Marine Safety Investigation Unit

Transport Malta

MARINE SAFETY INVESTIGATION REPORT

Safety investigation into the collision between the

Maltese registered bulk carrier

LIGARI

and the Korean registered product tanker

DL SUNFLOWER

in position 34° 40.7'N 129° 05.5'E

on 11 January 2014

201401/010

MARINE SAFETY INVESTIGATION REPORT NO. 02/2015

The MSIU gratefully acknowledges the assistance and cooperation of the Korean Maritime Safety Tribunal, during the safety investigation of this accident.

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 11 January 2014. 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.

MARINE SAFETY INVESTIGATION UNIT
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Crew members MT *DL Sunflower*

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GLOSSARY OF TERMS AND ABBREVIATIONS

AB	Able Bodied seaman
ABS	American Bureau of Shipping
AIS	Automatic Identification System
ARPA	Automatic Radar Plotting Aid
BA	British Admiralty
BT	Bottom Track
Ch	Channel (VHF)
COG	Course over ground
COLREGs	Convention on the International Regulations for Preventing Collisions at Sea, 1972
Company	TMS Bulkers Ltd
CPA	Closest Point of Approach
cST	Centistokes
E	East
ECDIS	Electronic Chart Display and Information System
ETA	Estimated Time of Arrival
(G)	Gyro course
GPS	Global Positioning System
GT	Gross Tonnage
HDG	Heading
kW	Kilowatt
ISM Code	International Safety Management Code
iwo	In way of
KRS	Korean Register of Shipping
LNG	Liquid natural gas

LOA	Length Overall
LT	Local time
m	metres
Mins	Minutes
MSD	Merchant Shipping Directorate
MSIU	Marine Safety Investigation Unit
MT	Motor tanker
MSM	Minimum Safe Manning
MV	Motor vessel
N	North
NM	Nautical miles
NT	Net Tonnage
NUC	Not Under Command
OOW	Navigational officer of the watch
OS	Ordinary Seaman
Rel	Relative
RPM	Revolutions per minute
Secs	Seconds
SOG	Speed over ground
Spd	Speed
Stbd	Starboard
STCW	International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended
(T)	True Course
TCPA	Time of Closest Point of Approach
USA	United States of America

UTC	Universal Time Constant
VDR	Voyage Data Recorder
VHF	Very high frequency
VRM	Variable Range Marker

SUMMARY

On 10 January 2014, at about 2125, the Marine Safety Investigation Unit (MSIU) was notified by the managers of MV *Ligari*, that at about 1730 UTC[1], their vessel, while on a loaded voyage from Portland, Oregon, USA to Longkou in China, was involved in a collision with the South Korean registered motor tanker *DL Sunflower* in the Korean Straits in position 34º 40.7'N 129º 05.5'E, South of Pusan, Republic of Korea.

Preliminary information indicated that the collision occurred when *Ligari* was proceeding on an approximate Southwest by Westerly course, West of Tsushima Island, Japan and South of Pusan, Republic of Korea, while *DL Sunflower* was crossing from the starboard side on an approximate Southwest by Southerly course.

As a result of the collision, *Ligari*, which had a cargo of corn, sustained damages to her starboard side in way of her forward engine-room bulkhead. Moreover, two fuel oil tanks were ruptured and her engine-room was flooded. *Ligari* was eventually towed to the Pusan No. 4 anchorage. *DL Sunflower*, which was loaded with gas oil, sustained damages to her bow section and arrangements were also made for the necessary repairs to be carried out.

No injuries were reported, although a fuel oil spill was reported.

The safety investigation concluded that the immediate cause of the accident was that basic bridge procedures and COLREGs requirements were not followed in a typical crossing situation, in good visibility and with both vessels in sight of one another.

Two recommendations have been made to the managers of both vessels aimed to address navigational watch keeping practices.

[1] 11 January 2014 at about 0230 (LT).

[2] Since *Ligari*'s VDR data was in UTC, and all entries in *Ligari*'s logbook and other ship's

1 FACTUAL INFORMATION

1.1 Vessel, Voyage and Marine Casualty Particulars

Name	*Ligari*	*DL Sunflower*
Flag	Malta	Republic of Korea
Classification Society	ABS	KRS
IMO Number	9279513	9168740
Type	Bulk Carrier	Product Tanker
Registered Owner	Star Record Owning Co. Ltd.	Daelim Corp. Seoul
Managers	TMS Bulkers Ltd.	NDSM Co. Ltd.
Construction	Steel (Double bottom)	Steel
Length overall	225.0 m	182.5 m
Registered Length	217.68 m	121.6 m
Gross Tonnage	38,851	28,519
Minimum Safe Manning	16	22
Authorised Cargo	Solid Bulk	Liquid bulk
Port of Departure	Portland, Vancouver, Oregon, USA	Pasir Panjang, Singapore
Port of Arrival	Longkou, China	Kolkata, India
Type of Voyage	International	International
Cargo Information	65680 metric tonnes of corn	Containers
Manning	22	22
Date and Time	11 January 2013 at 0230 (LT)	
Type of Marine Casualty or Incident	Serious Marine Casualty	
	Serious Marine Casualty	Less Serious Marine Casualty
Location of Occurrence	34° 40.7'N 129° 05.5'E	
Place on Board	Starboard side shell plating iwo the engine-room / cargo hold no. 7; Starboard fuel oil settling tank no. 4.	Forecastle deck
Injuries/Fatalities	None	None
Damage/Environmental Impact	Yes	None
Ship Operation	On passage	On passage
Voyage Segment	Transit	Transit
External & Internal Environment	Visibility was good (about 10 nautical miles) and the weather was good. The Westerly wind was Force 5 and the Northwesterly swell was about 1.5 m high.	
Persons on Board	22	22

1.2 Description of Vessels and Crew Members

1.2.1 MV *Ligari*

The Maltese registered *Ligari* (Figure 1) is a 38,851 gt, Panamax-size bulk carrier, owned by Star Record Owning Co. Ltd and managed by TMS Bulkers Ltd. of Greece. The vessel was built by Sanoyas Hishino-Meisho in Mizushima, Japan in 2004 and is classed by American Bureau of Shipping (ABS).

The vessel has a length overall of 225.0 m, a moulded breadth of 32.26 m and a moulded depth of 19.30 m. The vessel has a summer draught of 13.995 m and a summer deadweight (DWT) of 75,583 tonnes. *Ligari* has seven cargo holds and a grain capacity of 89,232 tonnes.

Propulsive power is provided by a 7-cylinder MAN B&W 7S50MC-C, two-stroke, single acting slow speed diesel engine, producing 8,973 kW at 104 rpm. This drives a fixed pitch propeller to give a service speed of about 14.0 knots.

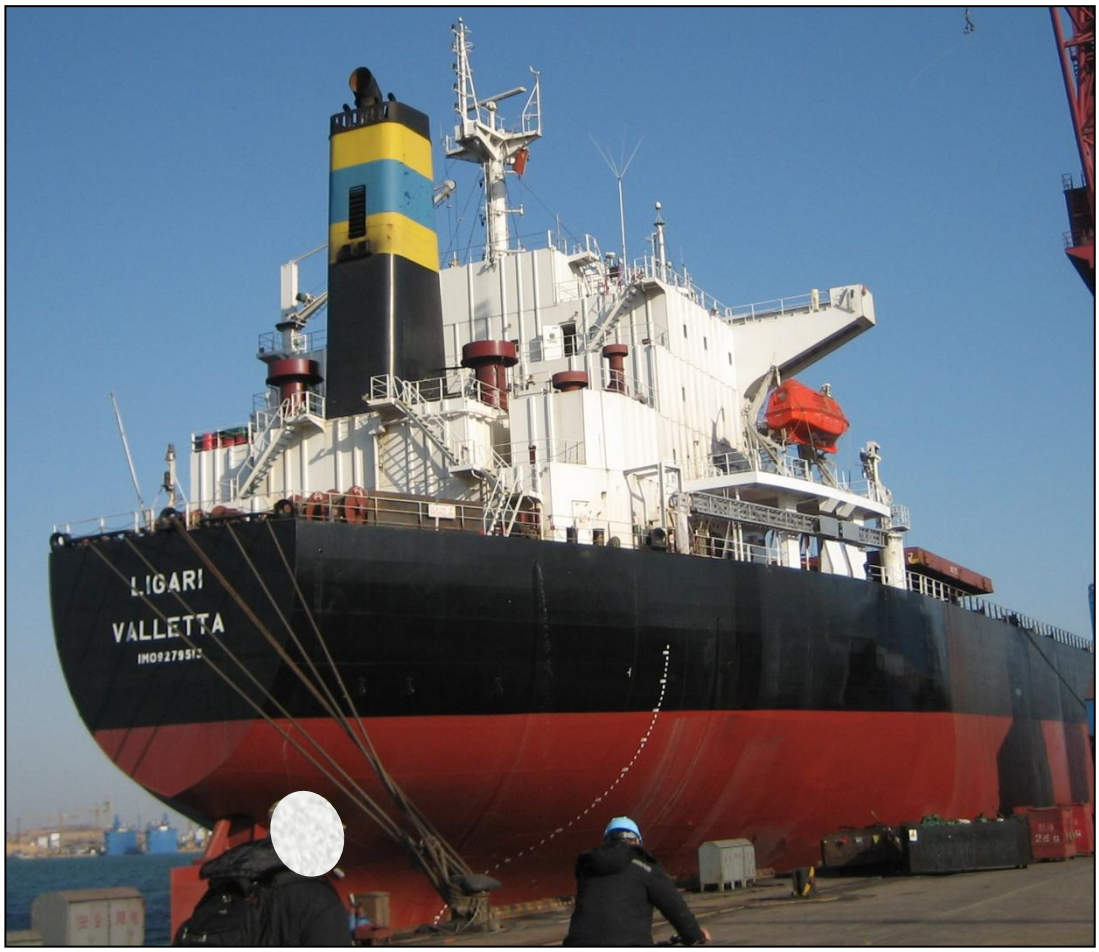

Figure 1: MV *Ligari*

MV *Ligari* was equipped with the required navigation equipment as listed on her Record of Equipment for Cargo Ship Safety Equipment Certificate-Form E (**Annex 1**). The navigational equipment included two radar sets, one X Band and one S-band, both fitted with ARPA facilities.

1.2.2 Crew members on board *Ligari*

At the time of collision, *Ligari* had a crew of 22 officers and ratings. The crew compliment was in accordance with the Minimum Safe Manning (MSM) Document issued by the flag State Administration on 15 July 2011 and valid until 07 September 2016. A copy of the MSM Document is attached with this report as (**Annex 2**).

The crew consisted of 13 Romanian nationals and nine from the Philippines. All the officers were Romanians, whereas the ratings were Romanian and Filipino nationals. The working language on board was English.

According to the gathered evidence, the second mate was the navigational officer of the watch (OOW) at time of collision. One AB was also on duty on the bridge.

The vessel was operating on a three-watch system whereby the third mate kept the 8-12 watch, the second mate was responsible for the 12-4 watch and the chief mate had the 4-8 watch. Although he did not keep a navigational watch, the Master was on call at all times.

