



**The Bahamas
Maritime Authority**

THE COMMONWEALTH OF THE BAHAMAS

Polar Spirit v Zhe Xiang Yu 41020



Report on the collision between the LNG tanker Polar Spirit and the fishing vessel Zhe Xiang Yu 41020 on 30 September 2018 resulting in the loss of eight lives

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1 GLOSSARY

| | |
|---------|--|
| AB | Able-bodied seafarer |
| AIS | Automatic Identification System |
| ARPA | Automatic radar plotting aid |
| BMA | Bahamas Maritime Authority |
| Cable | Unit of distance: 0.1 NM / 185.2m |
| COLREGS | International Regulations for Preventing Collisions at Sea 1972 (as amended) |
| CPA | Closest point of approach |
| ECDIS | Electronic chart display and information system |
| HRU | Hydrostatic release unit |
| ISM | International Safety Management Code |
| LNG | Liquid natural gas |
| m | meters |
| mm | millimeters |
| MSA | Maritime Safety Administration (People's Republic of China) |
| NM | Nautical mile (1852m) |
| OOW | Officer of the Watch |
| OS | Ordinary Seafarer |
| TCPA | Time until closest point of approach |
| UTC | Universal Time Co-ordinated |
| VDR | Voyage Data Recorder |
| VRM | Variable range marker |

All times noted in the report are given as local time (UTC +8).

2 SUMMARY

On 30 September 2018, the LNG tanker Polar Spirit collided with the fishing vessel Zhe Xiang Yu 41020. The collision occurred in an area of relatively high traffic density in the East China Sea, approximately 60 nautical miles east of the port of Ningbo, China.

Prior to the collision, Polar Spirit made a series of small alterations to starboard, to pass close astern of Zhe Xiang Yu. Zhe Xiang Yu then made a bold alteration of course to port when the vessels were less than half a mile apart.

Polar Spirit sustained only minor damage to its bulbous bow and starboard shell plating but Zhe Xiang Yu sank moments after the collision. None of the eight crew survived.

As the give way vessel, Polar Spirit did not take action to avoid collision in good time, nor were the series of small alterations in line with statutory requirements. As the stand on vessel, Zhe Xiang Yu did not take appropriate action once the collision could not be avoided by the action of Polar Spirit alone. Neither vessel used an appropriate sound signal.

Polar Spirit's Officer of the Watch (OOW) had spent several hours navigating through dense fishing fleets prior to the collision. This may have increased his threshold for acceptable collision risk. In any event, he did not follow minimum passing distance requirements, take appropriate action to avoid the collision or make use of bridge resources to manage the risk of collision.

There have been several similar incidents in the region, many leading to loss of life, yet risk perception remained low – despite the many fishing vessels concentrated in the area, Polar Spirit's bridge team did not consider amending the voyage plan, reducing speed or enhancing the bridge manning in light of the conditions experienced.

Additionally, the failure by the Polar Spirit's bridge team to recognise that a collision had occurred and take steps to render assistance significantly reduced the chances of survival for the crew of Zhe Xiang Yu.

3 DETAILS OF INVOLVED VESSELS AND OTHER MATTERS

Polar Spirit

Polar Spirit is a liquefied natural gas tanker, registered under the flag of The Commonwealth of the Bahamas since 13 December 2007.

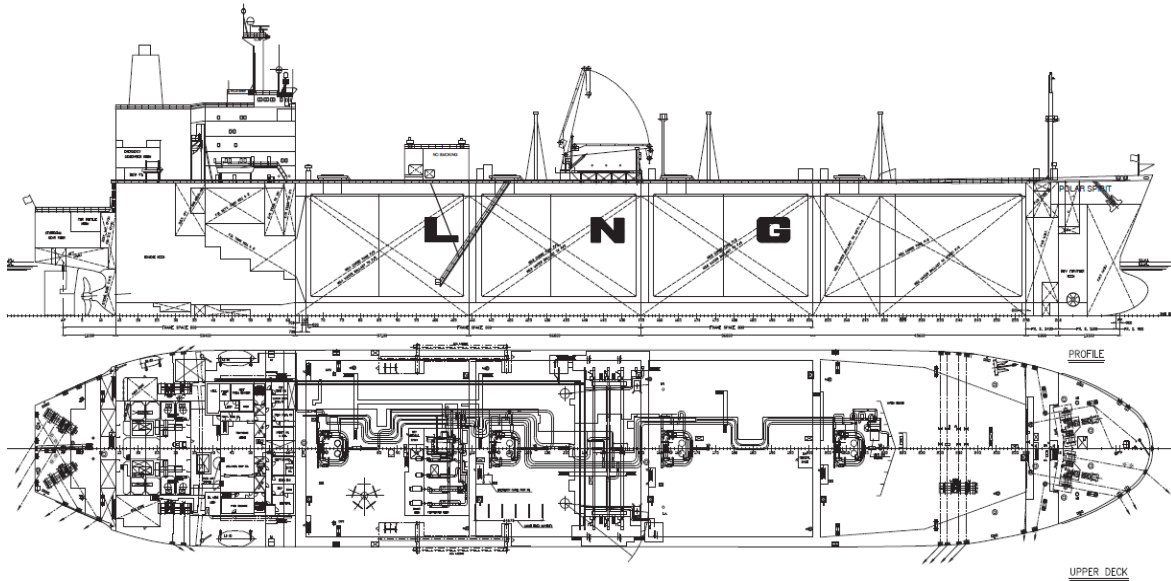


Figure 1: Polar Spirit general arrangement

At the time of the incident, the vessel complied with all statutory and international requirements and certification. The Company’s safety management system had been audited by DNV GL. The vessel had the following principal particulars:

| | |
|--------------------------|--|
| Call sign | C6WL6 |
| IMO number | 9001772 |
| MMSI number | 311153000 |
| Built | 02 nd October 1991, Chita (Japan) |
| Length overall | 228.36 metres |
| Breadth | 40.0 metres |
| Depth moulded | 20.70 metres |
| Propulsion power | 15,445.50 kW |
| Gross registered tonnage | 66,174 tonnes |
| Net registered tonnage | 19,852 tonnes |
| Type | Liquefied Natural Gas |
| | |
| Class Notation | ✠ A1 Liquefied Natural Gas Carrier, ✠ AMS, ✠ ACCU, ✠ APS |

Polar Spirit’s Bridge team

The Polar Spirit’s bridge was manned using standard four hour watches by a Second Officer and two Third Officers. At the time of the collision, the Third Officer (A) was on watch with a duty AB and OS on rotation as helmsman and lookout.

| | Master | Chief Officer | Third Officer (A) | Duty AB | Duty OS |
|--------------------------------|------------------|------------------|-------------------|-----------------------|---------------|
| Qualification | Master STCW II/2 | Master STCW II/2 | OOW STCW II/1 | Deck Rating STCW II/4 | OOW STCW II/1 |
| Certification Authority | UK | Spain | India | Philippines | Philippines |
| Nationality | Indian | Spanish | Indian | Filipino | Filipino |
| Age | 43 | 43 | 24 | 37 | 26 |
| Time in rank | 18 months | >3 years | <1 year | | |
| Time onboard | 2 months | 3 months | <1 month | 6 months | <1 month |

Zhe Xiang Yu 41020

Zhe Xiang Yu 41020 (Zhe Xiang Yu hereafter) was registered in Ningbo as a “large or medium size” oceangoing fishing vessel and was crewed by certificated crew and two deck hands. There are limited details of the vessel and crew certification available.



