Marine Safety Investigation Unit

Transport Malta

MARINE SAFETY INVESTIGATION REPORT

Safety investigation into the collision between the

Maltese registered LNG carrier

ASEEM

and the Hong Kong registered VLCC

SHINYO OCEAN

within the passage channel of the Fujairah Offshore Anchorage Area, U.A.E.

on 25 March 2019

201903/023

MARINE SAFETY INVESTIGATION REPORT NO. 07/2020

FINAL

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

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

The objective of this safety investigation report is precautionary and seeks to avoid a repeat occurrence through an understanding of the events of 25 March 2019. Its sole purpose is confined to the promulgation of safety lessons and therefore may be misleading if used for other purposes.

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

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CONTENTS

LIST OF REFERENCES AND SOURCES OF INFORMATION

Crew Members – *MT Aseem*

ISM Managers of MT *Aseem* – The Shipping Corporation of India Ltd.

VDR – MT *Aseem*

VDR and other data – *Shinyo Ocean*, as received from the Federal Transport Authority – Land and Maritime, of the United Arab Emirates

GLOSSARY OF TERMS AND ABBREVIATIONS

°C	Degrees Celsius
AB	Able seafarer deck
ABS	American Bureau of Shipping
AIS	Automatic Identification System
ARPA	Automatic Radar Plotting Aid
AST	Arabia Standard Time (UTC + 3)
Aweigh	Anchoring term – an anchor is said to be 'aweigh' the moment it has broken out of the ground and is clear of the seabed
Ballast	Water carried instead of cargo in order to stabilise a vessel
CPA	Closest point of approach
COLREG	International Regulations for Preventing Collisions at Sea, 1972 (as amended)
Dual-fuel diesel-electric engine	An engine which can operate either by using diesel oil as the main fuel, or gas as the main fuel with diesel oil as the pilot fuel
DWT	Dead-weight tonnes – a measure (normally in metric tons) of a vessel's carrying capacity, including bunker oils, fresh water, crew and provisions
E	East
ECDIS	Electronic Chart Display and Information System
GT	Gross tonnage
kW	Kilowatt
LNG	Liquefied natural gas
Laytime	Chartering term – A period of time agreed between the parties of a charter party agreement, during which the owner of the vessel will make and keep the vessel available for loading/unloading without payment additional to the freight
MLC, 2006	Maritime Labour Convention, 2006 (as amended)
MSC	Maritime Safety Committee – a committee of the International Maritime Organization
MT	Motor tanker
m	Metres
mt	Metric tons
N	North
NOR	Chartering term – Notice of readiness – a notice tendered (issued) to the charterer, shipper, receiver or other person as required by the charter party agreement, stating that the vessel has arrived at the port or berth, as the case may be, and is ready to load/unload cargo.
nm	Nautical miles
OOW	Officer in charge of a navigational watch

rpm	Revolutions (of the crankshaft of an engine) per minute
SMS	Safety management system – a structured and documented system enabling a company's personnel to effectively implement the company's safety and environmental protection policy
SPM	Single point moorings – mooring systems used by oil terminals, whereby a tanker is moored to a single buoy through her forepart
STCW Convention	International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978 (as amended)
STCW Code	Seafarer's Training, Certification and Watchkeeping Code, 1995 (as amended)
Shackles	A unit used to measure the length of an anchor cable (1 shackle = 27.5 m)
U.A.E.	United Arab Emirates
UTC	Universal Time Coordinated (or Coordinated Universal Time)
VHF radio	A fixed two-way radio transceiver using the radio frequencies ranging between 156 and 174 Megahertz (very high frequency)
VLCC	Very large crude oil carrier – a tanker having a DWT between 160,000 and 320,000 metric tons

SUMMARY

During the night of 24 March 2019, MT *Aseem* was approaching the designated passage channel to the Fujairah Offshore Anchorage Area, U.A.E., while MT *Shinyo Ocean* was proceeding outwards through the same passage channel.

Aseem established contact with *Shinyo Ocean* over the VHF radio, and the two vessels mutually agreed on a suitable course of action. *Aseem* conveyed to *Shinyo Ocean* that she would take a round turn to starboard in order to allow *Shinyo Ocean* time to leave the anchorage areas; while *Shinyo Ocean* conveyed to *Aseem* that she would be altering her course to port in order to leave the anchorage areas and proceed towards the Hormuz Strait.

Shortly after the two vessels commenced their respective actions, another vessel, which had just left the anchorage areas, was observed crossing ahead of *Shinyo Ocean*, at a close range. Due to this situation *Shinyo Ocean* altered her course from the one conveyed to *Aseem*; thereby setting the two vessels on a collision course within a short span of time.

On 25 March 2019, at 0006[1], *Aseem* and *Shinyo Ocean* collided. As a result of the collision, the hulls of both vessels were breached below the waterline, with *Shinyo Ocean* sustaining extensive damages.

The safety investigation concluded that the immediate cause of the collision was communication between the two vessels over the VHF radio, which continued even when a close-quarter situation had developed, thus reducing the possibility of timely and effective corrective action until the collision occurred.

The MSIU has made a recommendation to the managers of *Shinyo Ocean*, designed to ensure that the safety and latent factors are brought to the attention of, and addressed with the masters and navigating officers within their fleets. One recommendation was made to the flag State Administration of Malta to emphasize the hazards involved in VHF radio communication between vessels, for the purpose of collision avoidance.

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1 Unless specified otherwise, all times mentioned in this report are in the local time of U.A.E. (UTC + 4)

2 The STCW II/5 qualifications were introduced through the Manila Amendments to the STCW

1.0 FACTUAL INFORMATION

1.1 Vessel, Voyage and Marine Casualty Particulars

Name	*Aseem*	*Shinyo Ocean*
Flag	Malta	Hong Kong
Classification Society	ABS	ClassNK
IMO Number	9377547	9197868
Type	LNG tanker	Crude oil tanker
Registered Owner	India LNG Transport Co. (No. 3) Ltd.	Shinyo Ocean Ltd.
Managers	The Shipping Corporation of India Ltd.	Synergy Maritime Pvt. Ltd.
Construction	Steel (Double hull)	Steel (Double hull)
Length overall	285.1 m	330.0 m
Registered Length	275.55 m	319.029 m
Gross Tonnage	97,874	149,274
Minimum Safe Manning	15	*Not available*
Authorised Cargo	Liquefied natural gas	Crude oil
Port of Departure	Dahej, India	Fujairah, U.A.E.
Port of Arrival	Fujairah, U.A.E.	Al Shaheen Terminal, Qatar
Type of Voyage	International	International
Cargo Information	In ballast	In ballast
Manning	31	*Not available*
Date and Time	25 March 2019 at 0006 (LT)	
Classification of Occurrence	Serious Marine Casualty	
Location of Occurrence	Off Fujairah Offshore Anchorage Areas in position 25° 15.11' N 056° 35.04' E	
Place on Board	Bulbous bow, stem and forecastle	Hull – over side / ballast tank and cargo tanks
Injuries/Fatalities	None	None
Damage/Environmental Impact	Damages above and below the water line / None	Damages above and below the water line / None
Ship Operation	Manoeuvring	Manoeuvring
Voyage Segment	Arrival	Departure
External & Internal Environment	Clear weather with a visibility of 10 nm, North-easterly wind of Beaufort force 3, Calm sea.	
Persons on Board	37	*Not available*

1.2 Description of Vessels

1.2.1 MT *Aseem*

Aseem (Figure 1) was a Maltese-registered, double hull, 97,874 gt liquefied natural gas carrier, built in the Republic of Korea in 2009. She was owned by India LNG Transport Co. (No. 3) Ltd., managed by The Shipping Corporation of India Ltd., India, and classed with ABS.

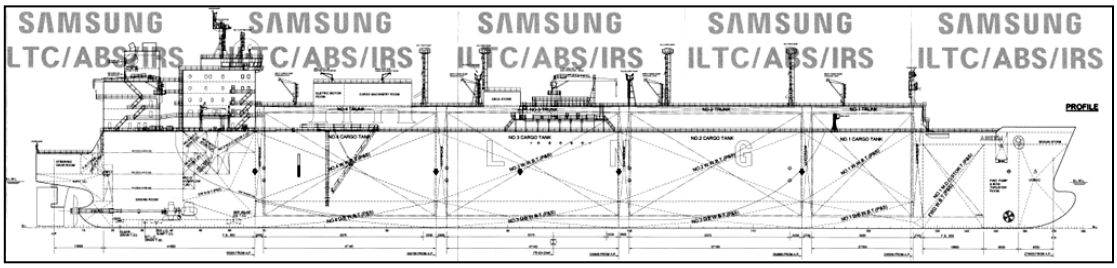

Figure 1: Extract of General Arrangement Plan - *Aseem* (Scale 1:300)

The vessel had a length overall of 285.10 m, a moulded breadth of 43.40 m, a moulded depth of 19.95 m, and a summer DWT of 86,655.40 mt, corresponding to a summer draft of 12.50 m. At the time of the collision, she was reportedly drawing a forward draught of 4.70 m, and an aft draught of 7.30 m.

Propulsive power was provided by two dual-fuel diesel-electric engines, manufactured by ABB OY, Finland, each rated at a speed of 514 rpm and producing a combined power of 24,950 kW. The engines drove a single, fixed pitch propeller, through a reduction gear box fitted to propulsion electric motors, which enabled *Aseem* to reach a speed of 20 knots.

The vessel was fitted with all navigational equipment, required for a vessel of her size, including two ECDIS. The layout of her bridge can be seen in Figures 2 and 3.

