REPUBLIC OF THE MARSHALL ISLANDS

Maritime Administrator

OLYMPIA CASUALTY INVESTIGATION REPORT

Collision with Fishing Vessel

South China Sea | 9 March 2021

Official Number: 7727

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AUTHORITY

An investigation, under the authority of the Republic of the Marshall Islands laws and regulations, including all international instruments to which the Republic of the Marshall Islands is a Party, was conducted to determine the cause of the casualty.

Maritime Administrator

TABLE OF CONTENTS

LIST OF ABBREVIATIONS AND ACRONYMS

3/O	Third Officer
AIS	Automatic Identification System
ASD	Able Seafarer Deck
C/E	Chief Engineer
C/O	Chief Officer
COVID-19	Coronavirus Disease 2019
COLREGs	International Regulations for Preventing Collisions at Sea
CPA	Closest Point of Approach
ECDIS	Electronic Chart Display and Information System
ft	Feet
ILO	International Labour Organization
IMO	International Maritime Organization
ISM Code	International Management Code for the Safe Operation of Ships and for Pollution Prevention
ITU	International Telecommunications Union
kn	Knots
m	Meters
MLC, 2006	Maritime Labour Convention, 2006
MMSI	Mobile Marine Service Identity
MRCC	Maritime Rescue Coordination Center
mt	Metric Tons
NM	Nautical Miles
OICNW	Officer in Charge of a Navigational Watch
OOW	Officer on Watch
SAR	Search and Rescue
SMS	Safety Management System
SOLAS	International Convention for the Safety of Life at Sea, 1974
STCW Code	Seafarers' Training, Certification and Watchkeeping Code
T	True
TEU	Twenty-foot Equivalent Unit
UTC	Coordinated Universal Time
VDR	Voyage Data Recorder
VHF	Very High Frequency
VTS	Vessel Traffic Service

PART 1: EXECUTIVE SUMMARY

On the morning of 9 March 2021, the Republic of the Marshall Islands-registered container ship OLYMPIA, managed by Leonhardt & Blumberg Shipmanagement GmbH & Co. KG (the "Company"), was underway in the South China Sea on a voyage from Shanghai, People's Republic of China (hereinafter "China") to Sihanoukville, Kingdom of Cambodia (hereinafter "Cambodia").

The ship was about 80 NM east of the Socialist Republic of Vietnam (hereinafter "Vietnam") when it encountered a group of fishing vessels near its planned route. These included the Vietnam-registered TB-96666-TS, which was hove to and not engaged in fishing. The weather was good with visibility of more than 5 NM.

At about 0916,[1] OLYMPIA and TB-96666-TS collided. The fishing vessel capsized almost immediately after the collision and sank about 30 minutes later. Of the nine crewmembers on board TB-96666-TS, seven were rescued and two remain missing.

1 Unless stated otherwise, all times are ship's local time (UTC +7).

The marine safety investigation conducted by the Republic of the Marshall Islands Maritime Administrator (the "Administrator") identified the following:

1. Causal factors that contributed to this very serious marine casualty include:
   (a) that neither vessel maintained an adequate lookout due to:
      i. ineffective navigational watchstanding on board OLYMPIA due to the OOW's apparent prioritization of other watchkeeping tasks over maintaining an effective lookout and avoiding collision while approaching and passing the fishing vessels that were in the vicinity of the ship's planned route; and
      ii. TB-96666-TS not having an assigned watch stander on duty;
   (b) OLYMPIA's OOW did not summon the duty ASD to the Bridge to assist him as the ship approached a group of fishing vessels that were in the vicinity of the ship's intended route. At the same time he was required to verify the ship's position and make hourly entries in the Deck Logbook when there was an increased risk of collision as the ship approached, and passed through, the fishing vessels that were in the vicinity of the ship's planned route;
   (c) OLYMPIA's radars were in standby and were not used for vessel detection and collision avoidance; and
   (d) over reliance by OLYMPIA's OOW on AIS information for vessel detection and collision avoidance.

2. Additional causal factors that may have contributed to this very serious marine casualty include:
   (a) the guidance for navigational watchstanding in the Company's SMS did not provide clear instructions regarding their expectations for how Masters and OOWs should implement the STCW Code's principles for navigational watchkeeping;
   (b) the reported reluctance of the OICNWs on board OLYMPIA to use the ship's radars as required by COLREGs Rule 7(b) due to fear of being criticized by the ship's Master;
   (c) the apparent lack of awareness of OLYMPIA's Master, who was on the forecastle, of the increased risk of collision as the ship approached and passed through the fishing vessels that were in the vicinity of the ship's route;
   (d) either TB-96666-TS was not equipped with an AIS unit or the vessel's AIS unit was not transmitting; and
   (e) TB-96666-TS's Captain did not hold certificates required for his position on board the fishing vessel.

3. Additional issues that were identified but did not contribute to this very serious marine casualty include:
   (a) TB-96666-TS's crewmembers did not hold certificates required for their positions on board the fishing vessel;
   (b) OLYMPIA's OOW did not make the signals prescribed by the COLREGs Rule 34(d);
   (c) TB-96666-TS was displaying the day shape for a tow whose length exceeded 200 m; and
   (d) not all the fishing vessels in the vicinity of OLYMPIA's route with AIS units were transmitting MMSI numbers that were unique to the vessel per ITU-R M.585-8.

