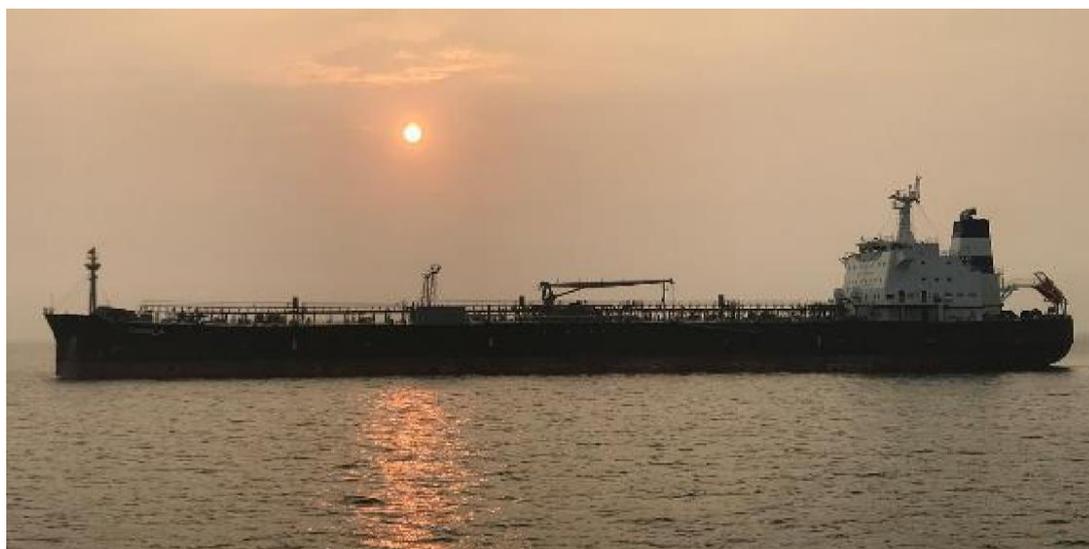




Marine Safety Investigation Unit



Transport Malta



MARINE SAFETY INVESTIGATION REPORT

Safety investigation into the collision involving the
Maltese registered oil tanker

KANALA

and the Chinese registered fishing vessel

LIAODANYU 23626

in position 39° 02.9' N 120° 49.10' E

on 03 September 2019

201909/004

MARINE SAFETY INVESTIGATION REPORT NO. 16/2020

FINAL

Investigations into marine casualties are conducted under the provisions of the Merchant Shipping (Accident and Incident Safety Investigation) Regulations, 2011 and therefore in accordance with Regulation XI-I/6 of the International Convention for the Safety of Life at Sea (SOLAS), and Directive 2009/18/EC of the European Parliament and of the Council of 23 April 2009, establishing the fundamental principles governing the investigation of accidents in the maritime transport sector and amending Council Directive 1999/35/EC and Directive 2002/59/EC of the European Parliament and of the Council.

This safety investigation report is not written, in terms of content and style, with litigation in mind and pursuant to Regulation 13(7) of the Merchant Shipping (Accident and Incident Safety Investigation) Regulations, 2011, shall be inadmissible in any judicial proceedings whose purpose or one of whose purposes is to attribute or apportion liability or blame, unless, under prescribed conditions, a Court determines otherwise.

The objective of this safety investigation report is precautionary and seeks to avoid a repeat occurrence through an understanding of the events of 03 September 2019. Its sole purpose is confined to the promulgation of safety lessons and therefore may be misleading if used for other purposes.

The findings of the safety investigation are not binding on any party and the conclusions reached and recommendations made shall in no case create a presumption of liability (criminal and/or civil) or blame. It should be therefore noted that the content of this safety investigation report does not constitute legal advice in any way and should not be construed as such.

© Copyright TM, 2020.

This document/publication (excluding the logos) may be re-used free of charge in any format or medium for education purposes. It may be only re-used accurately and not in a misleading context. The material must be acknowledged as TM copyright.

The document/publication shall be cited and properly referenced. Where the MSIU would have identified any third party copyright, permission must be obtained from the copyright holders concerned.

MARINE SAFETY INVESTIGATION UNIT
Blk H (Ent B)
Antonio Maurizio Valperga Street
Floriana FRN 1710
Malta

CONTENTS

LIST OF REFERENCES AND SOURCES OF INFORMATION	iv
GLOSSARY OF TERMS AND ABBREVIATIONS	v
SUMMARY	vi
1 FACTUAL INFORMATION	1
1.1 Vessel, Voyage and Marine Casualty Particulars	1
1.2 Description of Vessel	2
1.2.1 Oil tanker <i>Kanala</i>	2
1.2.2 Fishing vessel <i>Liaodanyu 23626</i>	3
1.3 Bridge Manning on <i>Kanala</i>	3
1.4 Environment	4
1.5 Narrative	4
1.6 Action by the Master	7
1.7 Inspection of <i>Kanala</i> 's Stem and Bow Sections	8
2 ANALYSIS	10
2.1 Purpose	10
2.2 Fatigue	10
2.3 Drugs & Alcohol	10
2.4 Actions by the Bridge Team	10
2.5 Foundering of FV <i>Liaodanyu 23626</i>	12
3 CONCLUSIONS	15
3.1 Immediate Safety Factor	15
3.2 Latent Conditions and other Safety Factors	15
3.3 Other Findings	15
4 ACTINS TAKEN	16
4.1 Safety Actions Taken During the Course of the Safety Investigation	16
5 RECOMMENDATIONS	16

LIST OF REFERENCES AND SOURCES OF INFORMATION

IMO. (1972). Convention on the international regulations for preventing collisions at sea. London: Author.

