

# **FINAL REPORT**

**COLLISION BETWEEN SRS  
MV APL SOUTHAMPTON AND  
CHINESE FISHING VESSEL (ZHE LING YU 52035)  
OFF WENZHOU-ZHEJIANG, CHINA  
ON 15 MARCH 2018**

**MIB/MAI/CAS.038**

**Transport Safety Investigation Bureau  
Ministry of Transport  
Singapore**

**28 June 2019**

## The Transport Safety Investigation Bureau

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## **SYNOPSIS**

On 15 March 2018, when the SRS APL Southampton was enroute from the port of Xiamen to Ningbo (China), she was involved in a collision with a fishing vessel during the hours of darkness and in restricted visibility (fog).

The collision resulted in the capsizing and sinking of the fishing vessel, with reportedly one fatality, one missing and eight injured crew of the fishing vessel.

The TSIB classified the occurrence as a very serious marine casualty and launched an investigation.

The investigation revealed that the APL Southampton was operating in an area with a heavy concentration of fishing vessels, during restricted visibility at a speed of 21kts. The vessel's passage plan did not take into account the environment conditions and peculiarities of the eastern coast of China during a fishing season where fog was expected. The vessel's speed was not reduced nor was its manning level increased when the visibility reduced and an increased fishing vessel concentration.

The bridge team did not positively establish whether there was a collision, and continued its voyage to the next port. The investigation also revealed that both APL Southampton and the fishing vessel did not take appropriate actions to assess risk of collision and take appropriate actions to avoid collision.

This incident reiterates the importance of proper bridge watchkeeping, and complying with international regulations for preventing collisions at sea.

## VIEW OF VESSEL



MV APL Southampton

## VESSEL(S) PARTICULARS

Name	APL Southampton (APLS)	Zhe Ling Yu 52035 (ZLY) <sup>1</sup>
IMO Number	9462017	-
International Call Sign	9V9399	(Local) "52035"
MMSI Number	566409000	412417432 <sup>2</sup>
Flag/ Port Registry	Singapore	Wenling City, Taizhou County (Zhejiang) - China
Classification society	DNV-GL	N.A.
Ship type	Cargo Ship (Container) 9850 TEU	Fishing vessel
Year Built	2012	Unknown
Owners/ Operators	CMB Ocean 8 Leasing Company Pte. Ltd. (Singapore)	Single-Owner
Company <sup>3</sup>	CMA CGM International Shipping Company Pte Ltd (Singapore)	Single-Owner
Gross tonnage	128929	396
Length overall / Breadth	347.00m / 45.20m	46.0m / 8.0m
Draught <sup>4</sup>	10.8m (Fwd) / 11.5m (Aft)	Unknown
IMO Line of Sight <sup>5</sup>	Attained Invisible Range: 475.74m (Loaded)	N.A.

<sup>1</sup> Information according to China MSA and open source. Other details not known.

<sup>2</sup> Fitted with AIS-B transponder

<sup>3</sup> In accordance with ISM Code – SOLAS Chapter IX, IMO Res.A.741(18) as amended thereof.

<sup>4</sup> Reported and/or recorded before the incident.

<sup>5</sup> As per SOLAS Chapter V, Regulation 22 – Navigation Bridge Visibility

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# 1 FACTUAL INFORMATION

All times used in this report are Local Time. (UTC +8.0H)

## 1.1 Sequence of events

- 1.1.1 APLS departed (FAOP<sup>6</sup>) the port of Xiamen, China, at about 1100H on 15 March 2018, and was bound for another port in China, Ningbo. Her estimated time of arrival (ETA) was 0830H on 16 March 2018 at the pilot station. The distance between pilot stations to be covered was 460nm (nautical mile<sup>7</sup>). To make the ETA, the vessel would have had to achieve an average speed of about 21kts as per the passage plan.
- 1.1.2 At about 1955H on 15 March 2018, with the Second Officer (4-8 watch) in con<sup>8</sup>, the Master penned down his night orders for the night and left the bridge. The Third Officer (3O) then took over as the Officer of the Watch (OOW) at about 2000H and was assisted by an able-seafarer deck (ASD) as the lookout, while the vessel was on auto-pilot proceeding with an average speed of 21kts, at about 82 RPM.
- 1.1.3 From about 2100H, the bridge watchkeepers encountered intermittent fog, reducing the visibility to about 5nm, with less than 10 vessels within a range of 6nm. There were some fishing vessels in the vicinity which could be sighted visually. At about 2240H, when passing near the coast of Wenzhou (East China Sea), the concentration of fishing vessels increased (about 10 to 30 within a 6nm range), most of them were on APLS' planned north-easterly course of about 034°(T).
- 1.1.4 Using the auto-pilot, 3O altered APLS' course to pass some groups of fishing vessels at a distance of about 0.2nm to 0.4nm. The intermittent fog persisted and at times, reduced the visibility to less than 1nm. 3O wanted to assess<sup>9</sup> if the restricted visibility prevailed more than two to three minutes before deciding to call the Master.
- 1.1.5 At about 2313H, the Taizhou vessel traffic system (VTS) broadcasted a Securite<sup>10</sup> message on the VHF regarding the heavy fishing vessel traffic

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<sup>6</sup> Sea speed on 'Full Away' on passage (FAOP) at about 21 knots @ 82 RPM. Under normal operating conditions, would require about 12 minutes for APLS's engine to be reduced to manoeuvring speed @ 65RPM. Such a reduction does not require any notice to engine room. According to Master's standing orders, OOW was fully authorised to use the engine at any time in case of an emergency..." – rpm to be read in thousands of

<sup>7</sup> one nautical mile is equivalent to 1852 metres or 1.852 km.

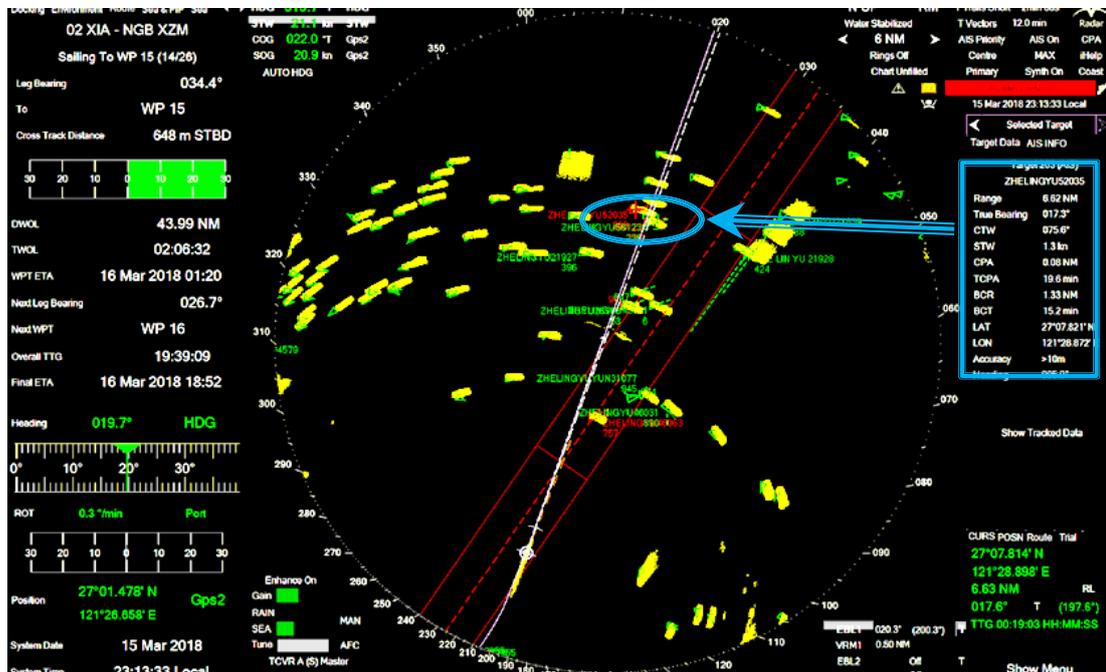
<sup>8</sup> Having control of the navigation of the ship

<sup>9</sup> 3O referred to his previous experience when transiting the area in January 2018.