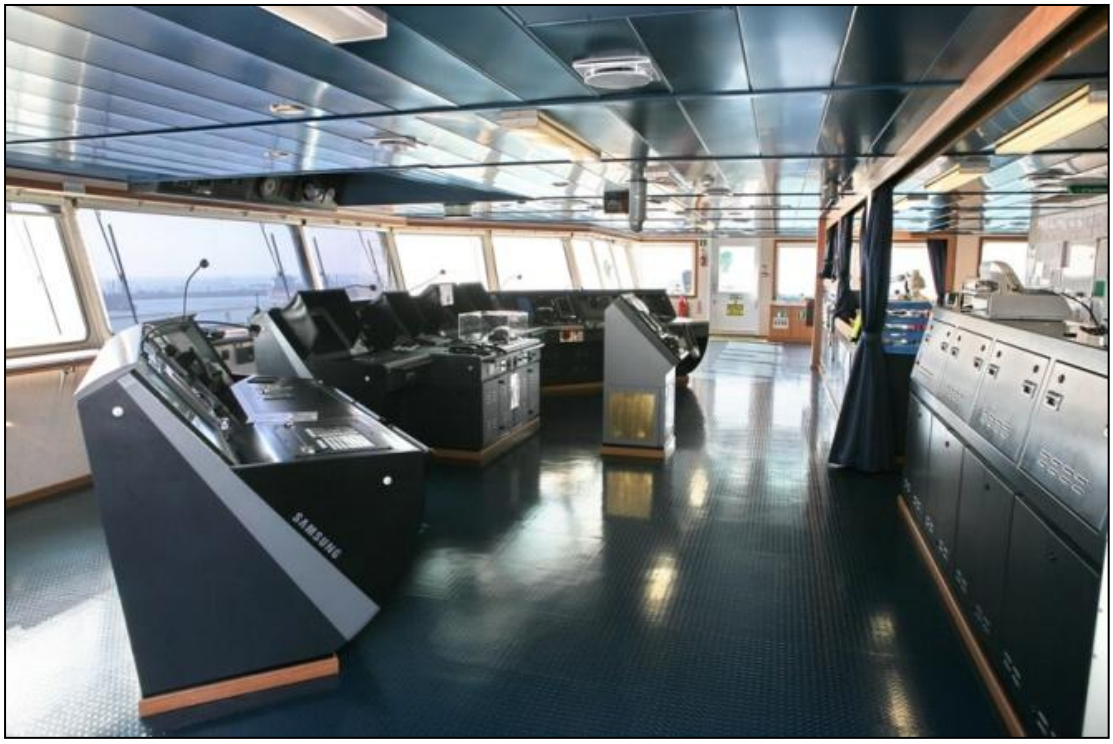

Figure 2: Bridge of *Aseem* – from port side

Figure 3: Bridge of *Aseem* – from starboard side

1.2.2 MT *Shinyo Ocean*

Shinyo Ocean was a double hull, 149,274 gt crude oil tanker, built in 2000. She was owned by Shinyo Ocean Ltd., and managed by Synergy Maritime Pvt. Ltd., India. At the time of the accident, the vessel was registered with Hong Kong, and classed with Class NK.

The vessel had a length overall of 330.0 m, a moulded breadth of 60.0 m, and a summer DWT of 281,395.00 mt. At the time of the collision, she was reportedly drawing a forward draught of 7.8 m, and an aft draught of 10.8 m.

Propulsive power was provided by a 7-cylinder, single-acting, direct-drive, medium speed, DU-Sulzer 7 RT A84T marine diesel engine.

1.3 Crew on Board *Aseem*

The Minimum Safe Manning Certificate of *Aseem* stipulated a crew of 15. At the time of the collision, the vessel had 31 crew members on board. The crew list included a master, a chief officer, a first officer, a trainee first officer, a second officer, and two third officers. All crew members were Indian nationals.

1.3.1 Recommended manning levels of the bridge

During approaches to / departure from ports or anchorages, the Company's safety management system (SMS) procedures recommended that *Aseem*'s bridge be manned by the master, a watchkeeping officer, an additional watchkeeping officer, a helmsman and a look-out.

At the time of the collision, the vessel's bridge was manned by the master, who was conning the vessel, the third officer, and two ABs – one of whom was acting as a helmsman.

1.3.2 The master

The master had joined the vessel on 09 November 2018. His career at sea spanned a total of 12.3 years, all of which were served with the Company. He had served for 2.1 years in the rank of a master holding STCW II/2 qualifications. His Certificate of Competence was issued by the Directorate General of Shipping, India.

His experience on gas carriers spanned a total of seven years of which, he served 1.8 years in the rank of a master on gas carriers.

1.3.3 The third officer

The third officer had joined the vessel on 18 December 2018. He had been at sea for about 8.3 years, all of which were served with the Company. He served about two years in the rank of a third officer, holding STCW II/1 qualifications. His Certificate of Competence had also been issued by the Directorate General of Shipping, India.

1.3.4 The ABs on the bridge

The AB (AB 1) who was steering the vessel, had joined the vessel on 18 August 2018. He had a sea career spanning 16 years, 9.3 years of which were served with the Company. He has been serving as an AB for 7.8 years and held the recently introduced STCW II/5[2] qualifications for the last 1.7 years.

The other AB (AB 2), who was on the bridge, had joined the vessel on 09 November 2018. He had 7.8 years of sea-going experience. He had been employed by the Company for about 2.4 years. He served for 3.7 years in the rank of an AB and he held the STCW II/5 qualifications for about 2.1 years.

The certificates of proficiency of both ABs were issued by the Directorate General of Shipping, India.

1.4 Crew on Board *Shinyo Ocean*

It was reported that, at the time of the collision, the vessel had 27 persons on board. During the course of the safety investigation, the MSIU neither had access to details on the nationality, qualifications and experience of the crew members, nor on the Company's recommended manning levels of the vessel.

Although the exact composition of the vessel's bridge team was not known, evidence suggested that the master, an OOW[3] and a helmsman were present on the bridge.

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[2] The STCW II/5 qualifications were introduced through the Manila Amendments to the STCW Convention and the STCW Code. Prior to these amendments, which entered into force on 01 January 2017, an able seafarer was required to be certified in accordance with the requirements of STCW II/4 and ILO Convention C074 (Certification of Able Seamen, 1946).

[3] The rank of this OOW was not known to the safety investigation.

1.5 Company's Drug and Alcohol Policy on Board Both Vessels

The drug and alcohol policy of the managers of *Aseem* prohibited the consumption of drugs and alcohol on board. Moreover, the Company's SMS procedures required that an alcohol test is conducted on all persons at the earliest, and within an hour of any accident.

The drug and alcohol policy observed by *Shinyo Ocean* was not made available to this safety investigation

1.6 Voyage Plans

1.6.1 *Aseem*

Aseem was on a passage from Dahej, India, to Fujairah Offshore Anchorage Area, U.A.E, in ballast. The vessel intended to carry out Statutory and Class surveys and receive bunkers in Fujairah Offshore Anchorage Area, and was instructed by Fujairah Port Control to proceed to 'D' Anchorage.

Her passage was planned so as to enter and pass through the designated passage channel on a Westerly heading, and then into the designated anchorage. Figure 4 shows the anchorage area of Fujairah.

1.6.2 *Shinyo Ocean*

After weighing her anchor, *Shinyo Ocean* was reportedly scheduled to proceed in ballast condition, towards Al Shaheen Terminal, Qatar. Evidence suggested that *Shinyo Ocean* was required to arrive at Al Shaheen Terminal by 0000 AST on 26 March 2019, as her laytime was due to commence from this time and the master had to tender a NOR upon the vessel's arrival. Evidence also indicated that the crew members of *Shinyo Ocean* had estimated that this voyage would take about 30 hours.

1.7 Local Regulations – Fujairah Offshore Anchorage Area

Version 4 of the Notice to Mariner no. 148 provided port information and regulations for vessels calling at the port of Fujairah, its oil terminals, SPMs and offshore anchorage area.
This notice specified that the passage channel (Figure 4) was intended for free passage of vessels to the various anchorages, and that vessels were not permitted to anchor within this channel. The width of this passage channel was 0.5 nm.

The notice further stipulated that steaming through 'G' Anchorage was restricted, and only liquefied natural gas and liquefied petroleum gas carriers, which intended to conduct ship-to-ship cargo transfer operations, were permitted to enter this anchorage. In order to enter 'G' anchorage, special permission would have to be sought from Fujairah Port Control.

Furthermore, as per this notice, the maximum speed of vessels within the offshore anchorage area was limited to 5 knots.

1.8 Environment

Around the time of the accident, the weather was clear, with a visibility of about 10 nautical miles (nm). The sea was calm, and the winds were blowing from a North Northeasterly direction, at a speed of 10 knots. The air temperature was recorded to reach 23 °C.

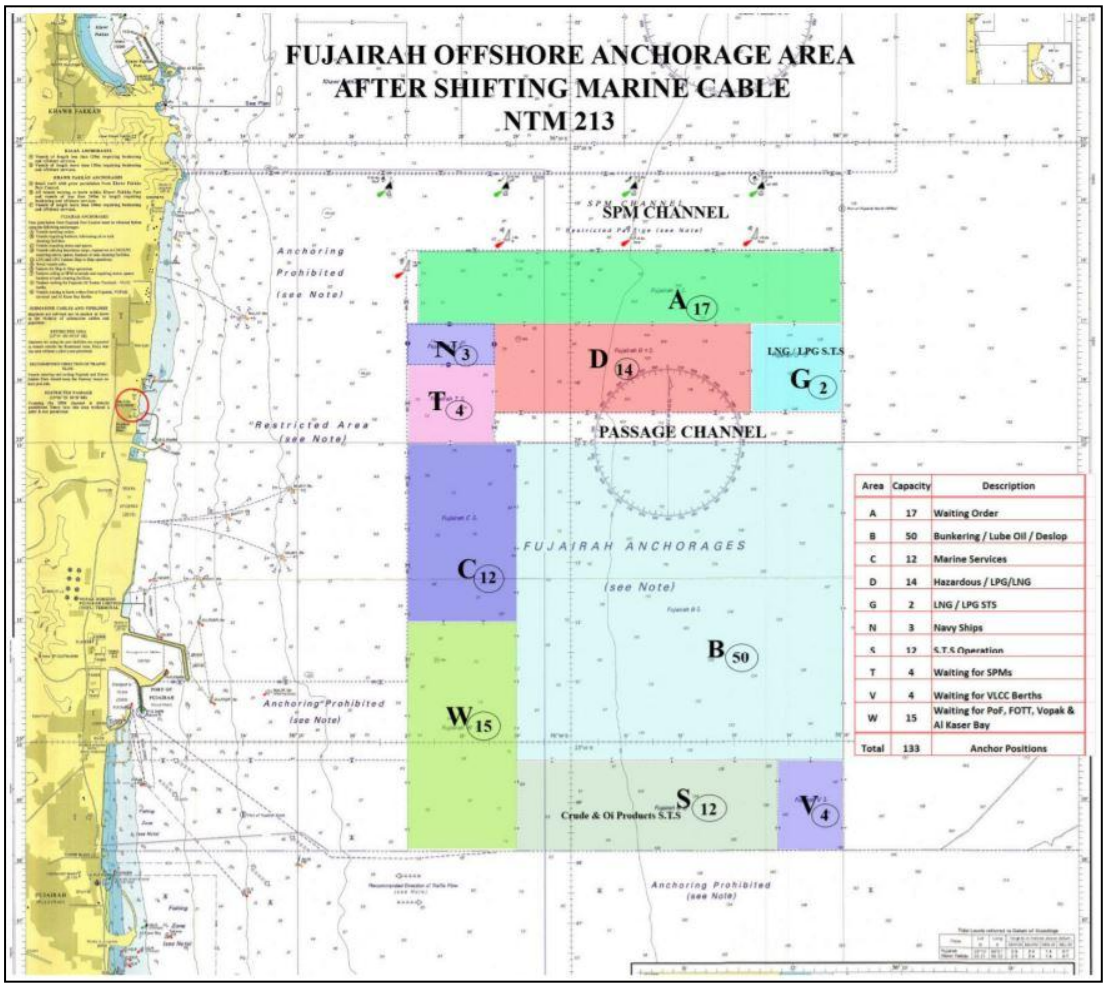

Figure 4: Fujairah Offshore Anchorage Area

(*Source: Port of Fujairah Notice to Mariner No. 148 – Version 4*)

1.9 Pre-collision Events

1.9.1 Events on *Aseem*

Aseem had departed from the port of Dahej, India, on 22 March 2019. On 24 March 2019, the third officer was keeping the navigational watch from 2000 onwards, with AB 1 who, at that time, was carrying the duties of a lookout. The master went up to the bridge at 2130 and thereafter, he remained on the bridge.