Figure 2: Zhe Xiang Yu 41020 (source: MSA)

The vessel had the following principal particulars:

| | |
|----------------|--------------------------------|
| Type | Single Trawler, bottom trawler |
| Construction | Steel |
| Built | 1995, China |
| Length overall | 34.57 meters |
| Gross tonnage | 149 |
| Breadth | 6.3 meters |
| Depth moulded | 2.85 meters |

Environmental Conditions

The collision occurred shortly after a typhoon passed through the region. Weather at the time of the collision was northerly winds between 7 – 16 knots, wave height did not exceed 1 metre and a moderate swell. The sky was mostly clear with good visibility estimated at approximately 8NM. It was dark with the moon rising above the horizon, providing low illumination.

Regulations

International Regulations for Preventing Collisions at Sea (COLREGS) Rules 2, 5, 6, 8, 15, 16, 17 and 34 of the COLREGS are particularly relevant.

The United Nations Convention on the Law of the Sea (UNCLOS) requires the Master of any ship involved in a collision to stand by and offer assistance to the other vessel:

Article 98 - Duty to render assistance

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:

- to render assistance to any person found at sea in danger of being lost;
- to proceed with all possible speed to the rescue of persons in distress, if informed of their need of assistance, in so far as such action may reasonably be expected of him;
- 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.

Chinese fishing vessels are administered and regulated by the Fisheries Department of the Ministry of Agriculture. Over 300,000 fishing vessels are registered in China, with an estimated 1 million operating along the Chinese coast.

The Ministry of Agriculture requires fishing vessels' liferafts to be secured by hydrostatic release units (HRUs) and an emergency position indicating radio beacon (EPIRB) to be carried on coastal fishing vessels over 24m.

4 NARRATIVE

On the evening of 28 September 2018, Polar Spirit arrived at Wuhaogou, China, to discharge a cargo of 54,093m³ liquefied natural gas, loaded at Bintulu, Malaysia. Discharge of cargo was completed the next morning, but the vessel's departure was delayed due to heavy weather.

On 30 September 2018 at 12:18, the Polar Spirit sailed from Wuhaogou for the return voyage to Bintulu. At 17:00 the vessel increased speed to approximately 18 knots (full service speed).

At 17:06, the Master handed over the conn to Third Officer (B). The traffic was heavy and the bridge manning was set to Watch Condition 2: one OOW, one lookout and a helmsman maintaining hand steering. The engine room became an unmanned machinery space at 18:00.

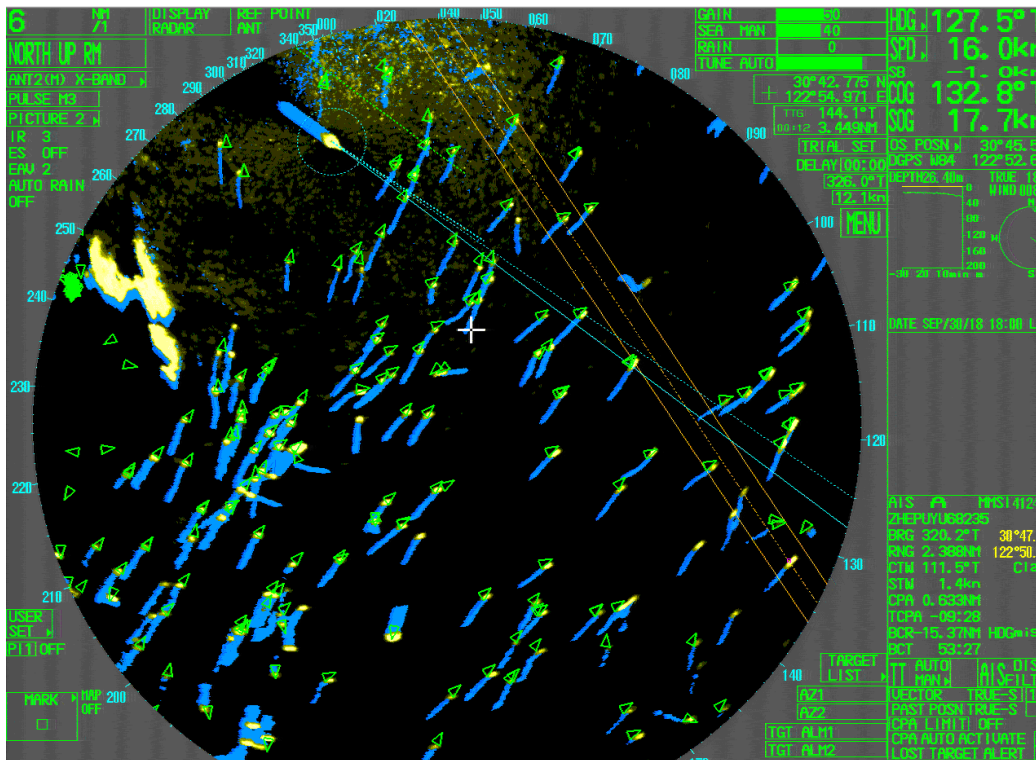


Figure 3: Polar Spirit's X-band radar, 18:00 30 September 2018¹

At 20:00, the bridge watch was handed over to Third Officer (A), assisted by an able-bodied seafarer (AB) and an ordinary seafarer (OS). The vessel was still at full service speed and in hand steering. The traffic density was heavy and predominantly made up of fishing vessels.

The Master returned to the bridge at 20:10 to assist the Chief Officer with ballasting operations in the Cargo Control Room (located at the rear of the bridge) and remained there until 21:35.

¹ Start of saved voyage data recorder information

At 22:05, the lookout (AB) reported to the Third Officer that there was a fishing vessel fine on the starboard bow. The Third Officer acknowledged this acquired the target on the X-band radar's automatic radar plotting aid (ARPA) four minutes later.