<sup>10</sup> Message typically concerning the safety of navigation or giving meteorological warnings (IMO - International Code of Signals) – The message was repeated at about 2319H.

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near the coastal waters between Wenzhou, Taizhou and Ningbo. These areas were on APLS' passage. Among these fishing vessels, was the ZheLingYu 52035 (ZLY). Many of the vessels including ZLY were auto-acquired on both X and S-band radars of APLS, which had Automatic Radar Plotting capabilities (overlay with AIS identification) (See **Figure 2**).



**Figure 1:** X-band radar acquired the presence and identity of fishing vessel ZLY annotated in blue by TSIB, and other vessels in APLS' route at about 2313H.

1.1.6 The red dotted line in the figure above shows APLS' planned passage with 0.5nm cross track safety margins on either side. At this time APLS was on a heading of 020°(T), and 0.3nm to the starboard side of the planned passage. The target acquisition data at 2313H showed that a fishing vessel (later identified to be the ZLY) was heading east, at a speed of over 1kt and indicating a bow crossing range of 1.3nm (referenced to APLS). Time to this crossing was about 15 minutes.

1.1.7 At about 2323H, an automated<sup>11</sup> collision warning directed to APLS (using the call sign) was heard over the VHF. About two minutes later, the ASD asked 3O whether to call for the Master, which was turned down by the latter. APLS was on the port side of its course line at a cross track distance of about 0.5nm and its heading remained unchanged at about 2324H. A group of fishing vessels remained ahead of APLS' path at this time (see **Figure 2**).

<sup>11</sup> An anti-collision warning broadcast with vessel's international or domestic call-sign using INTERCO radio-communications phonetics. The source of this broadcast is unknown. According to China Marine Safety Administration (MSA), this broadcast was not from the VTS service.

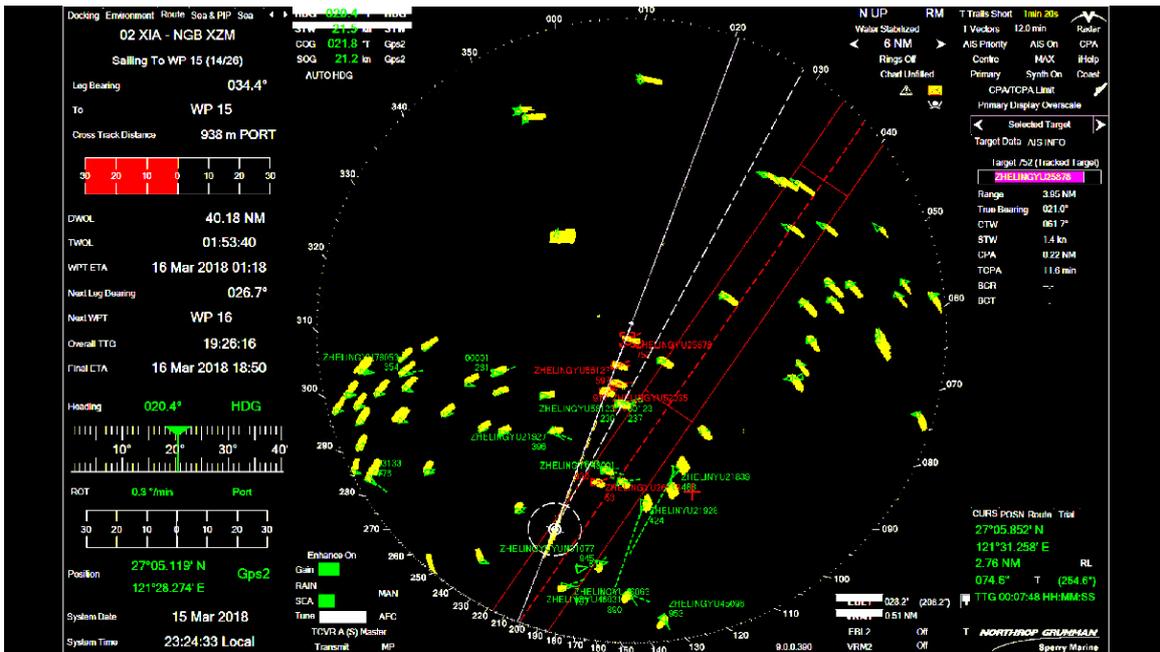


Figure 2: APLS' X-band radar screen display at 2324H

1.1.8 By about 2325H the visibility had reportedly dropped to almost zero. 30 claimed to have pressed the automatic fog signal<sup>12</sup> on the bridge console. Another collision warning (automated) was addressed to APLS to exercise caution. This warning was heard on the VHF twice at two-minute intervals, i.e. at about 2325H and 2328H. The call sign used in the warnings was as per International Code of Signals (INTERCO)<sup>13</sup> and not the IMO's Standard Marine Communication Phrases (SMCP)<sup>14</sup> –

*“Novenine (9) Victor (V) Novenine (9) Terra three (3) Novenine (9) Novenine (9) [9V9399] – **there are fishing boats in the boat position eight degrees three point six nine nautical miles navigate with caution**”*  
[emphasis added in bold]

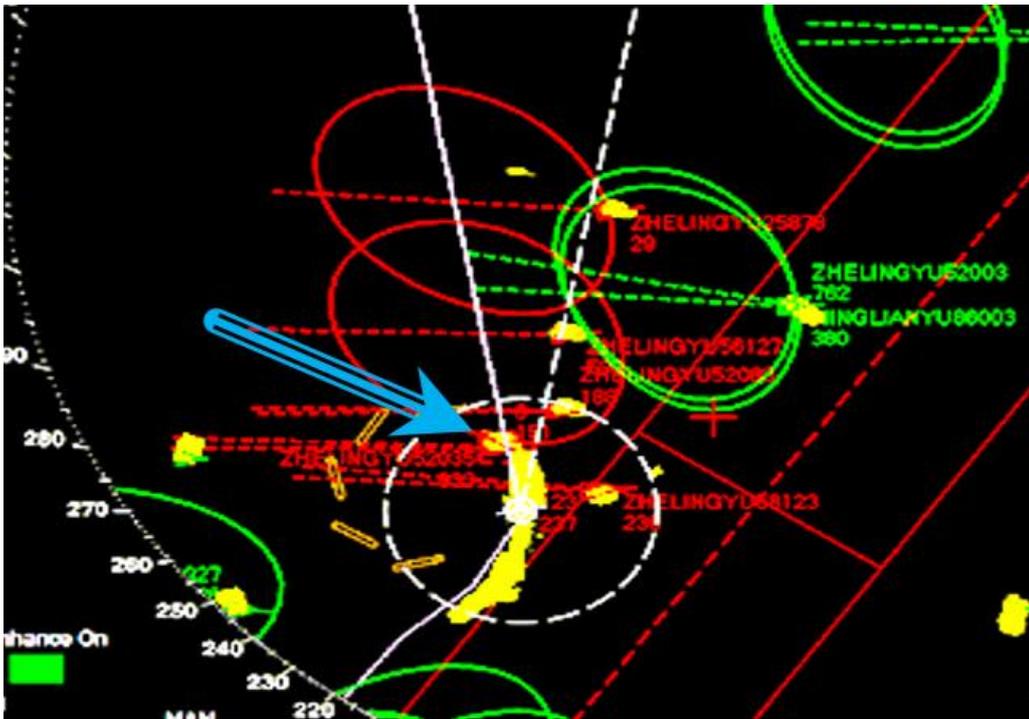
1.1.9 The ASD was about to give his relief watchkeeper a wake-up call, when at about 2329H, 30 instructed the ASD to change from auto-pilot to manual

<sup>12</sup> Expected sound signals as per COLREGs for restricted visibility (Rule 35a) – at intervals of not more than two minutes one prolonged blast.