At 2325, the master advised the third officer to have the anchor lashings of both anchors removed. At 2330, as the vessel was approaching Fujairah, the master took over the con and requested for the engines to be put on 'stand-by'. At this time, the third officer informed the master that the distance to the anchorage area was about four nautical miles (nm), and that one vessel was outbound through the passage

channel. He also informed the master that the engine was running at 72 rpm and that the speed of the vessel was 17.8 knots[4]. A few minutes later, AB 2 arrived on the bridge.

At 2336, while the speed of the vessel was 15.1 knots, the master ordered AB 1 to switch to manual steering. At this time, the heading of the vessel was 291°, and the master requested AB 1 to steer on a course of 320°. Around this time, AB 2 asked about taking over steering duties from AB 1, however, the master decide that AB 1 should continue steering the vessel.

1.9.2 Events on *Shinyo Ocean*

Shinyo Ocean was anchored in 'B' Anchorage in position 25° 14.08' N 056° 30.00' E (Figure 5). Available information indicated that the vessel was anchored with nine shackles of her starboard anchor cable on deck.

Prior to weighing the anchor the crew members carried out relevant tests on the main engine telegraph, the steering gear and its alarms, and on the main engine.

On 24 March 2019, at 1330, the crew members on board *Shinyo Ocean* commenced weighing her anchor and, while doing so, experienced some problems which delayed the operation. The anchor was finally aweigh, sighted and clear at 2235. At this time, the heading of the vessel was 230°. The vessel was then turned around by a starboard helm and manoeuvred into the passage channel at 2315. At this time, the vessel's speed was about 5.3 knots. At 2332, the master ordered her engine to 'Full Ahead'.

Evidence suggested that, at 2336, while the vessel was proceeding through the passage channel, the master informed the officer of the watch that he planned to alter the vessel's course to port after passing the vessels which were on her port side (Figure 6).

[4] Unless specified otherwise, speeds of all vessels mentioned in this report are speeds over the ground.

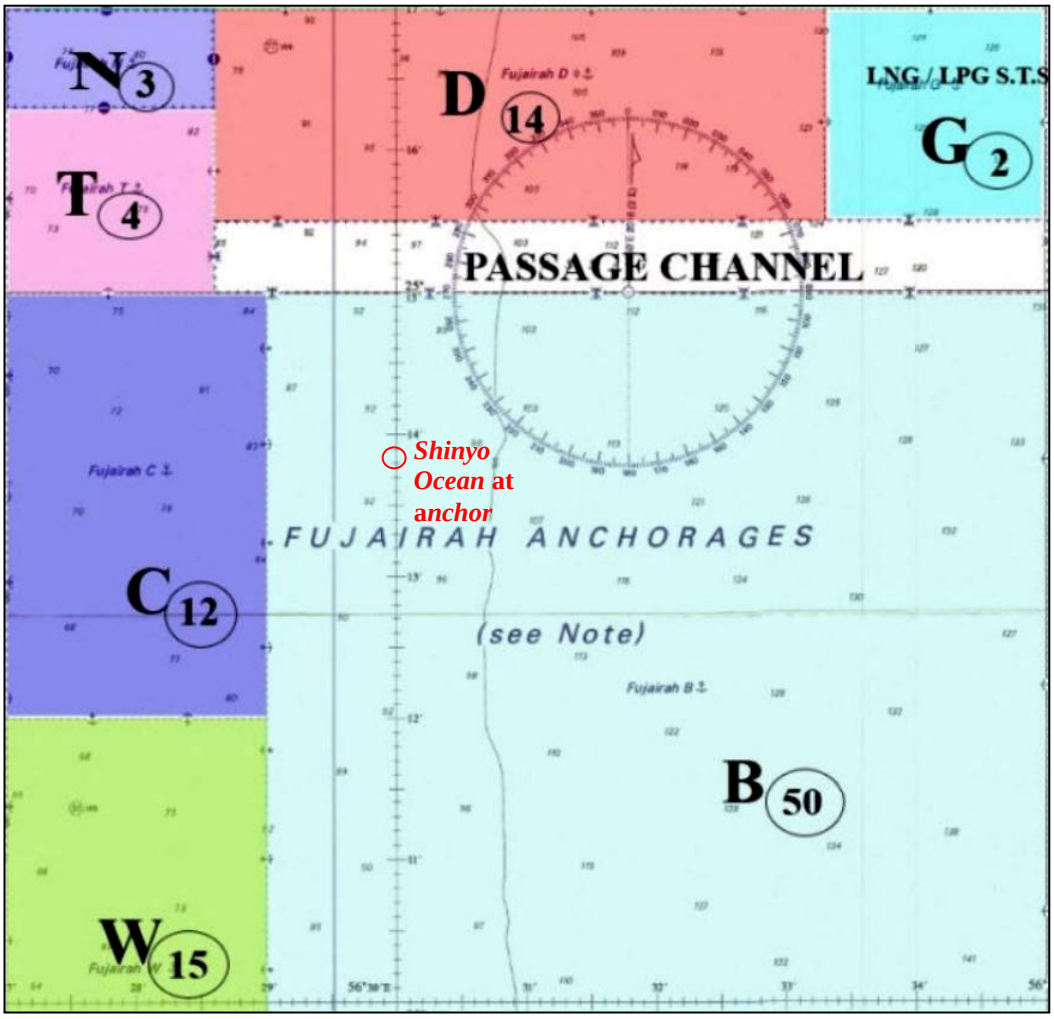

Figure 5: Location of *Shinyo Ocean* in 'B' Anchorage

(Adapted from Port of Fujairah Notice to Mariner No. 148 – Version 4)

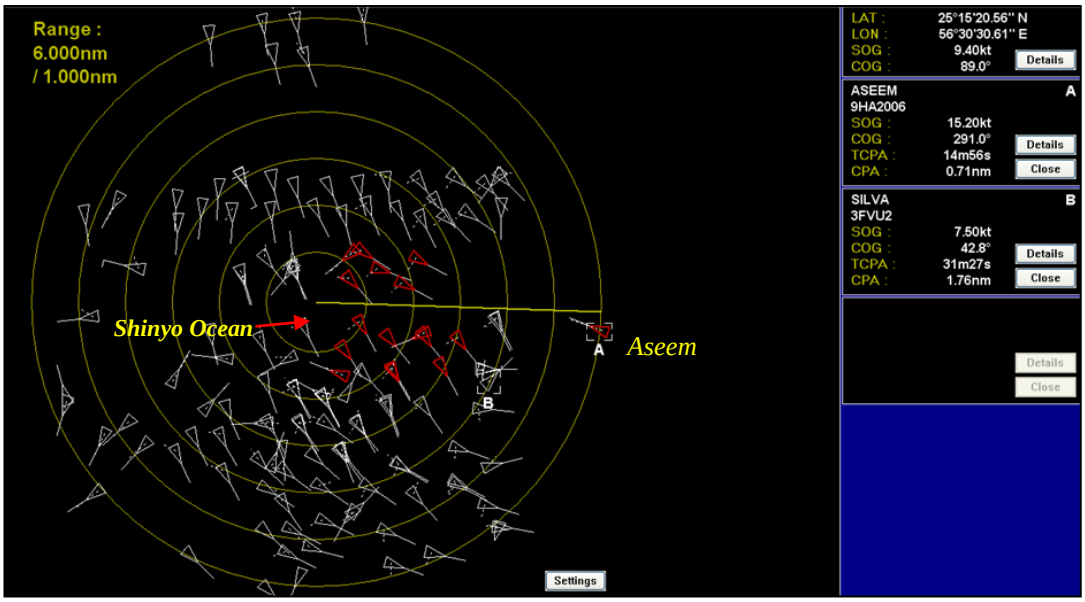

Figure 6: AIS showing the situation at 2336

1.10 Narrative

On 24 March 2019, at 2338, the masthead lights of a vessel proceeding outwards through the passage channel were seen by the master and the third officer of *Aseem*. At 2341, the master asked the third officer for the name of this vessel, who, on checking the AIS, reported the name as *Shinyo Ocean*.

The master then established contact with *Shinyo Ocean* over the VHF radio and informed *Shinyo Ocean* that *Aseem* would be taking a round turn to starboard in order to allow *Shinyo Ocean* to clear the channel, after which *Aseem* would enter the passage channel, with the intention to anchor within 'D' Anchorage. This message was acknowledged by the officer of the watch (OOW) aboard *Shinyo Ocean*, who also informed *Aseem* that *Shinyo Ocean*'s course would be altered to port and that she would be proceeding towards the Hormuz Strait (Figure 7). At 2343, *Aseem* commenced a round turn to starboard; while *Shinyo Ocean* started altering her course to port at 2345.

Figure 7: Extract adapted from an ECDIS playback, showing the situation at around 2342

(Source of the ECDIS playback: Federal Transport Authority – Land and Maritime, U.A.E.)

At 2346, the attention of the master of *Shinyo Ocean* was drawn towards another vessel, *Silva* (Figure 7), which had just departed from 'B' Anchorage. He inquired with his OOW about the vessel and the OOW acquired *Silva* on the radar.

Around the same time, while *Aseem* was passing a heading of 030° through her round turn, she received a call over the VHF radio from *Silva*. *Silva* asked *Aseem* about her intentions, to which the third officer responded that *Aseem* would be taking a round turn and proceeding to 'D' anchorage. *Silva* asked for *Aseem* to pass to her starboard. The third officer acknowledged this message and also informed *Silva* that *Aseem* would pass her stern.

Once *Silva* was acquired on the radar, the OOW of *Shinyo Ocean* informed the master that the CPA to *Silva* was 0.3 nm. At this time, *Shinyo Ocean*'s speed was 10.2 knots. At 2349, the master of *Shinyo Ocean* called *Silva* over the VHF radio and asked about her intentions. *Silva* replied that the course and speed of the vessel would be maintained following which, the master of *Shinyo Ocean* requested that *Silva* alters her course slightly to port and pass her stern, as *Shinyo Ocean* would also be altering her course to port and would be proceeding North. However, the reply from *Silva* was that the vessel was already out of the anchorage area and that, since *Shinyo Ocean* was within the anchorage area, she should reduce her speed.

