passage from Port Kembla to Ardrossan. This led to the ship sailing through a charted fishing area and being two miles closer to the coastline than was recommended. *[Safety issue]*
2. During the period of time leading up to the collision, *Silky Ocean*'s third mate was not keeping a proper lookout by sight and he was not appropriately using all means available, in particular the radar, to make a full appraisal of the situation and the risk of collision. *[Safety issue]*
3. *Silky Ocean*'s third mate assumed that a collision between his ship and *Peter Crombie* had not occurred. He did not immediately report the incident to the ship's master and he made no attempt to contact the damaged fishing vessel. In doing so, he disregarded his legal and moral obligations to ensure the safety of the fishing vessel's crew. *[Safety issue]*
4. At the time of the collision, there was no lookout being maintained on board *Peter Crombie*. The skipper had not adequately managed the crew's work/rest periods and, consequently, on the morning of 23 April, they were all tired and needed to sleep. Furthermore, the skipper did not consider it necessary to keep a lookout while the vessel was at anchor. *[Safety issue]*
5. *Peter Crombie* was possibly difficult to detect, either visually or by radar, because of the vessel's timber construction, paint scheme, lack of a radar reflector and the prevailing weather conditions. *[Safety issue]*

4 SAFETY ACTIONS

4.1 ATSB safety advisory notices

MS20070018

Silky Ocean's master and crew did not appropriately consider the information provided by the navigational charts and publications when they planned the ship's passage from Port Kembla to Ardrossan. This led to the ship sailing through a charted fishing area and being two miles closer to the coastline than was recommended.

The Australian Transport Safety Bureau advises that ship owners, operators and masters should consider the safety implications of this safety issue and to take action where it is considered appropriate.

MS20070019

During the period of time leading up to the collision, *Silky Ocean*'s third mate was not keeping a proper lookout by sight and he was not appropriately using all means available, in particular the radar, to make a full appraisal of the situation and the risk of collision.

The Australian Transport Safety Bureau advises that ship owners, operators and masters should consider the safety implications of this safety issue and to take action where it is considered appropriate.

MS20070020

Silky Ocean's third mate assumed that a collision between his ship and *Peter Crombie* had not occurred. He did not immediately report the incident to the ship's master and he made no attempt to contact the damaged fishing vessel. In doing so, he disregarded his legal and moral obligations to ensure the safety of the fishing vessel's crew.

The Australian Transport Safety Bureau advises that ship owners, operators and masters should consider the safety implications of this safety issue and to take action where it is considered appropriate.

MS20070021

At the time of the collision, there was no lookout being maintained on board *Peter Crombie*. The skipper had not adequately managed the crew's work/rest periods and, consequently, on the morning of 23 April, they were all tired and needed to sleep. Furthermore, the skipper did not consider it necessary to keep a lookout while the vessel was at anchor.