<sup>13</sup> INTERCO – International Code of Signals is intended to cater primarily for situations related essentially to safety of navigation and persons, especially when language difficulties arise. It is suitable for transmission by all means of communication, including radiotelephony and radiotelegraphy, and embodies the principle that each signal has a complete meaning.

<sup>14</sup> The pronunciation of APLS' call sign using SMCP would be **Niner (9) Victor (V) Niner (9) Tree (3) Niner (9) Niner (9)**. Phrases contained in SMCP are not intended to supersede the International Code of Signals. SMCP was drafted in a simplified version of maritime English in order to reduce grammatical, lexical and idiomatic varieties to a tolerable minimum. They are intended to become an acceptable safety language, using English for the verbal interchange of intelligence among individuals of all maritime nations on the many and varied occasions when precise meanings and translations are in doubt, as is increasingly evident under modern conditions at sea.





**Figure 4:** Zoomed-in radar display at about 2333H - fishing vessel ZLY, indicated by blue arrow

- 1.1.12 The VDR audio recording captured a queried “... *did we hit a boat...*”. ASD responded “...*I can’t see, past already...*”. The 3O called the Master at about 2335H.
- 1.1.13 At about 2337H, the Master arrived on the bridge and was briefed by the 3O on the visibility, the heavy concentration of fishing vessels and about the close-quarter situation with a boat whose AIS icon (including the radar target acquisition symbol) was missing from the radar, after it passed APLS’ bow. The Master took over the con, and instructed the ASD to steer some courses to clear some other fishing vessels in the vicinity.
- 1.1.14 By about 2343H, the vessel’s steering was reverted to auto-pilot. The Master then reviewed the Electronic Chart Display and Information System (ECDIS) playback. Some conversations on the VDR<sup>16</sup> indicated the Master querying the 3O, “... *which one? You could not see her after...? What time? ...*”. At about 0005H on 16 March 2018, the next group of watchkeepers took over the navigation watch. Both 3O and ASD subsequently<sup>17</sup> left the bridge. The Master stayed on the bridge until about 0030H before handing over the con to the Second Officer (12-4 watch).

<sup>16</sup> VDR data revealed that the radar received AIS-messages at about 2338H from five different fishing vessels about a possible collision in APLS’ vicinity.

<sup>17</sup> 3O stayed on the bridge until 0025H – based on VDR audio.

- 1.1.15 On the morning of 16 March 2018, the pilot boarded APLS at 0910H and APLS was diverted to Beilun anchorage (inner Ningbo Port waters). Shortly after the vessel anchored, officers from the Ningbo MSA (China) boarded the vessel for an investigation into an alleged collision incident between APLS and a fishing vessel in the East China Sea, off Wenzhou at about 2332H on 15 March 2018<sup>18</sup>.
- 1.1.16 The Chief Officer accompanied the MSA officers and took pictures of the forward hull of the vessel, above the bulbous bow (See **Figure 5**). The Master, 3O and ASD were later briefed that the fishing vessel sank. There were 10 crew, 8 were injured, one was missing and one had died as a result of the collision.
- 1.1.17 After receiving permission from port authorities, cargo operations for APLS commenced at the container terminal on 19 March 2018 and she resumed her voyage with a crew change on 20 March 2018. The Master, 3O and the ASD, under the instructions of the local authorities were required for further investigations.



**Figure 5:** Paint scratch marks and minor indentations on the forward hull, above waterline.  
(Photo source: the ISM Manager)

- 1.1.18 The Class surveyor's report on the damages sustained on the bulbous bow (See **Figure 6**) which did not compromise hull integrity, indicated a condition of class<sup>19</sup> for the repairs.

<sup>18</sup> According to the information provided to the Master of APLS by the MSA officers

<sup>19</sup> A 3-month period to ensure permanent repairs are done



**Figure 6:** Buckled frames and fractured welding seams on the port side to forward of the bulbous bow (*Photo source: ISM Manager*)

## 1.2 APL Southampton

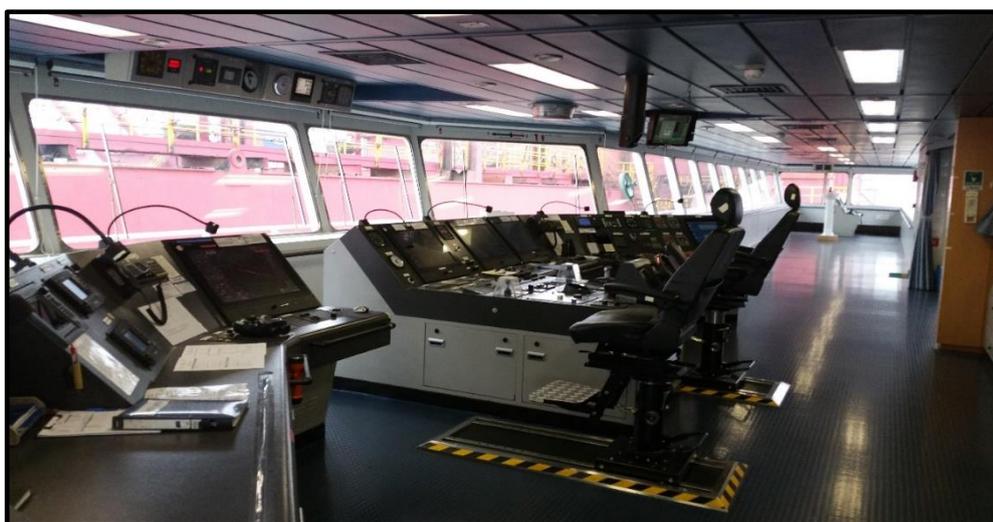
1.2.1 The vessel was manned with a crew complement of 24 officers and ratings at time of the incident. All crew held valid STCW<sup>20</sup> competency certificates required for their respective positions held on board.

1.2.2 The qualification and experience of the Master, 3<sup>rd</sup> Officer and ASD are listed in the table.

Designation	Master	3 <sup>rd</sup> Officer	Able Seafarer - Deck
Qualification	STCW II/2 Issued 2008 IV/2 - Revalidated 2016	STCW II/3 - Issued 2015 I/11 - Revalidated 2016	STCW II/5 Issued 2017
Certification Authority	Ministry of Transport – Romanian Naval Authority	Maritime and Port Authority of Singapore	MARINA – Republic of Philippines
Nationality	Romanian	Malaysian	Filipino
Age	46	25	33
Experience in Rank	10 years	2 years	1 year
Period with Company	(Master) 2.5 years	(Cadet to 3 <sup>rd</sup> Officer) 7 years	(Able Seaman) 1 year
Period on board	5.5 months	4.5 months	1 month
Watchkeeping Schedule	N/A	0800 – 1200 2000 - 0000	0800 – 1200 2000 - 0000

<sup>20</sup> The International Convention on Standards of Training, Certification and Watch keeping for Seafarers (or STCW), 1978 sets qualification standards for masters, officers and watch personnel on seagoing merchant ships.

- 1.2.3 Records of hours of rest and work, documented as per Company’s SMS indicated that the bridge team’s rest hours were in compliance<sup>21</sup>. There was no evidence to suggest that alcohol was consumed on board the vessel.
- 1.2.4 APLS had an enclosed bridge (see **Figure 7**) with an integrated bridge system. A sound reception system<sup>22</sup> was fitted and functional. ECDIS was the primary means of navigation with the displays fitted together with two separate automatic radar plotting aid (ARPA) radars for both the S-band and X-band frequencies, on the centre console, together with the auto-pilot controls and helm. There was no record of navigation equipment failure or malfunction, including the automatic fog signals and ship’s (manually operated) whistle.