By 2350, *Shinyo Ocean* was North of the passage channel limits and within 'G' Anchorage (Figure 8). Following the conversation between *Shinyo Ocean* and *Silva*, at 2351, the OOW of *Shinyo Ocean* suggested that the vessel's speed is reduced, as altering the vessel's course to starboard could result in a close-quarter situation with *Aseem*.

At around 2352, the master of *Shinyo Ocean* ordered the helm to 10° to starboard, followed by an order of 'hard to starboard'. At this time, *Shinyo Ocean* was on a heading of 070° with a speed of 9.6 knots, while her course was being altered to starboard. *Aseem*, bearing 074° at a distance of 2.36 nm from *Shinyo Ocean*, was on a heading of 164°, through her round turn to starboard, with a speed of 5.6 knots, and *Silva*, bearing 103° at a distance of 1.89 nm from *Shinyo Ocean*, was on a heading of 000° with a speed of 7.5 knots (Figure 9).

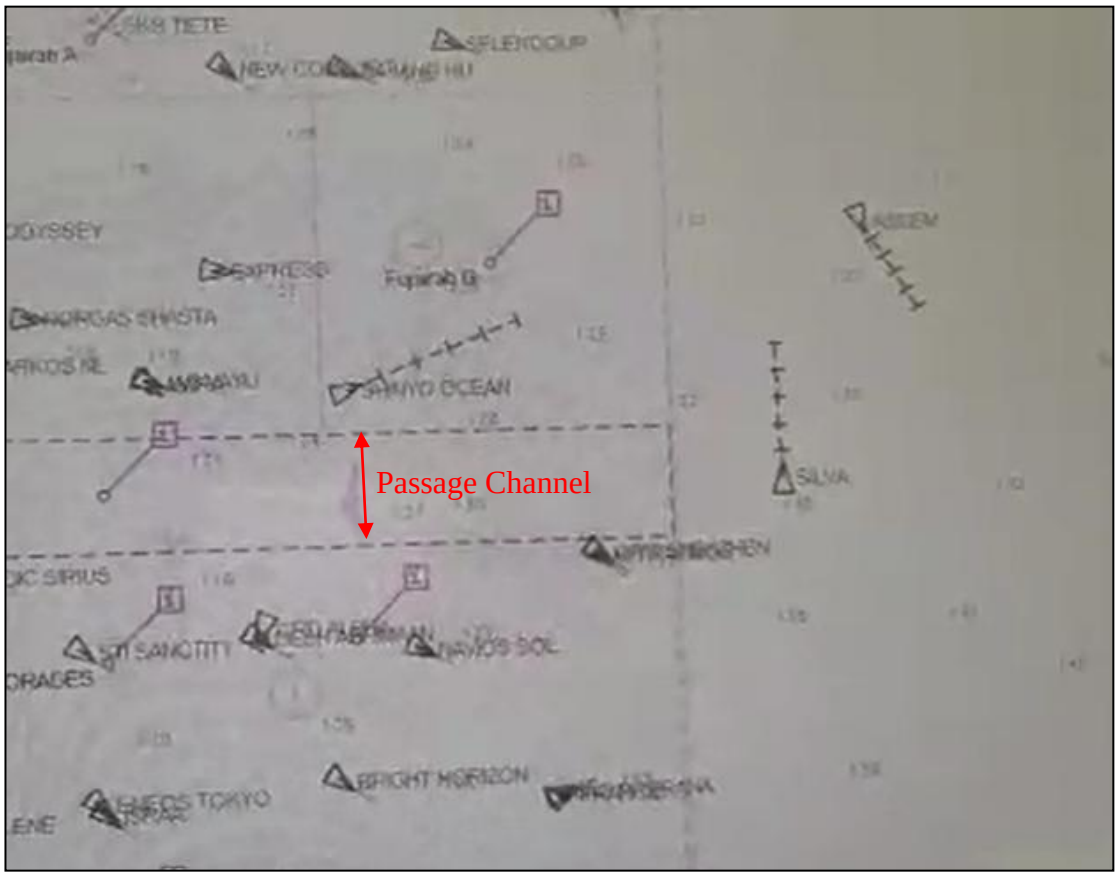

Figure 8: Extract adapted from the ECDIS playback, showing the situation at around 2350

(*Source of the ECDIS playback: Federal Transport Authority – Land and Maritime, U.A.E.*)

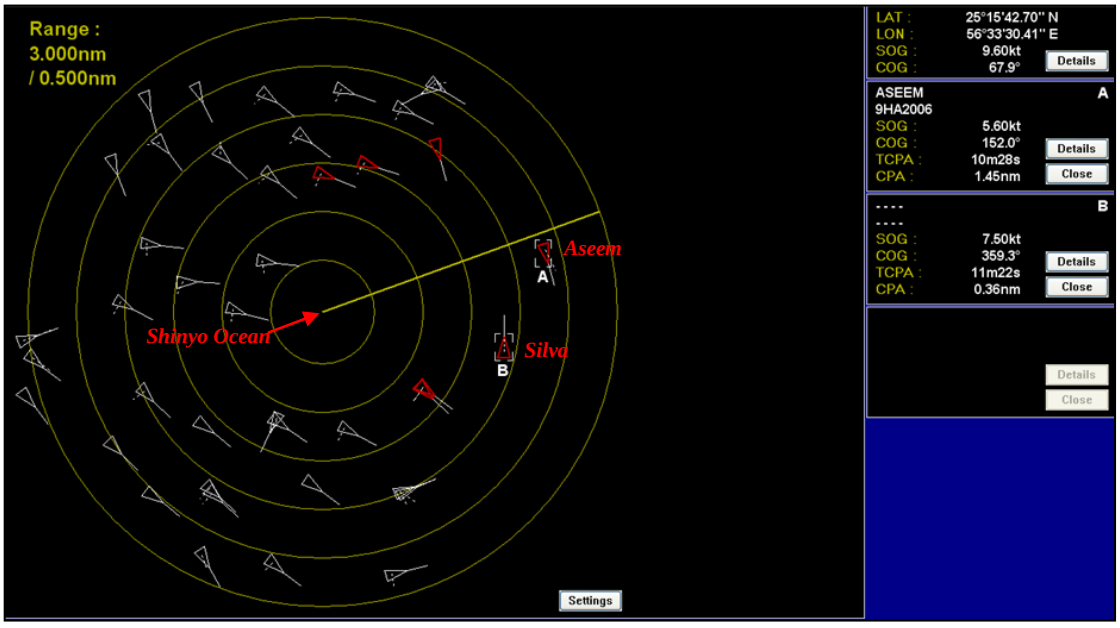

Figure 9: AIS showing the situation at 2352 (A: *Aseem*; B: *Silva*)

At 2353, the master of *Shinyo Ocean* called *Aseem* over the VHF radio and informed the latter that his own vessel's course would be altered to starboard for *Silva* to pass

clear, and requested *Aseem* to maintain her course and speed for some time. The master of *Aseem* acknowledged this message. At this time, the master and the third officer of *Aseem* saw the port sidelight of *Shinyo Ocean*.

At 2356, the master of *Shinyo Ocean* once again called *Aseem* over the VHF radio and informed the latter that he would continue swinging the vessel to starboard, and that *Aseem* could turn around and proceed towards the anchorage. He also informed *Aseem* that *Shinyo Ocean* would only proceed back North, once *Aseem* had altered and proceeded. The third officer of *Aseem* acknowledged this message; however, he informed the master of *Aseem* that *Shinyo Ocean* had stopped and had asked *Aseem* to proceed towards the channel. At this time, *Shinyo Ocean* as well as *Silva* were lying on the starboard beam of *Aseem* (Figures 10 and 11). The master of *Aseem* then ordered AB 1 to ease off on the starboard helm.