The target was Zhe Xiang Yu at a distance of 4.38NM. The ARPA calculated it was making good a course of 080°T at 4.3 knots. Polar Spirit was on a course of 182°T at 17.6 knots.

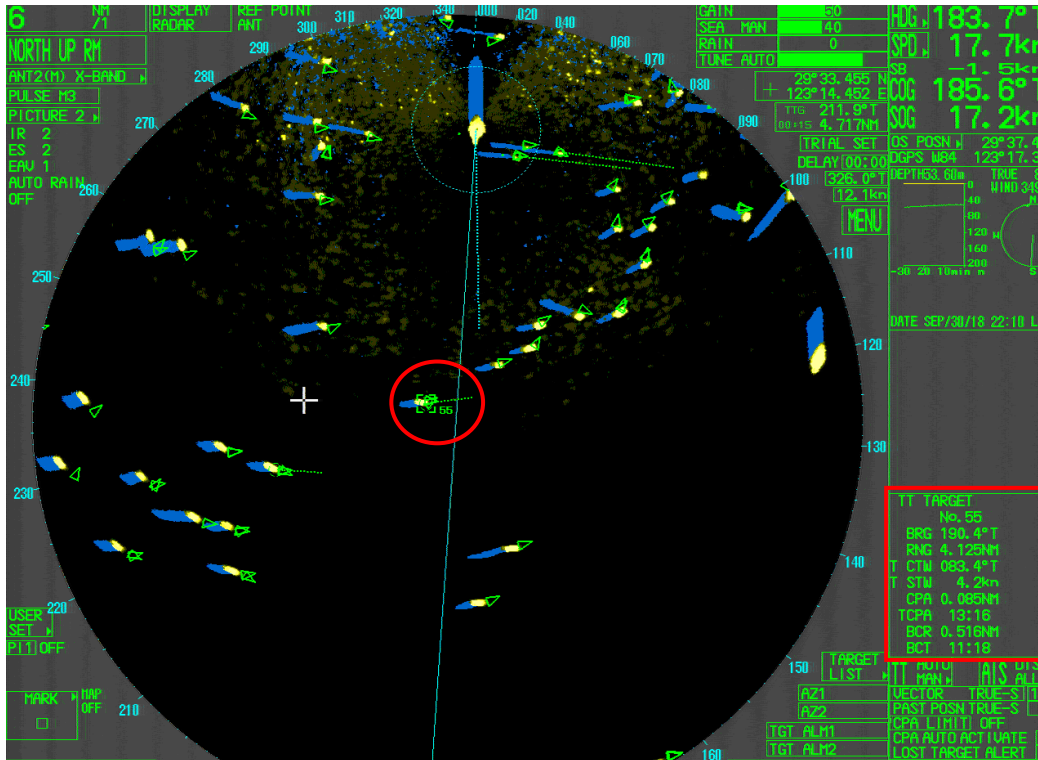


Figure 4: Polar Spirit's X-band radar, 22:10. Zhe Xiang Yu (ringed) is target 55

At 22:12, the Third Officer called the Chief Officer to inform him of an alarm sounding in the Cargo Control Room, he arrived on the bridge two minutes later. Zhe Xiang Yu now had a closest point of approach (CPA) of 0.1NM in 11 minutes.

At 22:19, the vessels were 1.4NM apart. Polar Spirit's lookout started flashing an aldis lamp at Zhe Xiang Yu to attract its attention.

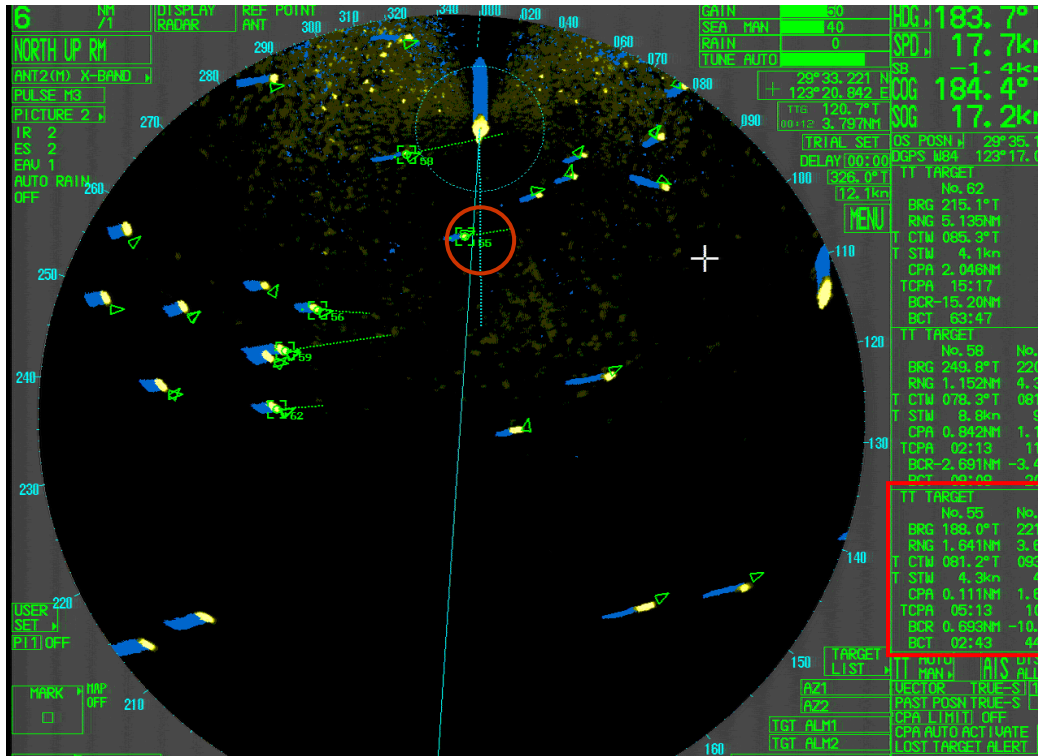


Figure 5: Polar Spirit's X-band radar, 22:19. Zhe Xiang Yu ringed

At 22:21, the Third Officer ordered a two-degree alteration of course to starboard. The aldis lamp was now being continuously used to attract the attention of Zhe Xiang Yu. A minute later, the Third Officer ordered a further one-degree course alteration and 28 seconds later, by another two degrees to starboard (187°T).

A few seconds later, at 22:22:40, the Third Officer ordered the wheel to starboard 5. Zhe Xiang Yu was fine on the port bow at a distance of 0.47NM and was altering course to port, towards the Polar Spirit. Neither vessel sounded any manoeuvring signal.