**Figure 7:** Navigation bridge of APL Southampton  
(Photo source: ISM Manager)

- 1.2.5 The Safety Management System (SMS) manual included aspects relating to bridge watchkeeping and passage planning, which contained detailed procedures / requirements for ensuring safety of navigation, i.e. the “*Bridge Manual*”. A recorded bimonthly management checklist on bridge procedures was practised covering aspects of bridge management, passage planning and bridge equipment.

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<sup>21</sup> Maritime Labour Convention (MLC) 2006 provides guidelines on minimum number of hours of rest required for seafarers on merchant ships. Also established in the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended (STCW Convention).

<sup>22</sup> SOLAS V/19.2.18, as amended – when the ship’s bridge is totally enclosed and unless the Administration determines otherwise, a sound reception system, or other means, to enable the officer in charge of the navigational watch to hear sound signals and determine their direction.

1.2.6 The Company's SMS did not explicitly prescribe bridge watchkeeping manning levels<sup>23</sup> under various (weather) conditions. According to the Company, this was to give room for Master's authority, allowing appropriate determination of bridge manning levels under prevailing circumstances. The SMS had various checklists for different situations, such as coastal and restricted waters navigation (Checklist no. 120), deep sea navigation (Checklist no. 130) and navigation in restricted visibility<sup>24</sup> (Checklist no. 140). These checklists were in the form of laminated cards and marked (checked-off) temporarily (to be re-used). The first item of Checklist no. 140, stated:

***“After completion of this check-list, it should be recorded in the Bridge log book Navigation in restricted visibility checklist as per IMS Card No Bridge-140 completed”.***

*OOW will indicate points which have not been satisfied and why, as well as the measures taken which are not planned in this list.*

*The OOW will comply with the Master's standing and special orders, in particular with the minimal visibility when he must call him. In any case, the minimal restricted visibility defined by Master should not be less than 3 nautical miles.”*

Amongst others the following line items were required to be checked-off:

- Master called
- Comply with COLREGs rule 19
- Navigation lights checked on and sound signals on as per COLREG Rule 35
- Extra look-out by sight and hearing
- Duty engineer advised
- Safe speed adopted (see COLREGs rule 6)

1.2.7 The SMS further stated that, at any moment, the OOW may call<sup>25</sup> an additional officer on the bridge when deemed necessary (e.g. restricted area, dense traffic, shallow water, Traffic Separation Schemes, approaches to pilot station, low visibility, canal passage).

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<sup>23</sup> Bridge Procedures Guide – A publication, which is mandatory for carriage on the company vessels, contains (appendix B2) a manning matrix to assist in preparing ship specific requirements for watchkeeping levels under different conditions.

<sup>24</sup> Deck logbook contained the following entry by 3O – “2330H: Checklist No.140 complied with”. There was no evidence to confirm whether this checklist was initiated when restricted visibility was encountered first at 2100H, nor completed at 2240H.

<sup>25</sup> The company's view is that the SMS does not restrict the OOW from directly calling other person(s), instead of calling the Master, on the bridge.

1.2.8 The bridge team procedures in this manual with regards to watchkeeping included -

- OOW has the duty to take into consideration of any remark by the duty AB<sup>26</sup> regarding collision avoidance, safety or security issues;
- OOW has the duty to ensure full appraisal of the situation on the risk of collision and other dangers of navigation;
- Calling the Master must be considered as a normal action, essentially when in doubt or when facing potential danger. Amongst others, the OOW shall notify the Master immediately and record in the log book when restricted visibility is encountered;
- The duty AB shall also notify the Master immediately if the OOW deliberately does not take into consideration of his remarks;
- The OOW shall not hesitate to use hand steering, the engine and sound signalling equipment, and summon supplementary crew if needed;
- OOW must be aware of the need to inform Master on all Maritime Safety Information<sup>27</sup> - including urgent information relevant to safe navigation broadcasted to ship

1.2.9 The Master's (relevant) standing orders stated -

- OOW, in charge of the safe navigation of the ship must constantly be aware of the status of all vessels in the vicinity so that you are always prepared to take early and effective action to avoid close quarter situations;
- Close watch must be kept on the visibility so that deterioration is identified at an early stage;
- When navigating within fishing grounds, the acceptance of a smaller CPA may frequently be necessary. However, in such circumstances, the CPA of the fishing vessels must be maintained as large as practicable, and in no circumstances should a fishing vessel cross the bow at a distance of less than 0.5 mile;
- When large concentrations of fishing vessels are indicated on the radar screen, consider the possibilities of avoiding the whole group – with due considerations to other navigational restrictions. If this is not practical, and a reasonably clear passage through the group is not apparent, call me so that the situation can be further assessed;
- All radar targets within the 12-mile range are to be monitored;
- In the event that visibility is reduced to less than 3nm – call me, and ensure that you have at least one lookout on the bridge;
- I need to know whenever there is a change to the surroundings in which the ship is sailing, be this an increase in traffic density, significant deterioration of weather conditions;
- In the case of an emergency, full use is to be made of the engines and helm to avoid imminent collision or grounding. Do not wait for me to arrive on the bridge.

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<sup>26</sup> Referring to ASD in this report.

<sup>27</sup> Defined in SOLAS Convention, Chapter IV as navigational and meteorological warnings, meteorological forecasts and other urgent safety related messages broadcast to ships.

- 1.2.10 Separately, four notable instructions recorded in the Master's night order's, on 15 March 2018 amongst others, stated:
- Stay clear of fishing groups
  - Keeping required speed for arrival at pilot station
  - To make use of all means to avoid close encounters with fishing boats (whistle, signal, laser, bold alterations, speed reductions etc.)
  - Switch on coaming lights<sup>28</sup> to be more visible
- 1.2.11 The Company had a dedicated department to support the fleet for navigation. A copy of the passage plans (final) prepared on board each vessel was routinely sent to this unit for record-keeping, monitoring of the vessel(s) and knowledge management, taking into account peculiarities for specific routes, ports and/or terminals.
- 1.2.12 Regular debriefings<sup>29</sup> after completion of a voyage on board were also routinely conducted to capture notable issues with regards to each voyage, including watchkeeping, communications, meteorological observations, cargo stowage, equipment and machinery.
- 1.2.13 APLS' passage plan<sup>30</sup>, in addition to containing waypoints of the passage, reflected information about nautical publications<sup>31</sup> used for planning the passage, communication channels with port authorities, tidal information, under keel clearance calculations, ship's security level, position plotting intervals and equipment to be consulted for weather forecast<sup>32</sup>. Each leg of the waypoint indicated the relevant security level of the ship in accordance with the Ship's Security Plan. There was no reference of what the minimum bridge watchkeeping level is to be kept along various legs of the passage.
- 1.2.14 The publication e-NP32A (referenced in the plan), stated that fog was expected between the months of March and July, which could last up to 60 days. Information relating to fishing vessel traffic or conditions of fog

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<sup>28</sup> Coaming lights are under deck passage lights typically found on container vessels. At the time of the incident these lights were not switched ON.

<sup>29</sup> Required as per company's SMS – A final debriefing shall be organised to report possible corrective actions for smoother running of the next voyage. Debriefing could also be included in the next passage plan briefing. Passage plan briefing was required to be done prior commencement of a voyage, taking into account all sources of information. There was no information to indicate whether such a briefing had been conducted prior to the commencement of this voyage. There was no information to confirm whether such a briefing took place for this voyage.

<sup>30</sup> The passage plan reportedly took into account briefing done after the previous voyage as required by the company's SMS.

<sup>31</sup> Admiralty sailing directions (referred to as Pilot books) e-NP32A – China Sea Pilot – contains information on navigational hazards, meteorological data amongst others.