Course recorder and VDR, MT *Kanala*.

Crew members, MT *Kanala*.

Managers, MT *Kanala*.

Maritime Safety Administration, People's Republic of China.

Hutchins, E. (1995). *Cognition in the wild*. Cambridge: The MIT Press.

Sneddon, A., Mearns, K., & Flin, R. (2006). Situation awareness and safety in offshore drill crews. *Cognition, Technology & Work*, 8(4), 255-267.

Woods, D., Patterson, E. S., & Cook, R. I. (2007). Behind human error: taming complexity to improve patient safety. In P. Carayon (Ed.), *Handbook of human factors and ergonomics in health care and patient safety* (pp. 459-476). London: Lawrence Erlbaum Associates.

GLOSSARY OF TERMS AND ABBREVIATIONS

°C	Degree Celsius
AB	Able Seafarer
AIS	Automatic Identification System
ARPA	Automatic Radar Plotting Aid
DSC	Digital Selective Calling
E	East
ECDIS	Electronic Chart Display and Information System
FV	Fishing vessel
GPS	Global Positioning System
GT	Gross Tonnage
kW	Kilowatts
LT	Local Time
m	Metres
mm	Millimetres
MLC	Maritime Labour Convention
MSA	Maritime Safety Administration
MSIU	Marine Safety Investigation Unit
MT	Motor tanker
N	North
Nm	Nautical miles
OOW	Officer of the watch
Rpm	Revolutions per minute
SAR	Search and rescue
SMS	Safety Management System
STCW	International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended
T	True
TSS	Traffic Separation Scheme
UMS	Unmanned machinery space
UTC	Universal Time Co-ordinated
VDR	Voyage Data Recorder
VHF	Very High Frequency
VTS	Vessel Traffic Service

SUMMARY

On 04 September 2019, the managers of MT *Kanala* notified the Marine Safety Investigation Unit (MSIU) that *Kanala* had been in a collision with a fishing vessel in position 39° 02' N 120° 49' E (Bohai Sea, China). *Kanala*, laden with a full cargo of gasoline was enroute to Sakai, Japan. Following the collision, the Maritime Safety Administration (MSA) of the People's Republic of China instructed the master to alter course and anchor at Laotieshan Anchorage, China in order to carry out an investigation.

Preliminary information indicated that FV *Liaodanyu 23626* was engaged in pair trawling with sister FV *Liaodanyu 23625*. Both fishing vessels were making way at three knots. Just before the collision, FV *Liaodanyu 23625* cast off the trawling gear. Following a thorough review of the evidence submitted to the MSIU, the safety investigation established that when *Kanala* was about to pass the fishing vessels, FV *Liaodanyu 23626* crossed the bow with the trawling gear trailing behind her. *Kanala* snagged the trailing gear which resulted in the fishing vessel foundering with the loss of one person on board.

Background to the safety investigation

The MSIU would like to acknowledge the support and assistance received from the MSA. During the course of the safety investigation, the MSIU did not have access to the fishing crew, thus, to this extent, the dynamics of the events on the fishing vessels remain unclear.

1 FACTUAL INFORMATION

1.1 Vessel, Voyage and Marine Casualty Particulars

Name	<i>Kanala</i>	<i>Liaodanyu 23626</i>
Flag	Malta	China
Classification Society	Nippon Kaiji Kyokai (NKK)	NA
IMO Number	942552	NA
Type	Oil tanker	Fishing /trawler
Registered Owner	Alyss Shiptrade S.A.	NA
Managers	Executive Shipmanagement Pte Ltd.	NA
Construction	Steel (Double hull)	Steel
Length overall	182.5 m	29.47 m
Registered Length	175.0 m	NA
Gross Tonnage	28465	125
Minimum Safe Manning	14	NA
Authorised Cargo	Oil	Fish
Port of Departure	Jinzhou, China	NA
Port of Arrival	Sakai, China	NA
Type of Voyage	International	NA
Cargo Information	35,048.271 tonnes of gasoil	Fish in bulk
Manning	23	10
Date and Time	03 September 2019 at 2121 (LT)	
Type of Marine Casualty or Incident	Very Serious Marine Casualty	
	Less Serious Marine Casualty	Very Serious Marine Casualty
Location of Occurrence	39° 02.90' N 120° 49.10' E	
Place on Board	Bow / over side	Over side
Injuries/Fatalities	None	One fatality
Damage/Environmental Impact	None	None
Ship Operation	On passage	On passage
Voyage Segment	Transit	Transit
External & Internal Environment	Wind South Beaufort Force 2 to 3. Slight sea, low swell and visibility good. Air temperature 25 °C, sea temperature 26 °C.	
Persons on Board	23	10

1.2 Description of Vessel

1.2.1 Oil tanker *Kanala*

Kanala, a 28,465 gt oil tanker was owned by Alyss Shiptrade S.A. and managed by Executive Shipmanagement Pte., Ltd. She was classed with Nippon Kaiji Kyokai (NKK). The vessel's length overall was 182.50 m and her summer deadweight was 44,996 tonnes. Propulsive power was provided by a six-cylinder Mitsui-MAN-B&W 6S50MC slow speed diesel engine producing 8,580 kW at 127 rpm, driving a single, fixed pitch propeller. The vessels' service speed was 15.0 knots. *Kanala*'s General Arrangement plan and Midship Section are shown in Figure 1.