Ten seconds later, the lookout reported that Zhe Xiang Yu was crossing the bow of the Polar Spirit, at which point the Third Officer ordered the helm hard to starboard.

Fourteen seconds later (22:23:04), the Third Officer ordered the helm hard to port. Zhe Xiang Yu continued turning to port and towards Polar Spirit. At this point, the vessels were less than two cables apart with a closing speed in excess of 20 knots. Less than 30 seconds later, the bridge team of the Polar Spirit lost sight of Zhe Xiang Yu beneath the bow. The lookout went to the starboard bridge wing to sight the Zhe Xiang Yu but reported that he could not see it.

At 22:24:12, the Zhe Xiang Yu's radar echo reappeared on Polar Spirit's port quarter. The Chief Officer came out of the Cargo Control Room and followed the lookout to the starboard bridge wing. Both reported sighting a light on the port quarter. The Chief Officer and lookout then went to the port side funnel deck to look for Zhe Xiang Yu. The Third Officer went out to the port bridge wing. All three reported sighting Zhe Xiang Yu astern.

At 22:25, the Third Officer ordered a course of 180°T and Zhe Xiang Yu immediately fell into the radar's blind sector. Approximately 15 seconds later, Zhe Xiang Yu's AIS symbol disappeared from the radar.

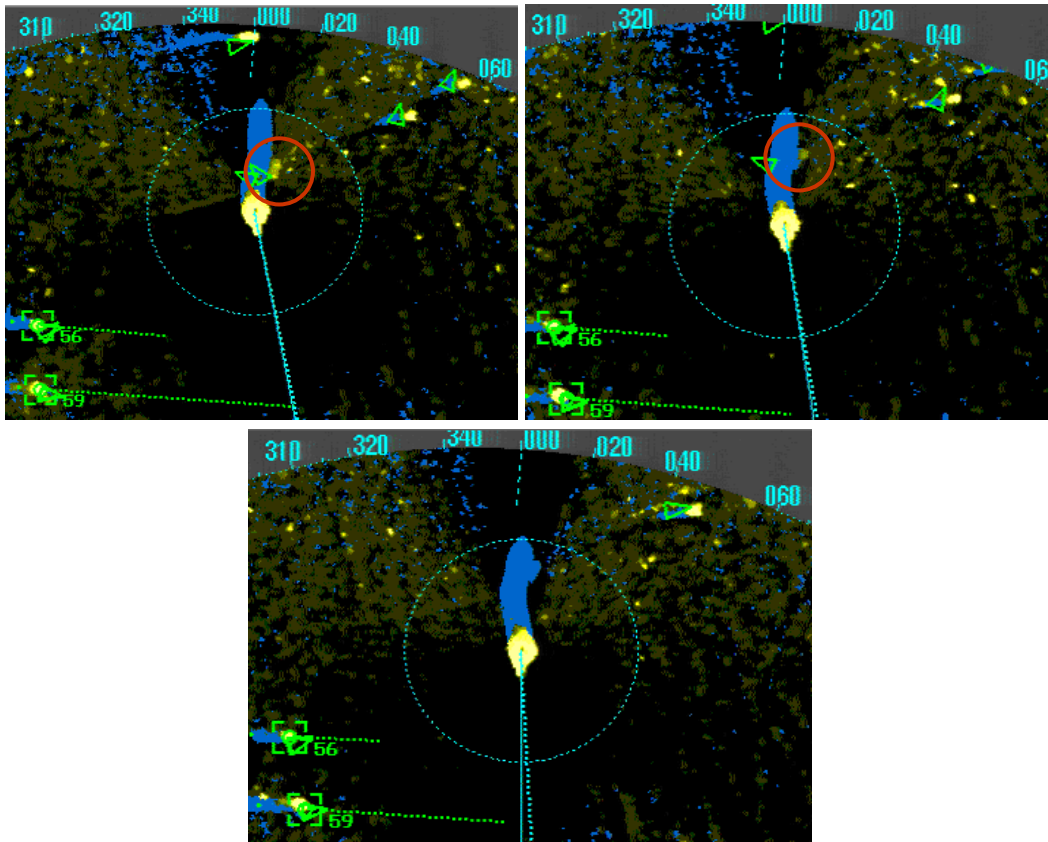


Figure 6: Polar Spirit's X-band radar 22:24-22:25. Zhe Xiang Yu radar paint visible on the port quarter, in blind sector and after AIS target disappears

After a 17-second discussion, the bridge team concluded that there had been a near-miss with the Zhe Xiang Yu, but there had been no collision. Polar Spirit continued its passage to Bintulu.

By 23:00, the traffic density of fishing vessels had reduced, and the Third Officer changed steering to autopilot. At midnight, the Third Officer handed over the watch to the Second Officer.

During his watch, the Second Officer received telephone calls: first from the vessel's agent in Shanghai and then directly from the Chinese Maritime Safety Administration (MSA) office in Ningbo, informing him of the collision and that a fishing vessel had sunk. The vessel was directed to head to Ningbo. The Master informed the vessel's manager, saved data to the Voyage Data Recorder (VDR) and removed the memory card to preserve the evidence.

At 04:30 on 01 October 2018, the vessel altered its passage to Ningbo, arriving in the evening. The vessel remained at the anchorage until 20 October 2018 whilst MSA Officers and VDR technicians conducted their investigation.

Post-collision

The collision occurred at 22:24 on 30 September 2018 in position 29°33.68'N 123°16.87'E.

At approximately 23:00, the Fishery Bureau received notification from a third party that the Zhe Xiang Yu had sunk and immediately dispatched a patrol vessel to the area. It also instructed fishing vessels in the vicinity to conduct search and rescue operations. Ningbo MSA also dispatched patrol vessels and a helicopter to assist in the search and rescue effort.

The official search and rescue operation ceased on 8 October 2018, with no survivors found. At the request of the missing crew's families, a number of local fishing vessels continued the search.

None of the eight crew on board Zhe Xiang Yu survived the sinking. Six bodies were recovered from the sea on 22 October 2018, two crew remain missing.

No signal was received from any EPIRB associated with the vessel and no liferafts or other life-saving appliances were recovered.

5 ANALYSIS AND DISCUSSION

Damage Sustained - Zhe Xiang Yu 41020

The wreck of Zhe Xiang Yu 41020 was located on the seabed in position 29°33.40'N 123°16.44'E². Details of the damage it suffered have not been made available, but it is known that the damage sustained resulted in its sinking.

