

# Collision dangers on the Great Barrier Reef

by S.W. Mort\*

RECENTLY there has been a large increase in fishing in Great Barrier Reef waters and also in the size of the ships navigating the area.

This has led to a number of close encounters, and to the sinking of the trawler *Suzie PK*.

To help avoid further accidents, I want to draw the attention of fishermen to some of the problems of piloting a large vessel through the inner route of the Great Barrier Reef, particularly insofar as those problems concern fishing vessels.

## Confined waters

Large vessels have deep drafts — 11.89 m (39 ft) being the present maximum draft capable of navigating the inner route — and they must keep to deepwater channels, thereby limiting the area in which to manoeuvre. By day they display a black cylinder, and by night three red lights vertically, in addition to their navigation lights.

Passage of such ships is quite safe, provided they do not have to deviate from the deep channels, which are well known to the pilots and usually approximate the recommended tracks printed on the charts. However recommended tracks are not always followed.

Ships invariably pass to the east of Burkitt Island and close to Magpie and Iris Reefs and usually to the east of Eden Reef. They also pass on either side of Heath Reef. These waters are particularly 'confined' to say the least.

On observing a fishing boat, the pilot has to start planning his avoiding action at a range of

about five miles in order not to have to take drastic action at close range, which could result in getting too far off course.

This is fine if the fishing vessel is on a constant course and maintains a constant speed and provided it has been seen. But if the fishing boat moves erratically it compounds the problem, especially if its navigation lights cannot be distinguished because of the intense glare from its working lights, which in themselves are frequently blinding to the people on the ship's bridge.

## Low visibility

Small vessels, under about 30 m (100 ft) long, can be extremely difficult to see from a large

ship's bridge, particularly if there is any sea running, because they are hidden against a background of white water.

Also, many boats have a lot of white paint or other low-visibility paint that makes them merge into the background, so they are not always seen at a range of five miles. In rough weather the radar echo of a fishing vessel is frequently undetectable due to the 'clutter' or sea return on the screen, so it is quite possible for the ship not to be aware of the fishing vessel's existence.

## Problems with lights

A number of close encounters have occurred at night in clear weather because of a fishing vessel's working deck lights.

## POTENTIALLY HAZARDOUS WATERS

Chart	Locality
AUS 832	The area around the Howick Group
AUS 833	The area between C. Melville and Pipon Is. The area between Eden Reef and Taiwan Shoal The area east of Burkitt and Hannah Islands to Iris and Magpie Reefs and on either side of Iris Reef Buoy.
AUS 834	The area between Hay and Fife Islands The area between either side of Heath, Bow and Waterwich Reefs The area between Eel Reef and Kemp Rock
AUS 835	The area between Piper Is. and Inset Reef The area around Home Islands (Clerke Island)
AUS 839	The area between Wyborn Reef and Edborac Is. (The Adolphus Channel) The area from west of Sue Reef to east of Bet Reef (Vigilant Channel)
AUG 293	The area from Herald Patches to Harrison Rock (Prince of Wales Channel)
AUS 296	The area between The Buoys of Gannet Passage

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These lights are brilliant, making it impossible for the pilot to distinguish the port and starboard side lights, so that he has no idea in which direction the fishing vessel is heading.

This is a particular problem when the vessel has her gear in and is free running. Many fishing vessels under these circumstances do not switch off their fishing and working lights, and turn on their navigation lights. This is very confusing and is an extremely dangerous practice.

Even if the proper lights are exhibited and the working lights are extinguished, the navigation lights of the trawler are difficult to see because of the height difference between the ship's bridge and the trawler.

Navigation lights are dioptic — that is, the light emanating from them is beamed in a horizontal plane so that little light is projected either up or down — so the pilot of the ship is well above the focal plane of the trawler's lights and the trawler's skipper is well below the focal plane of the ship's lights. This makes seeing each other's lights quite difficult, particularly at close quarters (see Figure 1).

If the trawler has its working lights on then the chances of the pilot seeing its side lights are very much diminished. Also, with these working lights on, the trawler skipper's vision must be limited to the circle of light surrounding him.