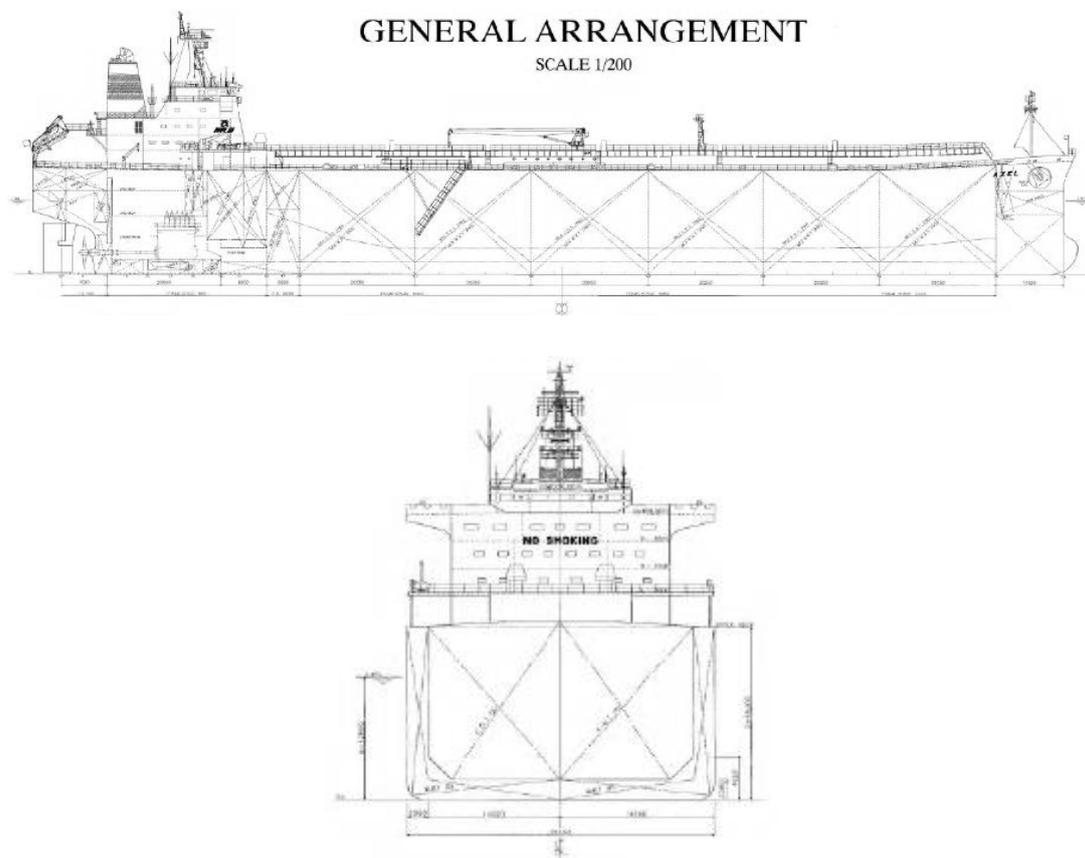


Figure 1: MT *Kanala* GA plan and Midship Section

The navigational equipment on board consisted of two sets of radar (S and X band) with Automatic Radar Plotting Aids (ARPA), Very High Frequency (VHF) radiotelephone with Digital Selective Calling (DSC), Global Positioning System (GPS), a gyro and magnetic compass, an echo sounder, ECDIS, a course recorder and an Automatic Identification System (AIS). The vessel was also fitted with a voyage data recorder (VDR) model FURUNO VR3000.

1.2.2 Fishing vessel *Liaodanyu 23626*

Liaodanyu 23626 was a 125 gt Chinese registered fishing vessel (**Figure 2**). The steel hull had a length of 29.47 m, a breadth 6.00 m and a moulded depth of 2.70 m. She was powered by a 330 kW main engine. She was fitted with a radar, AIS and VHF radio. The MSA confirmed that she was carrying valid statutory certificates. *Liaodanyu 23626* was privately owned and operated as a fishing vessel off the coast of China. *Liaodanyu 23626* was manned by 10 crew members including a skipper, a deck officer, a chief engineer and seven deck hands. At the time of the accident, *Liaodanyu 23626* was engaged in pair trawling¹ with sister FV *Liaodanyu 23625*. The type of trawling gear separating the two fishing vessels is not known.



Figure 2: FV *Liaodanyu 23626*

Source: China Maritime Safety Administration

1.3 Bridge Manning on *Kanala*

Kanala was manned in accordance with her Minimum Safe Manning Certificate, issued by the flag State Administration. There were 23 persons on board.

The master was a 39 year old Indian national. He held a Certificate of Competency as Master of a Foreign Going Ship issued in 2009 by the Government of India. He had

¹ Catching fish by dragging through the water a dredge net or other fishing apparatus.

been at sea for 10 years and was promoted as a master in 2015. He joined *Kanala* on 24 May 2019 in Sendai, Japan.

The third officer was 30 years old, also an Indian national. He had joined the Company in 2016. Since obtaining Second Mate Certificate of Competency in 2016, he had over 12 months experience as an independent OOW. Previously, he had sailed on ships trading in Asia and he had experience of navigating in waters with fishing traffic including *Kanala*'s last voyage to Jinzhou in Bohai Sea. He joined the vessel on 23 August 2019 at Yosu, South Korea.

At the time of the accident, the look-out on duty was a qualified able seafarer (AB). He was 32 years old from India. He had been at sea for over 9 years, eight years of which as an AB. He embarked *Kanala* on 08 June 2019.