Damage Sustained - Polar Spirit

The Polar Spirit sustained superficial hull damage on the bulbous bow and starboard shoulder at the waterline. A survey was conducted on 03 October 2018 by the vessel's classification society (ABS) which found:

- Bulbous bow plating set-in (up to) 100mm over a 800mm x 400mm area.
- No.4 stringer plating deformed.
- Hull paint scratched in way of the forward ballast tank, bow thruster room and forepeak tank.
- Blue paint residue (matching the hull paint of Zhe Xiang Yu) located within and adjacent to the hull damage, extending 24 meters aft from the bulbous bow on the starboard side.



Figure 7: Polar Spirit, indentations on bulbous bow and starboard bow, scratches along the starboard side

² 0.47NM from position of collision

external environment, but this is stipulated in Teekay Watch Conditions: “the applicable watch condition is to be determined by the most severe category of visibility, location or traffic pertaining to the ship’s external environment.” “Moderate to heavy” and “heavy” traffic requires a senior officer on the bridge.

The Master had been in the vicinity of the bridge, assisting the Chief Officer with ballasting operation during this period of heavy traffic but did not recognise a need to adjust the passage plan or bridge manning to suit the traffic conditions.

The Chief Officer arrived on the bridge to deal with a ballasting issue shortly before the collision. Working in the Cargo Control Room, he did not recognise that the OOW was not taking effective action to avoid collision until it was too late.

| Ships External Environment | | | |
|----------------------------|----------------------|---------------------------------|-------------------|
| Watch Condition (WC) | Visibility | Location | Traffic |
| 1 | Unrestricted / clear | Open ocean / deep sea | Light |
| 2 | Clear to restricted | Open ocean, offshore or coastal | Light to moderate |
| 3 | Restricted | Open ocean, offshore or coastal | Moderate to heavy |
| 4 | Restricted | Coastal and restricted | Heavy |
| P | Pilotage Waters | | |

The strength and responsibilities of the Bridge Team shall be guided by these tables. At the discretion of the Master, the watch may be further adjusted. **Any reduction in the strength of the Bridge Team from this guidance shall require completion of a risk assessment** that considers all parameters including operational condition, weather, traffic density, sea conditions and location/proximity from the coast and dangers.

The Officer in charge of the watch may call for additional personnel (e.g. lookout) at any time.

The applicable Watch condition is to be determined by the most severe category of visibility, location or traffic pertaining to the ship’s external environment.

Definitions
(for purposes of this poster)

Bridge Team
A Bridge Team consists of all crewmembers responsible for safe navigation of the ship including certificated personnel. Any Pilot and/or Mooring Master onboard shall be integrated into the Bridge Team.

Watch Condition (WC)
A watch condition structures the bridge team based on the environment in which the vessel is operating – both internal and external.

Open Ocean or Deep-sea
Areas further seaward of “Offshore”. Strength of the watch to be at Master’s discretion. However during hours of darkness, as a minimum, the bridge must be manned by the OOW and a Lookout.

Delegate
The term ‘delegate’ means the Chief Officer when appointed by the Master to fulfill the allocated role on the Master’s behalf.

| WC | Con | Collision Avoidance | Navigation | Communication | GMDSS | Lookout | Helm |
|-----------------------|---|-------------------------------------|------------|---------------|-------|------------------------|------------------------------|
| WC 1 | OOW | | | | | ABIOS/IR (As required) | ABIOS/IR (if required) |
| | Master is available if required | | | | | | |
| Engine Room Readiness | | As determined by Master | | | | | |
| WC 2 | OOW | | | | | ABIOS/IR (if required) | Extra ABIOS/IR (if required) |
| | Master is available if required | | | | | | |
| Engine Room Readiness | | As determined by Master | | | | | |
| WC 3 | Master or delegate or OOW | | | | | ABIOS/IR (if required) | Extra ABIOS/IR (if required) |
| | Master or delegate is available on the bridge | | | | | | |
| Engine Room Readiness | | ECR manned, as determined by Master | | | | | |
| WC 4 | Master or delegate or OOW | | | | | ABIOS/IR (if required) | Extra ABIOS/IR (if required) |
| | OOW and Extra Watch Officer if required Master or delegate is available on the bridge | | | | | | |
| Engine Room Readiness | | Engines on standby and ECR manned | | | | | |
| WC P | Master or delegate or OOW | | | | | ABIOS/IR (if required) | Extra ABIOS/IR (if required) |
| | OOW and Extra Watch Officer if required Master or delegate is available on the bridge, as required by actual WC 1 to 4 | | | | | | |
| Engine Room Readiness | | Engines on standby and ECR manned | | | | | |

Figure 9: Teekay Watch Conditions

Teekay’s watch conditions guidance is comprehensive but the use of “or”, “if required” and “as required” leaves room for both interpretation of minimum manning levels and roles at each watch condition. It does not distinguish between manning requirements during the day and night.

Calling the Master and closest point of approach

Teekay provides guidance on when to call the Master within its safety management system, the OOW is instructed to call the Master “if traffic conditions are causing

concern and unable to comply with CPA/TCPA requirement as per Master’s standing orders”

The Master’s standing orders, dated 15 September 2018, identify minimum closest point of approach in different conditions:

Min CPA

Will normally be stated in daily orders however in open waters 2.0NM, in adverse weather conditions 3.0NM, In restricted waters/High traffic density and in cases when the ship is transiting certain straits where CPA of 1NM is not attainable then the CPA needs to be as close as possible to 1NM and never less than 0.5NM. Please call me immediately if the above cannot be attained.

The Master’s night orders for the night of the collision required watchkeepers to “Maintain a sharp lookout. Watch out for fishing vessels, merchant traffic. Take early and substantial action to avoid a close quarters situation with passing traffic. Do not hesitate to call me when in doubt”. They did not specify any minimum CPA.

The Ningbo MSA Advisory Note advises passing trawlers no closer than 1 nautical mile from their stern and no closer than 0.5 nautical mile on each side.

No CPA alarms were set on the radars, but a variable range marker (VRM) was set on the X-band radar, initially at 0.75Nm and then at 1NM.



Figure 10: Radar alarm settings

In the two and a half hours that the Third Officer was on the bridge prior to the collision, there were dozens of close quarters situations, including 17 instances of passing vessels within the 0.75NM VRM and a further 12 instances when the VRM was adjusted to 1NM. Whilst the majority of these vessels were fishing vessels, this included passing a similarly sized bulk carrier, at a distance of two cables.

Whilst not part of the bridge team, the Master and Chief Officer were on the bridge for more than half of the close quarter’s situations. Neither made comment nor intervened when minimum passing distance thresholds were not met. This may have reinforced that minimum CPA violation was routine and there was no need to call the Master when requirements could not be met.