The Master was 58 years old. He had over 35 years of sea service and had been employed by the vessel's managers since July 2013 when he joined *Ligari*. His Certificate of Competency was issued in Romania in terms of Regulation II/2 and endorsed by the Maltese authorities in accordance with the provisions of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended (STCW Convention). He had been promoted to a master for the first time in 1990 and had previously sailed on similar sized vessels.

The OOW was 35 years of age. He had 17 years of sea service and had his Certificate of Competency issued in Romania in 2010, in accordance with Regulation II/1. He first worked as a third mate and then, in 2013, was promoted to second mate. He was hired for the first time by TMS Bulkers Ltd. as a third mate in 2009 and then, for a second contract, in 2011.

The OOW first joined *Ligari* in October 2013. Prior to *Ligari* he served on similar sized vessels under the same management. At the time of the accident, he was in possession of the Maltese Endorsement as required by the relevant provisions of the STCW Convention.

The Filipino AB, who was on watch at the time of collision, was 34 years old. He first went to sea in 2010 as a messman when he first worked for the ship's managers. He was then promoted to OS and eventually to AB in 2012. At the time of the accident, he held a Certificate of Ratings Forming Part of a Navigational Watch, issued by the Philippine authorities. He first joined *Ligari* on 14 June 2013.

1.2.3 *DL Sunflower*

The South Korean registered motor tanker *DL Sunflower* (Figure 2) is a 28519 gt, product tanker, owned by Daelim Corp. and managed by DL Shipping Co Ltd. of Pusan, South Korea. The vessel was built by Onomichi Dockyard Co. Ltd. in Hiroshima, Japan, in 1998 and is classed by the Korean Register of Shipping (KRS).

The vessel has a length overall of 182.50 m, a moulded breadth of 32.20 m and a moulded depth of 19.10 m. The vessel has a summer draught of 12.23 m and a summer deadweight (DWT) of 47204 tonnes. *DL Sunflower* has a 16 cargo oil tanks arranged in a port and starboard configuration, except for the first two, which are centre tanks only.

Propulsive power is provided by a 6-cylinder MAN B&W 6S50MC, two-stroke, single acting slow speed diesel engine, producing 8,562 kW at 127 rpm. This drives a fixed pitch propeller to give a service speed of about 15.30 knots.

Figure 2: *DL Sunflower*

1.2.4 Crew members on board *DL Sunflower*

According to the vessel's crew list, at time of the casualty, *DL Sunflower* had a crew compliment of 22, consisting of nine officers, including two third mates and 13 ratings. Two of the ratings were signed on as deck cadets. The officers and some of the ratings serving on board *DL Sunflower* were nationals of the Republic of Korea. Other ratings came from the Republic of Korea and Myanmar.

Available evidence indicates that at the time of the casualty, the bridge was manned by the second mate, who was the OOW, and one AB serving as a lookout/helmsman.

The master was 63 years old and had about 23 years of sea service. He had been sailing as a master for the previous seven years, with the last three years working for the managers of *DL Sunflower*.

The OOW was 26 years old and had two years of sea service as an OOW. He obtained his OOW Certificate of Competency in 2011. At the time of the accident, he had been working for the managers of *DL Sunflower* for two years and was promoted to second mate just six months prior to the collision when he joined *DL Sunflower* in July 2013. This was his first assignment in this rank.

The AB on watch at the time of the casualty was from Myanmar and he was 26 years of age. He had been at sea for five years, serving as an AB for the previous three years. He had been working for the present managers for the previous 10 months, *i.e.*, since he joined *DL Sunflower* in March 2013.

1.3 Location of the Accident and Prevailing Weather Conditions

The collision happened on 11 January 2014 at 0230 (LT) in position 34° 40.7'N 129° 05.5'E, *i.e.* about 12 nm West of Tsushima Island of Japan and about 16 nm East of the South Korean Island of Pungnyo Do.

At the time of the collision, the weather was fair with good visibility, about 10 nm. The wind was Westerly force 5 and the sea moderate from the West with a low Northwesterly swell.

1.4 Narrative

1.4.1 Events on *Ligari*[2]

After finishing the loading her cargo of 65,680 metric tonnes of corn, *Ligari* sailed from the port of Portland, Vancouver, Oregon, USA, on 22 December 2013, bound for Longkou in China. The sailing draught was 13.07 m, even keel.

According to the master, the vessel followed the prepared passage plan, which included the passage through the very busy Korean Straits, between the Republic of Korea port of Pusan and the Japanese island of Tsushima Island. Until 11 January 2014, the day of the casualty, the master had reported that the voyage was uneventful.

In accordance with the MSM Document and the vessel's crew list, *Ligari* had a full complement of deck officers. Hence, the watchkeeping hours on *Ligari* were taken up by the three deck officers.

During the evening of 10 January 2014 (ship's time), as *Ligari* was entering the Korean Strait, she encountered large numbers of fishing vessels that necessitated the presence of the master on the bridge. In fact, because of the presence of fishing vessels in the area, the master reported that he was on the bridge from 1500 to 2130. Before retiring to his cabin at 2200, the master wrote his 'Night Orders', which included the carrying out of the 'Safety and Security Patrol' by the AB and also to be called without delay if in any doubt.

This encounter with heavy traffic (Figure 3) was also mentioned by the third mate during his navigational watch handover to the second mate at midnight on 11 January 2014.

[2] Since *Ligari*'s VDR data was in UTC, and all entries in *Ligari*'s logbook and other ship's documents were in ship's time (UTC + 9), for consistency and comparison with other information obtained from other sources, all times quoted hereunder are in ship's time, with the occasional reference to UTC.

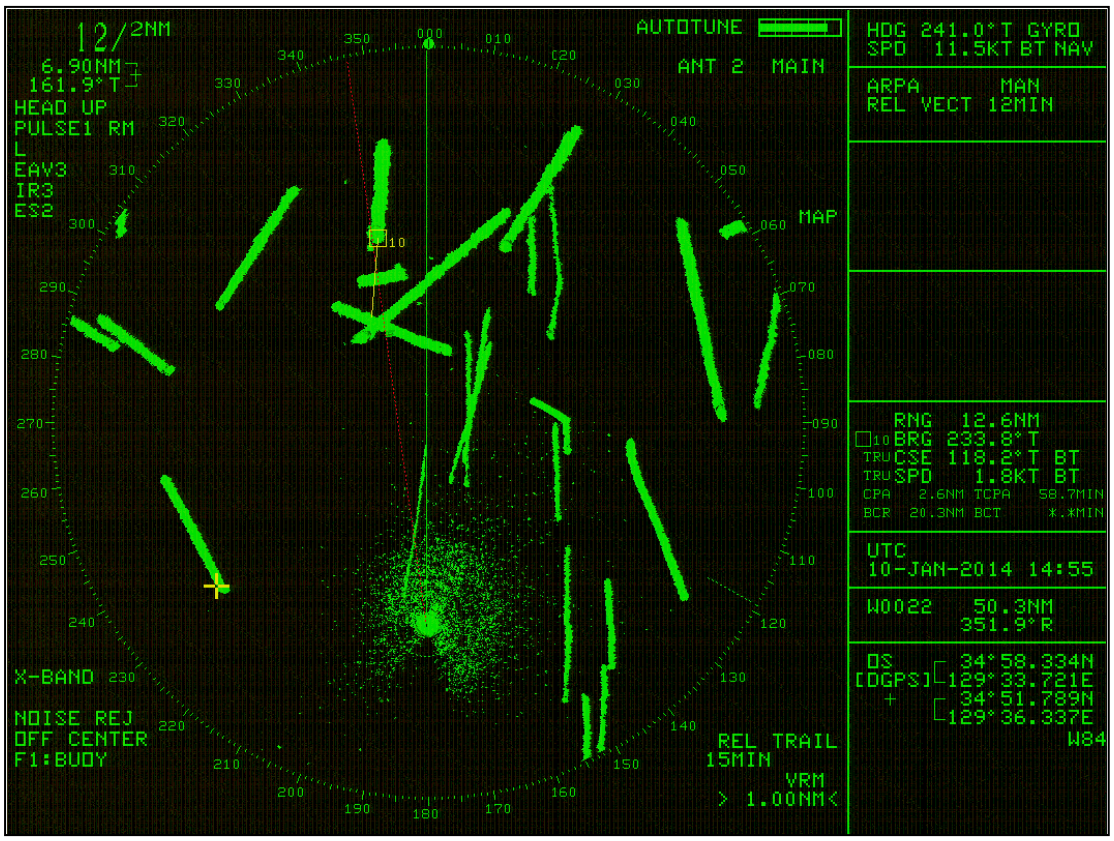

Figure 3: Screen shot at 2355 (LT) on 10 January

On the night in question, between the 10 and 11 January 2014, when the second mate took over the watch from the third mate at 0000 (1500 (UTC) on 10 January 2014), the bridge equipment was reported to be all functioning well and both Radars/ARPAs were running.

As soon as the Second mate took over the watch, at midnight on 11 January 2014, he adjusted the X-band ARPA[3], which was located on the portside of the bridge, to operate on North Up, off-centre, in relative motion, and on the 12 nm range. The Relative Target Trails of 15 minutes were on and so was the True Target Vectors of 12 minutes. The VRM was on, at 1 nm (Figure 4). The S-band ARPA, which was located on the starboard side of the bridge, was also set to operate on North Up in relative motion but with a centre display and on the 6 nm range. The Relative Target Trails function was not activated on this radar set.

[3] Extract from the VDR data.

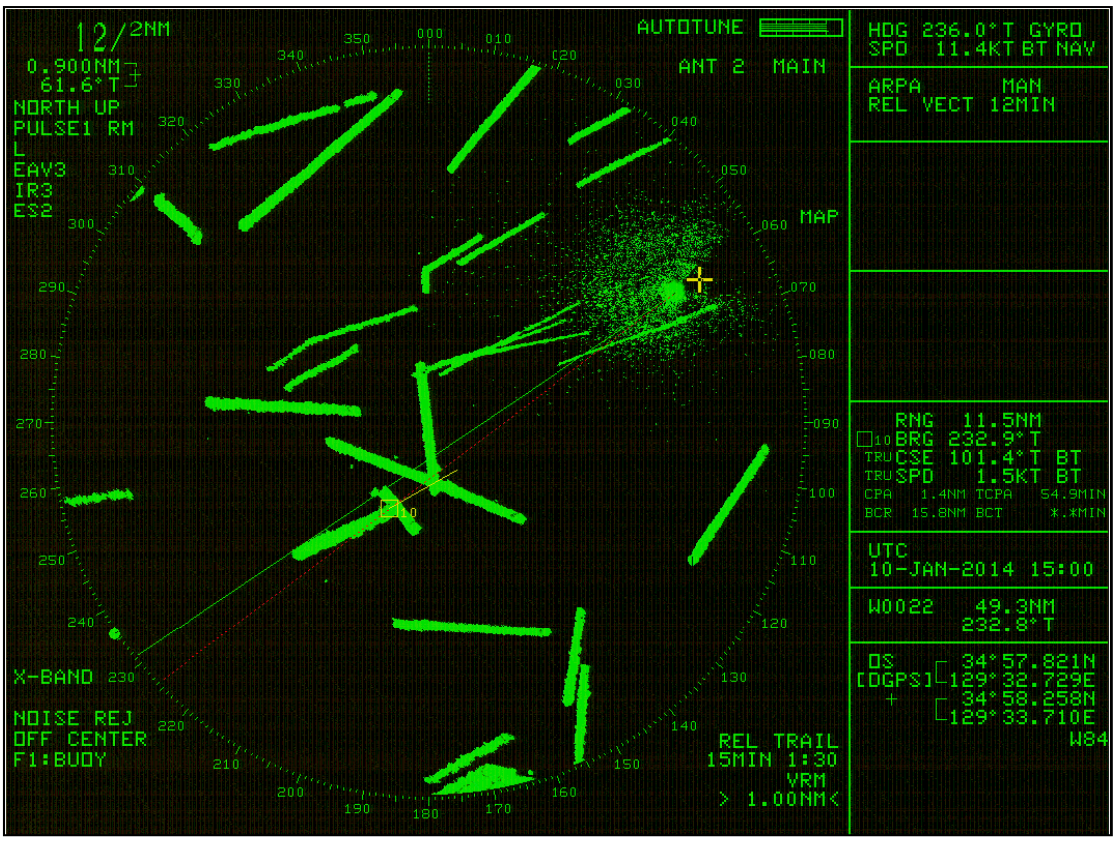

Figure 4: Radar screen shot at 0000 (LT) on 11 January

No collision warning alarm was set on the ARPA sets. The VDR data indicated that the X-band ARPA was interfaced with the GPS and the vessel's course and speed indicated were those made good over the ground. The charted course was 231°(T) but the vessel's course at the time was 236°(T). The vessel's speed was 11.3 knots over the ground (according to the GPS / ARPA). The weather was reported to be fine. One AB was also on duty on the bridge as the only look-out / helmsman.