PART 2: FINDINGS OF FACT

The following Findings of Fact are based on the information obtained during the Administrator's marine safety investigation. Due to travel restrictions imposed in response to the COVID-19 pandemic, the Administrator was not able to arrange for on board attendance as part of its marine safety investigation of this very serious marine casualty. All related information available to the Administrator was obtained remotely.

1. Ship particulars: *see* chart to right.

Background Information

2. On the morning of 9 March 2021, the 1,717 TEU container ship OLYMPIA *(see Figure 1)* was underway on a voyage from Shanghai, China to Sihanoukville, Cambodia. The ship was laden with 497 containers of 20 and 40 ft. The ship's drafts were 7.1 m forward and 8.2 m aft.

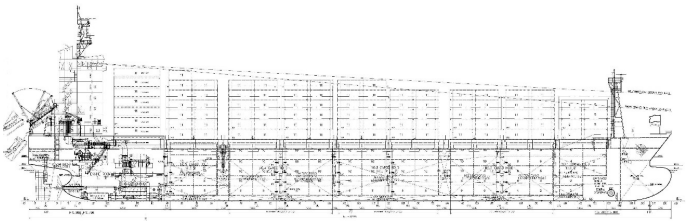

Figure 1: OLYMPIA general arrangement.

3. At 0800, the 3/O relieved the C/O as the OOW. The duty ASD was working on deck with the rest of the deck ratings. The ship was on a course of 215° T at 18.5 kn with the main engine full ahead.

4. The ship's navigation and communication equipment, main engine, auxiliary engines, and steering gear were all reported to be operational and working properly. Both radars were energized but not transmitting. The Master stated they had been placed in standby at 0730 since there was not much vessel traffic and the visibility was good.[2]

5. It was reported that, from the time the Master had signed on board, it was a common practice to place the radars in standby

2 It was reported that the radars had also been placed in standby, during the day, following OLYMPIA's departure from Shanghai.

VESSEL PARTICULARS

Vessel Name
OLYMPIA

Registered Owner
Fortune Aspiration I Shipping Limited

ISM Ship Management
Leonhardt & Blumberg Shipmanagement GmbH & Co. KG

Flag State
Republic of the Marshall Islands

IMO No.	Official No.
9765574	7727

Call Sign	Year of Build
V7FC7	2017

Length x Breadth x Depth
162.6 x 27.4 x 13.8 m

Gross Tonnage	Net Tonnage
17,907	8,103

Vessel Type
Container Ship

Document of Compliance Recognized Organization
DNV

Safety Management Certificate Recognized Organization
DNV

Classification Society
DNV

Persons on Board
19

during the day when the ship was at sea and the weather and visibility were good. It was also reported that although the Master told OOWs that they could use the radars if needed, he had criticized them when they had.

6. On the morning of 9 March 2021, the steel-hulled fishing vessel TB-96666-TS *(see Figure 2)* was hove to, using fender buoys as a sea anchor, and not engaged in fishing. The vessel's heading was northeasterly. A black diamond day shape was displayed forward.[3]

Figure 2: A fishing vessel of similar size and rig as TB-96666-TS. (Source: Vietnam Maritime Administration)

7. The fishing vessel's Captain and crewmembers were all reported to be resting after fishing through the night. There was not an assigned watch stander on duty.

8. It was reported that the fishing vessel's navigation and communications equipment, main engine, auxiliary engines, and steering gear were operational and working properly. The vessel's navigation and communications equipment consisted of a magnetic compass, satellite positioning system receiver, and a marine radio. The Administrator was not able to determine if the fishing vessel was equipped with an operational radar or AIS unit.

VESSEL PARTICULARS

Vessel Name
TB-96666-TS

Registered Owner
Bien Dong Technical Support Services and Fishing Logistics Company Limited

Flag State
Socialist Republic of Vietnam

Operator
Vu Nguyen Toan

Official No.	Year of Build
TB-96666-TS	2017

Length x Breadth
30.8 x 7.8 m

Gross Tonnage
185

Vessel Type
Fishing Vessel

Persons on Board
9

Collision

9. At 0815, OLYMPIA's Master left the Bridge. Before leaving the Bridge, he told the OOW that he would be on deck and to call him by sounding one short blast of the ship's whistle.

10. The weather was reported as good, with Beaufort Force 5 winds from the northeast. The seas were 1 m with a swell of 0.5 m from the east-northeast. Visibility was greater than 5 NM with clear skies.

11. The OOW stated he observed a few fishing vessels in the area as OLYMPIA proceeded along its planned route. He said that the closest one was passed at a distance of 0.5 NM or more.

3 A black diamond is the day shape prescribed by COLREGs Rule 24 (e)(iii) and (g)(iv) for a tow that exceeds 200 m in length.

12. At 0829, four AIS contacts forward of OLYMPIA's beam were displayed on the ship's ECDIS. The OOW selected the contact that was directly ahead of OLYMPIA at a range of 10 NM. The selected contact's course over ground was 259° T with a speed of 0.8 kn. The calculated CPA was 0.5 NM. The other three AIS contacts were 5-10 NM off the ship's port bow. The two closest of these contacts had westerly courses with speeds of less than 1 kn. The course and speed of the farthest contact was 087° T at 4 kn.