The working language on board was English.

1.4 Environment

The weather was clear and the visibility was good. The wind was from the South, Beaufort Force 2 to 3. The sea was slight with low swell. The air and sea temperature was 25 °C and 26 °C respectively.

1.5 Narrative²

On the morning of 03 September 2019, *Kanala* sailed from Jinzhou, China for Sakai, Japan. She was carrying 35,048 tonnes of gasoline on an even keel, drawing a draft of 10.35 m. At 1200, the master handed over the con to the second officer. He then completed several administrative tasks on the bridge and eventually retired to his cabin at 1730. Before leaving the bridge, he wrote his night orders in the Night Order Book and instructed the OOW to call him on arriving at Dalian VTS reporting position, around 2200.

At 1800, the third officer arrived on the bridge. He signed the master's Night Order Book and took over the navigational watch from the second officer. It was dark, the

² Unless otherwise stated, all times are Ship's Time (UTC +8).

visibility was good and there was no significant traffic. *Kanala* was in Bohai Sea, navigating on a planned course of 190° (T) in the direction of Laotieshan Traffic Separation Scheme (TSS). The gyro compass reading was 188° and her speed was 12.70 knots. The autopilot steering was engaged and the telegraph was set on full sea speed. The ship's two radars were switched on. The 'S' band radar was on six nautical mile (nm) range. The 'X' band radar, set on 12 nm scale was off-centred, North-up, relative motion. The vessel's navigation lights were in good working condition and switched on. An AB also arrived on the bridge for look-out duty at 2000. At 2100, the fourth engineer, fifth engineer and a motorman reported in the engine-room for the unmanned machinery space (UMS) checks.

On 01 September 2019, FV *Liaodanyu 23626* left for the fishing grounds, off the coast of China. On 03 September, she was engaged in pair trawling with her sister fishing vessel *Liaodanyu 23625*. At 2110, the fishing vessels were steering a course of 240° and their speed was three knots. They were reportedly exhibiting side lights together with an all-round red over white light on the mast. Both fishing vessels had deck working lights on. *Liaodanyu 23626*'s skipper reported that he first visually sighted *Kanala* on her starboard quarter at a distance of two nm.

At 2000, *Kanala*'s OOW and look-out observed a cluster of vessels, far off ahead on the port and starboard sides. It was also noticed that by 2030, the fishing vessels were increasingly getting closer to *Kanala*. 10 minutes later, the OOW started adjusting the autopilot heading gradually to starboard. By 2100 (**Figure 3**), *Kanala* passed the gyro heading of 210°. At the time, her speed was 13.10 knots.

The OOW recalled that at around 2110, two fishing vessels, about two points on the port bow, displaying red over white light and no side lights, were visually observed. They were identified on the radar and the AIS. He further reported that the ARPA acquisition of the targets was lost when at a distance of about one nm, they stopped moving.