Soon after taking over the watch, at about 0020 (1520 UTC on 10 January), the AB enquired with the OOW about the target trails on the X-band ARPA (Figure 5). After explaining to the AB what the target trails represented, the OOW gave the AB permission to occasionally use the X-band ARPA as part of his lookout duties. The OOW used the S-band ARPA.

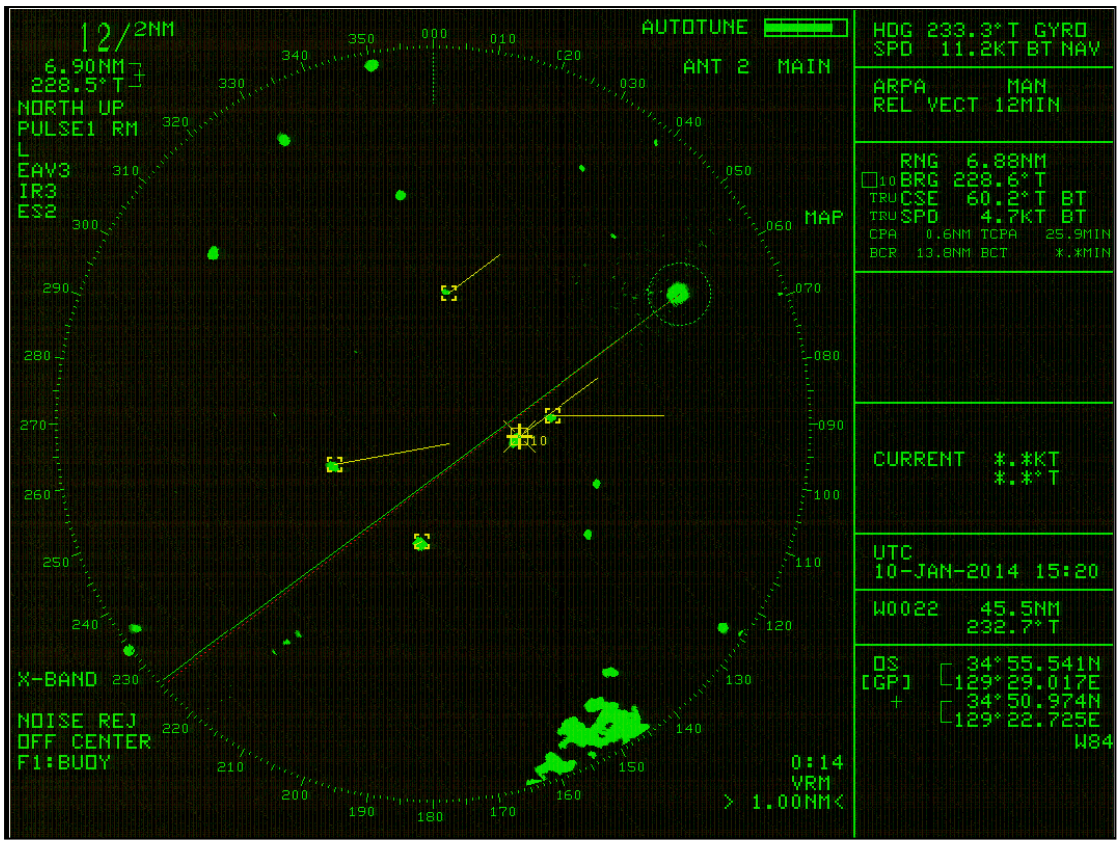

Figure 5: Screen shot at 0020 LT

At about 0027, *Ligari* encountered more traffic ahead and the OOW used the VHF to call *Madison Maersk* which, apparently, was on sea trials. *Madison Maersk*, which at the time was fine on the port bow at a range of 4.7 nm, was on a course of 030°(T) and had a speed of 5 knots and was crossing from port to starboard. After communicating verbally[4], *Ligari* altered course to port by about 15°.

At the time, at least two other vessels were also on the port bow (Figure 6).

[4] *Vide* Table 1.

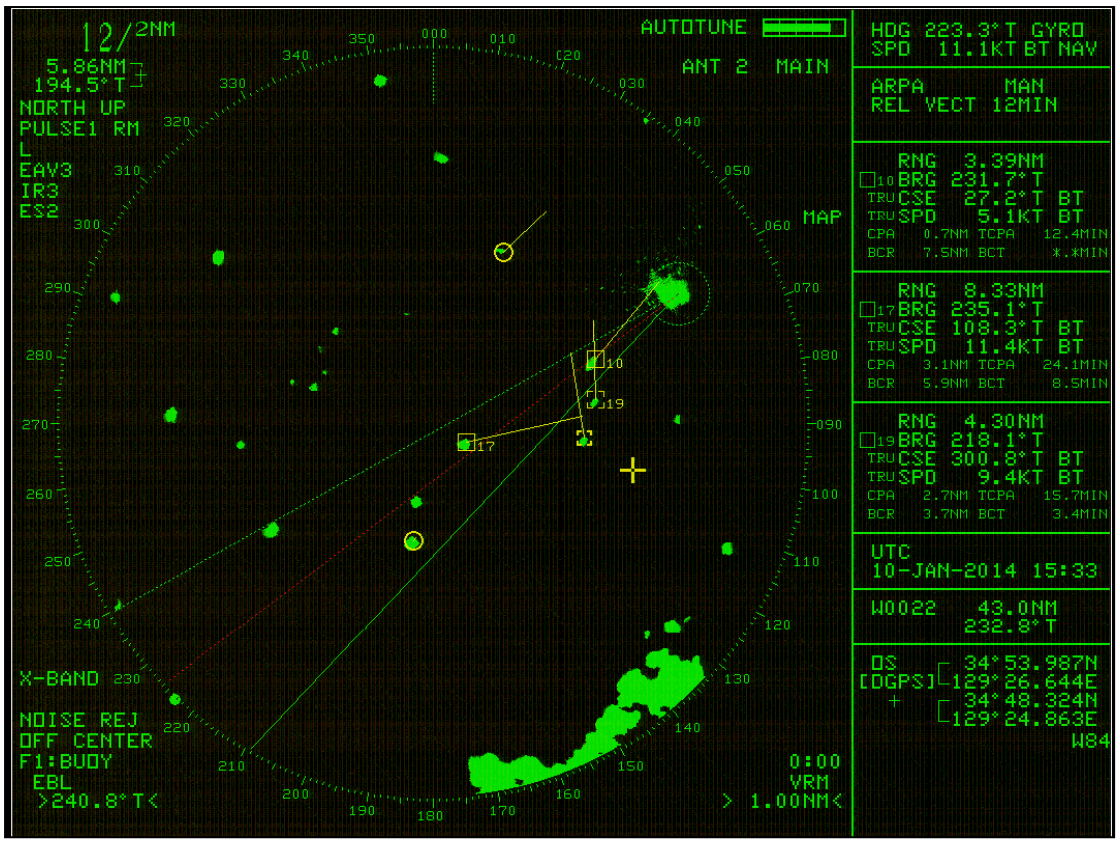

Figure 6: Screen shot at 0033 LT on 11 January

The Maltese registered LNG tanker *Cool Runner*, which at the time was conducting sea trials and was 'Not Under Command', first called *DL Sunflower* on VHF Ch 16 at 0159 and requested *DL Sunflower* to keep clear and to pass ahead of her. Then immediately after, at 0201, *Cool Runner* called *Ligari* on the VHF and requested that she also keeps clear of her. The OOW agreed to this request and immediately, at 0204, altered course by 5° to port to a new heading of 232°(T), using the autopilot selector dial.

At 0205 (1705 UTC on 10 January), the look-out reported (for the first time) the visual sighting of *DL Sunflower* on the starboard beam. The OOW then verified the look-out's report visually and on the S-band ARPA (Figure 7). He noticed that *DL Sunflower* was right on the starboard beam at a distance of about 2 nm and showing her port side light and its two masthead lights. However, at this time, the OOW recalled that *DL Sunflower*'s target was not acquired on the ARPA sets.