13. The MMSI numbers for three of the AIS contacts, including the one selected by OLYMPIA's OOW, included a country identification code but not the vessel's name. The MMSI for the fourth vessel included both a country code and the vessel's name.[4]

14. At 0900, the OOW went to the chart table *(see Figure 3)* to verify OLYMPIA's position and to make hourly entries in the Deck Logbook. The OOW would have had a clear view forward while standing at the chart table since the curtains in front of it were open.

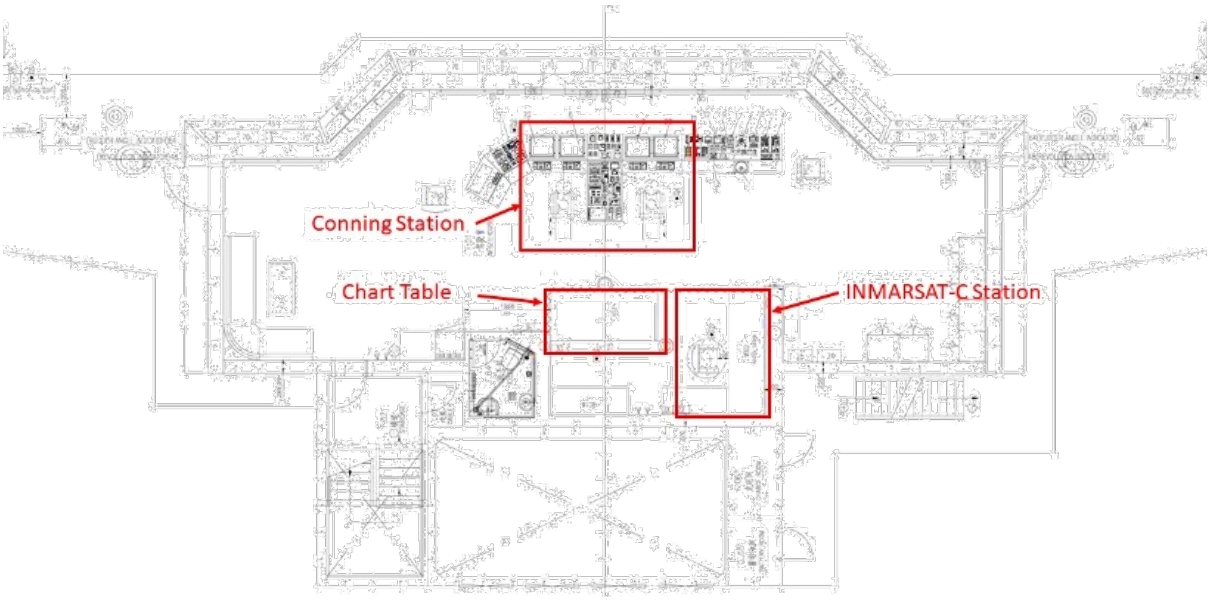

Figure 3: Layout of OLYMPIA's Bridge.

15. When the OOW went to the chart table at 0900, the AIS contact he had selected earlier was now about 30° off OLYMPIA's port bow at a range of 1.4 NM. The calculated CPA was about 0.7 NM in just under 4 minutes.

16. At 0901, an additional AIS contact was shown on OLYMPIA's ECDIS. This contact was 1-2 NM off the ship's starboard beam. Its course and speed were 146° T at 5 kn.[5] This contact was displayed intermittently.

17. The OOW stated there were four or five fishing vessels in the area where these AIS contacts were shown on the ECDIS. He said that some appeared to be underway and that others were drifting.

4 The MMSI number for three of the AIS contacts indicated they were registered in China. The fourth vessel's MMSI number included its name and indicated it was registered in Vietnam. It is noted that per ITU Recommendation ITU-R M.585-8, Assignment and Use of Identities in the Maritime Mobile Service, vessels should be assigned a unique nine-digit identity that includes the code for the country having jurisdiction over the vessel.

5 The MMSI number included the vessel's name and indicated it was registered in Vietnam. No other identifying information was included.

18. By 0905, OLYMPIA had safely passed the AIS contact that had previously been selected. It could not be confirmed if the OOW had returned to the front of the Bridge by this time or if he was still behind the chart table.

19. The OOW reported that the INMARSAT-C station alarm activated at 0911. He said that he went to the INMARSAT-C station *(see Figure 3)* and reset the alarm. He also checked the messages that had been printed and then filed them. Based on the VDR recording, he had likely finished filing the messages by 0915.[6]

20. The OOW stated he saw a fishing vessel just off the port bow at close range when he went back to the conning position. He initially used the autopilot to turn the ship to starboard. He said that he shifted to hand steering and increased the amount of right rudder because the response was delayed. The ship's speed at the time was 18 kn.

21. Based on the VDR information, the rudder angle went from small amounts of left or right rudder, which is consistent with an autopilot maintaining a set course, to 15° right rudder at 0916.[7] In about a minute, it was placed midship. Between 0916-0917, the ship's heading changed from 215° T to 245° T. The OOW stated that he then ordered the main engine half ahead.

22. The Master, who was on the Forecastle, reported seeing a fishing vessel almost directly ahead less than a minute before the collision occurred. He estimated the collision occurred at about 0915. The Master also stated that the fishing vessel TB-96666-TS struck OLYMPIA's port bow under the flare.

23. The collision occurred in position 13° 08.9' N, 110° 50.0' E, about 80 NM east of Vietnam.

24. Based on the OLYMPIA's VDR information, there is no indication that TB-96666-TS was transmitting AIS information *(see Figure 4)*.