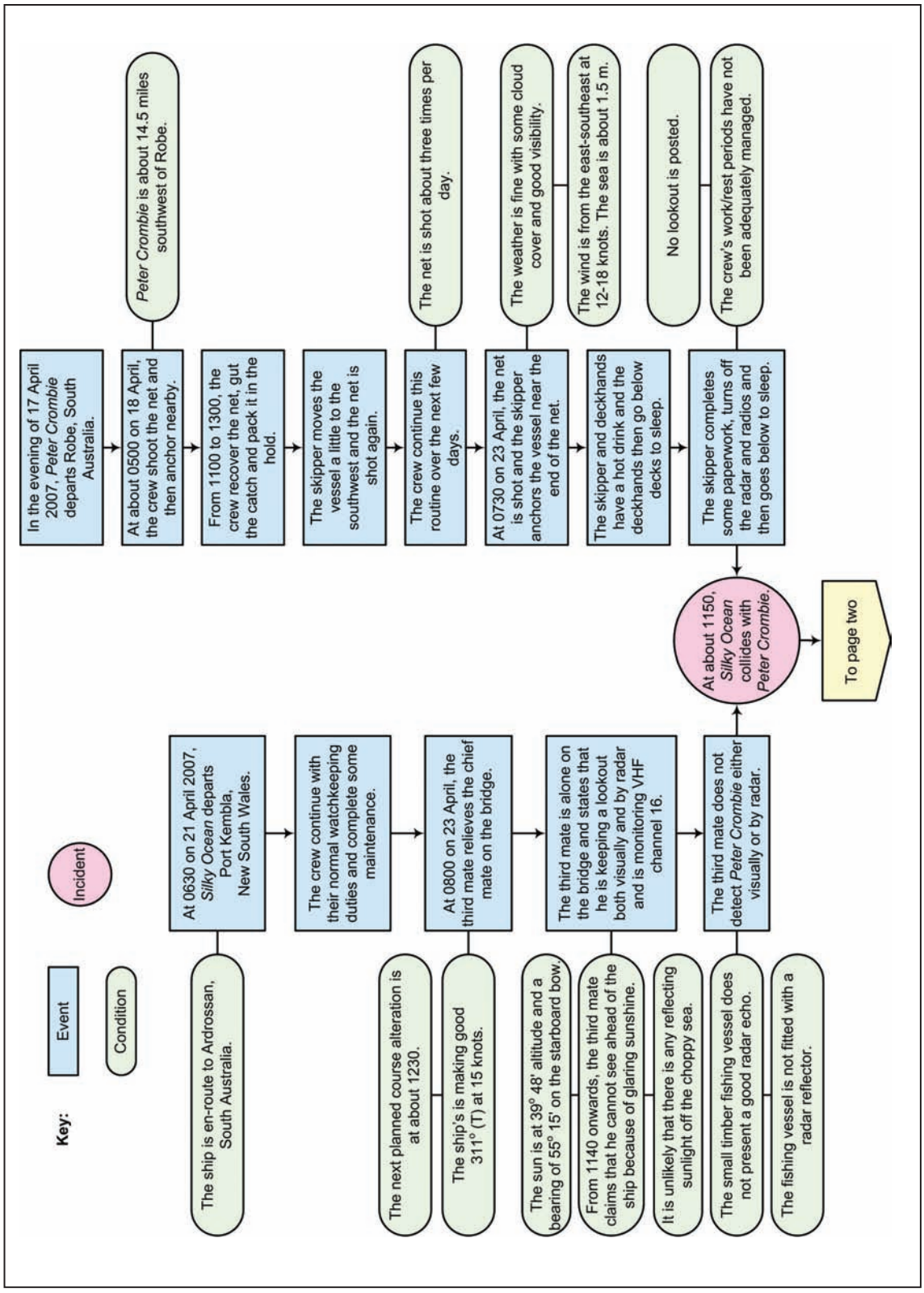
The Australian Transport Safety Bureau advises that fishing vessel owners, operators and skippers should consider the safety implications of this safety issue and to take action where it is considered appropriate.