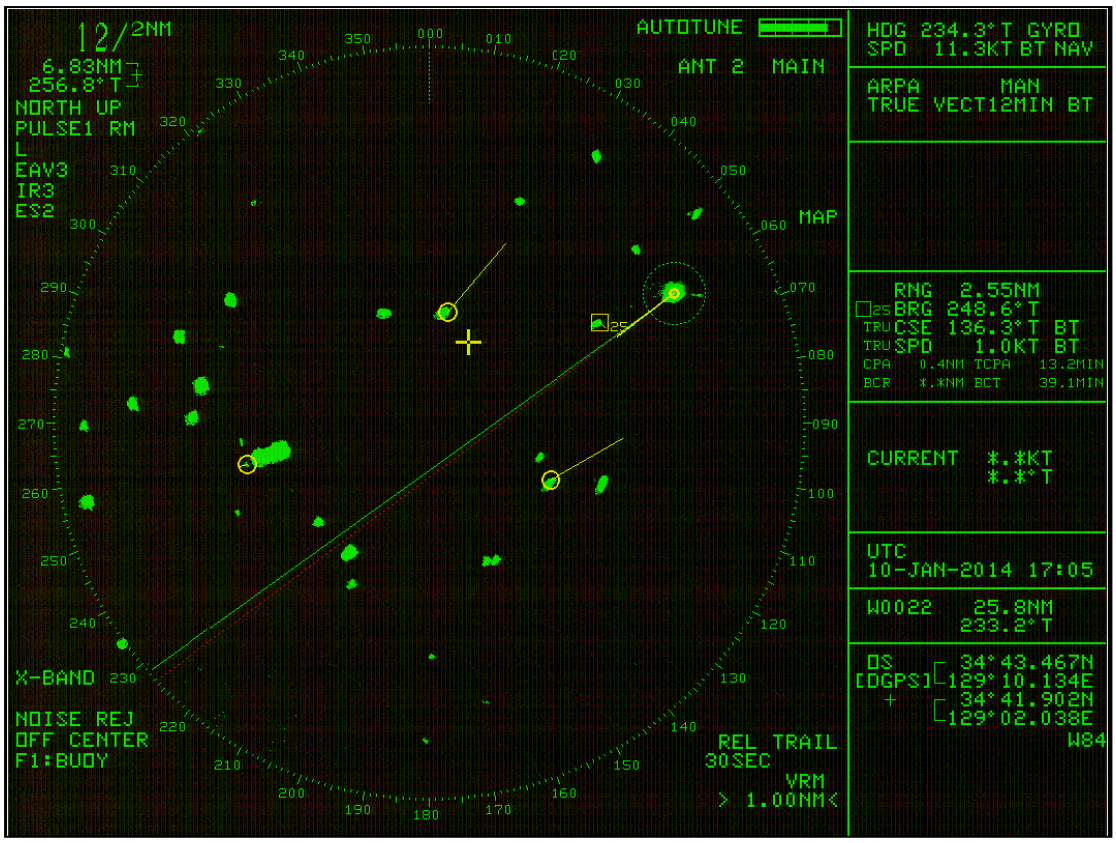

Figure 7: Screen shot at 0205 LT on 11 January

Soon after this sighting, the look-out was instructed by the OOW to carry out the 'Safety and Security Patrol' of the accommodation. He recalled that during this time, *Cool Runner*, which was displaying the NUC lights, was fine on the starboard bow, at a distance of 2.6 nm and with a CPA of 0.4 nm to starboard with a TCPA of 13 minutes.

At about 0215 (1715 UTC on 10 January), *Cool Runner* passed down the starboard side (Figure 8) and once clear, the OOW on *Ligari* altered the vessel's course back to 235°(T), using the autopilot course selector dial. At this time, the OOW acquired the target of *DL Sunflower* on the S-band ARPA.

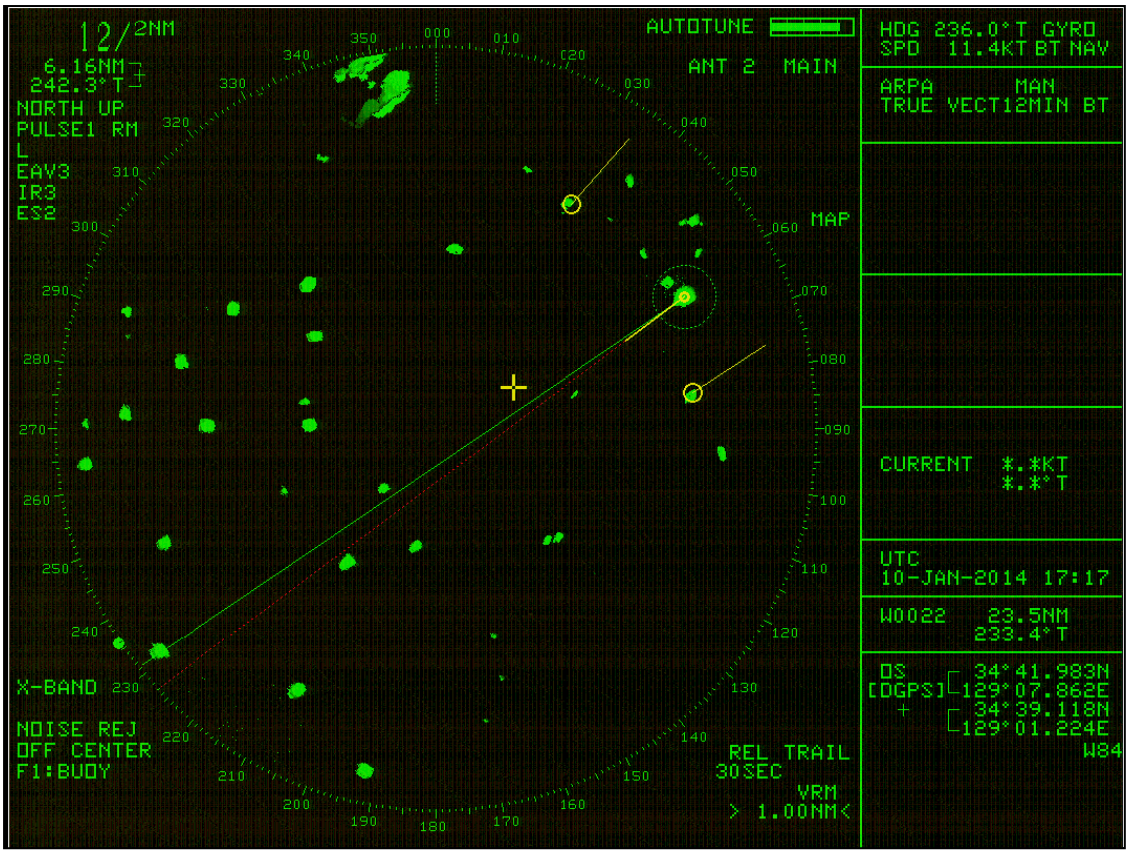

Figure 8: Screen shot at 0217 LT on 11 January

DL Sunflower was reported to be bearing less than half a point forward of the starboard beam at a distance of about 2 nm, however, no information was available as to its CPA and TCPA at this time. Nevertheless, after concluding that there was no risk of collision, the OOW decided to maintain his vessel's course of 235°(T).

At 0219 (1719 UTC on 10 January), *DL Sunflower* called *Ligari* on VHF Channel 16 and requested to change to VHF Channel 06. Immediately, *DL Sunflowe*r asked *Ligari* for her intentions. In response to this question, the OOW on *Ligari* checked the S-band ARPA again and noticed that *DL Sunflower* was on a course of 205°(T) and a speed over the ground of 12.3 knots. The vessel was also on a broadly steady bearing at a distance of 1.8 nm with a CPA of 0.5 nm to starboard. According to the OOW, he considered this situation as a safe one and informed *DL Sunflower* that he will be maintaining course and speed.

In response to this reply (from *Ligari*'s OOW), *DL Sunflower* requested that *Ligari* alters course more to starboard so that *DL Sunflower* would pass around *Ligari*'s stern[5].

In the meantime, after finishing the 'Safety and Security Patrol', the AB returned to the bridge at about 0220. According to the OOW, after observing *DL Sunflower* commence altering her course to port, at 0222 (Figure 9), he altered *Ligari*'s course by 5° to starboard to 240°(T), again using the autopilot course selector dial.

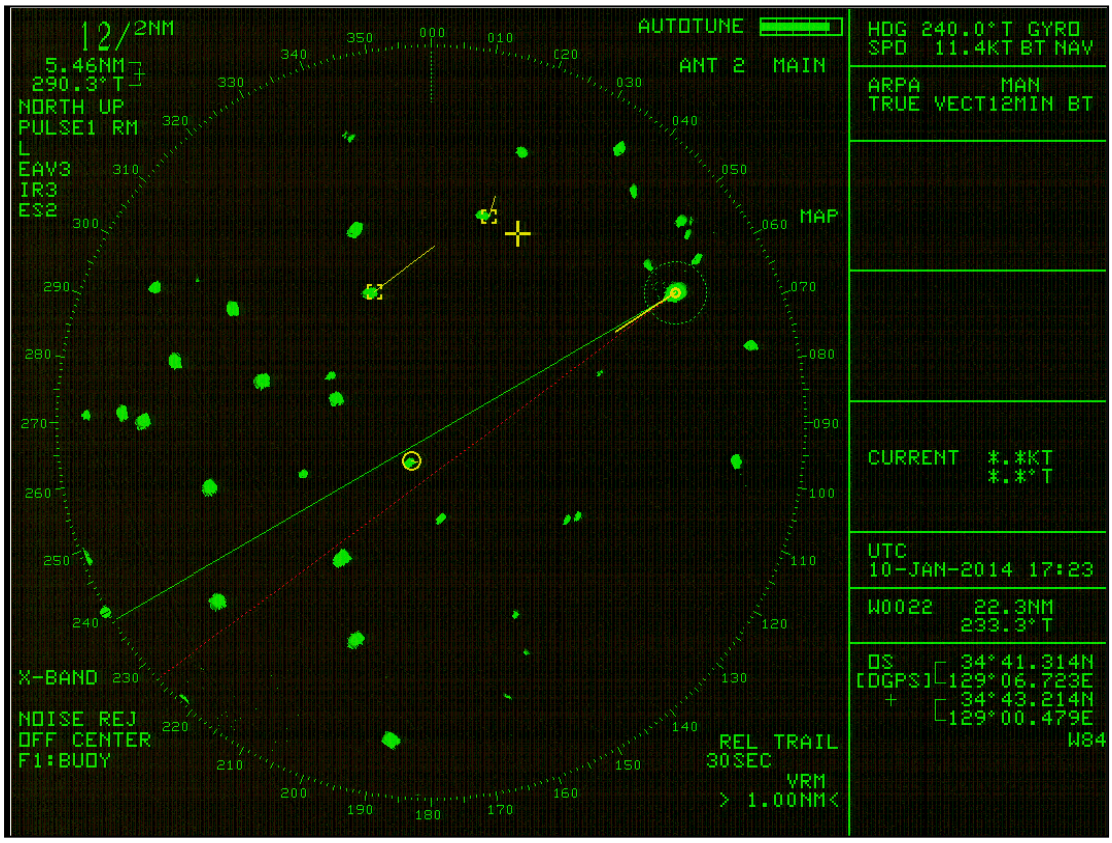

Figure 9: Screen shot at 0223 LT on 11 January

At about 0224, the look-out informed the OOW that *DL Sunflower* was getting closer. The OOW acknowledged but indicated that all was under control because he had communicated with the other OOW on the VHF and agreed that *DL Sunflower* will pass around its stern. At this time, the OOW could still see the red navigation sidelight of *DL Sunflower*, at a distance of about 1 nm on the starboard beam.

[5] Full transcript of the exchange of communication is reproduced in Table 1.

At about 0228, while the OOW was observing other vessels, the AB again brought to the attention of the OOW that *DL Sunflower* was getting closer. The OOW went to the starboard side of the bridge and observed *DL Sunflower* both visually and on the S-band ARPA. He realised that the CPA was very small, if not zero.

According to the OOW, he then went to the steering console, changed over to hand steering and put the rudder hard to port. However, a few seconds later, at 0230 (1730 UTC on 10 January), a collision between the two vessels occurred. *DL Sunflower* collided into the starboard side of *Ligari*, just below the starboard side bridge wing.