Figure 4: Portion of OLYMPIA's ECDIS display at 0915 immediately before the ship started turning to starboard. The AIS target off the ship's port beam had not previously been displayed.

6 Between 0911-0915, the alarm that the 3/O reported was from the INMARSAT-C station, a printer, and what sounded like a filing cabinet drawer being closed can be heard on the VDR audio recording.

7 The VDR information indicates that OLYMPIA's heading was steady at 214-215° T until seconds after the OOW applied 15° right rudder.

25. By 0920, the duty ASD arrived on the Bridge and began steering. The OOW stated he observed that TB-96666-TS had capsized and appeared to be sinking. He then ordered the rudder hard to starboard to return to the fishing vessel. This is consistent with the VDR information. It was not reported what prompted the duty ASD to go to the Bridge.

SAR Operation

26. At 0930, the Master and other deck officers arrived on the Bridge. The Master ordered the rescue boat be prepared for launching and that the main engine be stopped.

27. At 0940, OLYMPIA's crewmembers launched the rescue boat. The crewmembers on board the rescue boat immediately began to rescue the fishing vessel's crewmembers. Within about 10 minutes, seven crewmembers from the fishing vessel had been taken on board the rescue boat.

28. Immediately after the rescue boat was launched, OLYMPIA broadcasted a MAYDAY message reporting the collision, that the fishing vessel's crewmembers were in the water, and that the ship was starting a rescue operation.

29. At 0950, TB-96666-TS sank in position 13° 08.5' N, 110° 49.0' E in more than 2,500 m of water.

30. By 1024, the seven rescued crewmembers from TB-96666-TS had all been brought safely on board OLYMPIA. The fishing vessel's Captain informed OLYMPIA's Master that two crewmembers were missing.

31. At 1108, the Master informed MRCC Vietnam of the collision, that seven of the fishing vessel's crewmembers had been rescued, and that two were missing. The Master also requested assistance searching for the two missing fishing vessel crewmembers. MRCC Vietnam assumed responsibility for directing the SAR operation and provided instructions to OLYMPIA's Master to continue searching until the arrival of a Vietnam SAR vessel.

32. By 0545 on 10 March 2021, the SAR vessel had arrived on scene.

33. At 0725, MRCC Vietnam directed OLYMPIA to proceed to Nah Trang, Vietnam to disembark the fishing vessel's Captain and crewmembers.

34. It was not reported when MRCC Vietnam suspended the SAR operation for TB-96666-TS's two missing crewmembers.

Consequences of the Collision

35. OLYMPIA sustained minor damage. The guardrail on the forecastle was damaged and there were some scratches on the port side hull above the loaded waterline, in way of the Bow Thruster Room and the Engine Room.

36. TB-96666-TS capsized and sank within approximately 30 minutes of the collision. The vessel's Captain reported there was about 25 mt of fuel oil and 0.4 mt of lube oil on board when the vessel sank.

37. Two of TB-96666-TS's crewmembers remain missing at sea.

Crew on Board OLYMPIA and TB-96666-TS

38. On 9 March 2021, OLYMPIA had a complement of 19 crewmembers, three more than required by the Minimum Safe Manning Certificate issued by the Administrator. Each crewmember held valid Republic of the Marshall Islands-issued seafarer documentation required for their positions on board.

39. The experience of the Master, 3/O, and duty ASD was:

RANK	TIME ON BOARD OLYMPIA	TIME IN RANK	TIME WITH COMPANY	TOTAL TIME AT SEA
Master	9 months	7 years, 10 months	3 years, 5 months	23 years, 2 months
3/O	11 months	3 years, 3 months	1 year, 9 months	4 years, 7 months
ASD	8 months	1 year, 4 months	4 years, 9 months	6 years, 11 months

40. On 9 March 2021, TB-96666-TS had a complement of nine crewmembers, three more than the minimum required by Vietnam for fishing vessels more than 24 m long. The vessel did not have a designated mate, C/E, or mechanic as required by the applicable Vietnamese flag State regulations.

41. The Captain held a certificate issued by the Vietnamese authorities to work as fishing master on board fishing vessels between 6 m and less than 12 m in length. None of the other crewmembers held certificates for working on a fishing vessel.[8]

OLYMPIA Navigation Bridge Visibility

42. Based on SOLAS regulation V/22.1.1, the view from OLYMPIA's conning position *(see Figure 3)* of the sea surface directly head of the ship was required to not be obstructed by more than 344 m.[9]

43. The obstructed view of the sea surface from the conning position directly ahead of OLYMPIA when fully loaded and in ballast was:

LOADING CONDITION	DRAFTS	OBSTRUCTED DISTANCE
Full Load	Forward – 9.5 m Aft – 9.5 m	321.4 m
Ballast (Departure)	Forward – 4.65m Aft – 7.5 m	202.6 m
Ballast (Arrival)	Forward – 4.6 m Aft – 6.4 m	187.2 m

44. Based on the OLYMPIA's stowage plan, there were 168 containers loaded on deck. The sight line from the conning position during the voyage from Shanghai to Sihanoukville corresponded with the sight line when the ship was in ballast *(see Figure 5)*.

8 The applicable Vietnamese regulations require the mates, C/Es, and mechanics working on board fishing vessels of 24 m or more in length to hold certificates for their position on board.

9 SOLAS regulation V/22.1.1 requires that the view of the sea surface not be obstructed by more than two ship lengths or 500 m, whichever is less. OLYMPIA has an overall length of 172 m.