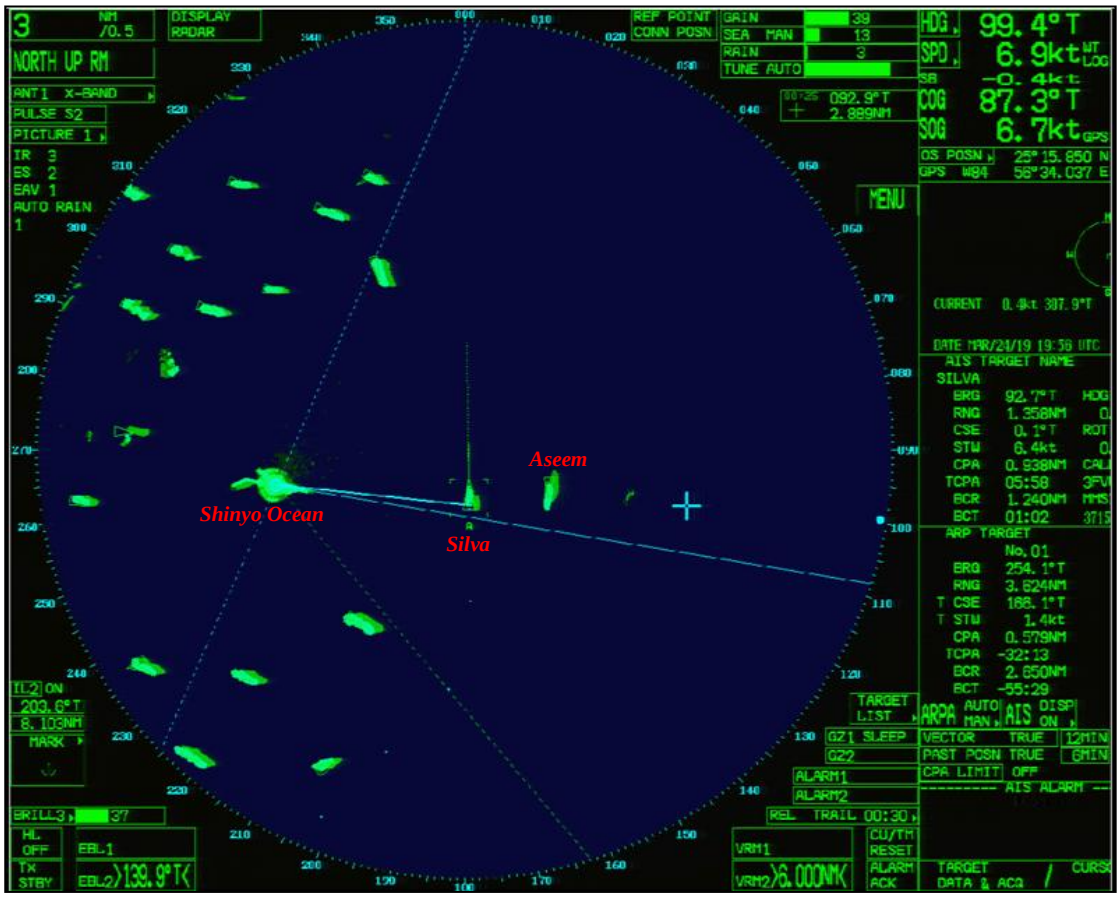

Figure 10: Radar showing the situation at 2356

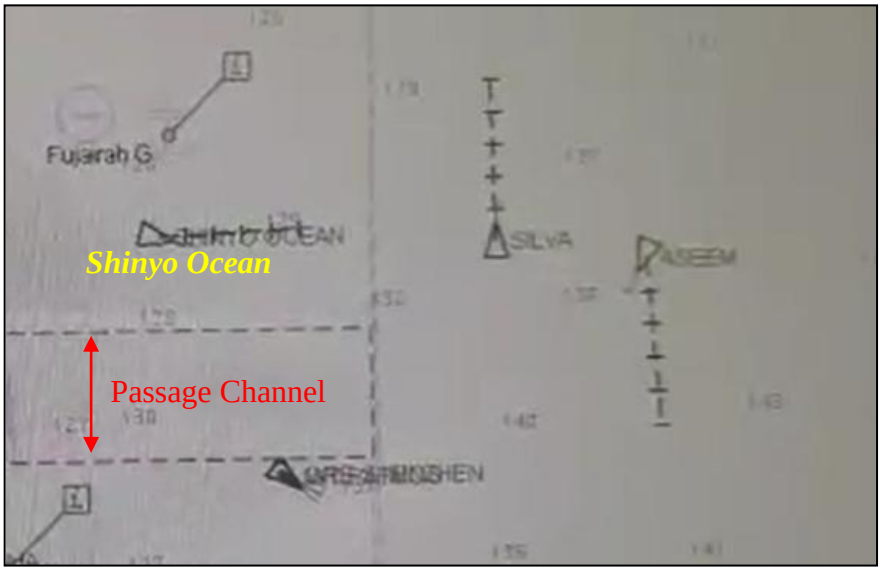

Figure 11: Extract adapted from the ECDIS playback, showing the situation at around 2356
(*Source of the ECDIS playback: Federal Transport Authority – Land and Maritime, U.A.E.*)

At 2359, while *Aseem* was passing a heading of 240° through her starboard turn, the master of *Aseem* asked the third officer whether *Shinyo Ocean* had stopped. The third officer responded that the speed of *Shinyo Ocean* was 6.5 knots. The two then discussed the manoeuvre of *Shinyo Ocean*, which included the alteration of her course to port, entering into 'G' anchorage, followed by a bold alteration to starboard. At this time, *Shinyo Ocean* was passing a heading of 125° through her alteration to starboard.

At 0000, on 25 March 2019, the master of *Aseem* ordered that the vessel's heading to be steadied on 247°, in order to assess the situation. On noticing that the CPA with *Shinyo Ocean* would be 0.4 nm and the time to reach this point of approach was five minutes, the master asked the third officer to call *Shinyo Ocean* and inquire about her intentions. The speed of *Aseem*, at this time was about 6.7 knots, and the distance to the closest vessel that lay at anchor in 'B' anchorage, right ahead of *Aseem*, was 1.17 nm.

At 0001, the third officer called *Shinyo Ocean* over the VHF radio. When the OOW of *Shinyo Ocean* responded, the master of *Aseem* took over the call and asked about the intentions of *Shinyo Ocean*. The OOW of *Shinyo Ocean* instead asked *Aseem* whether she would be altering her course further to starboard. The master of *Aseem* responded that he would need to alter the course of the vessel to starboard, since

another vessel was at a distance of one nm right ahead of *Aseem*. He once again asked *Shinyo Ocean* on her intentions, to which the OOW of *Shinyo Ocean* responded that the course and speed of his vessel would be maintained. The CPA with *Shinyo Ocean*, at this time, was 0.35 nm. The vessel at anchor was at a distance of 0.7 nm, right ahead of *Aseem* (Figure 12).

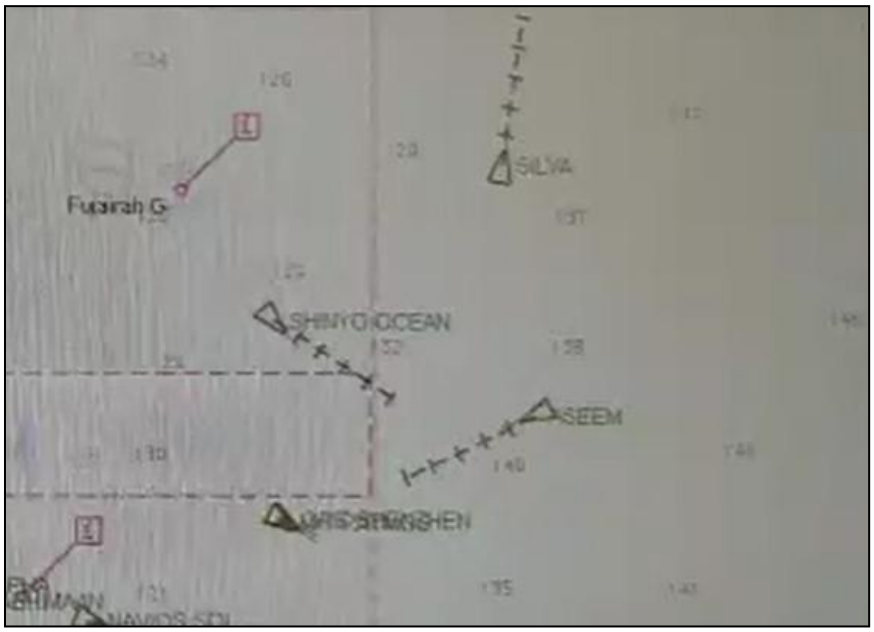

Figure 12: Extract of the ECDIS playback, showing the situation at around 0001
(*Source of the ECDIS playback: Federal Transport Authority – Land and Maritime, U.A.E.*)

The master of *Aseem* then asked *Shinyo Ocean* whether she would be able to alter her course to port. The master of *Shinyo Ocean* responded that this was not possible as it would lead to a close-quarter situation. He asked *Aseem* whether she could stop her engines. The master of *Aseem* responded that it would be difficult, and that he is altering the vessel's course to starboard which should enable her to pass clear. The OOW of *Shinyo Ocean* requested for *Aseem*'s wheel to be put hard over to starboard.

A couple of minutes later, the OOW of *Shinyo Ocean* once again called *Aseem* over the VHF radio and requested for *Aseem*'s wheel to be put hard over to starboard. The master of *Aseem* ordered the wheel hard over to starboard. The anchored vessel was now 0.3 nm ahead of *Aseem*. At 0004, the master of *Aseem* called *Shinyo Ocean* and confirmed that the wheel was hard over to starboard. He then asked for *Shinyo Ocean*'s wheel to be put hard over to port. At around 0005 (Figure 13), the master of *Shinyo Ocean* ordered the wheel of his vessel to be put hard over to port, while the master of *Aseem* ordered the wheel of his own vessel to be brought amidships.

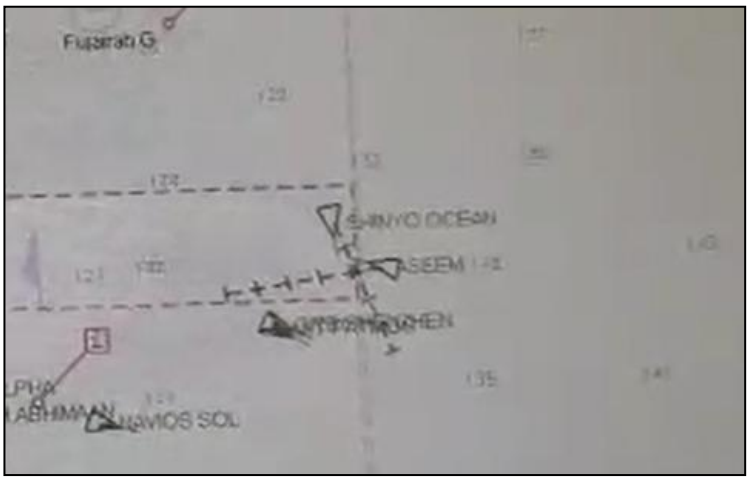

Figure 13: Extract of the ECDIS playback, showing the situation at around 0005

(Source of the ECDIS playback: Federal Transport Authority – Land and Maritime, U.A.E.)

At around 0006, *Aseem* and *Shinyo Ocean* collided in (approx.) position 25° 15.0' N 056° 34.9' E, just within the passage channel of the Fujairah Offshore Anchorage Area (Figures 14 and 15). At that time, the heading of *Aseem* was 295° and her speed was 8.3 knots, while the heading of *Shinyo Ocean* was 173° and her speed was 7.3 knots. Contact was made head on, by *Aseem*, into the port bow of *Shinyo Ocean*, about 20 metres aft of her anchor windlass.

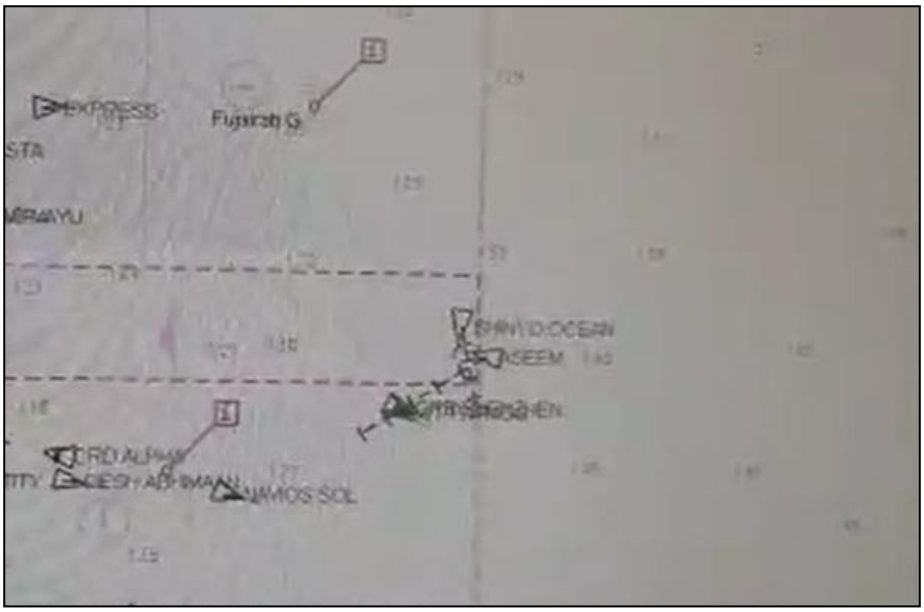

Figure 14: Extract of the ECDIS playback, showing the collision at around 0006

(Source of the ECDIS playback: Federal Transport Authority – Land and Maritime, U.A.E.)