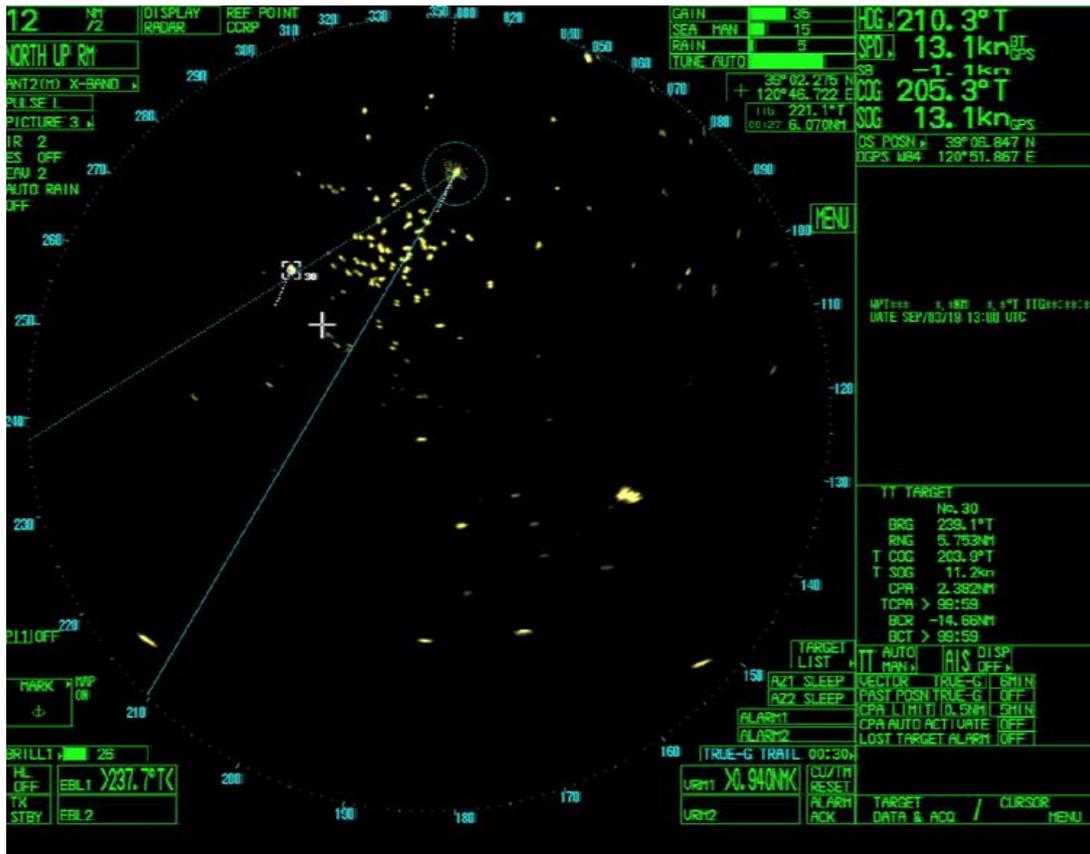


Figure 3: Radar image at 2100 showing concentration of fishing vessels ahead

At about the same time, the OOW saw two fishing vessels on the starboard side drawing closer to *Kanala*. He stated that he gradually altered the course between 4° to 5° to starboard and noticed that the fishing vessels had also altered their course to starboard. At a distance five cables, they crossed the bow at 4.5 knots. By this time, *Kanala* was on a gyro heading of 218.5° and the OOW started altering the course to port. The two fishing vessels that were initially sighted on the port bow, now eight cables distant, were seen advancing closer to *Kanala*.

The OOW reported that one of the fishing vessel passed on *Kanala*'s port side whilst the other was observed making way across the bow to starboard. The look-out reported that he used the Aldis lamp to alert the latter fishing vessel. As the fishing vessel got closer, the view was momentarily lost. The OOW stated that a few moments later, the fishing vessel's lights reappeared fine on the starboard bow. The vessel's gyro heading was 210° and he estimated that the fishing vessel was about four cables distant.

The OOW stated that he instantly changed from auto-steering to manual and turned the helm to port. At about that moment, he felt a very slight vibration along the ship's hull. He immediately summoned the look-out and requested him to take the helm. The OOW ordered the helm hard over to starboard to keep the fishing vessel clear of the propeller, called the master, and rushed to the starboard bridge wing to get a closer view of the fishing vessel as she passed along the ship's side. The OOW reported that he saw no fishermen on deck but could hear some commotion on the fishing vessel³.

The accident was logged in the deck logbook as 'suspected collision with fishing vessel at 2121 in GPS position 39° 02.90' N 120° 49.10' E'. The fishing vessel was later identified by her registered name *Liaodanyu 23626*.

1.6 Action by the Master

The master reported that while he was resting in his cabin, he felt a slight shudder, followed by a telephone call from the bridge. Within a minute or two, he was on the bridge. He noticed that the helm was hard over to starboard. He immediately rushed to the starboard bridge wing and was briefed by the OOW. The master looked towards the ship's stern and observed a solitary red light receding in the distance. His immediate concern was avoiding several more fishing vessels in the immediate vicinity and he returned inside the wheelhouse. He was soon focussed on navigating the vessel clear of the cluster of fishing vessels and heard *Kanala* being called on the VHF radio. He steadied *Kanala* on a heading of around 160° and set the main engine on stand-by and the vessel called the fishing vessel and Dalian VTS Centre on the VHF radio. The master stated that *Kanala* received no response from both stations.

The general alarm was sounded and the crew members were mustered at their designated muster stations. Both the chief officer and the chief engineer assessed the damage and checked the ship's tanks. All tanks were found intact and subsequently, the Company was informed. Meanwhile, Dalian VTS Centre called *Kanala* and advised that FV *Liaodanyu 23626* had capsized, one person was missing, and requested the master to carry out search and rescue (SAR) in the area of the accident.

³ The skipper of the sister fishing vessel *Liaodanyu 23625* reported that a searchlight was flashed at *Kanala* and the trawling gear was cut just before the impending contact. *Liaodanyu 23625* sustained no structural damage and there were no injuries to her crew.

The main engine rpm was set to manoeuvring speed and she proceeded to conduct SAR operations. At 0050, *Kanala* was joined by the Chinese SAR vessel *Bei Hai Jiu 119*. The following morning at 0950, the VTS Centre directed the master to suspend SAR and proceed to Laotieshan Anchorage.

At 1324, on 04 September 2019, *Kanala* dropped her anchor at no. 1 Laotieshan Anchorage.

1.7 Inspection of *Kanala*'s Stem and Bow Sections

At anchorage, the vessel was boarded by the vessel's managers, a Class surveyor, and officials from the MSA. The following damages were reported:

- indentation on the stem below side stringer no. 32, measuring about 270 mm by 160 mm and approximately 15 mm deep;
- indentation on shell plating in way of frame 78 (collision bulkhead) and below side shell longitudinal no. 28 on starboard side. The indent forward of frame no. 78 was about 450 mm by 200 mm and about 15 mm in depth. The indent, aft of frame no. 78 was about 240 mm by 100 mm and about 5 mm deep; and
- indentation on the side shell plating, forward and aft of frame no. 79 below side shell longitudinal no. 28, measuring about 450 mm by 200 mm in size and about 10 mm in depth.

No cracks, leakage, indentation or damages were found on the internal structures of the void space, forepeak tank and water ballast tank no. 1 starboard. The structural damage identified by Classification Society surveyor was within the tolerance of the Class rules' requirements and no repairs were recommended to the vessel hull (**Figure 4**).