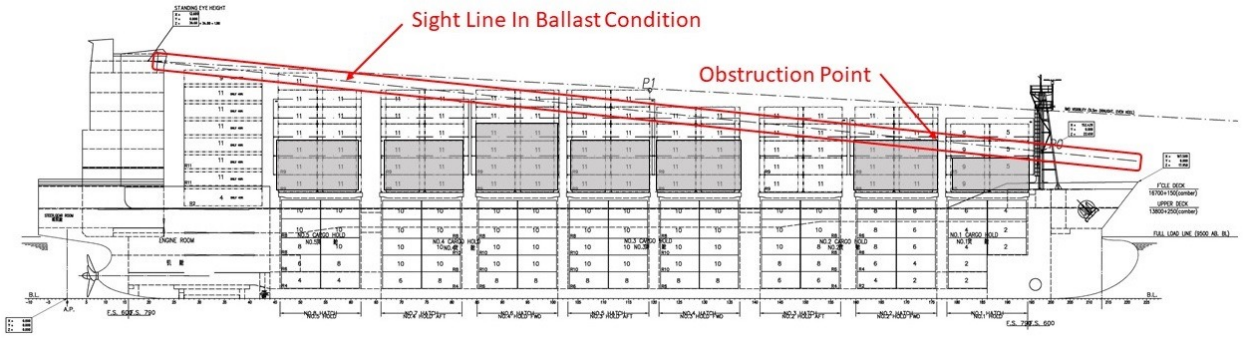

Figure 5: Sight line from the conning position based on OLYMPIA's deck cargo for the voyage from Shanghai to Sihanoukville. The slots on deck with containers are shown in grey.

45. Given OLYMPIA's drafts on departure from Shanghai, the height of the eye above the sea from the Bridge was between 37-38 m. Based on this, the line of sight from the Bridge to the horizon was about 12 NM.

COLREGs Requirements

46. The requirements of the COLREGs for power driven vessels underway were applicable to both OLYMPIA and TB-96666-TS.[10]

47. Based on COLREGs Rule 5, both vessels were required to "at all times maintain a proper look-out by sight and hearing as well as by all means appropriate in the prevailing circumstances."

48. Both OLYMPIA and TB-96666-TS were required by COLREGs Rule 7(a) to "use all available means appropriate to the prevailing circumstances and conditions to determine the risk of collision exists."

49. COLREGs Rule 7(b) requires that "proper use shall be made of radar equipment if fitted and operational, including long-range scanning to obtain early warning of risk of collision." This requirement was applicable to OLYMPIA since the ship's radars were operational. This rule would have been applicable to TB-96666-TS if the vessel was equipped with an operational radar.

50. COLREGs Rule 8(a) requires that any action taken to avoid collision "shall, if the circumstances of the case admit, be positive, made in ample time and with due regard to the observance of good seamanship."

51. COLREGs Rule 34(d) requires that "when vessels in sight of one another are approaching each other and from any cause either vessel fails to understand the intentions or actions of the other, or is in doubt whether sufficient action is being taken by the other to avoid collision, the vessel in doubt shall immediately indicate such doubt by giving at least five short and rapid blasts on the whistle. Such signal may be supplemented by a light signal of at least five short and rapid flashes."

OLYMPIA's Navigation Watchstanding Requirements

52. As required by the ISM Code, the Company's SMS contained guidance for shipboard operations including navigational watchstanding. Based on this:

10 *See* COLREGs Rules 1(a) and 3(i).

(a) the Master was responsible for preparing the Bridge watch plan, preparing standing and particular orders, and supervising and monitoring Bridge watchkeeping personnel;

(b) OOWs were responsible for conducting the navigational watch in accordance with STCW requirements and Master's orders; and

(c) duty watchkeepers were responsible for the performance of watchkeeping duties under the direction of the OOW.

53. The Company's guidance for navigation watchstanding did not address watchkeeping arrangements in different navigational situations, the prioritization of different watchkeeping tasks, conditions when it might be permissible for the duty ASD to not be on the Bridge, or the use of radar.

54. The Company did not have Standing Orders addressing navigational watchstanding at sea.[11]

55. The Master of OLYMPIA had issued Standing Orders as required by the Company's SMS that were signed by the 3/O and the other OICNWs on board the ship. The Master's Standing Orders established general requirements for standing a navigational watch.[12] These included that the OOW:

(a) must always comply with the COLREGs and the STCW Code, section A-VIII/2, parts 3 and 4;

(b) is responsible for maintaining an alert watch;[13]

(c) should ensure the Helmsman was in position and that the change over from autopilot to manual steering was done in enough time that any potentially hazardous situation could be dealt with in a safe manner;

(d) should always practice good seamanship; and

(e) should call the Master when in doubt about any situation.

56. The Master's Standing Orders did not address the prioritization of different watchkeeping tasks, the circumstances when it was permissible for the duty ASD to not be on Bridge or placing the radars in standby.

STCW Watchkeeping Principles

57. STCW Code, section A/VIII, parts 3 and 4 establish general principles for watchkeeping. These include:

(a) establishing proper arrangements for watchkeepers in accordance with the situation;

(b) that the OICNW maintain a proper watch, making the most effective use of the resources available, such as information, installations and equipment, and other personnel;[14] and

(c) that OICNWs are responsible for the ship's safe navigation while on watch and that they be "particularly concerned with avoiding collision and stranding."