Action to avoid collision

Polar Spirit’s OOW initial alteration of course to starboard, of only two degrees, followed by a further two small alterations (one degree, two degrees respectively),

could not have been readily apparent to other vessels, contrary to Rule 8(b)³. None of these alterations constituted a substantial action, contrary to Rule 16⁴.

In the 29 close-quarter situations preceding the collision, action to avoid collision, (where taken) was similarly small. Including when the Polar Spirit was the give way vessel approaching the similarly-sized bulk carrier.

Polar Spirit's OOW did not make use of the radar's trial manoeuvre function to check the effectiveness of any action to avoid collision during his watch. His decision to alter course in small increments may have resulted from a lack of awareness of the potential impact of passing close astern of a trawler towing gear.

It is unknown what operation Zhe Xiang Yu was conducting at the time of the collision, but it is possible that the bold alteration to port was a response to the perceived threat of Polar Spirit driving through Zhe Xiang Yu's nets, a behaviour seen on several earlier instances.

Failure to render assistance

Immediately after the collision Polar Spirit's bridge team looked astern to see if they could sight Zhe Xiang Yu. It was reported that its stern light could be seen from the port bridge wing no further checks were made to see if the lights of Zhe Xiang Yu were still visible⁵.

After a discussion of just 17 seconds, the bridge team concluded that a near miss had occurred and made no further attempt to verify this conclusion or the condition of Zhe Xiang Yu.

Sinking of Zhe Xiang Yu

Zhe Xiang Yu sank rapidly, this highlights potential issues regarding the structural integrity and effectiveness of watertight subdivision for similarly constructed vessels.

Zhe Xiang Yu was required to carry liferafts secured with HRUs, but no liferaft or any other life-saving appliances were found during search and rescue actions. It is unknown whether release devices failed, had not been fitted or if additional securing had been used to prevent accidental release.

Previous Casualties

There have been multiple similar incidents in the region, many leading to loss of life. A study, conducted by Huatai Insurance Agency and Consultant Service Ltd and published by Gard⁶, identified that there were 268 incidents involving fishing vessels in Chinese waters, resulting in 562 deaths in the period 2006 - 2011.

³ Rule 8(b) Any alteration of course and/or speed to avoid collision shall, if the circumstances of the case admit, be large enough to be readily apparent to another vessel observing visually or by radar; a succession of small alterations of course and/or speed shall be avoided.

⁴ Rule 16 Every vessel which is directed to keep out of the way of another vessel shall, as far as possible, take early and substantial action to keep well clear.

⁵ Assuming Zhe Xiang Yu's lights complied with COLREGS minimum range, its stern light would have been visible to the Polar Spirit for at least seven minutes after the vessels separated.

⁶ Protection and Indemnity Club

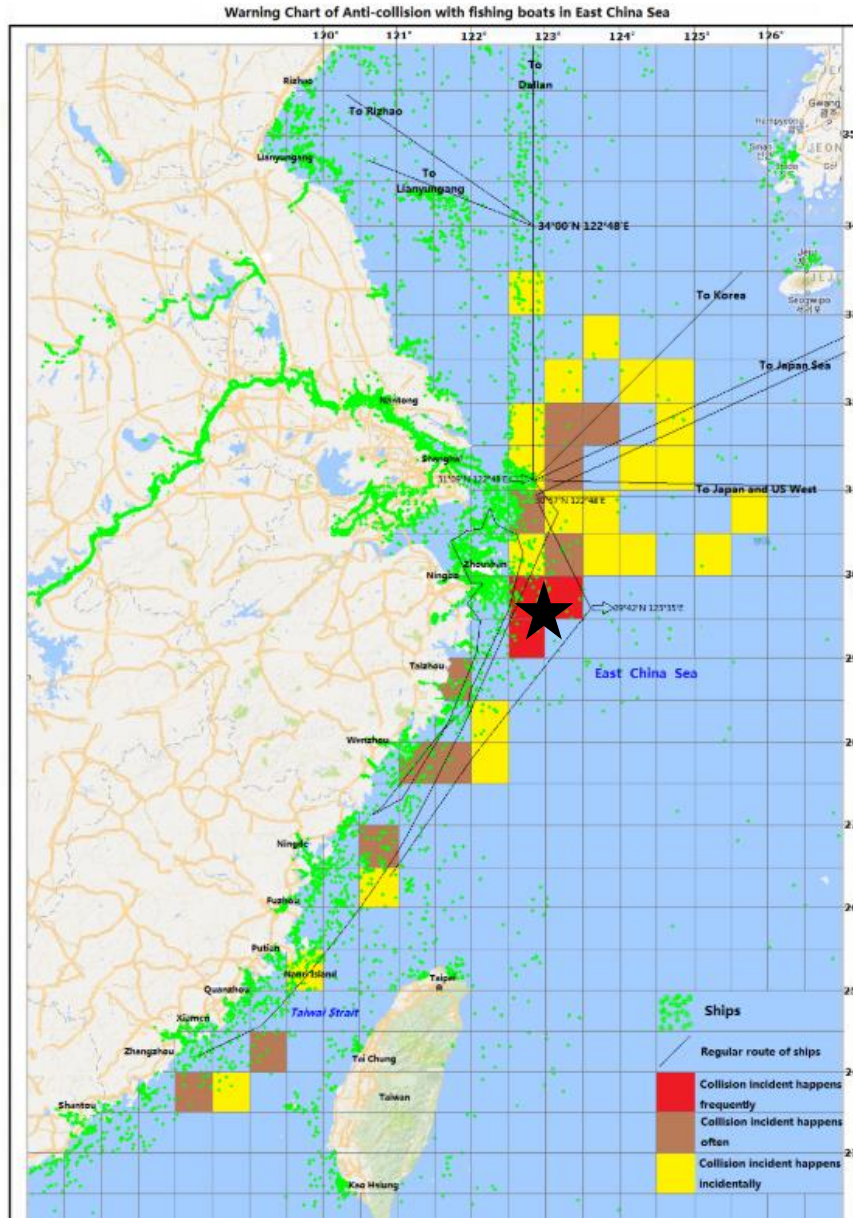


Figure 11: Collision density. Location of the collision marked “★”

Several similar incidents have been investigated and reported under the IMO Casualty Code:

- March 2018 - APL Southampton v Zhe Ling Yu 52035 (Singapore)
- May 2016 - Catalina v Lu Rong Yu 58398 (Malta)
- March 2011 - Cosco Hong Kong v Zhe Ling Yu Yung 135 (UK)
- Feb 2011 - Xin Zhang Zhou v Liao Wa Yu 75060 (China)

Amongst other root causes, common navigational issues in these cases are a failure to adjust passage plans to avoid areas of high density fishing traffic, failure to reduce speed in high density traffic areas and action to avoid collision being inappropriate, taken too late, with too small a margin for error or a combination of the three.

