Australian Government
Australian Transport Safety Bureau

# Collision between the container ship *Glasgow Express* and the fishing vessel *Mako*

15 NM south of Cape Woolamai, Victoria | 12 August 2017

Investigation

**ATSB Transport Safety Report**
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**Addendum**

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# Safety summary

## What happened

At 2000 on 12 August 2017, the fishing vessel *Mako* departed San Remo, Victoria, bound for fishing grounds about 3 hours away. Once clear of Cape Woolamai, *Mako* maintained a steady course (210°) and speed to the south-west. At the same time, the container ship *Glasgow Express* was passing Cape Liptrap heading north-west. The ship was bound for Melbourne, Victoria, and was maintaining a steady course (299°) and speed. From about 2030 the vessels were on a collision course.

No avoiding action was taken by either vessel and, at about 2246, they collided.

## What the ATSB found

The ATSB found that a proper lookout by 'all available means' was not being maintained on either vessel.

*Glasgow Express*'s bridge team saw and monitored *Mako* visually from about 2200. However, a full appraisal of the situation using other instruments or means available on the bridge (such as radar) was not done. As a consequence, the situation was misinterpreted and the risk of collision was not identified. Therefore, no avoiding action was taken.

Prior to handing over the watch at 2230, *Mako*'s watchkeeper identified *Glasgow Express* by radar and visually. However, the information was misinterpreted and it was concluded that the *Glasgow Express* was passing clear, ahead of the fishing boat, and no avoiding action was taken. Then, after taking the watch, *Mako*'s second watchkeeper did not see the *Glasgow Express* until moments before the collision.

In addition, *Mako* was under way with all external lights on. This made the vessel more easily seen, but reduced the ability for *Glasgow Express*'s bridge team to accurately visually appraise the situation. The bright lights also reduced *Mako*'s watchkeeper's night vision and ability to distinguish features beyond the glare of the lights.

The ATSB also noted that *Mako*, similar to other fishing vessels of this design, had a large fishing net winch drum mounted on deck forward of the wheelhouse. This winch drum restricts forward vision and may limit the ability to maintain a proper lookout unless accounted for in on-board procedures and training.

## What's been done as a result

*Glasgow Express*'s operator undertook a fleet-wide information and education program which outlined the incident and emphasised the need to use all available means to maintain safe navigation in accordance with the collision regulations.

## Safety message

The ATSB continues to see collisions between trading ships and small vessels. A common contributing factor has been the failure to use all available means to accurately appraise a situation and the risk of collision.

The ATSB reinforces to masters, owners, operators and skippers of all vessels the importance of a proper lookout by all available means including radar. Proper use of radar equipment including long range scanning and radar plotting allows for early detection, assessment and warning of vessels posing a risk of collision. This allows the watchkeeper sufficient time to take early and considered action to avoid collision in accordance with the *International regulations for preventing collisions at sea, 1972* (as amended) (COLREGs).

# The occurrence

## Overview

On the evening of 12 August 2017, the timber-hulled fishing vessel, *Mako,* collided with the container ship *Glasgow Express*, about 15 NM south of Cape Woolamai, Victoria. Both vessels had been on settled courses and speeds for at least 2 hours before the collision. Despite both crews detecting and monitoring the other vessel, both vessels maintained their respective courses until they collided.

## *Mako*

Earlier that evening, at 2000,[1] the 14.2 m long *Mako* (Figure 1) departed the fishing harbour in San Remo, Victoria, for a 3 day fishing trip. On board were the skipper and one deckhand. They had provisioned and fuelled the boat earlier in the day and were planning to be at their intended fishing grounds, in Bass Strait, at about 2300. In preparation for departure, the skipper had started and checked the boat's navigational equipment (radar, chart plotter and VHF radio) and ensured the navigation lights were operating.

**Figure 1: *Mako* alongside in San Remo after the collision**

Source: ATSB

The crew reported that as they sailed out the channel, all deck working lights and external lights were on as they set the paravanes (stabilising arms). The lights remained on as the skipper steered the vessel out to sea. At about 2030, they passed the heads at San Remo at a speed of about 6 to 6.5 knots[2] and the skipper set a course of about 210°, which he intended to keep until

[1] All times referred to in this report are local time, Coordinated Universal Time (UTC) + 10 hours.

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

nearing the destination. He took the watch while the deckhand settled in and went below for a rest.

The weather was overcast with light rain showers and about 15 knot winds from the south-west. The boat was rolling moderately in seas from the south-west and sea spray occasionally passed over the deck. The spray and light rain splattered the wheelhouse windows with water droplets.

At about 2230, the skipper roused the deckhand to take the watch while he rested prior to reaching the fishing grounds. During his watch the skipper had monitored a number of ships on the boat's radar and visually. He passed on information regarding his last sighting of a ship that he determined was passing from port to starboard, ahead and well clear of *Mako*. All else seemed clear. He then lay down to rest on the bunk in the wheelhouse, immediately behind the conning position, and the deckhand took over. The deckhand reported that he did not verify the sighting of the ship or its echo on the radar as he settled in for the watch.

## *Glasgow Express*

Meanwhile, at 2000, some 40 NM to the south-east of *Mako*, the 281 m long *Glasgow Express* (Figure 2) was en route from Sydney to Melbourne. At that time, the navigation watch changed and the second mate took over as officer of the watch (OOW), assisted by an ordinary seaman as lookout. The ship was south of Cape Liptrap, with a speed of 13.5 knots, on a course of 299°, bound for the pilot boarding-ground off the entrance to Port Phillip (Figure 3). The bridge log book recorded conditions as cloudy with good visibility, with the ship working moderately in rough seas with winds at Force 6[3] (22 to 27 knots) and a sea state of 5.[4]

**Figure 2: *Glasgow Express***


Source: Hapag-Lloyd

At 2200, the lookout left the bridge to complete routine safety rounds. The second mate reported that, at about this time, he visually identified a well-lit vessel (*Mako*) about 3 points[5] to starboard of

[3] 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

[4] Sea state 5 equals rough conditions with wave heights from 2.5 to 4 metres (Mariner's Handbook).

[5] A compass point of 11.25°.

the bow. He watched the target and concluded it was on a similar course as the ship, and estimated it would pass more than 1 NM to starboard as *Glasgow Express* overtook it.