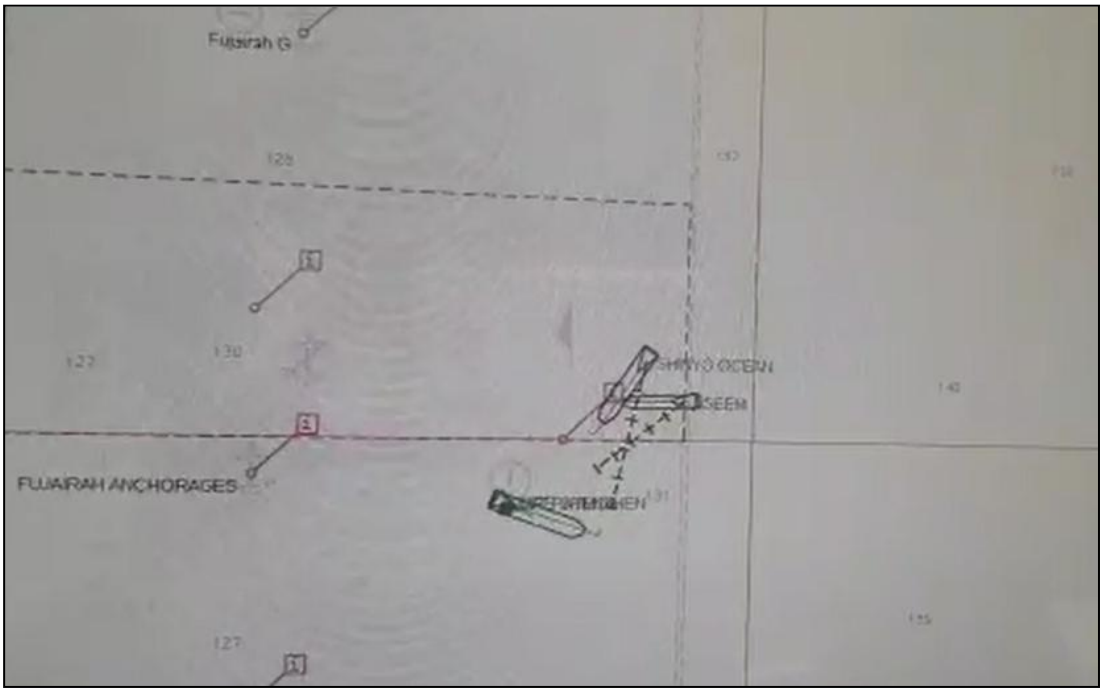

Figure 15: Extract of the ECDIS playback, showing the collision

(Source of the ECDIS playback: Federal Transport Authority – Land and Maritime, U.A.E.)

1.11 Post-collision Actions

Following the collision, the two vessels separated and both chief officers started assessing the damages sustained by their respective vessels.

At 0020, the master of *Shinyo Ocean* asked the OOW for the direction in which open sea was. The OOW responded saying that it was 070°, following which the master ordered for the wheel of *Shinyo Ocean* to be put hard over to starboard. At 0028, the master, the second officer and the third officer of *Aseem* noticed *Shinyo Ocean* heading towards 'G' anchorage.

About one minute later, the master of *Aseem* called Fujairah Port Control (FPC) and reported the collision, confirming that there were neither injuries on board his vessel, nor any signs of pollution; only damages to the vessel. He then informed FPC that *Shinyo Ocean* was still in the middle of the designated passage channel and requested FPC to ask *Shinyo Ocean* whether everything was in order on board so that she can clear the channel and thus, allow *Aseem* to proceed to 'D' anchorage.

From 0031 onwards, FPC tried to contact *Shinyo Ocean* several times, however, received no response until 0037. *Shinyo Ocean* then confirmed to FPC that there were

neither any injuries on board nor any signs of pollution. He also explained that the extent of damages was being assessed.

FPC then informed *Shinyo Ocean* that she was entering the restricted 'G' anchorage and ordered her to proceed to 'B' anchorage, drop her anchor and report to FPC. The master of *Shinyo Ocean* replied that he was taking the vessel out of 'G' anchorage and would stop outside the anchorage areas in order to assess the damages, following which the vessel would anchor in 'B' anchorage.

Both vessels were then instructed to forward statements to FPC, after they had anchored.

1.12 Damages Sustained

1.12.1 *Aseem*

The damages sustained by *Aseem* were limited to the region around her stem, but above and below the water line (Figure 16). The shell plating in way of the bulbous bow (Figure 17) and the starboard bow (Figure 18), the stem plating, the forward bulwark (Figure 19) and the forecastle deck plating were distorted, fractured and perforated in several places. The internal strengthening members in these areas were also distorted, buckled and fractured.

Figure 16: Damages sustained by *Aseem*, which was restricted to the region around the stem

Figure 17: Holes and distortion in the bulbous bow plating

Figure 18: Internal view of damaged shell plating on the starboard bow

Figure 19: Damaged bulwark and stiffeners on the forecastle

1.12.2 *Shinyo Ocean*

Shinyo Ocean sustained extensive damages to her deck plating and associated fittings (Figures 20 and 21), and her port side shell plating (Figure 22). Ballast tank no. 1 port and cargo tanks nos. 1 centre and 1 port were also reported to have been structurally damaged.

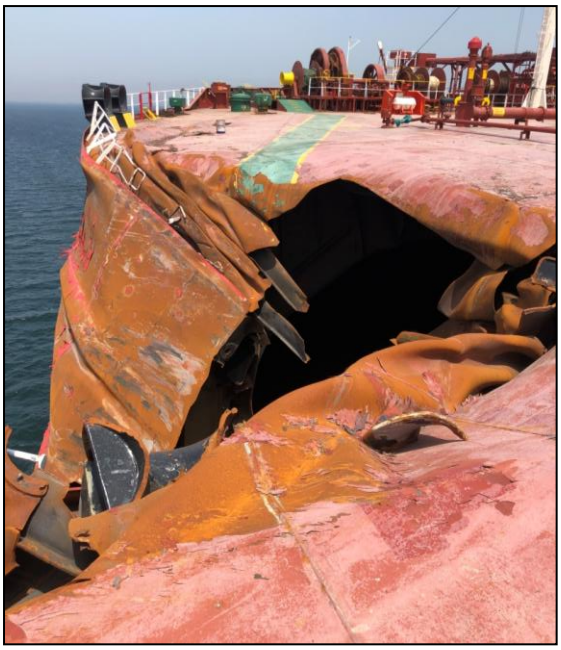

Figure 20: Damaged deck plating and fittings – as seen from aft to forward

(Source: Federal Transport Authority – Land and Maritime, U.A.E.)

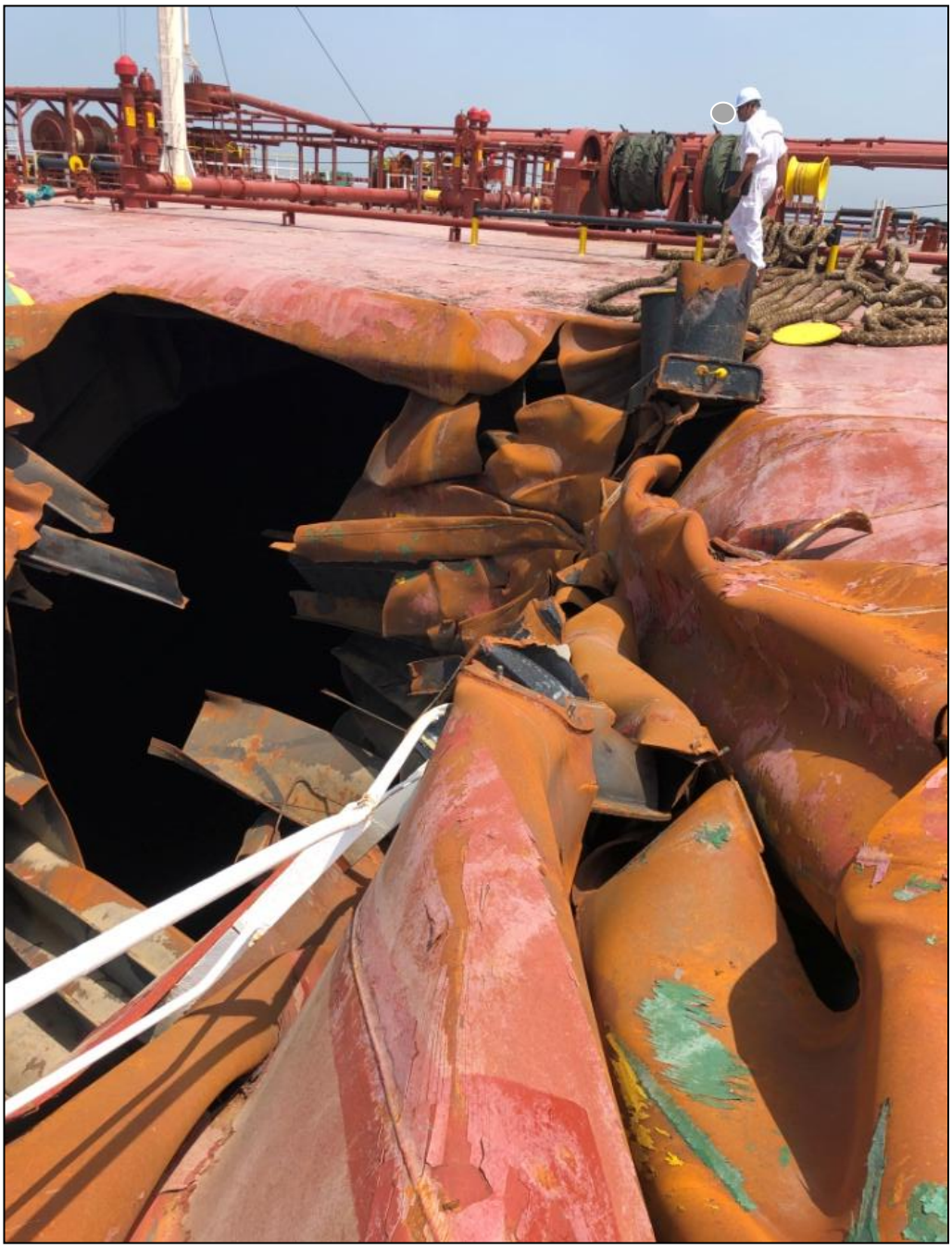

Figure 21: Damaged deck plating and fittings – as seen from the port side

(Source: Federal Transport Authority – Land and Maritime, U.A.E.)