6 CONCLUSIONS

The collision occurred in an area of relatively high traffic density and in an area where there have been many similar incidents, yet risk perception remained low. Despite the many fishing vessels concentrated in the area, Polar Spirit's Master and OOWs did not consider amending the voyage plan, reducing speed or enhancing the bridge manning in light of the conditions experienced.

The Polar Spirit's bridge was not manned in accordance with Teekay's watch condition guidance for the traffic conditions. With terms such as "or", "if required" and "as required", Teekay's watch conditions guidance left room for interpretation of minimum manning levels, roles at each watch condition and did not distinguish between manning requirements during the day and night.

The Master's guidance on minimum passing distance was not definitive but, in any event, Polar Spirit's OOW did not follow minimum passing distance requirements or call the Master when minimum distances could not be achieved. Significant time spent navigating through dense fishing fleets and passing close to vessels with senior officers on the bridge may have reinforced that rule violation was the norm and increased the OOW's threshold for acceptable collision risk.

As the give way vessel, Polar Spirit's OOW did not take appropriate action to avoid collision or make use of bridge resources to manage the risk of collision.

As the stand on vessel, Zhe Xiang Yu did not take appropriate action once the collision could not be avoided by the action of the Polar Spirit alone.

Neither vessel made any manoeuvring sound signal, which may have alerted the other to the action being taken to avoid collision.

The failure of the Polar Spirit's bridge team to recognise that a collision had occurred and take steps to render assistance significantly reduced the chances of survival for the crew of Zhe Xiang Yu.

Zhe Xiang Yu was required to carry liferafts secured with HRUs, but no liferaft or any other life-saving appliances were found during search and rescue actions.

No distress signal from Zhe Xiang Yu was received. Had the vessel been carrying a float free EPIRB, search and rescue actions could have started almost immediately after the sinking

7 LESSONS TO BE LEARNT

- Passage planning - probable traffic conditions should be risk assessed and critical areas identified as part of the appraisal. Effective control measures could include adjusting the passage to avoid high traffic areas, planning work to make senior watchkeepers available on the bridge for the transit of high risk areas or strategic use of the time available to reduce speed on high risk legs.
- Bridge resources - watchkeepers should be aware of the function of all available tools to assess risk of collision and support decision making.
- Action to avoid collision – needs to be early, substantial and easily seen by another vessel. Use of the appropriate sound signal helps clarify the action being taken.
- Collision - if there is any indication that a collision has occurred, it is essential to find out conclusively and render assistance as required.
- Watchkeeping – this collision should serve as a reminder to all OOWs on the potential outcomes for failing to comply with COLREGS.
- Life-saving appliances - float free life-saving equipment needs to be able to float free. Removal of release devices or additional securing can render equipment unusable when it suddenly becomes necessary.

8 ACTIONS TAKEN

Teekay Shipping has taken the following actions following the collision.

- Issued a fleet wide Safety Alert and requested its crews to meet to discuss the incident and lessons to be learned.
- Revised its National Advisory Notice (NN0270) to increase guidance on when to call the Master, safe passing distances and safe speed in fishing traffic.
- Used lessons learned from this collision to conduct case study reviews with officers and ratings at its Seafarers Conferences and to enhance its in-house ‘Command Assessment and Bridge Resource Management Training Course’.

9 RECOMMENDATIONS

Teekay Shipping is recommended to

- Reconsider the use of “or”, “if required” and “as required” in the Teekay watch conditions guidance.
- Revise its guidance on passage planning to cover assessment of safe speed and the strategic use of available time and resources to manage high risk area transits
- Consider the use of navigation audits to test the effectiveness and application of its navigational procedures.

China MSA is recommended to

- Consider the need for float free EPIRBs on fishing vessels operating deep sea.
- Remind fishing vessels on the need for life-saving appliances to be float free.



中华人民共和国宁波海事局
(Ningbo Maritime Safety Administration of P.R.C)

Navigational Notices for Fishing Areas

Dear Captain:

Good day. Welcome to Ningbo Zhoushan port!

The coastal water in Ningbo is at the "T" intersection of the Yangtze River economic belt and the main transportation route in China's coastal waters. This area is a maritime highway with heavy traffic, rich in fishery resources, with complex meteorological and hydrological conditions. In order to maintain a good maritime transport environment, and to secure the navigation safety, we hereby provide you with the following reminders:

1. there are about 5000 fishing boats along the coast of Ningbo every day .
2. it will be affected by heavy fog frequently in Ningbo coastal waters.
3. keep clear with fishing areas when making route plans, and mark the navigation method for complicated routes and also the Do' s and Don' ts in the plan.
4. navigate under safe speed and maintain effective watch-keepings.
5. inform the master when necessary.
6. call 12395 in case of any accident.

I . Safe Navigation in Fishing Areas.

a. Every year, fishing season in the East China Sea commences on **16th Sep to 1st May**. Please be noted that the fishing season for trawlers using spar drag method for shrimp, pots cast method, gill nets method and lighting enclosure (cladding) net method, starts from **1st August to 1st May**.

b. The Ningbo coastal route inter-cross with the East China Sea fishing zone, with fishing vessels navigate mostly in formation or operate in concentration. It is common for fishing vessels to operate in pairs using trawling method (Diagram A), long lining and bottom trawling in night time, or conduct operation when anchored. In addition, fishing vessels have a traditional to cross the bow large vessel for good luck.



- c. Vessels should avoid and maintain safe distance from areas with heavy traffic of fishing vessels, from as distant as possible. Crossing areas where fishing vessels are concentrated should be avoided.
- d. When navigating in fishing areas, vessels should enhance navigational watch, switch to hand steering when necessary, maintain a safe speed and ensure the main engine is readily operable. Vessels should use ship horn, signal light, and any means of communication or navigational aid to prevent close quarters situation. Captain should be in charge on bridge when necessary.
- e. If any casualty occurs, aside from reporting to the company's Designated Person Ashore (DPA), the vessel should report the to the nearest China MSA office directly or through the vessel agent.