<sup>32</sup> Navtex, Inmarsat-C, Weather fax, Bonvoyage

expected in the passage, were not mentioned in the plan. There was no indication whether these conditions were mentioned in the “notes” on the ECDIS.

### 1.3 Additional information from bridge team

- 1.3.1 3O was aware of the requirements to call the Master when the visibility was reduced below 3nm. He also acknowledged that ASD had asked him whether to call for the Master when the visibility had deteriorated. 3O stated that intermittent sea fog was a common occurrence in the area of transit. The bridge team were aware that the collision warnings issued prior to the collision were addressed to APLS.
- 1.3.2 3O added that the OOWs were given the liberty to reduce speed when required. On the previous<sup>33</sup> passage, he had comfortably navigated the vessel with a concentration of fishing vessels. He did not have the need to reduce the vessel’s speed during that transit. On the day of the incident during his watch, the coaming lights were not switched on, but he recalled that he had utilised<sup>34</sup> the whistle when the APLS was near a group of fishing vessels.
- 1.3.3 ASD’s relationship with the OOW had been good over the past month that he had kept watch with him. There were no known reports about any strain in relationship between the OOW and the Master. During the night watch with 3O on 15 March 2018, ASD recalled visibility being below 2nm. When the visibility had dropped to below 1nm, the ASD asked 3O whether the Master was to be called, coaming lights needed to be switched on and whether speed was to be reduced. ASD was subsequently asked to change the steering to manual from auto pilot.
- 1.3.4 ASD stated that the visibility deteriorated just before the incident where the forward masthead light<sup>35</sup> of APLS was no longer visible.
- 1.3.5 At the time when the collision took place, ASD felt slight vibration on APLS and briefly saw green light passing by on the vessel’s starboard side. He could not recollect if he heard any collision sound when APLS was making a sharp port turn. The S-band radar showed some broadcast messages (possibly from fishing vessels in the vicinity), indicating a possible collision in the area where APLS was navigating (see **Figure 8**).

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<sup>33</sup> Records show that APLS had transited through the same passage using the same passage plan in January 2018

<sup>34</sup> VDR audio data did not indicate any sound of fog signals being picked up by the mic in the enclosed space bridge

<sup>35</sup> Distance of forward masthead light from the bridge was 331.0 metres.

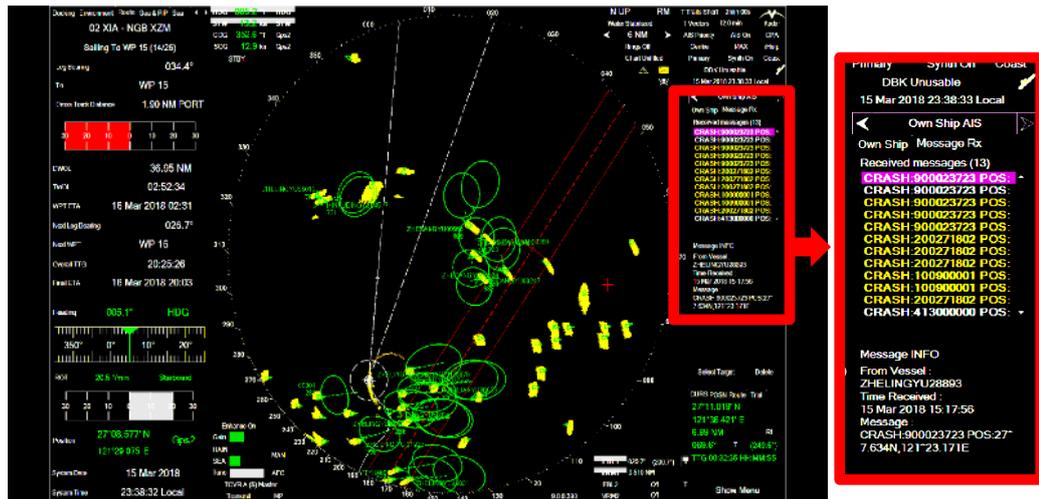


Figure 8: AIS broadcast messages on APLS' S-band radar display

## 1.4 Zhe Ling Yu 52035 (浙岭渔 52035)

- 1.4.1 The fishing vessel involved in the collision was confirmed to be ZLY.
- 1.4.2 ZLY was a single-owner registered purse-seine fishing trawler, licenced by the Bureau of Ocean & Fisheries of Taizhou municipal city (of the Zhejiang province), under China's Ministry of Agriculture and Rural Affairs.
- 1.4.3 There were no known records of the vessel's surveys, records of manning and crew qualifications<sup>36</sup> available to the investigation team. She was reportedly fitted with a Class B AIS<sup>37</sup> transponder. It is not known whether ZLY had lights fitted<sup>38</sup> or the means to give sound<sup>39</sup> signals.
- 1.4.4 ZLY appeared on APLS' radar at about 2313H, transiting in an easterly direction, doing an initial speed of about 1.4, which was similar to three other fishing vessels in close proximity (identified as fishing vessels from AIS).
- 1.4.5 At about 2330H, ZLY's speed increased gradually to about 5.7kts. The CPA with APLS reduced in tandem, without any significant change of ZLY's

<sup>36</sup> China MSA confirmed that the person navigating the ZLY (it's skipper) was qualified for the position he held on board.

<sup>37</sup> Class B AIS transponders are usually fitted on non-SOLAS vessels, which are cheaper. This type of transponder transmits at lower power and at a lower reporting rate than Class A types. Class B types operates either on Carrier-Sense Time-Division Multiple-Access (CSTDMA) or Self-Organised TDMA (SOTDMA).

<sup>38</sup> Vessels engaged in fishing with purse seine gear may exhibit two yellow lights in a vertical line. These lights shall flash alternately. These lights may exhibit only when the vessel is hampered by its fishing gear.

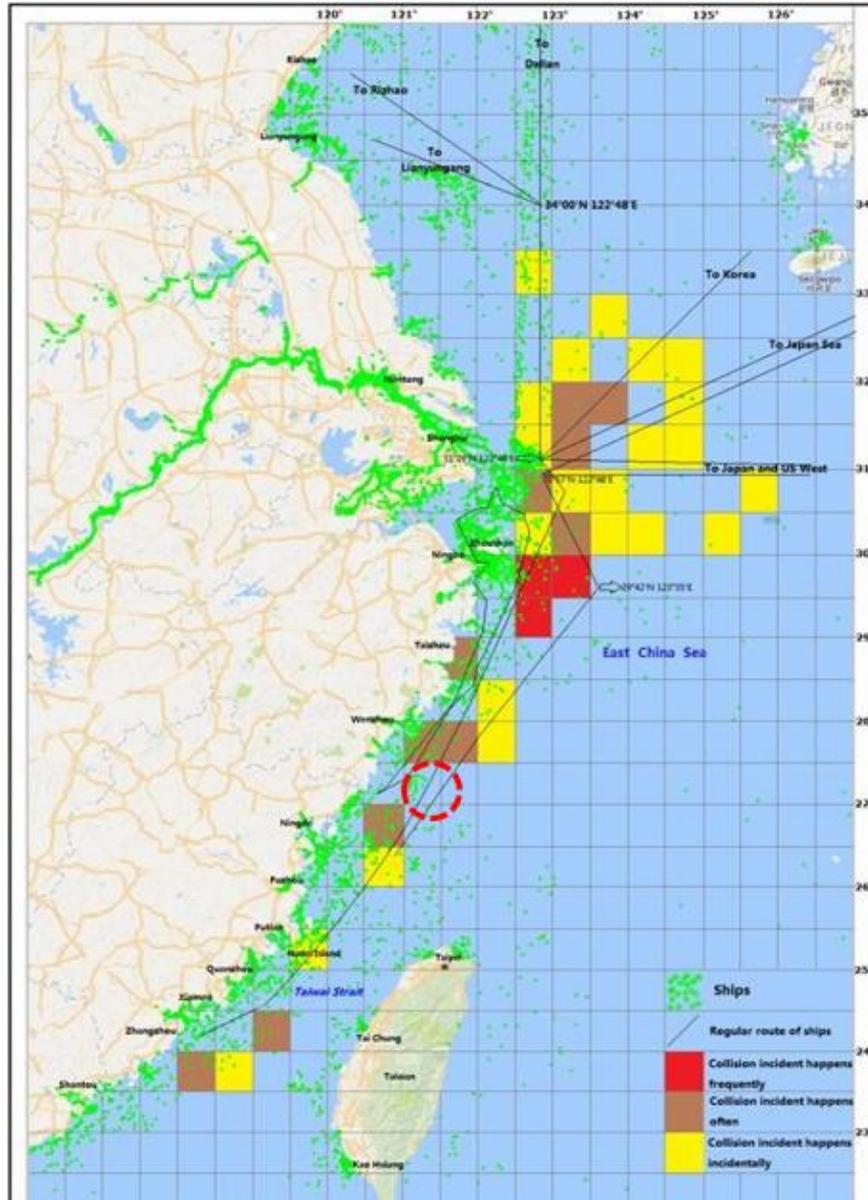
<sup>39</sup> COLREGs Rule 35(c) – In or near an area of restricted visibility, a vessel engaged in fishing shall, instead of giving one prolonged blast every two minutes, give one prolonged blast followed by two short blasts in the same interval.