At about 2230 the lookout returned to the bridge and reported all was well on the safety rounds. He went to his lookout position on the starboard side of the bridge and also identified the vessel to starboard. The lookout reported the sighting to the second mate and together they agreed that the vessel was ahead of them, they were overtaking it, and that it would pass well clear of the ship. They also concluded the target was a fishing boat maintaining a similar course to their own. The lookout then maintained visual observation of the target. The second mate stated he did not attempt to identify, confirm and/or track the target on the radar located adjacent to the lookout's position.

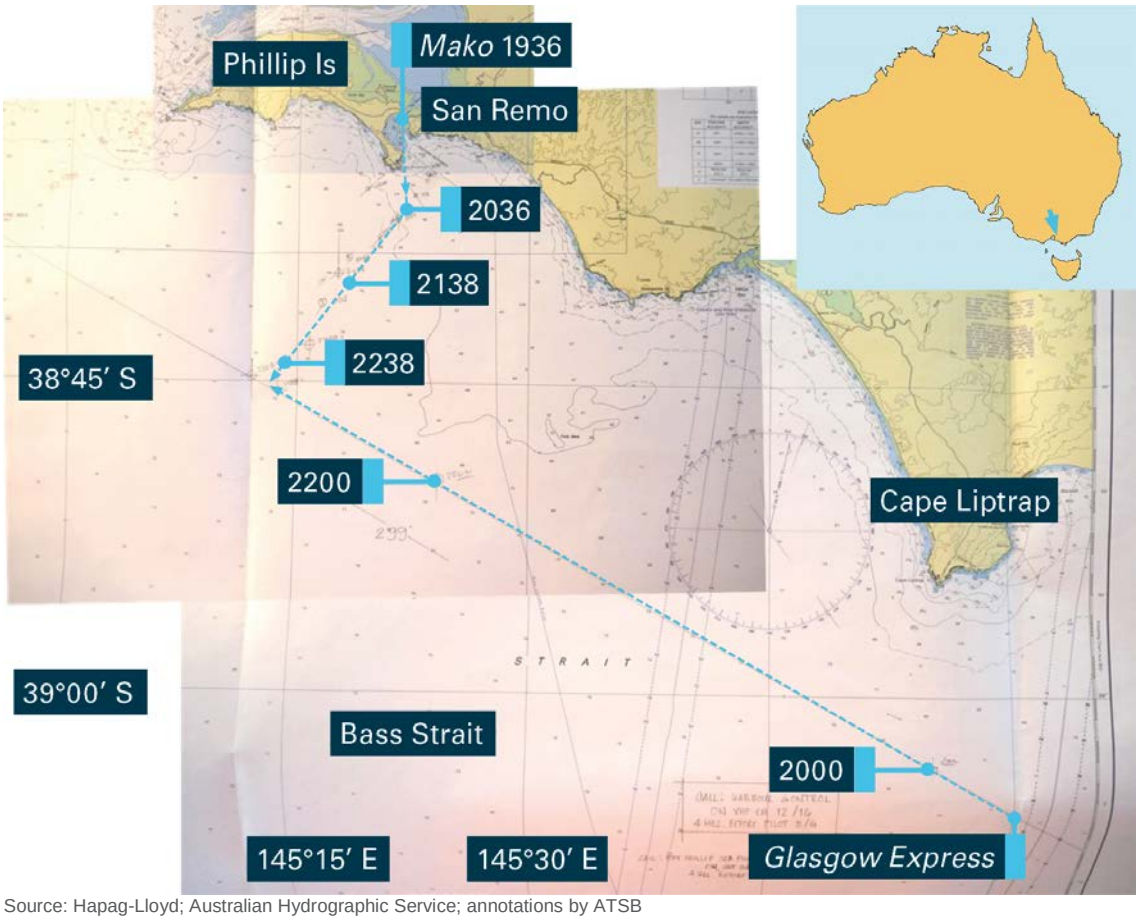
Following the collision, some data was downloaded from the *Glasgow Express*'s voyage data recorder (VDR). This data showed that, at 2222, an intermittent echo appeared on *Glasgow Express*'s S-band radar. This echo was *Mako*; 2.5 points to starboard and 5.5 NM from the ship. From 2232 onward, the echo would have been consistently visible on this radar.

## The collision

At 2234, *Mako* and *Glasgow Express* were about 3 NM apart on converging courses. *Mako*'s deckhand had not observed the ship and was unaware of its presence. *Glasgow Express*'s bridge team continued to observe the brightly-lit *Mako* and to assumed that their ship would overtake and pass well clear, and to port of it. The *Glasgow Express'*s second mate continued to rely on visual observations for his understanding of the situation.

The fishing boat and the ship continued on their respective courses without change until, at 2246, in position 38° 45.5' S 145° 13.6' E, they collided (Figure 3).

**Figure 3: Composite excerpt of *Glasgow Express*'s navigational chart (Aus 801) showing vessel tracks to collision**




Source: Hapag-Lloyd; Australian Hydrographic Service; annotations by ATSB

Moments before the collision, *Mako*'s deckhand become aware of a light on the port beam, visible out the window of the portside wheelhouse door. He went to the door, shielded his eyes and looked out in time to see *Glasgow Express*'s bow bearing down on the fishing boat. He then saw the ship's side and felt the impact. The skipper was immediately roused from his rest and moved the engine control lever to full astern. The boat was turned to starboard by the passing ship and the port stabiliser arm made contact with the ship's side.

Shortly before impact, *Glasgow Express*'s second mate became aware of the immediate danger. He directed the lookout to take the wheel, engage hand steering and turn immediately, hard to port. At the same time, he sounded the ship's whistle. The ship turned to port as the fishing boat contacted the hull on the starboard side in the region of cargo hold number 2—about 50 m aft of the bow.

## After the collision

The fishing boat scraped down the starboard side and then passed aft of the ship. The fishing boat's port stabiliser arm broke off and was dragged alongside by its lines. The skipper cut the stabiliser arm free and then attempted to determine the condition of the deckhand and the boat. The deckhand was shaken but otherwise unhurt. Inspection of the bow and forecastle revealed damage to the bow but no ingress of water.

*Glasgow Express* continued to turn to port and slowed. The second mate called the master to report the collision and the master, who had been asleep in his cabin, hurried to the bridge. As the ship continued to turn, the second mate called *Mako* on the radio seeking information and offering assistance.