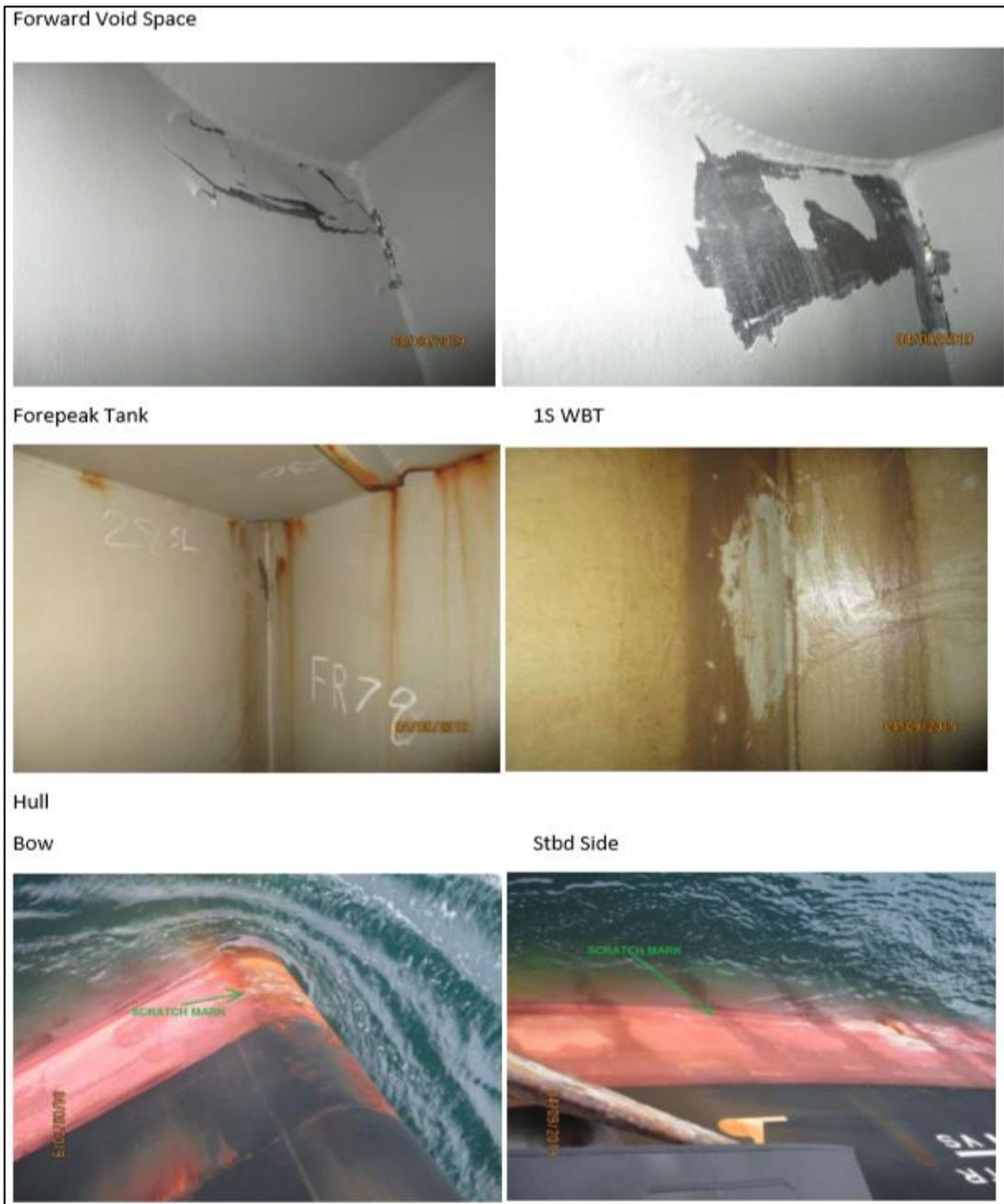


Figure 4: Structural damage sustained by Kanala
 Source: Executive Shipmanagement Pte Ltd.

2 ANALYSIS

2.1 Purpose

The purpose of a marine safety investigation is to determine the circumstances and safety factors of the accident as a basis for making recommendations, to prevent further marine casualties or incidents from occurring in the future.

2.2 Fatigue

The record of hours of work and rest of the master, third officer and look-out indicated that they were in compliance with the requirements of MLC and STCW Conventions. Their behaviour on the bridge did not appear to be impaired by fatigue and hence, fatigue was not considered to be a contributing factor to the accident.

2.3 Drugs & Alcohol

Shortly after the accident, the master carried out alcohol tests on the third officer, look-out, the chief engineer and himself. All the tests returned negative results (0%). The use of alcohol and / or drugs was not considered to be a contributing factor to the accident.

2.4 Actions by the Bridge Team

The bridge was manned in accordance with the SMS for navigation in coastal waters. Upon departure from Jinzhou and up to Laotieshan TSS in Bohai Sea, the passage was uneventful. However, shortly after 2000, a cluster of fishing vessels was detected both visually and on the radar (**Figure 5**). Although applicable standing orders allowed wide course alterations⁴, the OOW proceeded along the planned course. As mentioned earlier in the safety investigation report, the OOW had previous navigation experience through fishing traffic in these waters. It was therefore considered possible that he perceived that on this occasion, like previous occasions, the situation was under control and manageable, whilst the circumstances did not warrant large course deviation, reduction of speed and / or the need to call the master.

⁴ Standing orders permitted an alteration of course up to 60° without the need to call the master.