course. ZLY's AIS signal was lost about 20-30 seconds after crossing the APLS' bow, i.e. around 2335H. There was no distress alert broadcast during that time.

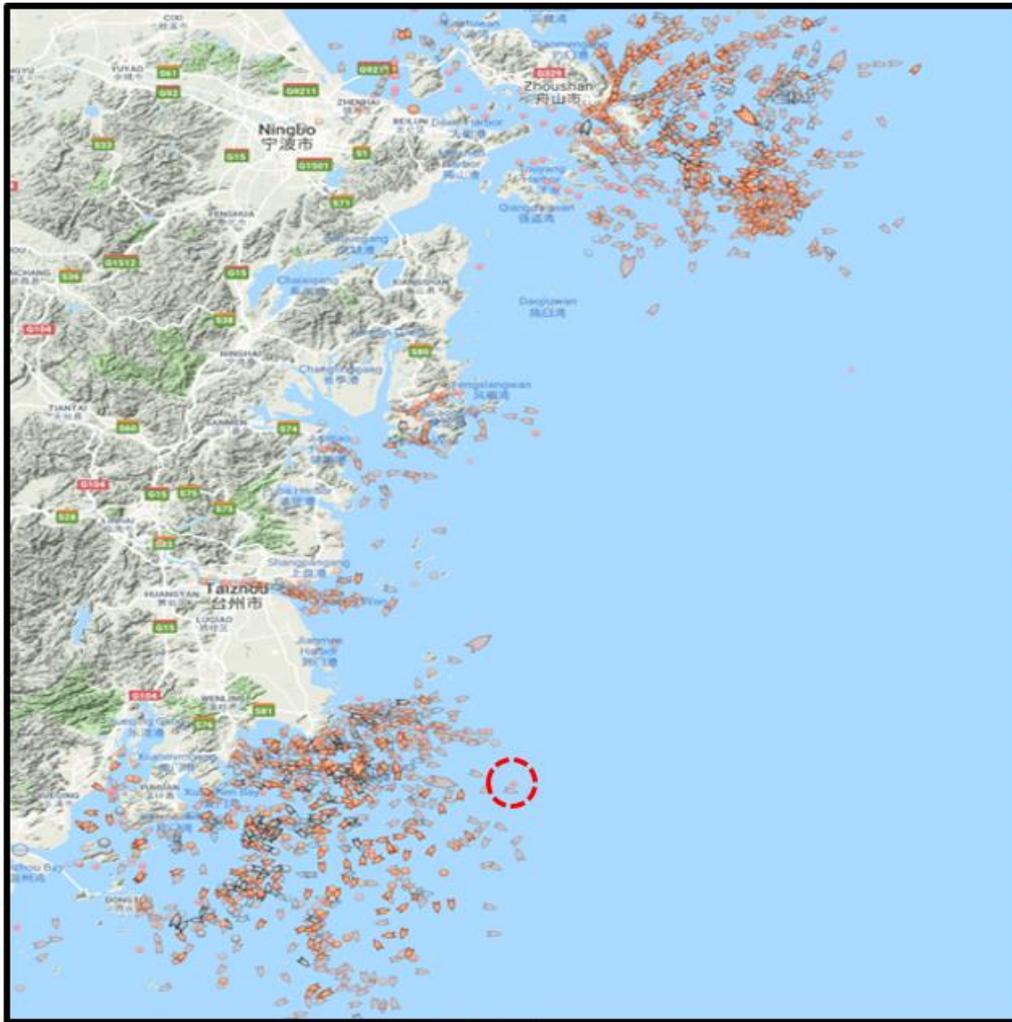
- 1.4.6 According to information provided by China MSA, ZLY was engaged in fishing at the time of the occurrence.

## **1.5 Incident location and environmental condition**

- 1.5.1 The incident occurred in the East China Sea, about 27nm east of Wenzhou, Zhejiang. The concentration of fishing vessels in this region was known to be heavy and was also an area along the typical routes for cargo vessels transiting between the north and south of China ports. The area was known to be where numerous collisions (and near misses reported) with fishing vessels had occurred (see **Figure 9** and **10**).



**Figure 9:** The incident location annotated by a red circle. Bottom picture shows the frequency of incident involving fishing vessels along the common routes taken by cargo ships and tankers in the East China Sea, China. (Source: Huatai Insurance Agency & Consultant Service Ltd - China, - through Gard A.S. – Norway)



**Figure 10:** The heavy concentration of fishing vessels in the Ningbo-Zhoushan region (North) and the Zhejiang coastal region (South) on a (random) single day, in the month of March 2018

Red dashed circle indicates location of collision - (Source: Marine Traffic)

- 1.5.2 A Safety Notification<sup>40</sup> from the China MSA with regards to safety of navigation near the Zhejiang coastal region (area where this collision took place) was published on 26 May 2016, i.e. about two years prior to the collision. This notice mentioned the meteorological peculiarities that affect navigation, like periodic strong currents, typhoon and fog<sup>41</sup>, which notably have known to have played a part incidents involving collision between fishing vessels and merchant vessels.
- 1.5.3 The notice advised transiting vessels to keep clear of concentrated fishing vessel areas, maintain sharp lookout and urges vessels to take positive

<sup>40</sup> <http://en.msa.gov.cn/newsList/1591.jhtml> - Safety Notification to All Vessels Sailing in Zhejiang Coast

<sup>41</sup> Records of meteorological forecast received on APLS prior to the collision indicated patchy fog conditions in the East China Sea. There was no specific mention of fog conditions for the area where the collision took place.

actions to avoid collision in ample time and with due regard to the observance of good seamanship.

- 1.5.3 In September 2017 (six months prior to the collision), Ningbo MSA (China) circulated a similar advisory note<sup>42</sup> with additional information on the different types of fishing vessels and their operations in the Ningbo-Zhoushan region. This note advised vessels to avoid fishing areas when planning the passage, maintain effective watchkeeping, navigate with safe speed, and to utilise ship's whistle as well as other means of communications. In addition, this advisory note recommended that the Master should be in charge on the bridge when necessary.
- 1.5.4 At the time of incident, the Company was aware of fishing concentration in the areas where their vessels would typically transit. The Company did not issue its fleet any advisory with specific reference to MSA's notifications issued in May 2016 or September 2017. After the collision, an advisory note based on the Maritime and Port Authority of Singapore's (MPA's) shipping circular, was circulated by the Company to its fleet of vessels in August 2018.
- 1.5.5 At the time of the incident, APLS was experiencing a north-westerly wind with a Beaufort Force of 4-5. The visibility recorded in the previous watch was 6nm. The meteorology reports received by APLS, at least 36 hours before the incident, did not highlight fog warnings at the location of the incident, but only dense fog warnings at about 240nm north.