## Lookout

At sea a lookout is required to be kept by all means at the ship's disposal, namely visually, by hearing and by radar. A radar watch alone is not considered a proper lookout, and in any case, unless plotting of an approaching vessel is resorted to, it is extremely dangerous to try to assess a collision potential from watching a radar screen. In fact, radar-assisted collisions can be caused by this practice.

Also, by looking into a radar screen, the operator's night

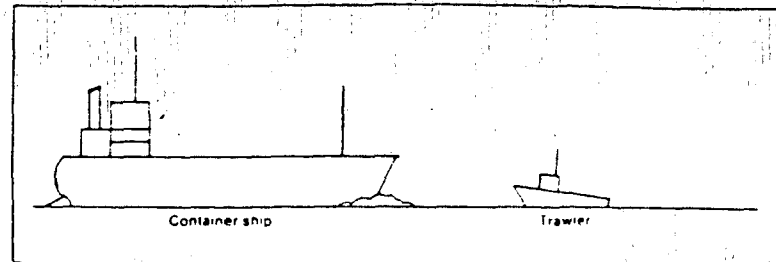


Figure 1: Dioptic light beams are horizontal and each vessel's navigation lights are on a different focal plane. It is very difficult for the vessels to see each other's lights, particularly if they are close.

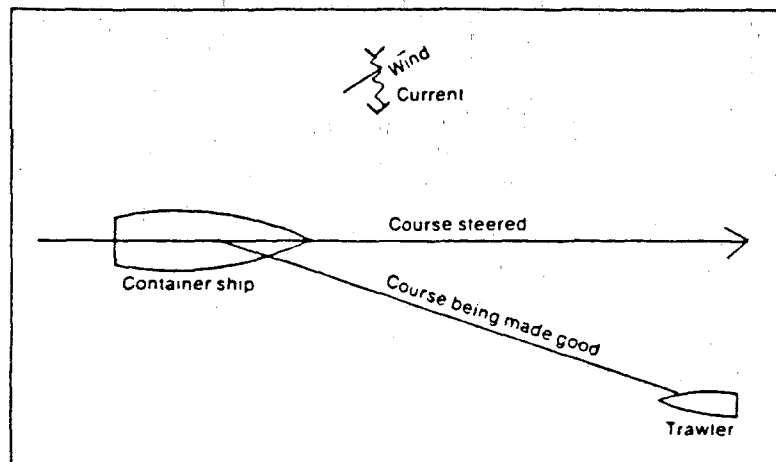


Figure 2: Trawler sees open masts by day and open mast lights and a green side light by night. Normally the trawler would be safe but because of the container ship's leeway it is in the ship's path and could be run down, irrespective of right of way.

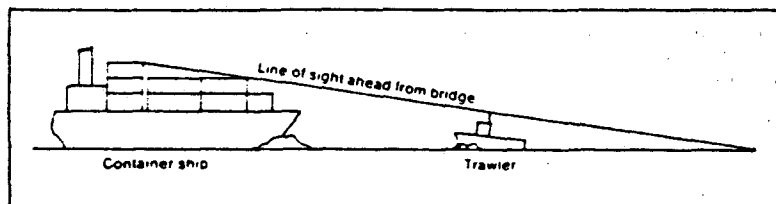


Figure 3: Line of sight ahead from container ship's bridge is restricted by deck cargo. Trawler could be run down, irrespective of right of way, because it might not even be seen.

vision is very much impaired, so that even if he does go outside into darkness he would not be able to see properly for some considerable time.

## Leeway problems

An average speed for ships passing through the inner route is about 15 knots. However some passenger ships and container ships are considerably faster, reaching more than 20 knots.

Both these types of ships have the problem of leeway due to a moderate draft and large wind-catching surfaces. This is particularly so in strong winds. Due to leeway being made, the course being steered can vary from the course being made good by as much as 10 degrees, so that it would be possible for a trawler to be in the direct line of approach of the ship but think otherwise, because the ship's masts would appear open by

day, and by night the mast lights would be open and only one side light would be visible (see Figure 2).