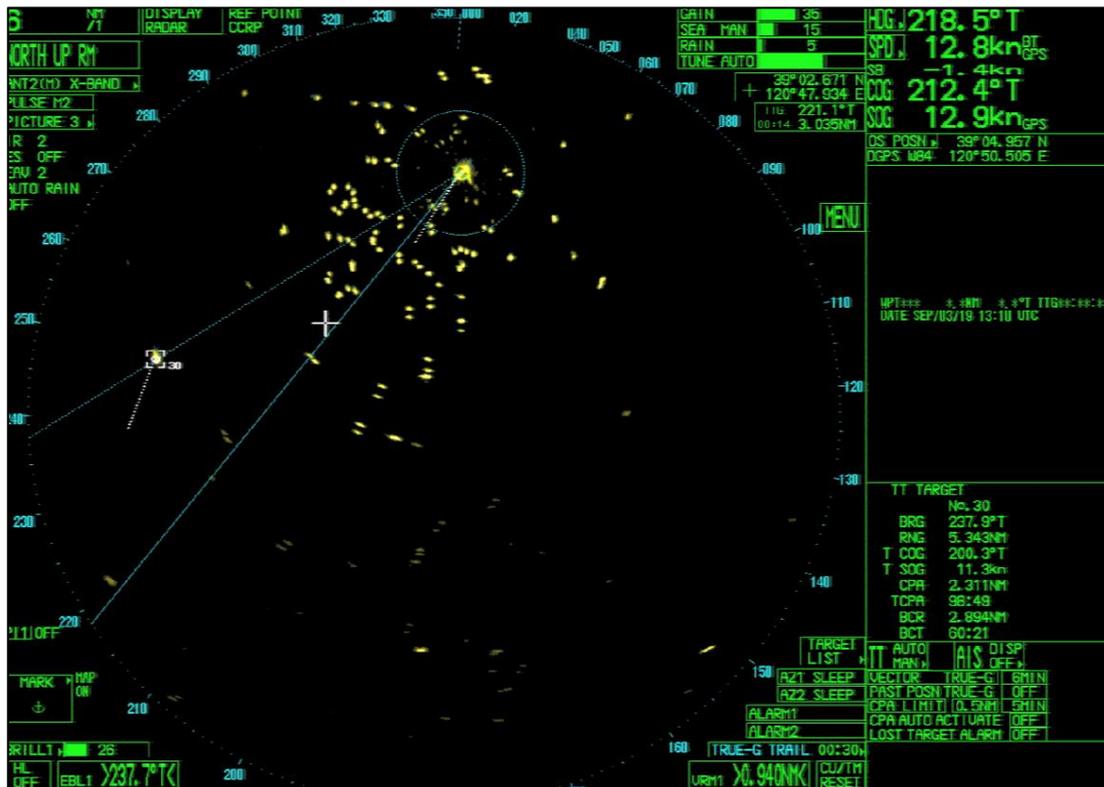


Figure 5: Radar image at 2110 showing fishing traffic in the close proximity of *Kanala*

As *Kanala* progressed along the planned route, the traffic became denser and the OOW was compelled to turn the vessel to keep clear. From the review of the VDR data and course recorder graph, it was evident that from 2040 onwards, the OOW had been making numerous incremental adjustments of *Kanala*'s course to starboard, apparently 'weaving' through fishing vessels. The audio records confirmed that at regular intervals, the AB was calling out the position and movement of the fishing vessels. It was evident from the radar image that the situation in the immediate vicinity of *Kanala* was demanding and dynamic, necessitating constant helm movements. Therefore, it would seem likely that under these conditions, the OOW was for most of the time stationed at the steering console, relying on look-out and his own assessment of the situation for evasive action.

The safety investigation was of the view that the OOW's positioning at the steering console created a particular context which imparted its effects on the OOW's observations of the external, dynamic environment. From a psychological perspective, the OOW was bound to receive partial information from the environment around him, even because attention is, by nature, selective. In turn, this would have

influenced other stages of the cognitive process and, inevitably, the understanding of what is very often described as an ‘events-rich domain’.

The safety investigation submitted that the absence of the master from the bridge may have also had a bearing on the outcome of the events. Aside from being part of the Company’s requirements, the night orders prepared by the master reflected an organisational set-up, which encouraged team effort. Research defines this as ‘distribution of cognitive labour’, and highlights the benefits of a shared workload, in addition to the access to the master’s knowledge. However, as indicated elsewhere in this safety investigation report, the OOW perceived a situation which was manageable and under control and to this effect, the need to call the master on the bridge was not felt.

As for any other vessel, the presence of the look-out was also intended to create teamwork on the bridge. This requirement, explicit in the relevant maritime convention, signifies that teamwork is essential for navigational watches, including the hours of darkness, where the context is expected to be more complex. It remains, however, that unless the two crew members have a shared understanding of the actual developing situation, the onus of critical observations and decisions remains on a single person, in this case, the OOW.

2.5 Foundering of FV *Liaodanyu 23626*

At 2110, *Kanala* was on a heading of 218.5° when the OOW started to make gradual alterations of course to port (probably to return back to the vessel’s planned route). The two fishing vessels that had been initially sighted on the port bow (*Liaodanyu 23626* and *Liaodanyu 23625*) were now eight cables distant. The regulatory lights sighted by the bridge team indicated that both vessels were engaged in fishing (neither trawling nor pair trawling) and their position and movement was being closely monitored.

Review of the course recorder graph suggested that at around 2106, further alterations of course to port side was impeded and *Kanala* was held steady on a course of 210°. As no definitive information was available, the safety investigation was unable establish whether a collision was imminent. However, taking account of the fact that

Kanala was on a steady heading of 210°, and the fishing vessels were on the port side, suggested that a collision was not anticipated by the bridge team. A few minutes later, *Kanala* passed clear of *Liaodanyu 23625*. *Liaodanyu 23626*, however, was observed running across the bow to starboard. Her movement was swift and the OOW had no time to act other than directing his Aldis lamp to alert the fishing vessel of the danger.