Table 1: Transcript if VHF communication

***LIGARI* – Extracts from its VDR Data**			
UTC	LT	Course (T)	Action / Transcript
1452	2352	240.5	Conversation and laughter can be heard on the Bridge as part of the handover of the watch. X-band ARPA on Head Up, off-centred, 12 nm range, Relative Trail of 15 minutes on, VRM of 1 nm on, and Relative Vectors of 12 minutes on.
1458	2358	238	X-band APRA changed to North Up, off-centred, 12 nm range, Relative Trail of 15 minutes on, VRM of 1 nm on, and True Vector of 12 minutes on.
1500	0000	236	Second mate takes over the navigational watch.
1516	0016	232.7	X-band ARPA: Relative Trail off, VRM of 1 nm on, True Target Vector of 12 minutes (BT) on.
1520	0020	233	X-band ARPA: Relative Vector of 12 minutes on. Various targets are acquired.
1527	0027	233.3	*Ligari* calls *Madison Maersk* on VHF Ch 16 and changed to Ch 6. Range 4.7 nm fine on the port side, Co 030°(T), Spd 5 knots. ***Ligari***: *Good morning Madison Maersk, Motor vessel Ligari, Ligari calling*; ***Madison Maersk***: *Motor vessel Ligari this is Madison Maersk on Ch 06 go ahead;* ***Ligari***: *You have some problems with the engines to know, to alter course?* ***Madison Maersk***: *Negative, we are just drifting on this place, so we just keep the minimum speed, and, I see you, I can see you on my [not clear] and I am keeping an eye on you;* ***Ligari***: *OK please keep your course to alter course, thank you*; ***Madison Maersk***: *I just maintain this speed and I maintain this course.* ***Ligari***: *OK thank you. Come back 16 please*.
1529	0029	233	*Madison Maersk* is at 4.6 nm range fine on the port bow. *Ligari* commences altering course to port.

1533	0033		Various targets are acquired.
1536	0036	219	*Ligari* completes the alteration of course.
1540	0040		Relative Trail switched on for a few seconds.
1545	0045	233	*Madison Maersk* abeam. *Ligari* back on its course. Echo of *DL Sunflower* on the edge of the screen, some 7 nm away on the *Ligari'*s starboard beam.
1547	0047	234.5	Relative Trail of 15 minutes on again. Conversation on the bridge. Echo of *DL Sunflower* can be seen with its Relative Trail pointing directly to the *Ligari*.
1550	0050	234.8	Relative Trail of 15 minutes off again. Conversation on the Bridge continues. True Vectors of 12 minutes on.
1615	0115	236.5	Various targets acquired but not the echo of *DL Sunflower* which was still on the starboard beam of *Ligari* at a range of about 5 nm.
1623	0123		Relative Trail of 15 minutes switched on for a few seconds.
1629	0129		Relative Trail of 15 minutes switched on for a few seconds. Echo of *DL Sunflower* with its Relative Trail pointing to the *Ligari* can be clearly seen on the screen.
1639	0139		Echo of *Cool Runner* acquired. Distance of 7.7 nm ahead.
1656	0156		Relative Trail of 30 seconds on.
1658	0158	239.2	Conversation on the bridge between OOW and the Look-out. Echo of *DL Sunflower* still on the starboard beam of *Ligari*, range about 2 nm.
1659	0159	238.7	*Cool Runner* calls *DL Sunflower* on VHF Ch 16.
1701	0201	238.8	*Cool Runner* calls *Ligari* on VHF Ch 16 and asks to change to Ch 06. Range 3.8 nm ahead.
			Cool Runner: *Good morning Ligari this is the Cool Runner on your starboard 3 miles off, I am NUC so please keep clear of me.*
			Ligari: *OK understood. I keep clear of you.*
1704	0204	235	*Ligari* altering to port for *Cool Runner*, range 2.65 nm.
1717	0217	235.7	*Cool Runner* abeam to starboard distance 0.5 nm. *DL Sunflower* still on the starboard beam of *Ligari*, range about 1.6 nm.
1719	0219	231.2	*DL Sunflower* calling *Ligari* on VHF Ch 16 and asked to change to Ch 06. Still on the starboard beam of *Ligari*, range about 1.5 nm off.
			DL Sunflower: *Yes this is DL Sunflower. Good morning sir.*
			Ligari: *Good morning, good morning.*
			DL Sunflower: *Yeah, what is your intention? Over.*
			Pause for a few seconds.
			Ligari: *I keep my course.*
			DL Sunflower: *OK. Please alter course more to starboard, over, and I pass your stern, over.*
			No reply from *Ligari.*
1720	0220	237.2	*DL Sunflower* calls again *Ligari.*
			DL Sunflower: *Please change course your, alter course your starboard so I pass your stern, over.*

			Ligari: *OK.*
			DL Sunflower: *OK thank you back to 16*.
1723	0223	240.5	*Ligari* completes alteration of course to starb'd by 5^0.
1725	0225	240.7	*DL Sunflower's* echo is at a range of 1 nm.
1727	0227	240.7	Conversation is heard on the bridge between the OOW and the look-out. *DL Sunflower's* echo less than 1nm range.
1729	0229	241.2	Conversation and sounds heard on the bridge.
1730	0230	242	Collision: Crushing sound is heard on the bridge.

NB: It is to be noted that the while the VHF conversations were clear on the VDR voice recordings, due to the background music playing on the bridge at the time, the conversations held on the bridge of the *Ligari* were not clear enough to be fully understand.

1.4.2 Damages to *Ligari*

Ligari suffered heavy damages to her starboard side shell plating iwo the engine-room's forward bulkhead, cargo hold no. 7, starboard side fuel oil bunker tank, starboard side fuel oil settling tank and one of the double bottom ballast tanks.

The damaged bunker and settling fuel oil tanks had about 20.05 metric tonnes and 28.28 metric tonnes of heavy fuel oil (380 cSt) respectively. As a result of the structural damages, it was estimated that approximately 37 metric tonnes of fuel oil were lost overboard. The day after the collision, salvage cleaning boats arrived on the accident scene and managed to pump out about eight metric tonnes of fuel oil from the fuel oil settling tank.

As a result of the serious damages to the vessel's side shell plating, the crew members were occupied in controlling the water ingress inside the engine-room. Moreover, an additional salvage boat arrived on scene and deployed booms around the vessel to prevent further pollution and contain the source of the slick.

1.4.3 Events on board *DL Sunflower*[6]

At 0200 (LT), *DL Sunflower* was on a course of 206°(T) making a speed of 12.5 knots. At that time, the Maltese registered *Cool Runner,* which was on sea trials and showing the NUC lights, called *DL Sunflower* on VHF Ch 16 and after changing to Ch 06, *Cool Runner* instructed *DL Sunflower* to keep clear of it.

[6] The information was made available to the MSIU by the KMST.

Immediately, *DL Sunflower* made a large alteration of course to starboard to a new course of 248°(T) in order to keep well clear of *Cool Runner*. As soon as this new course was reached, *DL Sunflower* started slowly coming back to her original course. By 0210, the vessel's course was 238°(T). At this time, *DL Sunflower* observed *Ligari* approaching her from the port side. By 0217, when *Cool Runner* was passing clear of *DL Sunflower*, *DL Sunflower's* course was back to 203^0(T). This resulted in the CPA between the two vessels to reduce to 0.05 nm to 0.10 nm.

At about 0220 (LT), the OOW on board *DL Sunflower*, concerned about this situation, the risk of collision and the lack of response from *Ligari*, called the latter vessel on VHF Ch 16. After changing to Ch 06, the OOW on *DL Sunflower* asked the OOW on board *Ligari* about his intentions. In response, the OOW on *Ligari* replied that he will maintain course[7].

Since the OOW on board *DL Sunflower* deemed that he did not have many options, he called again *Ligari* and again requested that the vessel alters course to starboard so that *DL Sunflower* will pass around *Ligari's* stern. At the end, the OOW on board *Ligari* confirmed by replying 'Okay'. After that, *DL Sunflower* (while waiting for the other ship to alter her course to starboard), only made a small alteration to port; the OOW believed that he could not make a larger alteration of course to port. Moreover, at this time, the OOW went to the chartroom to fix the vessel's position on the chart. At around 0230, after the look-out on watch brought to the attention of the OOW that *Ligari* was getting very close, the OOW altered course more to port, however, by this time, the two vessels were too close and eventually both vessels collided.

1.4.4 Damages to *DL Sunflower*

The bow of *DL Sunflower* struck the starboard side of *Ligari*, iwo of the forward bulkhead of the engine-room. *DL Sunflower* reported damages to the bow section but none of the cargo oil tanks were damaged.

[7] *Vide* Table 1.

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 Navigational Factors on *Ligari*

2.2.1 Absence of the look-out / helmsman from the bridge during hours of darkness

On the night of the casualty, while *Ligari* was navigating through an area of heavy traffic, which had also required the presence of the master on the bridge for a number of hours, the OOW released his look-out at 2200 to carry out the routine 'Safety and Security Patrol'.

Further on into the night, at about 0200, the OOW also released his look-out to carry out the 'Safety and Security Patrols'. Evidence suggested that this happened when:

- the crossing vessel *DL Sunflower* had just been observed and reported for the first time;
- the vessel was only 2 nm on the starboard beam;
- another vessel, *Cool Runner*, showing the NUC, was only about 3 nm ahead; and
- other vessels were in close proximity to *Ligari*.

The 'Safety and Security Patrols' were referred to in the master's Night Order Book and also in the vessel's Company Navigating Procedures, Section 13 – Fire and Security Rounds. However, while the Company's safety management manual specifically mentioned that these rounds were to be carried out at the end of each navigational watch, the master never made such a requirement in his Standing Orders and Night Orders.

According to the entries made in the bridge logbook, it seemed that these 'Safety and Security Patrols' of the accommodation were normally carried out midway through

the night watches, *i.e.* at 2200, at 0200, and at 0600. It also seemed that the patrols were carried out, irrespective of the traffic density around the ship, potentially leading to single person error situations.

2.2.2 Use of the two radars/ARPAs

On taking over the watch, at 0000 on the 11 January 2014, the OOW adjusted the two ARPAs, *i.e.*:

- X-band Radar/ARPA, which was the radar interfaced with the vessel's VDR on the port side of the bridge, was adjusted to operate on North Up in relative motion on 12 nm range, off-centred, with true target vectors and true target trails of 12 minutes duration functions all on; and
- S-band Radar/ARPA, on the starboard side of the bridge, (but not interfaced with the VDR), was also adjusted to operate on North Up in relative motion but with a centred display, on the 6 nm range and with no target trails[8].

It was determined that no collision warning alarm was set on the ARPA sets. The X-band ARPA was connected to the GPS and the vessel's course and speed indicated were those made good over the ground.

According to the OOW, he left the portside X-band ARPA for the look-out to use while he used the starboard side S-band ARPA, which was set on the 6 nm range. Hence, since the OOW confirmed that he did not use the X-band radar, and since no mention was made that he changed the range on his S-band radar, it was concluded that the OOW's use of the S-band ARPA was limited to the 6 nm range. The fact that only the X-band ARPA was interfaced with the vessel's VDR, the set up of the S-band Radar/ARPA prior to the collision could not be verified.

The X-band ARPA was set on 'off-centre'. Although the set-up increased the scanning range ahead from 12 nm to about 18 nm, it had the disadvantage of reducing the scanning range on the ship's beam and astern. Hence, *DL Sunflower*, which was crossing from the starboard side on the starboard beam of *Ligari*, only appeared on the X-band radar screen at around 0045 (Figure 10), when she was at a range of about 7 nm.

[8] The MSIU did not have any information on whether the radar was interfaced with the GPS but it was understood that it was.