### Steering difficulties

Large deep ships frequently do not steer well in shallow water — under 18.3 m (10 fathoms) — but tend to yaw from side to side, in some cases up to 10 degrees from the course being steered.

Also, they take a long time to stop, and frequently engineers need considerable notice to manoeuvre engines without damaging them a great deal. They also tend to get out of control in shallow water when the engines are put astern, swinging either to port or starboard in an unpredictable way. Due to their immense weight and consequent inertia it is not possible to stop them by dropping an anchor. In fact anchors and cables on modern large vessels are very delicate pieces of equipment, and are very easily broken or damaged if too much stress is put on them. They are also very expensive.

### Restricted vision

On some container ships, deck cargo restricts vision from the bridge. Frequently there is a blind spot extending from the bow of the ship forward for about two miles (see Figure 3). Also, a person standing on one side of the bridge might not be able to see the water on the opposite side of the ship.

When the language difficulties encountered on a foreign-flag ship are added to these limitations, fishermen can appreciate the difficulties pilots face to avoid fishing vessels in the confined shallow waters of the inner route of the Great Barrier Reefs.

### Recommendations

Fishing vessels would greatly assist pilots by observing the following recommendations.

1. Do not fish in areas designated as 'Deep Draft

Roues', particularly in the potentially hazardous waters listed on page 5.

2. At night turn off working lights when they are not required, or on the approach of or to a ship, and keep a very good lookout at all times.

3. Keep a constant listening watch on VHF channel 16, but do not converse on it; change to another channel for conversations.

4. Keep it constantly in mind that the pilot on an approaching ship may not have seen you or, if he has, he may not be able to tell what you are doing because he has been blinded by your working lights and is unable to see your side lights.

5. Keep to the letter of the International Regulations for the Prevention of Collisions at Sea, especially the steering and sailing rules and the rules concerning lights. (Rules 7, 8 and 9 are particularly important, as is rule 20b, which states that lights additional to the prescribed lights must not be shown if they impair the visibility or distinctive character of the specified lights or interfere with the keeping of a proper lookout. Many trawler lights contravene this rule.)

6. If on passage do not display fishing lights or have the working lights on. Both practices contravene the regulations and are very dangerous.

7. Remember the limitations of large vessels and the fact that fishing vessels do not have the right to impede the passage of other vessels navigating in narrow channels — (Rule 9c).

8. If you see an approaching ship's mast lights slightly open and see only one side light, do not assume all is well, because the ship may be making a lot of leeway, or yawing a lot in shallow water.

9. Keep a sharp lookout at all times, and especially when fishing near the shipping lanes on the chart. Remember, you can get off them but the ship cannot.

10. Assume the shipping lanes to be one mile wide on

either side of the charted track unless otherwise obstructed. One mile is not much from a ship's bridge.

11. The people on the bridge may be 214 m (700 ft) from the bow of the ship and more than 30 m (100 ft) above the water. If there is a collision they possibly might not know about it, because in a loaded ship the impact would be absorbed, and any noise would not be heard due to the shielding effect of the bow and the ambient noise on the bridge from engines, radar, fans, etcetera.

12. Ships' lights when close are considerably above the normal line of sight from a trawler, so keep your eyes lifted. And do not forget, it is quite likely that your lights have not been seen from the ship's bridge.

13. The bow wave from a large ship when close can affect the steering of a small ship dramatically. The small ship may steer into the side of the large ship even against full helm in the opposite direction. There can also be a suction effect if the vessels are very close.

From the foregoing it might appear that large ships want everything their own way. Such is not the case — we all have a living to make — but they do want a fair go in the narrow channels to which they are restricted. They will give way where possible, as required by the regulations, but so should trawlers, which in any case should not restrict other traffic in these areas.

Ships are extraordinarily expensive. Even a moderate-size tanker costs about \$60 million and has to earn about \$40 000 a day during its life. This works out at about \$1 667 an hour or almost \$28 a minute.

Should this earning rate not be achieved, freight rates must rise, causing most other costs to rise, so even from this point of view it is in everybody's interest that these ships are not hampered. 8

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*Australian Fisheries*, December, 1980

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