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<sup>42</sup> A copy of this note was circulated vide MPA Shipping Circular no.7 of 2018 in May 2018 – *Precautions when navigating through fishing vessel areas in the coastal waters of Ningbo-Zhoushan Port, China*  
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## 2 ANALYSIS

### 2.1 Conduct of Navigation APLS

- 2.1.1 3O had been on the same route prior to this passage in January 2018. He had experienced passing fishing vessels (perhaps lesser in concentration) and fog in the area. APLS' speed at this time was unchanged, she was on 82 RPM and doing about 21kts. Knowing that the ship's speed could be reduced, if needed, 3O did not consider doing so in this case.
- 2.1.2 His decision could be due to a combination of two factors. First, his past experience of being able to navigate out of the group of fishing vessels (and sporadic patches of fog). Second, the Master's night orders appeared to imply pressure<sup>43</sup> on the OOW, i.e. speed was to be maintained for ensuring the vessel meets her ETA to the pilot station.
- 2.1.3 It is widely known that container carriers are pressed for time and that it is important for them to maintain their arrival times. However, recognising the need to ensure safety of navigation<sup>44</sup> at all times, passage plans should take into account expected peculiarities on the passage before arrival times given by the scheduler are acknowledged, especially if a reduction in speed is anticipated.
- 2.1.4 Noting that both members of the bridge team confirmed that the visibility had reduced to near zero, i.e. they were not visually able to sight any of the fishing vessels in the vicinity, it is deemed that APLS was indeed navigating in an area of restricted visibility, prior to the collision. As such she was required to comply with COLREGs Rule 19 and give sound signals prescribed in Rule 35.
- 2.1.5 Under such conditions, APLS should have, in addition to sounding one prolonged blast of no more than two-minute intervals, reduced its speed<sup>45</sup> for a better assessment instead of solely relying on course alterations to manoeuvre away from the group of fishing vessels. Having determined that the fishing vessel ZLY likely posed a risk of collision, it was also

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<sup>43</sup> Commercial implication could affect the entire scheduling of the logistics.

<sup>44</sup> COLREGs Rule 6 – Every vessel shall at all times proceed at a safe speed so that she can take proper and effective action to avoid collision and be stopped within a distance appropriate to the prevailing circumstances and conditions.

<sup>45</sup> COLREGs Rule 19(b) – Conduct of vessels in restricted visibility – Every vessel shall proceed at safe speed adapted to the prevailing circumstances and conditions of restricted visibility. A power-driven vessel shall have her engines ready for immediate manoeuvre.

inappropriate<sup>46</sup> for APLS' course to be altered to port, when ZLY and other fishing vessels were detected by the radar.

- 2.1.6 As APLS approached the group of fishing vessels in reduced visibility, it is very likely that the fog signals on APLS were not switched on (see paragraph 1.3.2 and footnote 34). Reasons on why 3O did not comply with the Master's night orders relating to switching on the coaming lights and avoiding encounters with fishing vessels (by using whistle, bold alterations, speed reduction) could not be established.
- 2.1.7 When ASD asked 3O (about 4-5 minutes prior to the collision) if the Master was to be called, there was no response from 3O. It appeared that 3O may not have processed this information. This could be a result of channel capacity<sup>47</sup>, which is the limited means that humans are not able to devote conscious thought or "attend" to all of the stimuli that impinge upon the individual. In this case it is likely that the multiple stimuli acting on the 3O were the concentration of fishing vessels, restricted visibility, maintaining the ship's speed, APLS being off course, impending handing over of the watch, calling the next watchkeeper to name a few, a combination of some or all, could have contributed to him disregarding ASD's advice to call the Master.
- 2.1.8 It is thus extremely important for workload to be eased by having additional persons to assist so that a better situational awareness can be achieved which would aid in effective decision making.
- 2.1.9 Having encountered restricted visibility since 2100H and it being notably less than 3nm by 2240H, there was no evidence that the Master was called, the engineer was advised, the appropriate sound signals were sounded, or APLS' speed was reduced in accordance with Checklist No.140 (see Paragraph 1.2.6) for restricted visibility. Between this period, it is likely that items on this checklist, which was documented to have been complied with at 2330H (after Master was called), were not checked-off as per Company's procedures for the duration of restricted visibility.

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<sup>46</sup> COLREGs 19(d) A vessel which detects by radar alone the presence of another vessel shall determine if a close-quarter situation is developing and/or risk of collision exists. If so, she shall take avoiding action in ample time, provided that when such action consists of an alteration of course, so far as possible, an alteration of course to port for a vessel forward of the beam shall be avoided.

<sup>47</sup> Human factors

## **2.2 APLS' actions after Collision**

- 2.2.1 3O was in doubt whether APLS had come in contact with one of the fishing vessels during his turn to port.
- 2.2.2 When reviewing the ECDIS playback, it appeared that there was some indication of a possible collision with the fishing vessel. This indication could have been validated by interrogating the radar which showed that there were messages broadcast about a possible collision in the location where APLS was transiting. These tell-tale signs that a collision could have taken place, were missed by the Master when he reviewed the ECDIS playback. Instead, APLS continued on its voyage, assuming that there was a close quarter situation with the fishing vessel and not a collision.
- 2.2.3 The investigation team is of the view that a combination of “no distress alert” and a “fixed<sup>48</sup> ETA” for APLS to arrive Ningbo pilot station may have contributed to Master’s assessment that this situation was indeed a “near-miss” and thus did not require him to offer assistance. The Master, instead of assuming, should have positively established whether a collision occurred, enquired about the status of the fishing vessel and affirmed whether any assistance was required<sup>49</sup>.

## **2.3 Conduct of Navigation - ZLY**

- 2.3.1 Fishing vessels in the area, like ZLY have often been reported to cross ahead of oncoming vessels, in an attempt to protect their nets or gear which may be in the water. ZLY’s increase in speed from 1.4kts to 5.7kts in a short span of time could either indicate that ZLY was possibly attempting to “force” APLS to alter course towards ZLY’s stern or because ZLY was engaged in (pair) trawling.
- 2.3.2 However, there were no reports of the bridge team of APLS sighting any other lights before the visibility deteriorated or hearing any sound signals<sup>50</sup> from ZLY which could have indicated that ZLY was engaged in fishing or hampered by her fishing gear. It could not be established with certainty that

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<sup>48</sup> SOLAS V/34-1, as amended – The owner, the charterer, the company operating the ship as defined in regulation IX/1 or any other person shall not prevent or restrict the master of the ship from taking or executing any decision which, in the master’s professional judgement, is necessary for safety of life at sea and protection of the marine environment.

<sup>49</sup> SOLAS V/33, as amended – The master of a ship at sea which is in a position to able to provide assistance, on receiving information from any source that persons are in distress at sea, is bound to proceed with all speed to their assistance.

<sup>50</sup> There was also no evidence to suggest that ZLY sound signals as prescribed under COLREGs Rule 35(a)<sup>50</sup> or (d), see footnote 36, as no sound signals were heard on APLS’ VDR.

ZLY and other fishing vessels in the vicinity were engaged in fishing at the time of the collision.

2.3.3 If ZLY was maintaining a proper lookout, she could have noticed that APLS was initially turning to her starboard, i.e. away from ZLY's bow to avoid the group of fishing vessels on APLS' port side. ZLY should have altered its course to starboard to increase the passing distance, and reducing her speed.