Over the following minutes the situation calmed. Radio contact continued between the ship's master and the fishing boat skipper and shore authorities were alerted to the incident. The Australian Volunteer Coast Guard station at Hastings was alerted and activated its rescue boat to go to *Mako*'s assistance.

The ship's master confirmed the condition of the fishing boat and crew and kept *Glasgow Express* standing by. The ship then escorted *Mako* back toward San Remo and the approaching coast guard boat. At 0130 on 13 August, *Mako* was taken under escort by the coast guard rescue boat and *Glasgow Express* was released. At 0200, the master resumed the ship's passage toward Melbourne.

*Mako* was escorted to San Remo and at about 0300 was safely alongside.

**Figure 4: Composite representative image showing the scale and approximate point of collision**

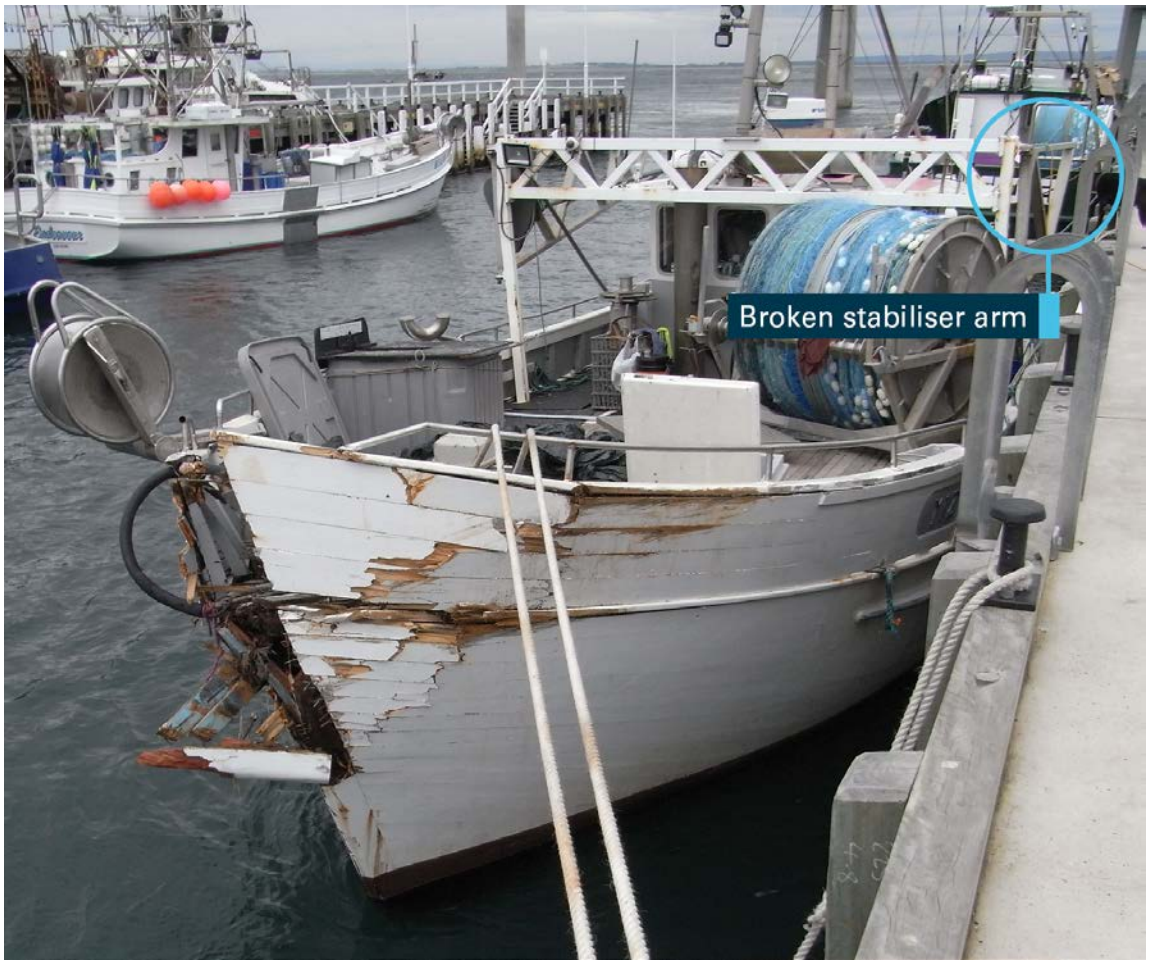

Source: Hapag-Lloyd; ATSB

## Damage

*Mako* suffered significant damage from the collision. The stem post was broken and the forecastle space was opened to the outside (Figure 5). However, the boat had remained otherwise watertight and did not take on any water. In addition, about 1 m of the bow was stoved in, the sheer strake[6] was marked and scratched for several metres along the port side, and the port stabiliser arm had broken away and the stabiliser arm mounting structure, including the boat's main mast, had been pushed to starboard.

[6] Sheer strake – the top strake, or plank, of a wooden vessel running from stem to stern, level with the upper deck.

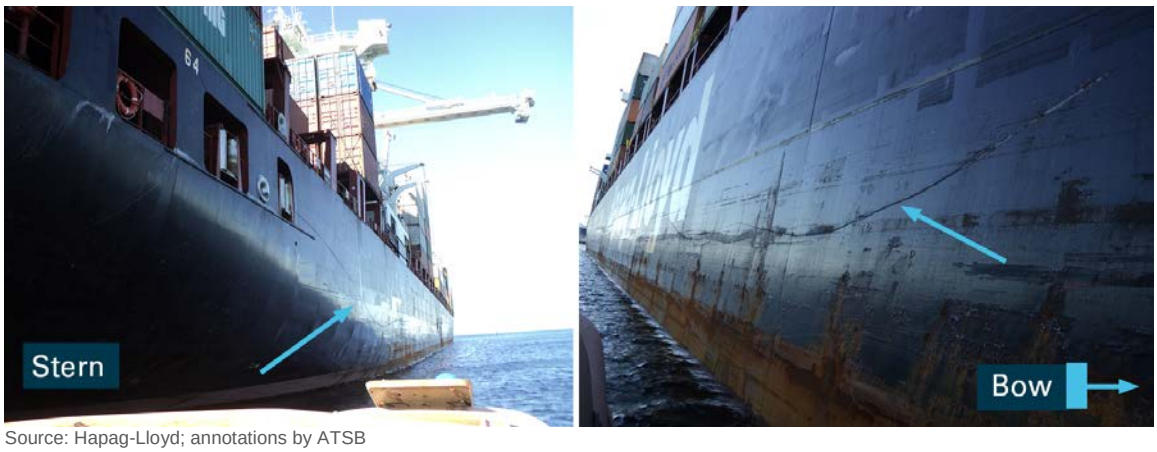
**Figure 5: Damage to *Mako*.**




Source: ATSB

*Glasgow Express* was inspected while alongside in Melbourne. Scratch marks from *Mako*'s stabiliser arm were visible from the impact point, about 50 m aft of the bow on the starboard side, to the stern (Figure 6). No other damage was found.