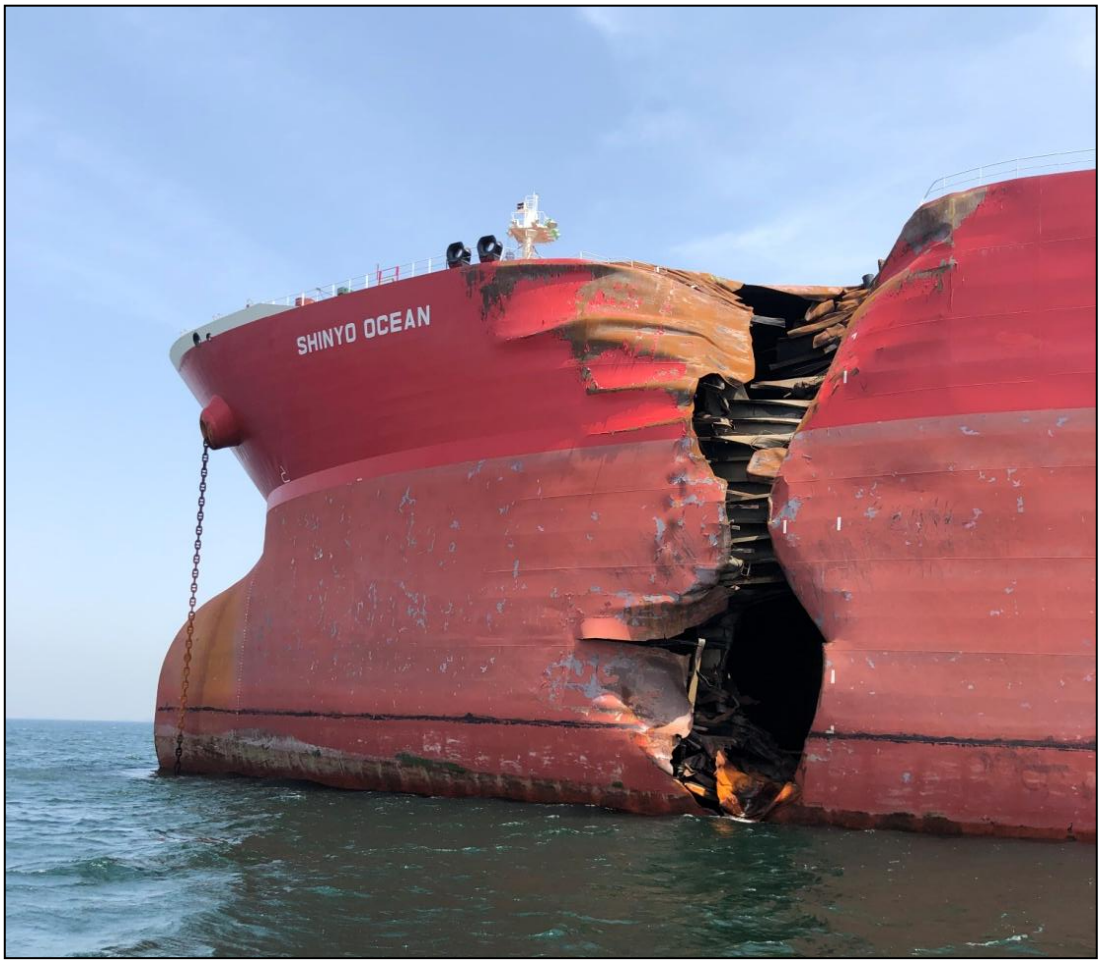

Figure 22: Penetrated hull plating
(Source: Federal Transport Authority – Land and Maritime, U.A.E.)

1.13 Use of VHF Radio for Collision Avoidance

1.13.1 SMS procedures - *Aseem*

The SMS Manual on board *Aseem* addressed the use of VHF radio for collision avoidance. The relevant section of the Manual, while indicating that warnings or intentions over the VHF radio were to be considered, warned the crew members that the use of VHF radio for collision avoidance could be dangerous if, amongst other reasons, too much time is spent communicating with other vessels instead of taking avoiding action.

1.13.2 Information Note by Hong Kong Marine Department

Hong Kong Merchant Shipping Information Note 14/2009 draws the attention of masters and officers towards the risks of relying solely on the use of VHF radio communication and AIS information for collision avoidance.

Paragraph 6 of the Note emphasizes that if an OOW solely relies on the actions agreed between two or more vessels over the VHF radio, without considering the risks of such an agreed action, it may lead to either a close-quarter situation, or a collision.

The Annex to this Note also highlights the following points:

- An agreement reached between vessels, via VHF radio communication, for collision avoidance could be misunderstood or misinterpreted due to language difficulties, imprecise or ambiguous expressions;
- Important messages in the VHF radio communication could be either interrupted or not received clearly due to busy radio traffic, static disturbance and interference;
- The agreed actions might not comply with the requirements of the COLREG, which may affect other vessels in the vicinity who are following the COLREG; and
- Valuable time would be wasted by lengthy conversations over the VHF radio, which could delay the OOW from taking appropriate actions to avoid a collision, in good time.

2 ANALYSIS

2.1 Purpose

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

2.2 Co-operation

Both Hong Kong, as the flag State of *Shinyo Ocean*, and the U.A.E., as the coastal State, were identified as States with substantial interest in this safety investigation.

During the course of this safety investigation, the MSIU received all the necessary assistance and cooperation from the Federal Transport Authority – Land and Maritime, of the U.A.E.

2.3 Fatigue

2.3.1 *Aseem*

The work / rest hour records of crew members on board *Aseem* indicated that the bridge team members were rested in accordance with the relevant requirements of STCW and MLC, 2006. Although the quality of the hours of rest could not be confirmed, fatigue of was not considered a contributory factor to this accident.

2.3.2 *Shinyo Ocean*

The work / rest hour records of the bridge team crew members were not available to the safety investigation. However, VDR audio data indicated that the master, the chief, second and third officers were present, either on the bridge or on the forecastle, from the time of commencement of weighing the anchor *i.e.*, 1330, until it was finally aweigh at 2235. It would be reasonable to assume that, during this time, a number of deck ratings and relevant engine-room crew members were also involved in tackling the encountered problems.

It is highly probable that the master would have been under stress because of the problems experienced in weighing the anchor and the delay in the vessel's schedule due to the same, which would have had a detrimental effect on the commercial operations of the vessel, even if he had not received any directions from the Company on this matter.

Moreover, the vessel's voyage included a transit through the Hormuz Strait, with a probabilities of encountering a high traffic density, including fishing vessels, and restricted visibility[5]. These conditions would have required the master to be readily available on the bridge, following the vessel's departure from the anchorage. Considering that the master would have also been aware of the aforementioned conditions and the importance of his presence on the bridge for the safe navigation of the vessel, the safety investigation is of the view that these conditions may have added to the level of stress on the master.

The level of stress on the master could have raised the level of fatigue he must have experienced[6]. Therefore, although as much as it could not be confirmed whether or not any of *Shinyo Ocean*'s bridge team members were fatigued prior to the collision, the safety investigation is of the view that the negative effects of fatigue most probably could have had an impact on the master's decision-making process around the time of the collision.

2.4 Consumption of Drugs and/or Alcohol

An alcohol test was carried out on the master, all bridge watchkeeping officers and ratings, the chief engineer and the second engineer on board *Aseem*, after this occurrence. The results of this test were all negative. Although a drug test was not carried out, there was no reason for the safety investigation to believe that any of the bridge team members might have been under the influence of any drugs prior to and at the time of the accident.

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[5] Weather forecasts from news reports, had predicted rough seas and reduced visibility in the Arabian Gulf until 26 March 2019. https://gulfnews.com/uae/weather/dusty-rainy-weather-to-continue-until-tuesday-1.62839524

[6] The Guidelines on Fatigue, contained in the Annex of MSC.1/Circ.1598, list lack of sleep, poor quality of sleep and rest, stress and excessive workload (mental and/or physical) as the most common causes of fatigue amongst seafarers.

As mentioned earlier in this safety investigation report, no information was provided on the drug and alcohol policy for *Shinyo Ocean*, and results of any drug and alcohol tests, if any, carried out after the collision. Although the safety investigation could not determine whether or not any of the members of her bridge team were under the influence of drugs and / or alcohol during the period of this occurrence, there were no indications in the behaviour of the bridge team which suggested that drugs and/or alcohol may have been an issue on board *Shinyo Ocean*.

2.5 Look-out

2.5.1 *Aseem*

As mentioned earlier in this safety investigation report, the bridge was manned by the master, who had taken over the con of the vessel, the third officer, who was the officer of the watch, AB 1, who was initially acting as a look-out until being asked to manually steer the vessel, and AB 2.

Taking into account that the vessel was to be anchored in a designated anchorage and that *Shinyo Ocean* was the only vessel navigating in the passage channel, it is possible that the master believed that the circumstances and surroundings were not such which would demand a larger bridge team. After all, the plan was clear and carried no extraordinary challenges to the crew members.

It would appear that there was not much movement of vessels in and around the anchorage areas at that time. Moreover, although there was continuous sharing of information between the bridge team members and the outcome of the lookout was as expected by the crew members, once the conditions changed and the data load increased on the crew members, the situation on the bridge became more complex and intricate for the crew members on the bridge. Moreover, when communication over the VHF radio started to increase, the Company's recommendations of having an additional watchkeeping officer could have benefitted the functioning of the bridge team. Once AB 1 started to steer the vessel manually, his duties as a look-out were compromised; and, during this period, AB 2 did not seem to take an active role within the bridge team.

The factors which would have adversely affected the maintaining of a proper look-out by the bridge team of *Aseem* were:

- hours of darkness, since the aspect of another vessel may not be easily determined;
- the presence of background light from the numerous vessels anchored with the anchorage areas;
- AB 1, who was previously acting as a look-out, taking over the steering of the vessel;
- the third officer engaged in communication over the VHF radio;
- the master's attention primarily focussed on manoeuvring his vessel, as a round turn was being executed;
- AB 2's passive participation as a look-out; and
- the absence of an additional watchkeeping officer.

2.5.2 *Shinyo Ocean*

It would appear that the master, an officer of the watch, and a helmsman were present on the bridge at the time of the collision.

A number of *Shinyo Ocean*'s crew members were involved in weighing her anchor until the vessel's departure. While approaching the passage channel, from the position at she was anchored, the bridge team noticed that no vessel was navigating within the passage channel. Therefore, it is possible that the master of *Shinyo Ocean* also believed that the circumstances and surroundings were not such that they would require a larger team on his bridge.

2.6 Actions by the Bridge Teams

2.6.1 *Aseem*

The speed at which *Aseem* approached the anchorage area was 17.8 knots. However, on noticing *Shinyo Ocean* proceeding outwards through the passage channel, the master decided to allow the vessel time to pass through by taking a round turn to

starboard. During the course of this round turn, the speed of the vessel was reduced and, at the time of the collision, *Aseem* had a speed of 8.3 knots.