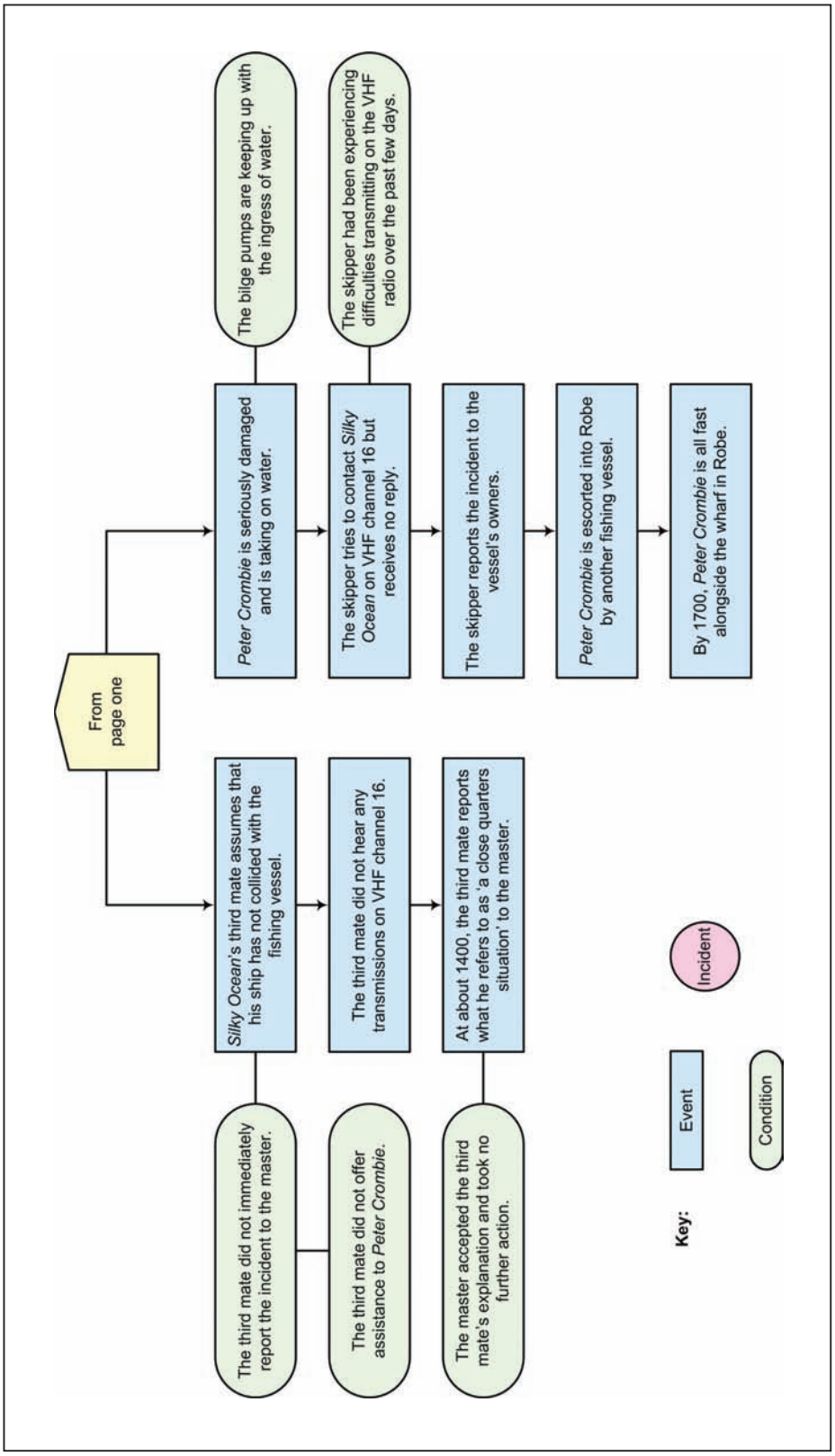
MS20070022

Peter Crombie was possibly difficult to detect, either visually or by radar, because of the vessel's timber construction, paint scheme, lack of a radar reflector and the prevailing weather conditions.

The Australian Transport Safety Bureau advises that fishing vessel owners, operators and skippers should consider the safety implications of this safety issue and to take action where it is considered appropriate.

APPENDIX A : EVENTS AND CONDITIONS CHART




From page one
Peter Crombie is seriously damaged and is taking on water.
The bilge pumps are keeping up with the ingress of water.
The skipper tries to contact Silky Ocean on VHF channel 16 but receives no reply.
The skipper had been experiencing difficulties transmitting on the VHF radio over the past few days.
The skipper reports the incident to the vessel's owners.
Peter Crombie is escorted into Robe by another fishing vessel.
By 1700, Peter Crombie is all fast alongside the wharf in Robe.
Silky Ocean's third mate assumes that his ship has not collided with the fishing vessel.
The third mate did not hear any transmissions on VHF channel 16.
At about 1400, the third mate reports what he refers to as 'a close quarters situation' to the master.
The third mate did not immediately report the incident to the master.
The third mate did not offer assistance to Peter Crombie.
The master accepted the third mate's explanation and took no further action.
Key:
Event
Incident
Condition

APPENDIX B : SHIP INFORMATION

Silky Ocean

IMO Number	9118446
Call sign	3FOD5
Flag	Panama
Port of Registry	Panama
Classification society	ClassNK
Ship Type	Geared bulk carrier
Builder	Tsuneishi Shipbuilding, Japan
Year built	1995
Owners	Lucertia Shipping
Ship managers	Santoku Senpaku, Japan
Gross tonnage	26 049
Net tonnage	14 872
Deadweight (summer)	45 665 tonnes
Summer draught	11.62 m
Length overall	185.74 m
Length between perpendiculars	177.00 m
Moulded breadth	30.40 m
Moulded depth	16.50 m
Engine	Mitsui MAN B&W 6S50MC
Total power	7171 kW
Crew	20