2.3.4 Anecdotal evidence suggests that crew of these fishing vessels in the area are often reported to be lacking familiarity with COLREGs. There are indications that though these vessels are provided with VHF communication equipment, they are seldom monitored by their crew and the primary focus is fishing operations than safety of navigation. In view of this, widespread awareness about the possible dangers of navigating in close proximity to such fishing vessels must be recognised and taken into account by watchkeepers on board merchant ships intending to transit such areas.

## **2.4 Passage Planning and Bridge Manning**

2.4.1 The area of APLS' transit was widely known to be an area of high fishing vessels concentration. Collisions between merchant vessels and fishing vessels are not uncommon in these areas. Coupled with restricted visibility during the months of March and July, these should have been taken into account when planning the passage. There was no mention of either of these voyage specific peculiarities in the passage plan, which could have alerted the bridge team, or the Master, to assess whether the vessel's passage through this leg was to be executed at a reduced speed and/or the bridge team manning was to be increased.

2.4.2 Though the Company's SMS on passage planning required routine and regular debrief, it appeared that this passage was likely treated as a "routine" passage with the usual encounters of fishing vessels and fog.

2.4.3 The investigation team notes the Company's view on not prescribing the bridge watchkeeping matrix for varying conditions. However, it must be recognised that guidance for watchkeeping for passage planning and related briefing, contained in the SMS, should be lean and simple (such as having a matrix), which would allow the watchkeeper to make appropriate decisions to call for assistance timely, as soon as it is apparent that extra persons are needed. Having such clarity within the SMS, is also likely to reduce the probability of over-reliance on individual assessments, which may vary.

- 2.4.4 Meteorological information, information on the areas with heavy fishing vessel concentrations (received via INM-C or Navtex) and the information on the frequent occurrences of collisions with fishing vessels etc. are essential for navigation, for vessels to take into account of, during the passage planning phase. Where necessary, routes should be re-planned and amended to keep the vessel's path away, for example from heavy fishing vessels concentration grounds.
- 2.4.5 Key information from China MSA's notification could have also been notated in the ECDIS, as "notes" to navigators at the planning stage, before the vessel arrived the leg where such conditions could be experienced. Doing so, would have likely alerted the bridge team to inform the Master timely, so that an assessment could have been done on reviewing the bridge team manning level as well as reduction of the vessel's speed for that passage.

## **2.5 Incidental observations on INTERCO vs SMCP**

- 2.5.1 Prior to the collision an automated warning addressing APLS by its call sign was broadcasted using phonetics as per INTERCO.
- 2.5.2 Though there was no evidence to suggest that the use of INTERCO caused any confusion to the bridge team of APLS or that they were not aware of the call sign for their vessel, the investigation team notes that the choice of INTERCO done during the broadcast instead of SMCP was not the norm in typical communication between ships and ship/shore.
- 2.5.3 A simple questionnaire sent to the accident investigation authorities, maritime colleges, and mariners was sampled. Majority of them attested that INTERCO, though taught in the maritime college as a part of curriculum, was rarely used for routine ship-to-ship or ship-to-shore communication. IMO's SMCP was the standard practised by most. Majority of them also attested that SMCP offered a simpler way of communication.
- 2.5.4 The phonetics in SMCP differ from those in INTERCO. The investigation team notes the position of SMCP in maritime practice (see footnote 13). It is also noted that while SMCP is the most commonly used phonetics, the mandatory INTERCO may be used by authorities who broadcast messages over the VHF.
- 2.5.5 The maritime community, sea-going vessels and its bridge teams should be aware of the difference in the phonetics of the two modes, and ensure that call signs of their vessels are well understood in both modes, to avoid confusion on whether the call was meant for their vessel.

### 3 CONCLUSIONS

*From the information gathered, the following findings are made. These findings should not be read as apportioning blame or liability to any particular organisation or individual.*

- 3.1 The APLS was navigating at a speed of 21kts in restricted visibility amongst a group of fishing vessels without sounding appropriate sound signals for a power driven vessel underway and collided with fishing vessel ZLY.
- 3.2 APLS did not comply with requirements of COLREGs such as reducing speed when encountering restricted visibility, sounding appropriate sound signals, and incorrectly altered course to port for a vessel forward of its beam.
- 3.3 The 3O was likely overwhelmed by the amount of information to be processed contributed by the high workload associated with navigating in an area of restricted visibility and heavy concentration of fishing vessels, and did not call for assistance as required by the Master's night orders.
- 3.4 The bridge team composition of APLS at the time of the collision is assessed to be inadequate, given that its passage plan did not positively take into account the environment conditions and peculiarities of the eastern coast of China during a fishing season where fog was expected. An amendment of its route to further east, for avoiding congregated fishing vessels should have been considered, taking into account information available from all sources, including local information on fishing vessel concentration and environmental conditions.
- 3.5 3O's decision of not reducing the vessel's speed for avoiding fishing vessels could have been influenced by the Master's night orders expectation on the speed of APLS to be maintained to Ningbo pilot station, despite him not complying with the Master's night orders.
- 3.6 After the collision, APLS failed to positively establish whether there was a collision and offer assistance to the crew of ZLY to fulfil its obligations for safety of life at sea.
- 3.7 While determining of the bridge manning level was left to the Master as per the SMS (who would be prompted by the watchkeeper), the guidance available in the SMS could have been a simpler process (such as having a matrix) to prompt the bridge team, especially during the planning stage, on which stage in the vessel's passage to get additional persons to relieve the workload of the bridge team.

- 3.8 It could not be established that ZLY was engaged in fishing at the time of collision in an area navigated by merchant ships bound for ports in China. There was no evidence to suggest that ZLY complied with requirements of COLREGs such as keeping a proper lookout, assessing risk of collision or sounding appropriate signals when in restricted visibility.
- 3.9 An incidental finding from this investigation shows that, while uncommon, INTERCO could be used by some shore stations to alert vessels through VHF. Hence, the maritime community, sea-going vessels and its bridge teams should be reminded of the difference in the phonetics of SMCP, which is the most commonly used phonetics and the mandatory INTERCO.

## 4 SAFETY ACTIONS

*During the course of the investigation and through discussions with the investigation team, the following safety actions were initiated.*

### 4.1 The Company of APL Southampton

- 4.1.1 The Company produced a Company Directive (CD 117-2-18) “*Safe Navigation with Fishing Boats*” dated 24 May 2018, which was circulated to its fleet. This was also shared during the annual workshop of safe navigation during the Company’s “sea staff seminar”.
- 4.1.2 The Company invited officials from China MSA to propose working together with the relevant authorities for improving the safety standards of China’s fishing fleet including their understanding of COLREGs, from the perspective of bridge watchkeepers.
- 4.1.3 The Company has undertaken a study for a global map profiler to enable its fleet and ship masters for making advanced and informed decisions when planning their passage, taking into account concentration of fishing vessels along typical trading routes.

### 4.2 The Flag Administration

- 4.2.1 MPA promulgated a Shipping Circular to Ship-owners (no. 7 of 2018) “*Precautions when Navigating through Fishing Vessel Areas in the coastal waters of Ningbo-Zhoushan Port, China*” dated 16 May 2018 and provided the China MSA’s advisory note to all Singapore registered ships.
- 4.2.2 MPA intends to promulgate the difference in phonetics of SMCP, which is the most commonly used phonetics, and the mandatory INTERCO, which may be used by some shore stations who broadcast messages over the VHF in the next e-bulletin, and create awareness.

## **5 SAFETY RECOMMENDATION**

*A safety recommendation is for the purpose of preventive action and shall in no case create a presumption of blame or liability.*

### **5.1 For the Company of APL Southampton**

5.1.1 To establish clear guidelines with a matrix of minimum bridge team manning level under varying environmental and traffic conditions for enabling effective passage planning and decision making. **[TSIB-RM-2019-013]**

### **5.2 For China MSA**

5.2.1 To take applicable steps to ensure crew of fishing vessels are proficient in the understanding of COLREGs. **[TSIB-RM-2019-014]**

**-End of Report-**