**Figure 6: Scratches along the side of *Glasgow Express***




Source: Hapag-Lloyd; annotations by ATSB

# Safety analysis

## Introduction

The container ship *Glasgow Express* and the fishing vessel *Mako* collided at about 2246 on 12 August 2017. At the time the vessels were about 15 NM south of Cape Woolamai, Victoria. Both vessels had been settled on course and speed for at least 2 hours before the collision.

This analysis will examine the incident, collision avoidance requirements and the relationship to the lookouts kept on both vessels. It will also assess the relevance of automatic identification systems (AIS) and voyage data recorders (VDR) to this incident.

## The collision

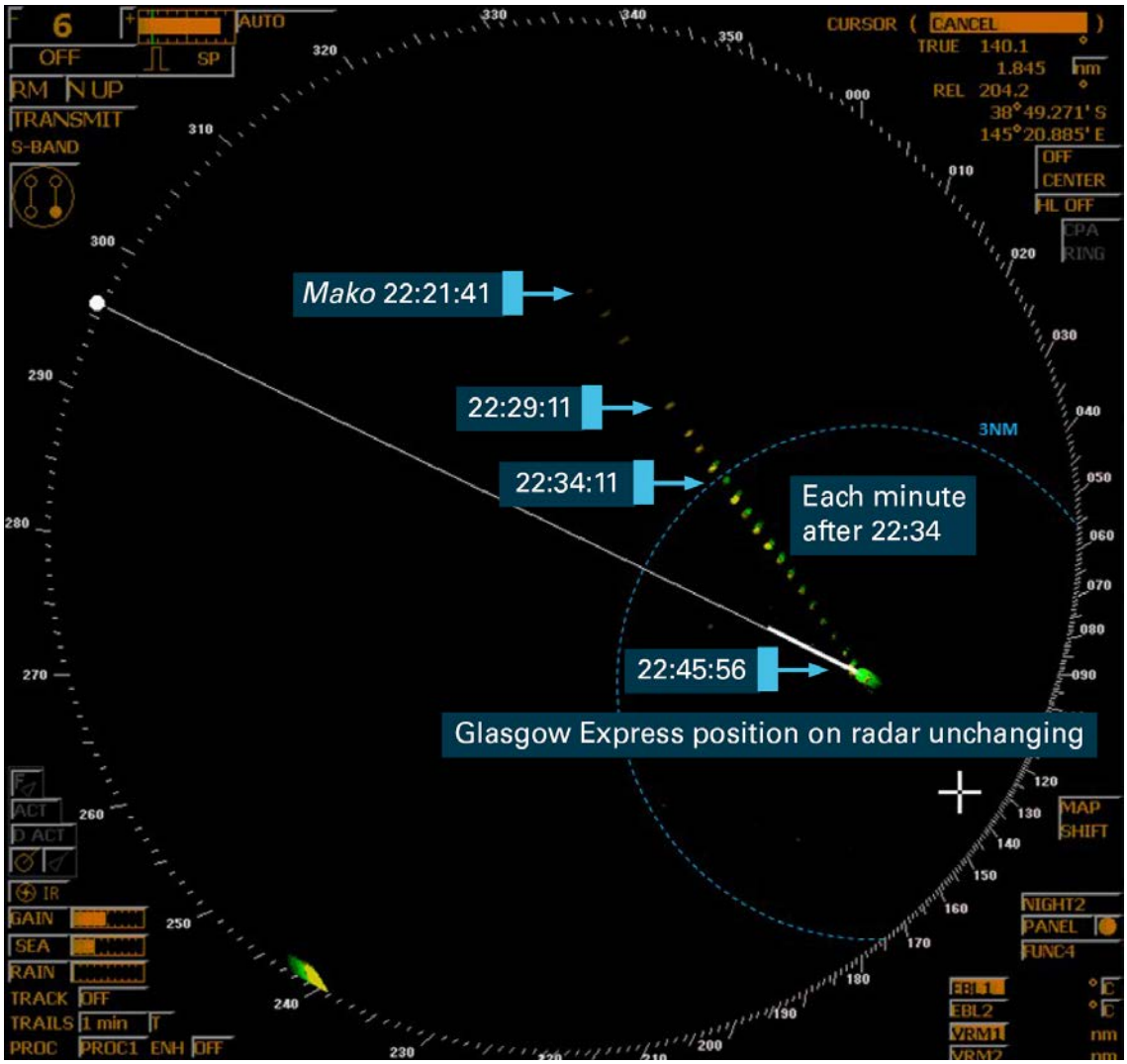
At 2036, *Mako* was settled on a course of about 210° at a speed of about 6 knots. At the same time, 31 NM to the south-east, *Glasgow Express* was settled on a course of 299° at a speed of 12 knots. From this point the two vessels were on a collision course unless some avoiding action was taken.

*Glasgow Express*'s officer of the watch (OOW) first sighted *Mako* at about 2200. Together, the OOW and the lookout mistakenly interpreted the visual information and agreed that they were overtaking the fishing vessel. No action was taken to use any other bridge equipment to confirm the actual situation, despite *Mako* being visible on the S-band radar intermittently from 2222, and continuously from 2232 (Figure 7).

On board *Mako*, visual and radar information was also misinterpreted, and it was assumed that *Glasgow Express* was passing well clear and ahead of the fishing vessel. As a consequence, the risk of collision was not identified and no avoiding action was taken.

At 2234 the two vessels were 3 NM apart and clearly visible to each other. However, the risk of collision was not identified on either vessel. As a consequence, no avoiding action was taken until the collision occurred 12 minutes later.