Peter Crombie

Identifying number	M150
Flag	Australian
Home port	Robe, South Australia
Survey authority	Transport SA
Owners	Southern Sea Eagles and E & Z Toumazos Family Trust
Vessel type	Timber fishing vessel – Class 3B
Where built	Ballina, New South Wales
Year built	1977
Construction	Hardwood planks over hardwood frames
Gross tonnage	48.1
Length overall	16.62 m
Moulded breadth	5.56 m
Moulded depth	2.29 m
Engine	Gardner diesel engine
Total power	150 kW
Crew	3

APPENDIX C : SOURCES AND SUBMISSIONS

Sources of information

The master and crew of *Silky Ocean*

The owners, skipper and crew of *Peter Crombie*

The Australian Maritime Safety Authority (AMSA)

References

The International Convention for the Safety of Life at Sea, 1974, as amended

International Chamber of Shipping, Bridge Procedures Guide, Third Edition 1998

Supplement to the Nautical Institute, Seaways, January 1994 – Radar detectability and collision risk

Admiralty Sailing Directions, Australia Pilot, the United Kingdom Hydrographic Office

Norries Nautical Tables, 1983 Edition.

Submissions

Under Part 4, Division 2 (Investigation Reports), Section 26 of the *Transport Safety Investigation Act 2003*, the Executive Director may provide a draft report, on a confidential basis, to any person whom the Executive Director considers appropriate. Section 26 (1) (a) of the Act allows a person receiving a draft report to make submissions to the Executive Director about the draft report.

The final draft of this report was sent to *Peter Crombie*'s skipper and owner, *Silky Ocean*'s master, third mate and ship manager and the Australian Maritime Safety Authority (AMSA). The submissions have been included and/or the text of the report was amended where appropriate.

APPENDIX D : MEDIA RELEASE

Bulk carrier collision risk with fishing vessels

The ATSB has found that there was no effective lookout being maintained on board either a fishing vessel or a bulk carrier when the two vessels collided off the South Australian coast on 23 April 2007, the latest in more than 50 such collisions investigated.

The Australian Transport Safety Bureau investigation again found that the fishing vessel was possibly difficult to detect, either visually or by radar, because of its timber construction, lack of a radar reflector, paint scheme and the prevailing weather conditions.

On the morning of 23 April, the Australian fishing vessel *Peter Crombie* was at anchor about 30 miles south of Robe, South Australia and the vessel's three crew members were below decks sleeping. The Panamanian registered bulk carrier *Silky Ocean* had sailed from Port Kembla, New South Wales, on 21 April, and was en-route to Ardrossan, South Australia.

The weather was fine with a partly cloudy sky and good visibility. There was a swell of about one metre from the east-southeast and seas of about 1.5 m. The wind was from the east-southeast at 12 to 18 knots.

At about 1150, Silky Ocean was on a course of 311° (T) when it collided with *Peter Crombie*. *Silky Ocean*'s bridge watchkeeper had not detected *Peter Crombie* either visually or on the ship's radar.

After the collision, *Peter Crombie*'s skipper tried to contact the ship using his vessel's VHF radio. However, *Silky Ocean*'s bridge watchkeeper did not acknowledge the call and made no attempt to communicate with the fishing vessel.

While *Silky Ocean* had sustained no damage as a result of the collision, *Peter Crombie*'s hull had been damaged and the vessel was taking on water. Fortunately, the fishing vessel's bilge pumps were able to keep up with the ingress of water.

Peter Crombie's skipper notified the vessel's owners of the collision and then set a course for Robe. By 1700, the vessel was all fast alongside the wharf in Robe.

The ATSB is concerned that this type of collision continues to occur in Australian waters, sometimes leading to serious injury or fatality; and has issued five safety advisory notices with the aim of preventing similar incidents.

Independent investigation into the collision between the Panamanian registered bulk carrier *Silky Ocean* and the Australian fishing vessel *Peter Crombie* off the South Australian coast on 23 April 2007