58. STCW Code, section A/VIII, part 4 includes three sub-parts addressing navigational, engineering, and radio watches. Principles particular to navigational watches, include that:[15]

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11 The Company did have Standing Orders addressing passage planning, Bridge and Engine Room preparations for arrival and departure, change of watch, and navigation with a pilot on board.

12 They also addressed watchstanding while in port.

13 The Master's Standing Orders included the observation that maintaining an alert watch "is one of the most important considerations in the avoidance of collisions."

14 This principle was also applicable to Masters and C/Es.

15 *See* STCW Code, section A/VIII, part 4-1 for all the principles particular to navigational watches that are addressed.

(a) a lookout be maintained at all times per the COLREGs Rule 5;

(b) the OOW can serve as the sole lookout during daylight hours provided:

  (i) the existing circumstances considering factors such as the weather conditions, visibility, traffic density, and proximity to dangers to navigation make it safe to do so; and

  (ii) assistance is immediately available and can be summoned to the Bridge if the situation changes;

(c) the Master determines the composition of the navigational watch is adequate to ensure a proper lookout can be continuously maintained, taking into account the above factors along with the ability to immediately summon assistance, when necessary, the operational status of the ship's navigation systems, and the configuration of the Bridge;[16]

(d) when using automatic steering, the OOW takes the following into account:

  (i) the need to station a person to put the steering into manual control and steer the ship "in good time to allow any potentially hazardous situation to be dealt with in a safe manner;" and

  (ii) that when automatic steering is engaged, it is "highly dangerous" to allow a situation to develop to the point where the OICNW is without assistance and has to break the continuity of the lookout to take emergency action.

PART 3: ANALYSIS

The following Analysis is based on the above Findings of Fact.

Collision

OLYMPIA and TB-96666-TS collided on the high seas during daylight hours and good visibility. OLYMPIA was underway on a course of 215° T at a speed of 18 kn and TB-96666-TS was hove to on a northeasterly heading when the collision occurred. Based on the vessel's headings and the locations of the scratches on OLYMPIA's hull, the collision likely occurred when the two vessels' port bows came in contact. Additionally, TB-96666-TS's booms contacted the guardrails on OLYMPIA's forecastle.

Although TB-96666-TS was hove to, the vessel was underway.[17] Further, the vessel was not actively engaged in fishing. Based on their headings, the two vessels were in a head-on situation as defined by the COLREGs Rule 14. Therefore, both OLYMPIA and TB-96666-TS were equally responsible for keeping out of the way of the other vessel.

Within minutes of the collision, TB-96666-TS capsized. The vessel sank just over 30 minutes later. Of the nine crewmembers who were on board, two remain missing and seven were rescued by OLYMPIA.

OLYMPIA sustained only minor damage. None of the ship's crewmembers were reported to have been injured.

16 Some of the additional factors that the Master should consider include: crewmembers' fitness for duty and their experience, current and planned operations, proximity to traffic separation schemes or other routing measures, and the ship's maneuvering characteristics. *See* STCW Code, section A/VIII, part 4-1, paragraphs 17 and 18 for a full list of factors that are supposed to be considered.

17 *See* COLREGs Rule 3(i).

OLYMPIA's Bridge Visibility

The sight line from the conning position during OLYMPIA's voyage from Shanghai to Sihanoukville corresponded with the sight line when the ship was in ballast *(see Figure 5)*. The ship was trimmed 1.1 m by the stern, which is less than the trim on arrival in a ballast condition (1.8 m by the stern) that was used to verify compliance with SOLAS regulation V/22.1.1. This suggests the view of the sea from the conning position may have been obstructed by about 200 m[18] and is not considered a causal factor for the collision of OLYMPIA and TB-96666-TS.

SMS and Master's Standing Orders

The Company's SMS contained guidance for navigational watchstanding that established general requirements for ships' Masters, OOWs, and duty watchkeepers. Masters' responsibilities included preparing standing and particular orders, and supervising and monitoring Bridge watchkeeping personnel.[19] OOWs were responsible for standing watches per STCW Code requirements and Master's orders.

The Company's SMS did not address watchkeeping arrangements in different navigational situations, prioritization of different watchkeeping tasks, conditions when it might be permissible for the duty ASD to not be on the Bridge, or the use of radar. Nor were these issues addressed in the Company's standing orders. The implication was that the Company's SMS effectively left individual Masters, and to a lesser degree OOWs, to determine how the STCW Code's principles for navigational watchkeeping would be implemented on board Company-managed ships.

The Master had issued Standing Orders that established general requirements for OOWs while standing a navigational watch. These included:

(a) complying with the COLREGs and the STCW Code, section A-VIII/2, parts 3 and 4;

(b) maintaining an alert watch, being prepared to change over from autopilot to manual steering in enough time that any potentially hazardous situation could be dealt with in a safe manner;

(c) log keeping;

(d) handing over the watch; and

(e) when to call the Master.

These Standing Orders did not address the prioritization of watchkeeping tasks, when it was permissible for the duty ASD not to be on the Bridge or placing the radars in standby. The Master had addressed the latter two by issuing verbal orders or directions to the OOWs.

Lookout

On the morning of 9 March 2021, the OOW on board OLYMPIA was serving as the ship's lookout as permitted by the STCW Code since the duty ASD was not on the Bridge. As the lookout, he was required by COLREGs Rule 5 to use sight and hearing, along with all available means, to appraise the situation and the risk of collision.