**Figure 7: *Glasgow Express*'s S-band radar image at 22:21:41 with the progress of *Mako* overlaid to the time of the collision**




Source: Hapag-Lloyd with annotations by ATSB

## Lookout and collision avoidance

### *Industry requirements and guidance*

The *International regulations for preventing collisions at sea, 1972* (as amended) (COLREGs) apply to all vessels at sea, including fishing vessels. The COLREGs require every vessel to maintain a proper lookout by 'all available means' so as to be able to make a full appraisal of the situation and to determine the risk of collision.

Specific mention is made in the regulations of the proper use of radar equipment to obtain early warning of the risk of collision. The regulations also warn against making assumptions based on scant information.

In addition, the COLREGs advise, among other things, that the risk of collision:

> …shall be deemed to exist if the compass bearing of an approaching vessel does not appreciably change…

Other guidance and regulations[7] require that masters and all persons engaged in watchkeeping duties observe the standards and guidance regarding watchkeeping set out in Sections A-VIII/2 and B-VIII/2 of the International Convention of Training, Certification and Watchkeeping for Seafarers (STCW code).[8] The STCW code states that the officer in charge of the navigational watch is the master's representative and is primarily responsible at all times for the safe navigation of the ship and for complying with the COLREGs.

STCW guidance on the principles to be observed in keeping a navigational watch require that:

- a proper lookout must be maintained at all times
- using all available means
- fully appraising the situation and the risk of collision
- in compliance with the COLREGs.

In performing a navigational watch, the STCW code requires that the OOW, among other things:

- shall take frequent and accurate compass bearings of approaching vessels as a means of early detection of risk of collision
- take early and positive action to avoid collision and ensure the actions are effective
- use radar in compliance with the COLREGs
- ensure that radar echoes are detected as early as possible
- ensure that plotting and/or systematic analysis of radar echoes is commenced in ample time.

With regard to interaction between vessels, the COLREGs also state that any vessel overtaking any other shall keep out of the way of the vessel being overtaken. Furthermore, in a crossing situation where a risk of collision exists, the vessel which has the other vessel on its starboard side shall keep out of the way of that other vessel and shall as far as possible avoid crossing ahead of it.

## *Glasgow Express*

The operator of *Glasgow Express*, Hapag-Lloyd Ship Management, has established and introduced a Safety Management (and Environmental Protection) System (SMS) throughout its fleet in accordance with the ISM Code.[9] This structured and documented system, in the form of a Safety Management Manual comprising the ISM Main Manual and ISM Emergency Plans, enables company personnel to effectively implement company policy.

The SMS includes guidance and procedures in relation to the navigation of the ship and maintaining a navigational watch. These procedures provide general guidelines for proper performance of the navigational watch, with reference to applicable and relevant rules, regulations and industry guidance. In particular, the SMS procedures require that at all times ships need to be navigated in compliance with the COLREGs, the master's standing orders, and the STCW Code, as well as the knowledge and application of the guidance contained in the Bridge Procedures Guide.[10]

*Glasgow Express*'s OOW sighted the brightly-lit *Mako* at about 2200, at a distance of 11 NM. From that point, the OOW, and later the lookout, visually monitored it. They concluded, from their observations, that they were overtaking the fishing vessel, and believed the white lights were directed toward the stern of the fishing vessel and that one of them was its sternlight. Although the

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7 See for example, Australian Maritime Safety Authority 2013, *Information for Seafarers regarding Watchkeeping Standards*, AMSA, Canberra.

8 International Maritime Organisation, *Seafarer's Training, Certification and Watchkeeping (STCW) Code*, 1995, as amended, IMO, London.

9 International Maritime Organisation, *International Management Code for the Safe Operation of Ships and for Pollution Prevention (ISM Code) as amended*, IMO, London.

10 International Chamber of Shipping 2016, *Bridge Procedures Guide*, Marisec Publications, London.

bright lights made *Mako* easily visible, initially this was at a distance significantly beyond that which its navigation lights are required to be visible (2 NM for sidelights and sternlight).[11]

As the vessels closed on each other, the bright decklights would have acted to obscure *Mako*'s navigation lights. In addition, the sidelights were positioned aft and inboard of *Mako*'s stabilising arms. In a seaway, these arms would have intermittently obscured the sidelight. To the observers on *Glasgow Express*, this would have made an accurate and complete appraisal of the situation, such as *Mako*'s heading, difficult based only on the vessel's lights.

Having visually identified the presence of *Mako*, the OOW should then have made attempts to verify this target using other equipment, in particular the radar, and by monitoring its bearing over time. However, the OOW did not seek further information to confirm the visual sighting, including that he was seeing the fishing boat's sternlight. A full appraisal of the situation using 'all available means' was therefore not made. Discussion between the OOW and lookout merely resulted in confirmation of the incorrect assumptions they had made.

Had the situation been confirmed by radar or by any other means, the overtaking scenario would quickly have been exposed as false. Confirmation by these means would have made it clear that the two vessels were in a crossing situation, with *Glasgow Express* as the give-way vessel. Regardless, the regulations required both the give-way vessel and the overtaking vessel—which *Glasgow Express* assumed that it was—to keep out of the way of the other vessel.

Furthermore, Figure 7 shows that for at least 25 minutes before the collision, *Mako* maintained an unchanging bearing in relation to *Glasgow Express*. As stated in the COLREGs, this is indicative of a collision situation. *Glasgow Express*'s OOW reported that he recalled first seeing the lights of *Mako* at about 2200. *Mako*'s bearing would have remained unchanged from this point. Therefore, there were more than 45 minutes in which the situation could have been clarified.

Notwithstanding this, the radar in operation on *Glasgow Express* was not set up to automatically acquire and track targets, in accordance with the practice of good seamanship. It is also usual practice to set up a radar guard zone, to provide warning of any target approaching within the minimum safe passing distance. Had this been done, an audible and visual alarm would have sounded as soon as the radar detected that the target, *Mako*, was on a collision course.

A proper lookout by 'all available means', as required by company and ship procedures, the master's expectation and the regulations was not maintained on board *Glasgow Express*. Had the visual information, and the unchanging bearing of the target, been confirmed using radar, the risk of collision would have been clear. Effective avoiding action could have then been taken in time to prevent a collision.