Taking into account the sizes of *Aseem* and *Shinyo Ocean*, the presence of vessels anchored in close proximity of the boundaries of the passage channel, and the presence of other boats and barges navigating within the anchorage area to provide various services to the anchored vessels, the master's decision to take a round turn was intended to avoid a close-quarter situation with *Shinyo Ocean* or any other vessel within the passage channel and to allow *Shinyo Ocean* to clear the anchorage area. As time progressed, and up until a few minutes before the collision, the course of *Aseem* was continuously being altered to starboard at a variable rate of turn, in order to align the vessel with the entrance of the passage channel.

The safety investigation has concluded that the approach speed and the round turn executed by *Aseem* were not contributing factors to the collision.

2.6.2 *Shinyo Ocean*

The maximum speed limit for vessels navigating within the Fujairah offshore anchorage area was five knots. The speed of *Shinyo Ocean* was about 5.3 knots when she entered the passage channel. As time progressed, the master sequentially ordered the vessel's main engine increased to 'Full Ahead', which brought the vessel's speed to about 10.3 knots, while she was still within the anchorage area.

When informed by the master of *Aseem* of the intention to take a round turn to starboard so as to allow *Shinyo Ocean* to clear the channel, the master of *Shinyo Ocean* informed *Aseem* that his own vessel's course would be altered to port in order to head towards the Strait of Hormuz. A couple of minutes later, it was observed that *Shinyo Ocean* had altered her course to port and was passing through 'G' Anchorage[7].

This manoeuvre by *Shinyo Ocean* had already been planned prior to the communication exchange between the two vessels. It remained unclear to the safety investigation as to why it was decided to proceed in this manner and at that speed. It was not excluded, however, that by increasing the vessel's speed and altering her

[7] The local regulations did not permit *Shinyo Ocean* to pass through 'G' anchorage. Moreover, it does not appear that *Shinyo Ocean* had requested FPC for permission to enter 'G' Anchorage.

course to pass through ‘G’ anchorage, the master would have cut down on the time that it would have taken to pass around ‘G’ anchorage.

This hypothesis was based on the following:

- for logistical reasons, the vessel was required to arrive at her next port of call on 26 March 2019, at 0000 AST; and
- although the voyage was estimated to take the vessel about 30 hours to complete, the operation of weighing the anchor had already taken around nine hours, thereby reducing, considerably, the amount of time available for navigation.

Moreover, the master may have also taken into consideration the need to rest as soon as possible, before he would be required on the bridge again for the Hormuz Strait transit.

As *Shinyo Ocean* was proceeding through ‘G’ anchorage, she encountered *Silva* (which had just departed from ‘B’ anchorage) crossing her bow at a range of about 1.24 nm (Figure 10). At this time, *Shinyo Ocean* was observed to be within ‘G’ anchorage – at a distance of approximately 0.74 nm from the seaward boundary of the anchorage area, while *Silva* was approximately 0.5 nm clear of the seaward boundary of ‘G’ anchorage (Figure 11). *Shinyo Ocean*’s course was then widely altered to starboard and the vessel continued swinging to starboard, thus bringing her back towards the passage channel and on a collision course with *Aseem*. The situation had by now become complex and evolved in such a way which had not been anticipated neither by *Aseem* nor *Shinyo Ocean*.

2.7 Communication Between the Two Vessels

Aseem and *Shinyo Ocean* were communicating their intentions via the VHF radio. Even *Silva*, which had left ‘B’ anchorage, communicated with *Aseem* via VHF radio to ascertain *Aseem*’s intentions as the latter was taking a round turn to starboard.

On encountering *Silva* crossing ahead of her, *Shinyo Ocean* informed *Aseem* about the change in the situation and that an action, different from that which was planned

earlier would be taken. The intention of passing on this information was, most probably, to avoid confusing *Aseem*.

After *Shinyo Ocean*'s course was altered to starboard, she initially asked for *Aseem*'s course and speed to be maintained; however, a few minutes later, and while continuing with an alteration of course to starboard, she communicated that *Aseem* could turn around and proceed towards the channel. This suggested a possibility of uncertainty in the intentions of *Shinyo Ocean*'s bridge team.

When *Shinyo Ocean* communicated to *Aseem* that she would "continue swinging to starboard and proceed further down" [*sic*], and that *Aseem* could turn around and proceed towards the entrance of the channel, the third officer on board *Aseem* interpreted this message as *Shinyo Ocean* had stopped and that *Aseem* would proceed towards the channel. The safety investigation believes that the term 'starboard', used by the master of *Shinyo* Ocean, was misheard as 'stopped'.

Furthermore, this message was followed by another one from the master of *Shinyo Ocean*, stating that he will "proceed back North" once *Aseem* had "altered and proceeded" (*sic*). Even if the third officer of *Aseem* would have had a doubt as to whether *Shinyo Ocean* would be altering to starboard or would be stopped, the use of the term 'proceed' by the master of *Shinyo Ocean*, in his following message, could have led the third officer of *Aseem* to assume that *Shinyo Ocean* would be stopped. Taking into account the proximity of the two vessels, had this information on *Shinyo Ocean* proceeding been interpreted correctly, it possibly could have alerted the master of *Aseem* to proceed with caution.

Provided that there is a positive identification of each vessel before communication is established and in cases where there is a limited amount of space available for manoeuvring, the safety investigation is of the view that effective verbal communication can facilitate actions to prevent close-quarter situations from developing. However, when the vessels are close proximity of each other, and/or when a close-quarter situation has already developed, timely and effective action (rather than verbal communication), is of the essence.

In high traffic density areas, such as in the vicinity of the Fujairah anchorage, continual communication between various vessels over the VHF radio could be

encountered. As a result, communication may either breakdown or may not be understood correctly due to interference from communication between other vessels. Therefore, a crucial amount of time can be lost in communicating rather than taking timely and effective action. Moreover, when coupled with uncertainty, as was suggested in the intentions of the bridge team of *Shinyo Ocean* (whereby the course of *Aseem* was initially requested to be maintained and then followed by communication that *Aseem* could turn and proceed towards the passage channel), communication over the VHF radio can considerably increase the risk of a close-quarter situation.

As stated earlier in this safety investigation report, the SMS Manual on board *Aseem* contained a warning on the use of VHF, particularly addressing the dangers associated with the time lost in communication, rather than being spent in taking avoiding action.

While the Hong Kong Marine Department had promulgated a warning through Merchant Shipping Information Note 14/2009, the safety investigation had no access to any evidence which could have indicated that this Information Note was available on board and that its contents were known to the master of *Shinyo Ocean*.

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

3 CONCLUSIONS

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

3.1 Immediate Safety Factors

1. *Aseem* and *Shinyo Ocean* were both communicating over the VHF radio. This communication continued even when a close-quarter situation had developed, thus reducing the possibility of timely and effective corrective action until the collision occurred.
2. *Shinyo Ocean* was proceeding at a speed (in excess of that allowed by local regulations), which reduced the amount of time available for the bridge to take avoiding action while *Silva* was crossing ahead of her, as well as when a close-quarter situation developed with *Aseem*.

3.2 Latent Conditions and other Safety Factors

1. *Shinyo Ocean*'s departure was delayed due to problems encountered with weighing her anchor, which would have resulted in a delay at her arrival at her port of loading.
2. The master of *Aseem* decided to take a round turn to starboard in order to allow *Shinyo Ocean* time and space to leave the anchorage areas, and thus avoid a close-quarter situation.
3. From the VDR audio data, it would appear that *Shinyo Ocean*'s bridge was manned by the master, an OOW and a helmsman, from the time that the vessel's anchor was aweigh until the time of the collision. No evidence was available to the safety investigation, which would indicate whether an additional look-out or an additional watchkeeping officer were present on her bridge.
4. The bridge of *Aseem* was manned by the master, the third officer and two able seafarers – one of whom was acting as a helmsman. An additional watchkeeping officer was not present on the bridge, as was recommended by the Company's SMS procedures.

5. The two vessels communicated over the VHF radio and initially agreed on a mutual course of action, which was interrupted by the approach of a third vessel, *Silva*.

6. Parts of the communication over the VHF radio were misconstrued by *Aseem*.

7. It is most probable that the master of *Shinyo Ocean* felt the need to increase the speed of the vessel and to cut short the distance of the voyage, by cutting across 'G' anchorage, in order to compensate for the delay and/or to be able get some rest before the Hormuz Strait transit.

8. The bridge team of *Shinyo Ocean* was most probably experiencing fatigue by the time the vessel was proceeding through the passage channel, due to lack of rest, stress and workload.

9. The communication by *Shinyo Ocean* over the VHF radio, following an alteration of the vessel's course to starboard, suggested a possibility of uncertainty in the intentions of her bridge team.

4 ACTIONS TAKEN

4.1 Safety Actions Taken During the Course of the Safety Investigation

During the course of the safety investigation, the Company identified a number of training needs for masters and navigating officers within the fleet. A number of safety actions were, therefore, adopted with the aim of preventing similar marine accidents in the future. These included:

.1 Ship Manoeuvring Simulation training courses are conducted for all masters and chief officers serving in the LNG carrier fleet, every five years;

.2 Large Ship Handling Simulation training courses are organised for masters joining LNG carriers, prior to their joining;

.3 All masters and chief officers serving in the LNG carrier fleet, are required to participate in Bridge Team Management courses every five years;

.4 A Behaviour-based Safety course for all officers serving on board the Company's LNG carriers has been introduced within the Company's own maritime training institute;

.5 A VDR dynamic analysis, consisting of a comprehensive review through observation of navigational practices during a voyage, conducted over a fixed period of time and involving a critical passage (such as a straits transit, pilotage or port approach), is being carried out at random, by a third party, on select tankers and gas carriers, to evaluate the human behaviour and activity of bridge team management towards compliance with the Company's procedures and other regulations;

.6 Navigational audits are conducted out on board the Company's fleet, in accordance with the below schedule:

- within 30 days of joining a vessel and every six months – an audit by the master,
- every year – an audit by a marine superintendent, and
- every year – a Static and Dynamic Navigational Assessment by a third party which also provides on-board training to all navigational officers;

.7 A case study on this accident has been prepared and circulated on board the fleet of vessels.

5 RECOMMENDATIONS

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

Synergy Maritime Pvt. Ltd., the managing Company of *Shinyo Ocean*, is recommended to:

07/2020_R1 Conduct audits/visits on board its vessels with the aim of observing how crew members operate and address system complexities, even in the light of potential fatigue issues, and take the necessary actions to address identified issues.

The flag State Administration of Malta (Merchant Shipping Directorate) is recommended to:

07/2020_R2 Issue an information notice addressed to all ship owners and managers of Maltese registered ships, highlighting the risks of using VHF radios in collision avoidance, especially when in close proximity of other vessels.