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18 As previously stated, SOLAS regulation V/22.1.1 required that the view of the sea surface from OLYMPIA's conning position not be obstructed by more than 344 m, which is twice the ship's overall length.

19 The Masters' responsibilities also included preparing the Bridge watch plan.

The collision most likely occurred around 0915-0916. Based on OLYMPIA's speed of 18 kn, TB-96666-TS would have been about 4.5-5 NM ahead of OLYMPIA at 0900. The OOW should have been able to see the fishing vessel before he went to the chart table at 0900 because the view of the sea from the ship's Bridge and line of sight to the horizon was about 12 NM. Also, the reported visibility was over 5 NM with clear skies. It is also reasonable that he should have seen it when he returned to the conning position after checking the ship's position and making the hourly entries in the Deck Logbook.

By 0911, when the OOW went to the INMARSAT-C station to reset the alarm that had activated, TB-96666-TS would have been about 1-1.5 NM ahead of OLYMPIA and should have been clearly visible from ship's Bridge. The OOW stated he first saw TB-96666-TS when he returned to the conning station after resetting the INMARSAT-C alarm and filing messages. TB-96666-TS was then probably about 550-600 m ahead of OLYMPIA.[20] Based on the VDR information, this was likely at about 0915, or just before the collision occurred.

Other available means to the OOW for monitoring vessel traffic included the radars, which were in standby, and AIS information displayed on the ECDIS. Radar will detect other vessels without them having to be equipped with any special equipment. In contrast, using AIS information to detect other vessels requires they be equipped with an AIS unit, and that the unit is transmitting. As previously stated, there is no indication that TB-96666-TS had been transmitting AIS information.

The AIS signals were displayed intermittently from some of the fishing vessels that were in OLYMPIA's vicinity *(see Figure 4)*.[21] This should have been an indication to the OOW that the AIS information from these vessels was not reliable and could not be relied on to monitor them. It is also an indication that AIS information is not a substitute for either sight or radar.[22] Based on the OOW's statement and the fact he did not make use of the ship's radars indicates he might not have recognized this.

Considering that TB-96666-TS was a steel hulled vessel with the wheelhouse a deck above the main deck and that its rigging included several masts and booms *(see Figure 2)*, it would be expected to provide a good radar return and might have been detected on radar before it could first have been seen by sight. Early detection using the radar would have provided the OOW ample time to monitor the vessel and determine if there was a risk of collision. Although radar might have permitted the OOW to detect TB-96666-TS sooner than he might have first seen it by sight, the use of radar is not a substitute for using sight to detect other vessels and assess the risk of collision.

It could not be verified whether the OOW had a means of summoning the duty ASD to the Bridge if needed. Based on his statement, the OOW provided no indication that he might have considered it necessary to summon the duty ASD to assist as OLYMPIA approached the group of fishing vessels.

TB-96666-TS did not have a watch stander on duty on the morning of 9 March 2021. The implication is that the vessel was not maintaining a lookout as required by COLREGs Rule 5 when the collision occurred.

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20 At 18 kn, OLYMPIA was moving about 555 m a minute.

21 Although it could not be determined, it is possible that fishing vessels equipped with AIS may have turned on the unit as OLYMPIA approached their position and that then turned it off after OLYMPIA passed by.

22 It is noted that the IMO has issued guidance that addresses the inherent limitations of AIS and its use for collision avoidance. *See* IMO Assembly Resolution A.29/Res.1106, paragraphs 3 and 40-44.

Assessment of the Risk of Collision

The intent of COLREGs Rule 7(a) is to determine if there is risk of collision with another vessel early enough so that action to avoid collision can be taken in ample time as required by COLREGs Rule 8. As discussed above, it is reasonable to expect that the OOW could have sighted TB-96666-TS by about 0900. This would have given him the opportunity to assess whether there was a risk of the two vessels colliding so that action could have been taken in ample time as intended by COLREGs Rule 7(a). Because he did not report seeing the fishing vessel until it was almost directly ahead of the ship, he did not have adequate time to completely assess the situation, but instead had to react immediately.

COLREGs Rule 7(b) requires the "proper use of radar equipment if fitted and operational, including long range scanning to obtain early warning of risk of collision." Both of OLYMPIA's radars were in standby before the 3/O relieved the C/O as OOW and were not used as OLYMPIA approached the group of fishing vessels that included TB-96666-TS. Although the use of radar "if fitted and operational" is required by the COLREGs, it is not a substitute for a visual assessment.

It was reported OLYMPIA's OOWs could use the radars if they felt it was necessary. However, it was also reported that they were reluctant to do so because of criticism they had received from the Master when they did use them. The OOW's statement did not indicate if he considered using the radars as the ship approached the fishing vessels. Therefore, it is not possible to determine whether he did not use the radars because he was worried about being criticized by the Master or because he did not think it was necessary to use them.

Actions to Avoid Collision

Based on the VDR information, at 0916 the rudder went from small amounts of left or right rudder that is consistent with an autopilot maintaining a set course to 15° right rudder. This was done when the fishing vessel was likely only about 550-600 m ahead of OLYMPIA, which is roughly the distance the ship would travel in a minute. At 0917, he brought the rudder to midships and ordered the main engine be reduced from full ahead to half ahead. Although the OOW took action to avoid a collision with TB-96666-TS, the action was not taken soon enough.