### *Mako*

As *Mako* departed San Remo, the skipper was aware that there was shipping traffic in the area through which *Mako* would pass. He set the radar and monitored a number of vessels both on the radar and visually. After the incident, the skipper recalled that he had seen a ship passing ahead and across *Mako* from port before he roused the deckhand to take the watch. He said he could see this ship's starboard navigation light and concluded it would pass well clear of *Mako*. He passed this information on to the deckhand during handover at about 2230. The deckhand did not verify this sighting, or its echo, on the radar as he settled in for the watch.

Ship traffic information from AIS data and from *Glasgow Express*'s radar images show that there was a number of ships in the area on the evening of 12 August. However, after about 2100, the only ship passing port to starboard near *Mako* was *Glasgow Express*. It is likely, then, that the ship *Mako*'s skipper recalled observing was *Glasgow Express*. He had misinterpreted the situation and the danger posed by *Glasgow Express* when assuming it would pass clear.

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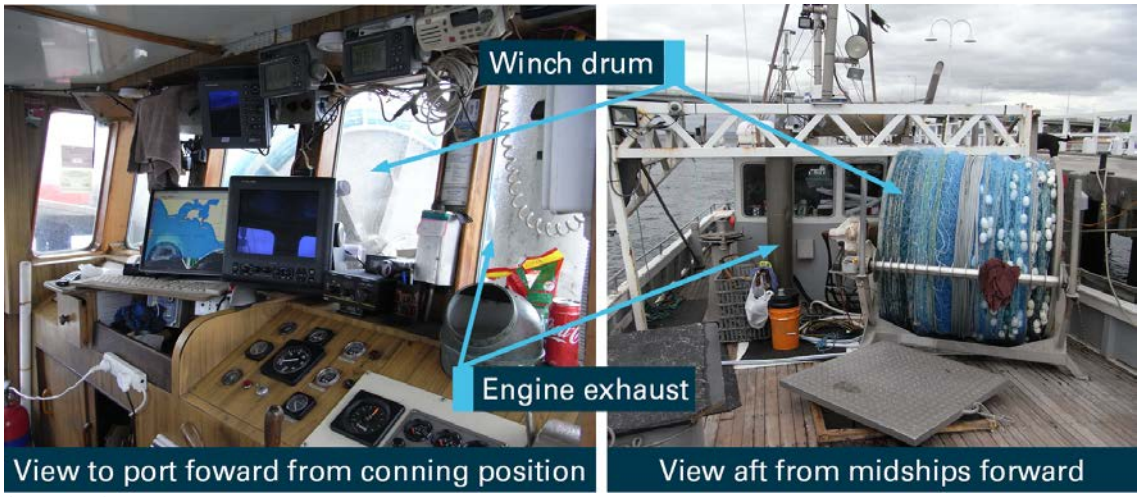
[11] COLREGs Rule 22 for vessels of 12 m to 50 m in length.

Furthermore, *Mako* had all its decklights on throughout its voyage. Under the COLREGs, fishing vessels are not entitled to do this, and should have only their navigation lights on, unless actually 'engaged in fishing'.[12] These bright floodlights served to reduce the effectiveness of *Mako*'s watchkeeper's night vision and thus the ability to distinguish features beyond the glare of the lights. This was exacerbated by sea spray and light rain obscuring the windows. This reduced the likelihood that *Mako*'s watchkeeper would have visually identified the presence of *Glasgow Express*.

In addition, many fishing vessels are constructed with the working deck located forward of the wheelhouse. Some, such as *Mako*, are also fitted with fishing net winch drums on the working deck. These winch drums can be of substantial size and, as a result, create blind sectors and obscure the view forward from the wheelhouse (Figure 8). Current regulations[13] (available at www.amsa.gov.au) limit the extent of such obstructions. However, these regulations have not been applied retrospectively and consequently, older vessels, such as *Mako,* continue to have equipment mounted on the foredeck obscuring the field of vision from within the wheelhouse.

Large equipment mounted on the foredeck presents as a significant risk to maintaining a proper lookout by watchkeepers. However, in this case, given the relative bearing of the *Glasgow Express*, it is unlikely that the winch drum significantly affected the ability of *Mako*'s watchkeeper to detect the other vessel. Nevertheless, it is important that this limitation in vessel design is recognised and understood by fishing boat crews in order to account for blind sectors and prevent future collisions.

**Figure 8: View from the conning position in *Mako*'s wheelhouse**




Source: ATSB

In summary, *Mako* was brightly lit in contravention of the COLREGs and a proper lookout as required by the COLREGs and prudent seamanship was not being maintained. Misinterpretation of radar information and limitations posed by the glare from the decklights combined with other factors led to *Glasgow Express* not being identified as a collision risk. As a consequence, no avoiding action was taken.

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12 Vessel engaged in fishing means any vessel fishing with nets, lines, trawls or other fishing apparatus which restrict the manoeuvrability, but does not include a vessel fishing with trolling lines or other fishing apparatus which do not restrict manoeuvrability. Exhibiting lights other than when fishing is referenced in COLREGs Rules 20(b) and 26(e).

13 See the National Standards for Commercial Vessels, Part C Design and construction, Section 1 Arrangement, accommodation and personal safety, Chapter 2 Operating stations, 2.11 Field of vision from the primary operating station.

## Navigation equipment requirements for domestic commercial vessels

The Australian Maritime Safety Authority (AMSA) is responsible for the safety of vessels and the seafarers who are operating in the domestic commercial industry. At the time of the collision, *Mako* was in survey with AMSA as a Class 3B domestic commercial vessel (DCV). Under current legislation, Class 3B vessels are required to carry an AIS Class B receiver/transmitter unit. However, grandfathering of survey arrangements for older DCVs (built before July 2013) allows them to continue to operate under the survey requirements that existed before the introduction of the national standards. Built in 1980, *Mako* was not required to have an AIS unit fitted to comply with survey requirements, and an AIS unit was not fitted on *Mako* at the time of the collision.

AIS is a VHF radio broadcasting system that transfers packets of data including course, speed and other pertinent vessel details. The system enables AIS-equipped vessels and shore-based AIS stations to send and/or receive identification information that can be displayed on an electronic chart, computer display, compatible radar or standalone unit. In this way, the information received can provide the navigational watchkeeper with immediate information regarding traffic in the area. This information can then be used as part of the all available means to assist the watchkeeper in making a full appraisal of the situation and of the risk of collision.[14]

Had *Mako* been fitted with and used an AIS transceiver, and depending on how the equipment was configured, the watchkeeper could have been alerted to the presence of *Glasgow Express* on 12 August. This information could then have been used to correctly appraise the situation and the taking of necessary action to avoid a collision. For this reason, it would be prudent for older vessels, such as *Mako,* to carry and use this equipment.