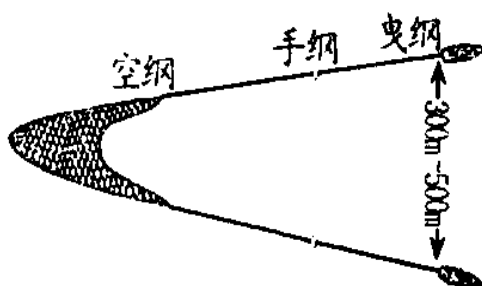


Diagram A – Twin trawler

II. Ningbo coastal fishing vessels operating characteristics

Common fishing methods in Ningbo coastal fishing area are: light purse, double drag, single drag, drag shrimp, sail net, crab cage, stream net, submarine string and small purse seining net. A brief introduction on the fishing method that has impact to safe navigation:

(1). Trawling

There are two main kinds of trawling method: the twin trawler and the single trawler.

Twin trawling refers to two separate fishing vessel, dragging in a fixed distance corresponding the hanging fishing nets. The trawl is 400-500 meters in length, deep into the water, trawl speed under normal weather conditions 3-4 knots. When the shooting and hauling the net, usually during night hours or near daybreak, the crew will be busy on



the deck, with deck lights shining on them. The lights and shapes for trawling is as follows:

- ① by daytime, a shape consisting of two cones with their apexes together in a vertical line one above the other near the top of the mast;
- ② by night, two all-round lights in a vertical line, the upper being green and the lower white, and side navigational lights at the aft masthead, and stern light;

In addition to the lights prescribed in paragraph ②

- ③ when shooting their net, two white lights in a vertical line;
- ④ when hauling their net, one white light over one red light in a vertical line.

A single trawler is a fishing vessel alone, dragged a fish net using side and stern tow. Trawling speed approximately 4-6 knots. The identification mark coincides with the double trawling method.

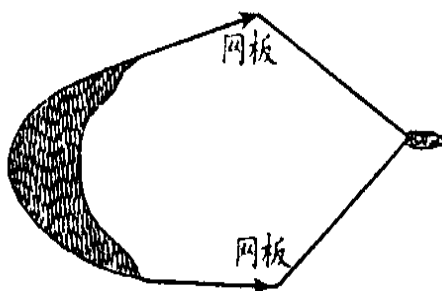


Diagram B – Single trawler

Advised action :

For double fishing trawling vessels, your vessel should maintain **no less than 1 nautical mile** from their stern and by **no less than 0.5 nautical mile** on each side. Your vessel should maintain a safe distance when crossing the fishing vessel's bow and is prohibited to cut across the middle of a double fishing trawling vessel operation. For single drag fishing trawling vessel, your vessel should take the same precaution and avoidance action as per double trawling fishing vessels.

The vessel is to pay attention and avoid the side of the fishing trawling vessel, especially when the vessel is retrieving or casting net, do expect sudden and frequent change of course. We recommended your



vessel keep a minimum distance of 0.5 nautical mile away from the fishing trawling vessel.

(2). Drift net fishing

Drift net fishing is expanded vertical mesh net cast in water, having a wide area of operation, from one to several nautical miles in diameter. The net is mark with buoys and flags, and flag pole with flashing light for night operation. One end of the net going downstream direction, is attach to the bow of the fishing trawler. The bow of the fishing trawler marks the direction and position of the fishing. The fishing vessel and the fishing net are drifting based on the wind direction. The means to identify driftnet is a column buoy, buoy and/or flag, and flag pole with flash lights at night. In the calmer sea surface. The top surface of the of the pontoon or buoy, and fishing vessel can be detected by the radar, forming almost into a straight line on the screen.

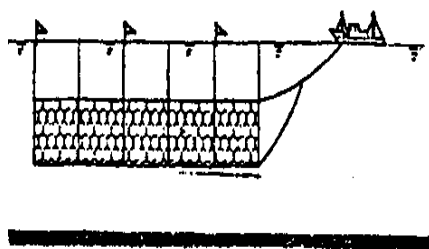


Diagram C – Drift net

Advised action :

Your vessel should maintain at least **0.5 nautical mile** away from this fishing trawler, and is prohibited from navigating close to the fishing trawler bow, and maintain at least **1.0 nautical mile** away from the fishing trawler when the driftnet has been cast.

In the event that your vessel is in close proximity of the drift net, the vessel should immediately stop all engines to avoid the net being entangled on the propeller, and let the vessel across the fishing vessel's net by inertia. Master or officer in charge should maneuver with extra caution and based on the performance of the vessel..

(3). Purse seine fishing

Purse seine fishing is a method using a long strip of net to surround a school of fish. It usually consists of one casting vessel, two lighting



vessels and a fishing vessel for transport purpose. The net length ranges from 980-1200 meters, and has a coverage of approximately 350m diameter. Purse seine fishing can be identified with a vertical display of an all-round red light above an all-round white light in vertical, and in the direction of the fishing net, a network shows a white light indicating the net position.

Advised action :

Vessel should keep a minimum safe distance **0.5 nautical mile** from the upstream direction of the purse seine fishing trawler.

Diagram D – Purse

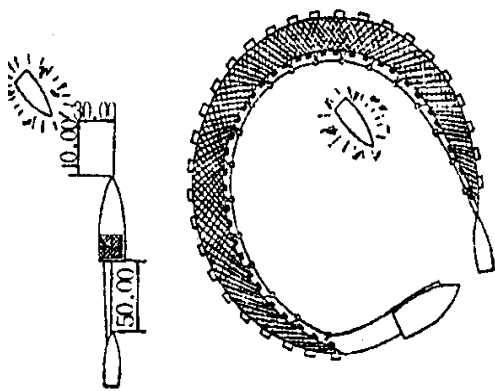


图 4 围网作业

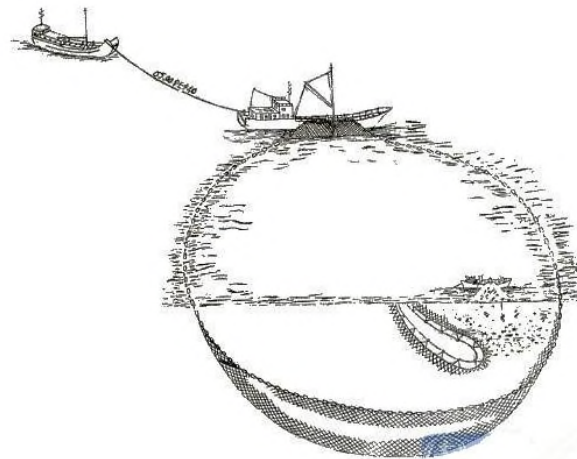


Diagram D – Purse seine

Master, please give close concern and take strict measures on the issues above, thus ensuring safety of navigation, life and assets, and maintaining clean ocean environment.

Ningbo Maritime Safety Administration
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