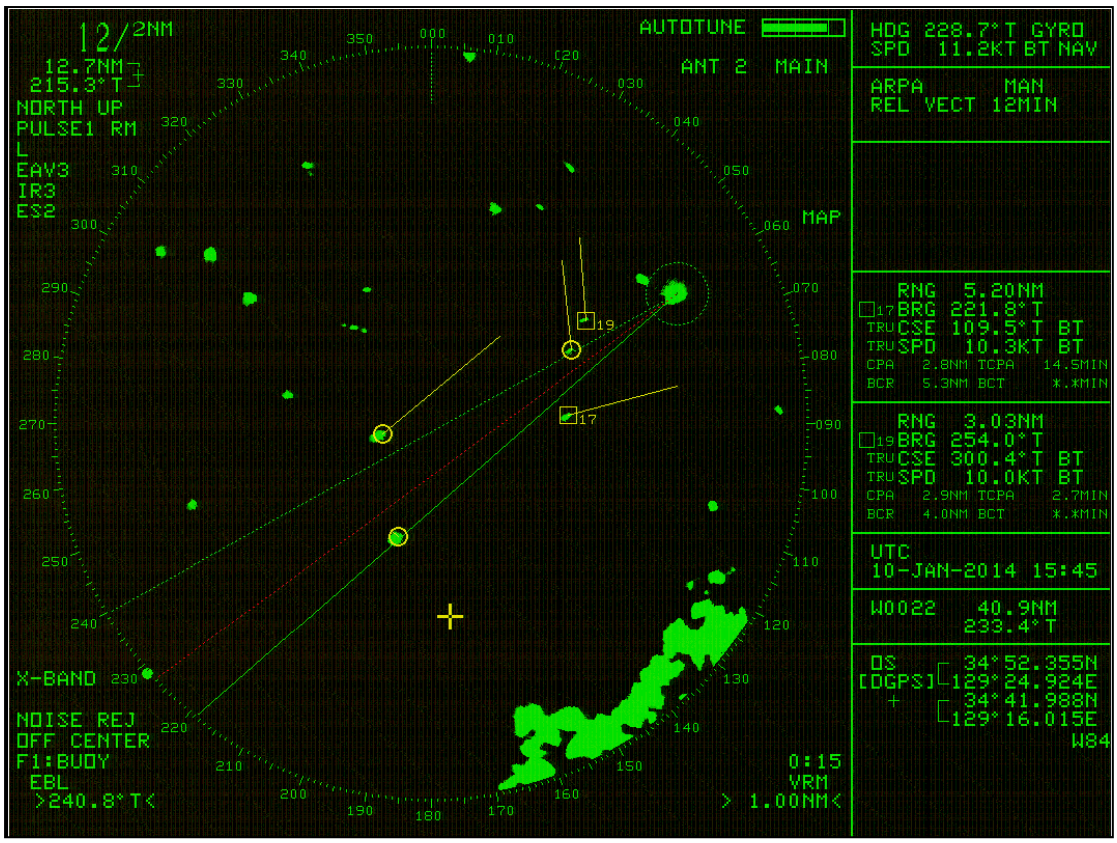

Figure 10: Screen shot at 0045 LT on 11 January

Still, since the X-band ARPA 'Relative Target Trail' function was off for most of the time, the echo of *DL Sunflower* did not attract the attention of the inexperienced eye of the look-out, who was using this ARPA at the time. For instance, at 0123 (LT) and at 0129 (LT) (Figures 11 and 12), when the Relative Trails function of 15 minutes was switched on for a few seconds by the AB, the relative track of *DL Sunflower* was very clearly pointing to the centre, but it still went unnoticed / picked up by the look-out.

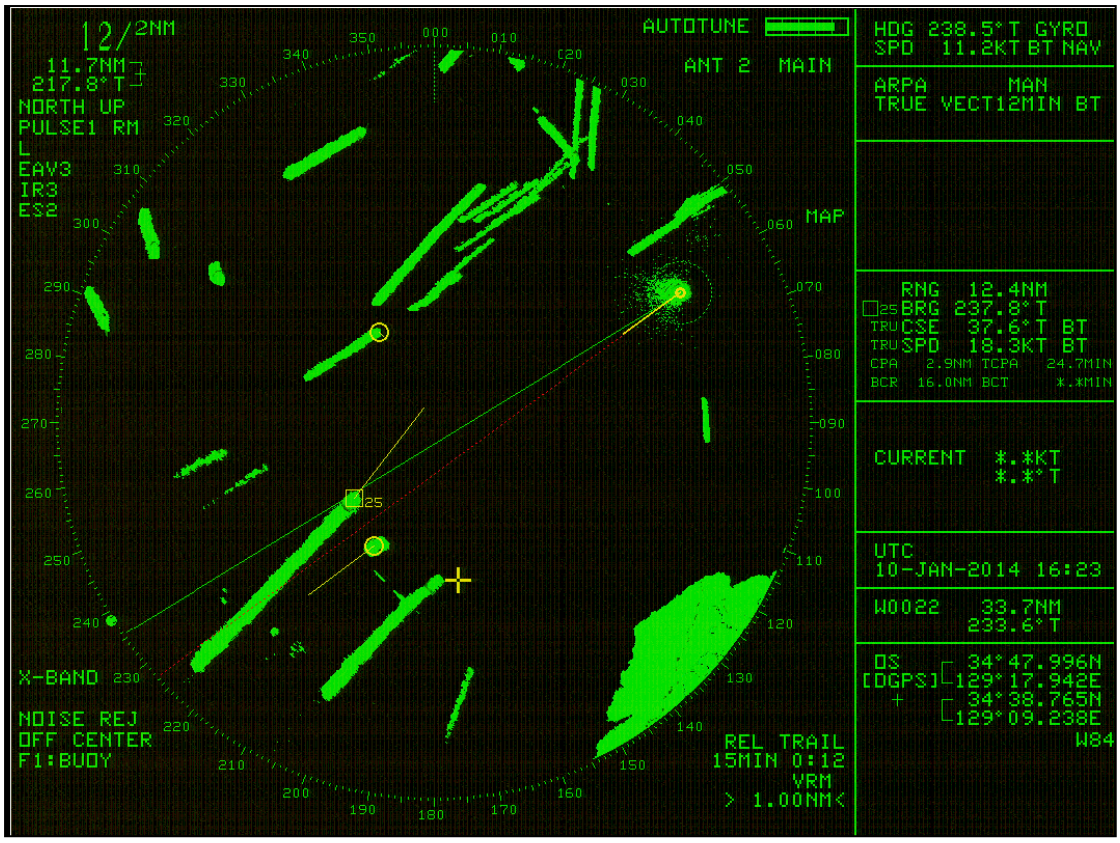

Figure 11: Screen shot at 0123 on 11 January

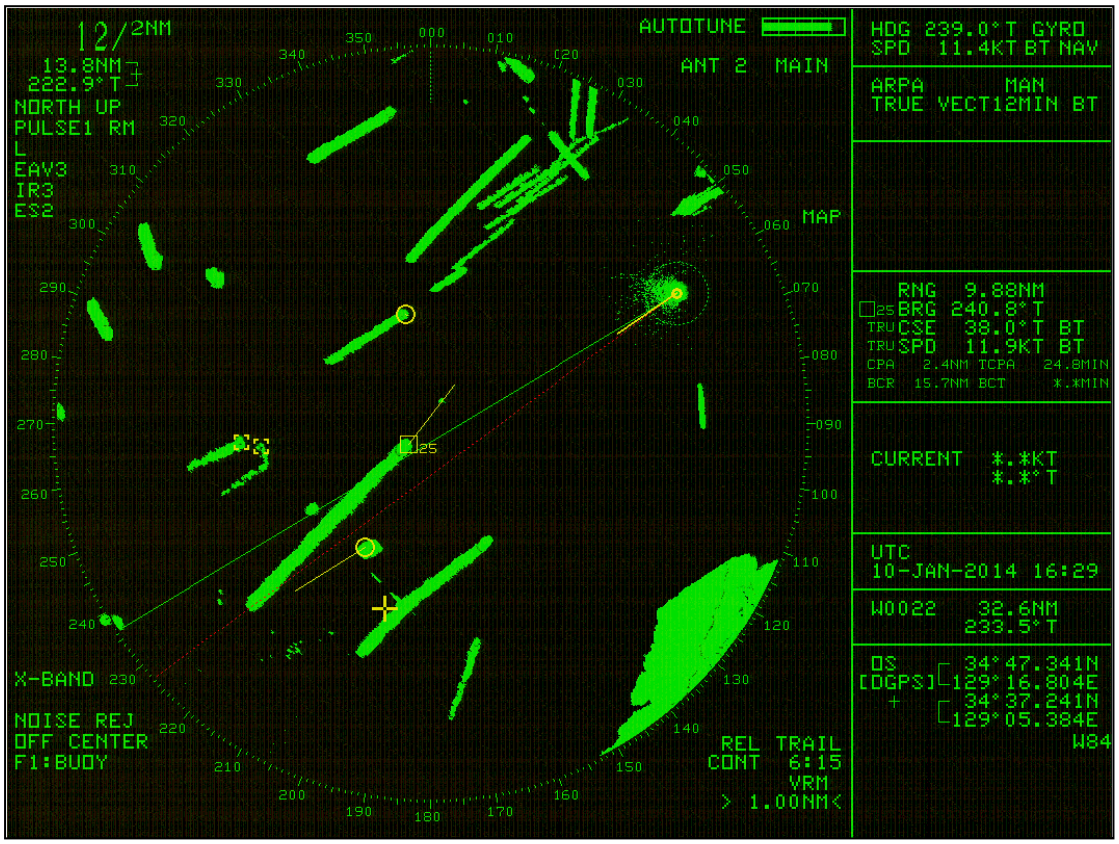

Figure 12: Screen shot at 0129 on 11 January

The S-band Radar/ARPA, which was in use by the OOW, had no 'Relative Target Trails' on and it seemed that the echo of *DL Sunflower* also went unnoticed by the OOW until 0205 when the AB reported visual contact with *DL Sunflower* which, by then, was only 2 nm on the starboard beam.

2.2.3 Keeping a proper lookout by sight and hearing

During the night of the casualty, the weather was fair with very good visibility - around 10 nm. Taking into consideration that the minimum range of the masthead light and sidelights of *DL Sunflower*, being a vessel of over 50 m in length, was 6 nm and 3 nm respectively[9], *DL Sunflower* should have been visually visible to *Ligari* at least when she was 6 nm off here starboard beam. However, with the height of eye of both vessels, it would have been possible that both vessels were visible to each other even from a range of around 10 nm.

However, *DL Sunflower* remained unnoticed for over an hour, until it was just 2 nm off the starboard beam when it was first reported by the look-out at around 0200 (Figure 13). This late reporting of *DL Sunflower* can only be attributed to inaccurate situation awareness by both the OOW and the look-out on board *Ligari*.