*Glasgow Express* was fitted with an AIS Class A receiver/transmitter unit, as required by SOLAS.[15] Had *Mako* carried and been using an AIS this would have been detected by equipment on *Glasgow Express*. The ship's radar could have automatically acquired and tracked *Mako*, triggering alarms if the vessel was to approach too closely, within a prescribed distance. The risk of collision would then have been readily apparent to the OOW and appropriate action could have been taken.

That said, the actions of *Glasgow Express*'s OOW, and the VDR recording, show that the ship's radars were not set up to acquire and track AIS targets. It is, therefore, likely that even if *Mako* had been carrying an AIS, it would have made little difference to the actions on board *Glasgow Express*.

## Previous collisions between ships and small vessels

The ATSB has been concerned about the number of collisions between trading ships and small vessels for many years. From 1990 to 2017, 63 collisions between trading ships and small vessels (excluding attending tugs) were reported to the ATSB or its predecessor. Of these, 38 were investigated. These safety investigations have consistently shown that keeping a proper and effective lookout and taking early avoiding action in accordance with the COLREGS could have prevented those collisions in almost every instance.

In a 2014 safety investigation report,[16] the ATSB issued a Safety Advisory Notice (MO-2014-006-SAN-019) to industry, which stated:

> The Australian Transport Safety Bureau reinforces to masters, owners, operators and skippers of all vessels, the importance of taking all necessary measures to ensure that a proper and effective

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14 Navigators are cautioned that AIS is unsuitable for collision avoidance.

15 *The International Convention for the Safety of Life at Sea (SOLAS) 1974 as amended*, IMO, London.

16 ATSB Marine Occurrence Investigation 311-MO-2014-006, Collision between *Kota Wajar* and the yacht *Blazing Keel*, Moreton Bay, Queensland, 6 July 2014.

> lookout, in accordance with the collision regulations, is kept at all times and early avoiding action in accordance with those regulations is taken to prevent collision.

Unfortunately, these types of collisions are still occurring. While measures to prevent collisions might appear straightforward, the recurrent contributing factors in collisions between ships and small vessels indicate that further effort is required from operators and crews to implement such measures.

Human performance aspects that are relevant to some of these collisions include expectancy and confirmation bias. Expectations are based on past experience and other sources of information, and they strongly influence where a person will search for information, what they will search for and their ability to notice and recognise a target or relevant aspect of a situation (Wickens and McCarley 2008). If the expectations are incorrect, then a person will be less likely to detect the target or a relevant aspect of the target (such as the heading or speed).

People generally seek information that confirms or supports their hypotheses or beliefs, and either discount or do not seek information that contradicts those hypotheses or beliefs. When the available information is ambiguous, it will generally be interpreted as supporting the hypothesis. This confirmation bias is an inherent aspect of human decision-making and has been demonstrated to occur in a wide range of contexts (Wickens and Hollands 2000).

If an assessment of another vessel's heading and speed is based on limited or incomplete information, there is a significant likelihood it will be incorrect. However, aspects such as expectancy and confirmation bias mean an initial incorrect assessment may not be effectively identified and corrected. Accordingly, it is imperative that crews follow the relevant requirements and guidance, and use all available means when looking out for, and then monitoring, other vessels.

Small vessels can improve their detectability with aids such as AIS transceivers and radar reflectors. An AIS transceiver can also assist small vessel crews in the early detection of ships and provide important dynamic and static ship information.

For ships, allowance must always be made for crew errors, and systems must be robust enough to detect errors or omissions before an accident results. Configuring the ship's radar to automatically acquire and track other vessels fitted with AIS and triggering alarms if the vessel was to approach too closely is one solution currently available to compensate for human fallibility.

In addition to many previous ATSB investigation reports, a number of ATSB safety bulletins also highlight collision risks to educate seafarers and mariners. These documents and other safety information about marine safety issues are available on the ATSB website.

## Voyage data recorder data and recovery

All ships of 3,000 gross tonnage or more, constructed on or after 1 July 2002, are required to carry a VDR to assist with accident investigation. *Glasgow Express* was fitted with a Simplified Voyage Data Recorder (S-VDR). The S-VDR consisted of the final recording medium contained in the protective capsule, which held at least 12 hours of data, and a removable compact flash memory card, which could be preserved by the crew following an incident.

*Glasgow Express*'s crew initiated the save procedure following the collision on 12 August 2017, and removed the compact flash memory card from the system. The S-VDR continued in an operational state, with data on the protective capsule being overwritten. However, the compact flash memory card installed at the time the save function was initiated was not of sufficient size to record the previous 12 hours of data.

Upon ATSB investigators attending the vessel the data loss was identified, and a subsequent review and download of the data contained within the protective capsule was performed. Radar images and parametric data at the time of the incident were able to be retrieved, however, the bridge audio data had already been overwritten.

In addition to providing beneficial information to investigations following an incident or accident, appropriate use of the data recorded on VDRs can be of value to operators for such things as analysing vessel performance. Further, routine download of data by crews would ensure they are familiar with the operation and requirements of the system fitted to the vessel. This would then allow for effective recovery of data in the case of an incident or accident.

# Findings

From the evidence available, the following findings are made with respect to the collision between the container ship *Glasgow Express* and the fishing vessel *Mako* on 12 August 2017 about 15 NM south of Phillip Island, Victoria. These findings should not be read as apportioning blame or liability to any particular organisation or individual.

## Contributing factors

- A proper lookout using 'all available means' was not maintained on board *Glasgow Express*. In particular, radar was not used and the relative bearing of the other vessel was not monitored over time.
- A proper lookout was not maintained on board *Mako*. In particular, radar was not effectively used, and little if any visual sightings were conducted after it was (incorrectly) assessed that *Glasgow Express* was passing clear.
- *Mako* was operating with all decklights on while under way. Although the bright lights increased the ability of *Glasgow Express*'s crew to detect the presence of the vessel, they also made it more difficult to determine its navigation lights and accurately and completely appraise the situation. In addition, glare from the lights likely made it more difficult for the crew of *Mako* to visually detect the presence of other vessels.