The OOW's initial reaction after seeing TB-96666-TS to use the autopilot to change course to avoid a collision was not consistent with either the principles for navigational watches in the STCW Code, section A/VIII, part 4-1 nor the Master's Standing Orders. These principles and the Master's Standing Orders both required that the change from automatic to manual steering be made in good time so that a potentially hazardous situation can be dealt with in a safe manner. The OOW had to steer the ship after switching to manual steering because the duty ASD was not on the Bridge. This is also not consistent with the STCW Code principles for navigational watches or the Master's Standing Orders.

Because the initial action to avoid a collision was taken when the vessels were within about 550-600 m of each other, it is unlikely that the collision could have been prevented if the OOW had immediately changed to manual steering.

Sound and Light Signals

The signal (five short, rapid blasts on the whistle) prescribed by the COLREGs Rule 34(d) requires a vessel to clearly indicate it does not understand the intentions or actions of another vessel with which it is in danger of colliding. This

signal needs to be sounded, with or without being supplemented by light, in sufficient time that the vessel whose intentions or actions are not clear can take action to avoid collision. Based on when OLYMPIA's OOW first reported seeing TB-96666-TS, it is unlikely that this signal could have been sounded early enough to achieve its intended purpose.

TB-96666-TS displayed a black diamond day shape forward on the morning of 9 March 2021. This is the day shape required by the COLREGs to be displayed when the length of a tow exceeds 200 m. It is not known why this day shape was displayed. It is not considered to be a causal factor for the collision.

PART 4: CONCLUSIONS

The following Conclusions are based on the above Findings of Fact and Analysis and shall in no way create a presumption of blame or apportion liability.

1. Causal factors that contributed to this very serious marine casualty include:
   (a) neither vessel maintained an adequate lookout due to:
      (i) ineffective navigational watchstanding on board OLYMPIA due to the OOW's apparent prioritization of other watchkeeping tasks over maintaining an effective lookout and avoiding collision while approaching and passing the fishing vessels that were in the vicinity of the ship's planned route; and
      (ii) TB-96666-TS did not have an assigned watch stander on duty;
   (b) OLYMPIA's OOW did not summon the duty ASD to the Bridge to assist him as the ship approached a group of fishing vessels that were in the vicinity of the ship's intended route. At the same time he was required to verify the ship's position and make hourly entries in the Deck Logbook when there was an increased risk of collision as the ship approached, and passed through, the fishing vessels that were in the vicinity of the ship's planned route;
   (c) OLYMPIA's radars were in standby and were not used for vessel detection and collision avoidance; and
   (d) over reliance by OLYMPIA's OOW on AIS information for vessel detection and collision avoidance.
2. Additional causal factors that may have contributed to this very serious marine casualty include:
   (a) the guidance for navigational watchstanding in the Company's SMS did not provide clear instructions regarding their expectations for how Masters and OOWs should implement the STCW Code's principles for navigational watchkeeping;
   (b) the reported reluctance of the OICNWs on board OLYMPIA to use the ship's radars as required by COLREGs Rule 7(b) due to fear of being criticized by the ship's Master;
   (c) the apparent lack of awareness of OLYMPIA's Master, who was on the forecastle, of the increased risk of collision as the ship approached and passed through the fishing vessels that were in the vicinity of the ship's route;
   (d) either TB-96666-TS was not equipped with an AIS unit or the vessel's AIS unit was not transmitting; and
   (e) TB-96666-TS' Captain did not hold certificates required for his position on board the fishing vessel.

3. Additional issues that were identified but did not contribute to this very serious marine casualty include:
   (a) TB-96666-TS' crewmembers did not hold certificates required for their positions on board the fishing vessel;
   (b) OLYMPIA's OOW did not make the signals prescribed by the COLREGs Rule 34(d);
   (c) TB-96666-TS was displaying the day shape for a tow whose length exceeded 200 m; and
   (d) not all the fishing vessels in the vicinity of OLYMPIA's route with AIS units were transmitting MMSI numbers that were unique to the vessel per ITU-R M.585-8.

PART 5: PREVENTIVE ACTIONS

In response to this very serious marine casualty, the Company has taken the following Preventive Actions.

1. The Company required that Masters of Company-managed ships discuss the collision with their OICNWs with particular emphasis on:
   (a) the need to for them to comply with the COLREGs, and
   (b) that at least one radar should always be active and available for use.
2. The Administrator issued Marine Safety Advisory No. 17-21 addressing the use of radar.

PART 6: RECOMMENDATIONS

The following Recommendations are based on the above Conclusions and in consideration of the Preventive Actions taken.

1. It is recommended that the Company:
   (a) review and if necessary, revise the applicable provisions of the Company's SMS or developing a standing order to provide clear guidance regarding the Company's expectations for how Masters and OOWs must implement the STCW Code's principles for navigational watchkeeping;
   (b) ensure that Company expectations regarding how Master's exercise their responsibility for monitoring and supervising OOWs and for how the STCW principles for navigational watchkeeping are implemented are addressed during pre-joining briefings for Masters; and
   (c) review and, if necessary, revise how the Company's shore staff audits navigational watchkeeping on board the ships in its managed fleet.
2. It is recommended that the Vietnam Maritime Administration share this marine safety investigation report with the relevant national authorities.

The Administrator's marine safety investigation is closed. It will be reopened if additional information is received that would warrant further review.