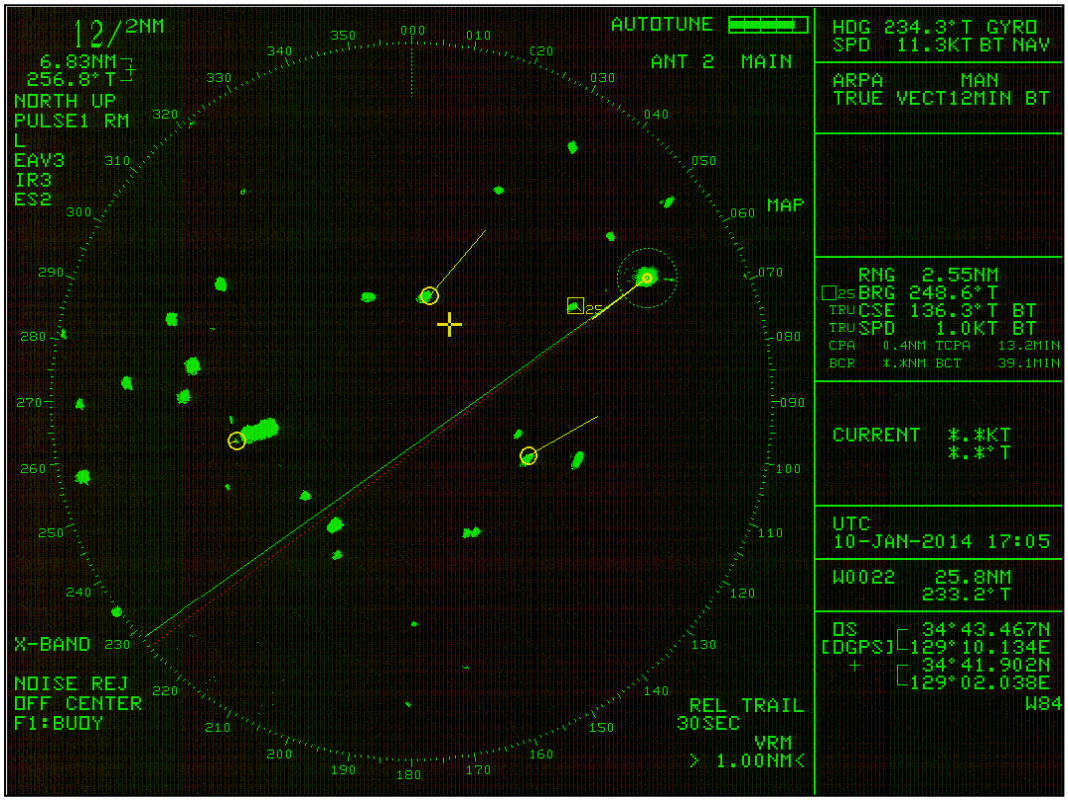

Figure 13: Screen shot at 0205 LT

[9] COLREGs, Rule 22(a) – Visibility of Lights.

While it is impossible to determine exactly the reasons for this inaccurate situation awareness, however, it is possible that due to the fact that the X-band radar, which was being used by the look-out at the time, was located on the port side of the bridge, the look-out was distracted, having spent most of the time inside the bridge and on the port side where the X-band ARPA was located.

The fact that the X-band ARPA was noted to have been frequently used, including the acquisition of targets and the switching on and off of the vectors and trails functions at different times, confirmed that the AB had spent a significant amount of time on the ARPA. On the other hand, the OOW, who was using the S-band ARPA, and which was located on the starboard side of the bridge, did not (visually) notice earlier the lights of *DL Sunflower* on the starboard beam of his vessel.

With reference to the keeping of a proper lookout by means of hearing, although no sound signals were reported to have been used at this time, however, the loud background music playing on the bridge of *Ligari* would have impaired the keeping of a proper lookout by 'hearing'.

2.2.4 The master, OOW and AB on watch

2.2.4.1 The master

The master, who was experienced and had been sailing in this rank since 1990, had joined the Company when he embarked on *Ligari* in July 2013. Hence, this was his first trip working for this Company. While the master had confirmed that he had read and fully understood the Company's SMS Manuals and requirements, these were not followed and complied with. For instance, he did not promulgate the Company's requirements of the composition of bridge watchkeeping during the hours of darkness (sunset to sunrise), with respect to the 'Fire and Security Rounds'. There was no reference to a minimum CPA, which had to be allowed.

The 'Bridge Master's Standing Orders' and the 'Master's Night Orders', which for the two nights prior to the casualty were identical, did not make any reference to these important points. Furthermore, the fact that the master had signed the deck logbook, where it was well documented that the 'Fire and Security Rounds' were being carried out midway through the night watches, namely at 2000, 0200 and at 0600, meant that

he was fully aware of this practice and that he had accepted this since there were no indications of any attempt from his side to correct this.

2.2.4.2 The OOW

The OOW stated that he had read and fully understood the Company's SMS requirements, in particular, those related to safe navigational procedures. However, he did not comply with these requirements, in particular, those related to the 'Fire and Security Rounds', and the minimum CPA.

A number of issues were identified with respect to the OOW:

- the fact that *DL Sunflower* was only noticed for the first time at about 0200, after the vessel was reported by the AB when it was just about 2 nm off on the starboard beam, meant that a proper lookout, by sight and hearing and all available means, was not properly kept. The look-out who spent time on the X-band ARPA was a distraction;
- once aware of the presence of *DL Sunflower*, the OOW did not fully assess the close-quarters situation that was developing with *DL Sunflower*, which was crossing from the starboard side;
- with *DL Sunflower* close on the starboard beam and in a NUC condition, and *Cool Runner* fine on the starboard bow (less than 3 nm ahead), the OOW authorised the look-out to leave the bridge and carry out the 'Fire and Security Rounds', rather than changing to manual steering and put the look-out on the wheel;
- once *Cool Runner* was clear and abeam to starboard, the OOW altered *Ligari*'s course to starboard, *i.e.* back to its original course without fully assessing the impact of this alteration on the close-quarters situation that was developing with *DL Sunflower*, which was now only 1.6 nm on the starboard beam;
- with *DL Sunflower* closing in from the starboard beam on a crossing/collision course, the OOW did not take proper action as a 'give-way' vessel should in a crossing situation; and

- even after *DL Sunflower*, (as the 'Stand-on vessel') called *Ligari* on the VHF and enquired about the intentions, the OOW did not take appropriate action as the 'Give-way vessel';

2.3 Navigational Factors on *DL Sunflower*

2.3.1 The OOW

On the night of the accident, at around 0200, while *DL Sunflower* was on a course of approximately 206°(T), *Cool Runner,* which was showing the NUC lights, called *DL Sunflower* on the VHF and requested that she kept clear of it. The OOW immediately took a substantial alteration of course to starboard and put the vessel on a new course of approximately 248°(T).

At this time, *Ligari* was already approaching *DL Sunflower* from the port side, at a range of approximately 2 nm, but no mention was made about the approaching *Ligari* until 0210 (LT), when *Cool Runner* was past and clear, and the OOW started bringing back the vessel onto her original course.

However, as already pointed out elsewhere, the two vessels should have been in sight of one another when they were approximately 10 nm apart, *i.e.*, at least two hours before the collision. The fact that *Ligari* was only noticed at such a late stage can only be attributed to an inaccurate situation awareness.

At 0210 (LT) *DL Sunflower'*s course was 239°(T) and the OOW continued with his course alteration to port to bring back the vessel onto its original course until 0220 (LT) when *DL Sunflower*'s course was about 206°(T). However, it seems that the OOW did not take into consideration the effects this alteration of course to port would have on the close quarter's situation that was developing with *Ligari,* which was approaching from the port side and which was then at a range of just 2 nm.

At this time the OOW, concerned about the close-quarter's situation that was developing with *Ligari*, decided to call the latter on the VHF in order to find out about the vessel's intentions. However, no light and / or sound signals were made by the OOW in order to express his concern about this developing situation.

An exchange of communication took place between the two vessels which, at the end, was not all that clear and which could have caused more confusion between the two OOWs. In fact, the OOW on *DL Sunflower* understood that the 'Okay' given by the OOW of *Ligari* meant that *Ligari* would alter her course to starboard as required by the COLREGs. With this in mind, the OOW made another alteration of 15° to port and at 0225 LT, *DL Sunflower*'s course was 190°(T). The term "Okay" does not indicate a close loop communication, which would have ensured that the 'agreed' alteration of course would have been accurately understood.

After the alteration of course was carried out, instead of monitoring the situation, the OOW went to the chartroom to fix the vessel's position. When his look-out went up to him to advise that *Ligari* was getting too close, it was too late to avoid the collision even though the OOW tried to go further to port. The visit to the chartroom at the time was crucial because the context outside the bridge windows was changing and developing and therefore the situation had to be monitored to react, if necessary. However, this would have been impossible because the visit to the chartroom prevented the capturing of these important cues.

2.4 Misuse of the VHF in Collision Avoidance

In December 2004, the carriage of AIS became mandatory for all vessels over 300 gt. Since then, the identification of vessels had become easier and this had resulted in an increase in the use of the VHF during close-quarters situations.

On the night of the collision, the use of the VHF was no exception. According to the *Ligari'*s VDR data:

- At 0027 (LT), *Ligari* called *Madison Maersk*, which was crossing from port to starboard at slow speed, and after an exchange of communication between the two vessels, *Ligari* altered her course to port, even though, besides *Madison Maersk*, there were other vessels crossing from the port side to the starboard side;
- At 0200 (LT), *Cool Runner*, which although it was showing the NUC lights, still called both *DL Sunflower* and *Ligari* and asked both vessels to keep well clear of it; and

- At 0219 (LT), *DL Sunflower*, as the 'Stand-On' vessel in a crossing situation, instead of following the COLREGs and sounded the appropriate sound and / or light signals, called *Ligari* and asked about her intentions.

In all these three occasions, the vessels could have just followed the COLREGs requirements as there was no need for the VHF to be used. In fact, the use of the VHF, at the end, could have easily caused misunderstandings amongst the vessels, especially since there was also a language problem.

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

3 CONCLUSIONS

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

3.1 Immediate Safety Factor

.1 The immediate cause of the collision was an unclear assessment of the risk of collision in a dynamic environment.

3.2 Latent Conditions and other Safety Factors

.1 Both vessels did not maintain a proper look-out by sight and hearing as well as by all available means appropriate to the prevailing circumstances and conditions;

.2 Both OOWs did not take visual compass bearings of the approaching vessels in order to determine if risk of collision existed;

.3 Both vessels did not sound the appropriate manoeuvring and warning sound/light signals when approaching one another and when alteration of courses were carried out;

.4 Both vessels did not follow basic bridge procedures as required by the STCW Convention, Regulation VIII/2 and Section A-VIII/2;

.5 Both vessels had misused the VHF during close-quarters situations and which could have contributed to this collision;

.6 The master of *Ligari* did not address the malpractice on board whereby during the hours of darkness, the AB (look-out / helmsman) was being requested by the OOWs to leave the bridge, half way through the watches, to carry out the 'Safety and Security Patrol';

.7 The OOW on board *Ligari* did not to make a full appraisal of the situation and of the risk of collision with nearby vessels, including *DL Sunflower*, when, at 0200 (LT), he requested his AB (lookout/helmsman) to leave the bridge in order to carry out the 'Safety and Security Patrol' of the accommodation;

.8 *Ligari*, as the 'Give Way Vessel' in accordance with COLREGs Rules 15 and 16, did not take an early and substantial action to keep well clear of *DL Sunflower* and to avoid a close-quarters situation from developing;

.9 *DL Sunflower*, as the 'Stand-on Vessel', did not follow the requirements of COLREGs Rule 17(c) when an alteration of course to port was executed at a time when *Ligari* was still on her port side;

.10 The OOW on board *DL Sunflower* did not take into consideration the effects, which this alteration of course to port would have on the close quarter's situation that was developing;

.11 The OOW on board *DL Sunflower* was unable to monitor the developing situation after the alteration of course to port because he went into the chartroom during a crucial time when the situation was still evolving.