## Other factors that increased risk

- *Mako* did not have an Automatic Identification System (AIS) transceiver fitted, nor was such a unit required to be fitted because of the age of the vessel. Had an AIS been carried, the presence of *Glasgow Express* could have been alerted to *Mako*'s crew. In addition, relevant information about *Mako*, such as heading and speed, would have been available to the bridge team on *Glasgow Express*.
- As with many other fishing vessels, *Mako* had a fishing reel mounted forward of the wheelhouse, which significantly obstructed the watchkeeper's ability to maintain a visual lookout forward. This increased the risk of objects not being detected and therefore of collision.

## Other key findings

- *Glasgow Express* was fitted with a voyage data recorder, and the crew attempted to download the data following the collision. However, due to the use of an undersized memory card, not all of the available information was able to be effectively downloaded and made available to the safety investigation.

# Safety actions

Whether or not the ATSB identifies safety issues in the course of an investigation, relevant organisations may proactively initiate safety action in order to reduce their safety risk. The ATSB has been advised of the following proactive safety action in response to this occurrence.

## Hapag-Lloyd Ship Management

Hapag-Lloyd Ship Management, *Glasgow Express*'s operator, notified the ATSB that the incident had prompted a fleet-wide information program outlining details of the incident. The program emphasised that the officer of the watch was responsible for ensuring safe navigation at all times in accordance with collision regulations and using all available means.

In addition to this, voyage data recorder annual performance test procedures were amended to include ensuring the correct memory card is fitted.

# General details

## Occurrence details

| | | |
|---|---|---|
| Date and time: | 12 August 2017 – 2246 AEST (UTC +10) | |
| Occurrence category: | Serious incident | |
| Primary occurrence type: | Collision | |
| Location: | About 15 NM south of Phillip Island, Victoria | |
| | Latitude: 38° 45.5’ S | Longitude: 145° 13.6’ E |

## Vessel details

| | | |
|---|---|---|
| Name: | *Glasgow Express* | *Mako* |
| IMO number: | 9232589 | Vessel ID number: Y1Z |
| Call sign: | DDSC2 | VKV7159 |
| Flag: | Germany | Australia |
| Classification society: | DNV GL | |
| Ship type: | Fully cellular container ship – 4,121 TEU | Domestic Commercial Vessel Class 3B Timber hull, gill net fishing vessel |
| Builder: | Daewoo Shipbuilding and Engineering (South Korea) | Pompei’s boat building works (Victoria, Australia) |
| Year built: | 2002 | 1980 |
| Owner(s): | Amotango (Germany) | Mr S. L. Rose |
| Manager: | Hapag-Lloyd (Germany) | |
| Gross tonnage: | 46,009 | |
| Deadweight (summer): | 54,221 t | |
| Summer draught: | 12.52 m | 2.25 m |
| Length overall: | 281.00 m | 14.2 m |
| Moulded breadth: | 32.20 m | 4.90 m |
| Moulded depth: | 17.42 m | |
| Main engine(s): | Sulzer 9RTA96C-B | Cummins |
| Total power: | 25,000 kW at 82 rpm | 143.90 kW |
| Speed: | 20.5 knots at 96.5% MCR | |
| Damage: | Minor – hull paint scratching | Major damage to bow and stabilising arms and structures |

# Sources and submissions

## Sources of information

The sources of information during the investigation included:

- the master and watchkeepers of *Glasgow Express*
- the owner, skipper and deckhand of FV *Mako*
- Hapag-Lloyd (operator of *Glasgow Express*)
- the Australian Maritime Safety Authority (AMSA)
- the Australian Volunteer Coast Guard
- the Federal Bureau of Marine Casualty Investigation (BSU), Germany
- Marine and Safety Tasmania (MaST)
- Maritime Safety Victoria.

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## Submissions

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

A draft of this report was provided to the master and watchkeepers of *Glasgow Express*, the owner, skipper and deckhand of FV *Mako*, Hapag-Lloyd, the Australian Maritime Safety Authority (AMSA), the Federal Bureau of Marine Casualty Investigation (BSU), Germany and Marine and Safety Tasmania (MaST).

Submissions were received from AMSA and Hapag-Lloyd. The submissions were reviewed and where considered appropriate, the text of the report was amended accordingly.

# Australian Transport Safety Bureau

The Australian Transport Safety Bureau (ATSB) is an independent Commonwealth Government statutory agency. The ATSB is governed by a Commission and is entirely separate from transport regulators, policy makers and service providers. The ATSB's function is to improve safety and public confidence in the aviation, marine and rail modes of transport through excellence in: independent investigation of transport accidents and other safety occurrences; safety data recording, analysis and research; fostering safety awareness, knowledge and action.

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 operations involving the travelling public.

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 identify and reduce safety-related risk. ATSB investigations determine and communicate the factors related to the transport safety matter being investigated.

It is not a function of the ATSB to apportion blame or determine liability. At the same time, 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 initiate proactive safety action that addresses safety issues. Nevertheless, the ATSB may use its power to make a formal safety recommendation either during or at the end of an investigation, depending on the level of risk associated with a safety issue and the extent of corrective action undertaken by the relevant organisation.

When safety recommendations are issued, they focus on clearly describing the safety issue of concern, rather than providing instructions or opinions on a preferred method of corrective action. As with equivalent overseas organisations, the ATSB has no power to enforce the implementation of its recommendations. It is a matter for the body to which an ATSB recommendation is directed to assess the costs and benefits of any particular means of addressing a safety issue.

When the ATSB issues a safety recommendation to a person, organisation or agency, they must provide a written response within 90 days. That response must indicate whether they accept the recommendation, any reasons for not accepting part or all of the recommendation, and details of any proposed safety action to give effect to the recommendation.

The ATSB can also issue safety advisory notices suggesting that an organisation or an industry sector consider a safety issue and take action where it believes it appropriate. There is no requirement for a formal response to an advisory notice, although the ATSB will publish any response it receives.

**Australian Transport Safety Bureau**

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Investigation

**ATSB Transport Safety Report**
Marine Occurrence Investigation

Collision between the container ship *Glasgow Express* and the fishing vessel *Mako* 15 NM south of Cape Woolamai, Victoria on 12 August 2017

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