In the absence of compelling evidence, it is hypothesized that when *Liaodanyu 23626* was crossing the bow, the skipper of the *Liaodanyu 23625* cut the trawling warp, leaving the trawling gear trailing behind the sister fishing vessel. During crew interviews on board the vessel in Japan, both the OOW and look-out maintained that *Liaodanyu 23626* was momentarily out of view and was again sighted fine on the starboard bow. This indicated that *Liaodanyu 23626* had effectively crossed over within the shadow zone of the forecastle structure which briefly blocked the view of her lights. As soon as *Kanala*'s helm was turned to port to give the fishing vessel more sea room, very mild vibrations were reportedly felt by the OOW with no significant drop in speed. This suggested that the vessel's stem snagged the trailing end of the trawl warp (**Figure 6**), resulting in swamping and foundering of the fishing vessel.

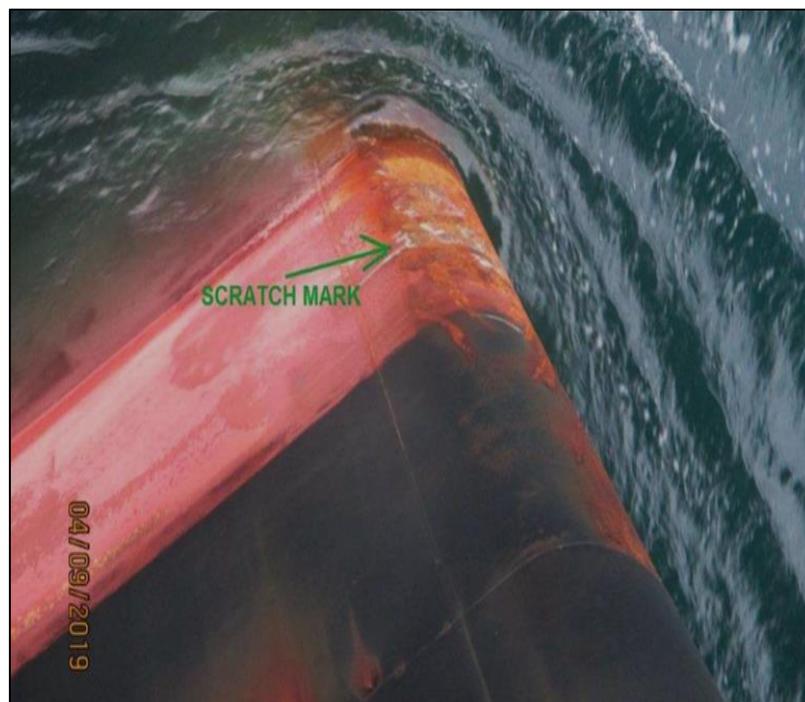


Figure 6: Superficial scratch marks on *Kanala*'s stem and starboard side hull
Source: Executive Shipmanagement Pte Ltd.

THE FOLLOWING CONCLUSIONS, SAFETY ACTIONS AND RECOMMENDATIONS SHALL IN NO CASE CREATE A PRESUMPTION OF BLAME OR LIABILITY. NEITHER ARE THEY BINDING NOR LISTED IN ANY ORDER OF PRIORITY.

3 CONCLUSIONS

Findings and safety factors are not listed in any order of priority.

3.1 Immediate Safety Factor

- .1 Kanala's stem snagged the trailing end of the trawl warp and swamped FV *Liaodanyu 23626*;
- .2 The foundering of FV *Liaodanyu 23626* was attributed to the loss of reserve buoyancy.

3.2 Latent Conditions and other Safety Factors

- .1 Although applicable standing orders allowed wide course alterations, the OOW proceeded along the planned course;
- .2 The situation may have been perceived under control and manageable, whilst the circumstances did not warrant large course deviation, reduction of speed and / or the need to call the master;
- .3 For most of the time, the OOW must have been stationed at the steering console, relying on look-out and his own assessment of the situation for evasive action;
- .4 The absence of the master from the bridge may have also had a bearing on the outcome of the events;
- .5 FV *Liaodanyu 23626* was not displaying lights for a vessel engaged in trawling or pair trawling;
- .6 The third officer had not anticipated one of the fishing vessel would attempt to run across the bow.

3.3 Other Findings

- .1 The audio records confirmed that at regular intervals, the AB was calling out the position and movement of the fishing vessels.

4 ACTIONS TAKEN

4.1 Safety Actions Taken During the Course of the Safety Investigation

Procedures for navigating in Bohai Sea and the East coast of China were revised. Additional control measures were introduced, addressing the risk of encountering dense fishing traffic and actions required by the officers on watch. The master was instructed to include in standing / night orders course deviation of up to 15 nm from planned track to avoid fishing traffic.

The OOW was briefed on the use of radar, calling master, navigational officer, look-out / helmsperson, whenever a situation necessitated their presence on the bridge. The master and third officer were required to attend training and simulation courses on navigational safety.

The Company planned seminars with senior officers and onboard audits to ensure that safe navigational practices were adhered to by all navigational officers.

5 RECOMMENDATIONS

In view of the conclusions reached and taking into consideration the safety actions taken during the course of the safety investigation,

China Maritime Safety Administration is recommended to:

16/2020_R1 Issue an information notice to the fishing industry to highlight:

- the importance of exhibiting lights and signals in accordance with the requirements of the International Regulations for Preventing Collisions at Sea, 1972; and
- the dangers of carrying out fishing activities in close proximity of shipping lanes.