4 ACTIONS TAKEN

4.1 Safety Actions Taken During the Course of the Safety Investigation

TMS Bulkers Ltd., as *Ligari*'s managers, immediately carried out their own investigation into this casualty, in accordance with Section 9 of the ISM Code. A report was issued, copy of which was sent to the vessel's flag State Administration. In line with the findings of this investigation, the Company issued instructions to all their fleet vessels that they shall, at all times, ensure compliance with the Company Navigating Procedures Manual and maintain proper look-out by sight and hearing as well as by all available means appropriate to the circumstances and conditions so as to make a full appraisal of the risk of collision.

5 RECOMMENDATIONS

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

TMS Bulkers Ltd. is recommended to:

02/2015_R1 Ensure that the safety policy incorporated within their Safety Management System is implemented at all levels of the organisation during the Company's regular audits that are carried out on board ships under its management, especially with respect to the potential risks associated with music played on the bridge during hours of watch.

NDSM Co. Ltd. is recommended to:

02/2015_R2 Disseminate the findings of this safety investigation to all the ships under its management and issue a fleet circular on the potential risks related to the misuse of VHF as a means of collision avoidance.

LIST OF ANNEXES

Annex 1 ***Ligari*** **Cargo Ship Safety Equipment Certificate - Form E - Record of Equipment**

Certificate No.: 04123229-2522841-003

SHORT TERM
CARGO SHIP SAFETY EQUIPMENT CERTIFICATE

THIS CERTIFICATE SHALL BE SUPPLEMENTED BY A RECORD OF EQUIPMENT (FORM E)

ISSUED UNDER THE PROVISIONS OF THE
INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974,
AS MODIFIED BY THE PROTOCOL OF 1988 RELATING THERETO

UNDER THE AUTHORITY OF THE GOVERNMENT OF

Republic of Malta

(name of the State)

by **American Bureau of Shipping**

Particulars of Ship:

Name of Ship	Distinctive Number or Letters	Port of Registry	Gross Tonnage[1] [a] According to Annex 2 [b] According to Annex 3
LIGARI	9HQY8	Valletta	38851
Maximum Deadweight of Ship (Metric Tons)[4]	Length of Ship (Regulation III/3.12)	IMO Number	Date on Which Keel Was Laid[5]
N/A	217.68 m	9279513	04 November 2003

Type of ship:[1]
Bulk Carrier
~~Oil Tanker~~
~~Chemical Tanker~~
~~Gas Carrier~~
~~Cargo Ship other than any of the above~~

THIS IS TO CERTIFY:

1 that the ship has been surveyed in accordance with the requirements of Regulation I/8, of the Convention.

2 that the survey showed that:

2.1 the ship complied with the requirements of the Convention as regards fire safety systems and appliances and fire control plans;.

2.2 the life-saving appliances and the equipment of the lifeboats, liferafts and rescue boats were provided in accordance with the requirements of the Convention;

2.3 the ship was provided with a line-throwing appliance and radio installations used in life-saving appliances in accordance with the requirements of the Convention;

1 Delete as appropriate.
2 The above gross tonnage has been determined in accordance with the International Convention on Tonnage Measurement of Ships, 1969.
3 The above gross tonnage has been determined by the authorities of the Administration in accordance with the national tonnage rules which were in force prior to the coming into force for existing ships of the International Convention on Tonnage Measurement of Ships, 1969.
4 For oil tankers, chemical tankers and gas carriers only.
5 Date on which keel was laid or ship was at a similar stage of construction or, where applicable, date on which work for a conversion or an alteration or modification of a major character was commenced.

2.4 the ship complied with the requirements of the Convention as regards shipborne navigational equipment, means of embarkation for pilots and nautical publications.

2.5 the ship was provided with lights, shapes, means of making sound signals and distress signals in accordance with the requirements of the Convention and the International Regulations for Preventing Collisions at Sea in force;

2.6 in all other respects, the ship complied with the relevant requirements of the Convention.

2.7 the ship was not subjected to an alternative design and arrangements in pursuance of regulation II-2/17 or III/38 of the Convention;

2.8 a Document of approval of alternative design and arrangements for fire safety or lifesaving appliances and arrangements is not appended to this Certificate.

3 That an Exemption Certificate has been issued.

This Certificate is valid only when Record Form E issued at Busan, Korea on 22 January 2014 is attached.

This certificate is valid until 25 February 2014 [6]

"THIS CERTIFICATE IS VALID FOR A SINGLE TOWED PASSAGE FROM BUSAN, KOREA TO LONGKOU, CHINA FOR DISCHARGING UNDER FAVOURABLE WEATHER CONDITIONS BUT NOT LATER THAN 25 FEBRUARY 2014."

Completion date of the survey on which this certificate is based: **14 March 2009**

Issued at Busan, Korea on 22 January 2014

(Place of issue of certificate) *(Date of issue)*

[redacted]

(Surveyor, American Bureau of Shipping)

ABS BUSAN

ABS

6 Insert the date of expiry as specified by the Administration in accordance with Regulation I/14(a) of the Convention. The day and the month of this date correspond to the anniversary date as defined in Regulation I/2(n) of the Convention, unless amended in accordance with Regulation I/14(h).

Certificate No.: 04123229-2522841-004

RECORD OF EQUIPMENT FOR THE CARGO SHIP SAFETY EQUIPMENT CERTIFICATE
(FORM E)

THIS RECORD SHALL BE PERMANENTLY ATTACHED TO THE CARGO SHIP SAFETY EQUIPMENT CERTIFICATE

RECORD OF EQUIPMENT FOR COMPLIANCE WITH THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974 AS MODIFIED BY THE PROTOCOL OF 1988 RELATING THERETO

1 *Particulars of ship*

Name of Ship: LIGARI

Distinctive number or letters: 9HQY8

2 *Details of life-saving appliances*

1 Total number of persons for which life-saving appliances are provided	27	
	Port	Starboard
2 Total number of lifeboats	One (1)	One (1)
2.1 Total number of persons accommodated by them	25	25
2.2 Number of totally enclosed lifeboats (regulation III/31 and LSA Code, section 4.6)	One (1)	One (1)
2.3 Number of lifeboats with a self contained air support system (regulation III/31 and LSA Code, section 4.8)	-	-
2.4 Number of fire-protected lifeboats (regulation III/31 and LSA Code, section 4.9)	-	-
2.5 Other lifeboats		
2.5.1 Number	-	-
2.5.2 Type	-	-
2.6 Number of freefall lifeboats		
2.6.1 Totally enclosed (regulation III/31 and LSA Code, section 4.7)	-	
2.6.2 Self-contained (regulation III/31 and LSA Code, section 4.8)	-	
2.6.3 Fire-protected (regulation III/31 and LSA Code, section 4.9)	-	
3 Number of motor lifeboats (included in the total lifeboats shown above)	Two (2)	
3.1 Number of lifeboats fitted with searchlights	Two (2)	
4 Number of rescue boats	One (1)	
4.1 Number of boats which are included in the total lifeboats shown above	One (1)	
5 Liferafts		
5.1 Those for which approved launching appliances are required:		
5.1.1 Number of liferafts	-	
5.1.2 Number of persons accommodated by them	-	
5.2 Those for which approved launching appliances are not required:		
5.2.1 Number of liferafts	Two (2) + One (1) (transferrable)	
5.2.2 Number of persons accommodated by them	50 + 6	
5.3 Number of liferafts required by regulation III/31.1.4	One (1)	
6 Number of lifebuoys	14	
7 Number of lifejackets	41	

8 Immersion suits	
8.1 Total number	33
8.2 Number of suits complying with the requirements for the life-jackets	-
9 Radio installations used in lifesaving appliances	
9.1 Number of search and rescue locating devices	
9.1.1 Radar search and rescue transponders (SART)	Two (2)
9.1.2 AIS search and rescue transmitters (AIS-SART)	-
9.2 Number of two-way VHF radiotelephone apparatus	Three (3)

3 *Details of navigational systems and equipment*

Item	Actual Provisions
1.1 Standard magnetic compass*	Provided
1.2 Spare magnetic compass*	Provided
1.3 Gyro compass*	Provided
1.4 Gyro compass heading repeater*	Provided
1.5 Gyro compass bearing repeater*	Provided
1.6 Heading or track control system*	Provided
1.7 Pelorus or compass bearing system*	Provided
1.8 Means of correcting heading and bearings	Provided
1.9 Transmitting heading device (THD)*	-
2.1 Nautical charts	Provided
2.2 Back up arrangements for ECDIS	-
2.3 Nautical publications	Provided
2.4 Back up arrangements for electronic nautical publications	-
3.1 Receiver for a global navigation satellite system	Provided
3.2 9 GHz radar*	Provided
3.3 Second radar (3 GHz)	Provided
3.4 Automatic radar plotting aid (ARPA)*	Two (2) Provided
3.5 Automatic tracking aid*	Provided (By Item 3.3.4)
3.6 Second automatic tracking aid*	-
3.7 Electronic plotting aid*	-
4.1 Automatic identification system (AIS)	Provided
4.2 Long-range identification and tracking system	Provided
5.1 Voyage data recorder (VDR)	Provided
5.2 Simplified voyage data recorder (S-VDR)	-
6.1 Speed and distance measuring device (through the water)*	Provided
6.2 Speed and distance measuring device (over the ground in the forward and athwartship direction)*	-
6.3 Echo sounding device*	Provided
7.1 Rudder, propeller, ~~thrust, pitch and~~ operational mode indicator*	Provided
7.2 Rate of turn indicator*	-
8 Sound reception system*	-
9 Telephone to emergency steering position*	Provided
10 Daylight signalling lamp*	Provided
11 Radar reflector*	-
12 International Code of Signals	Provided
13 IAMSAR Manual, Volume III	Provided
14 Bridge navigational watch alarm system (BNWAS)	Provided

* Alternative means of meeting this requirement are permitted under regulation V/19. In case the other means, they shall be specified.

Certificate No.: 04123229-2522841-004

THIS IS TO CERTIFY that this record is correct in all respects

Issued at Busan, Korea
Place of issue of certificate

22 January 2014
Date of issue

[redacted]
Surveyor, American Bureau of Shipping

ABS BUSAN

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Annex 2 *Ligari* Minimum Safe Manning Document

MINIMUM SAFE MANNING CERTIFICATE

Issued in compliance with the International Convention for the Safety of Life at Sea 1974 Chapter V Regulation 14(2), and the Merchant Shipping (Safe Manning and Watchkeeping) Regulations 2003

This is to certify that in accordance with the principles and guidelines set out in Resolution A.890 (21) of the International Maritime Organisation the ship named in this certificate will be considered to be safely manned, when it proceeds to sea with not less than the numbers and grades of the personnel shown in this document, subject to any conditions stated hereunder.

Vessel

Name of Ship	*LIGARI*
Port of Registry	*Valletta*
Official Number	*IMO No.*
IMO Number	*9279513*
Type of Ship	*Bulk Carrier*
Gross Tonnage	*38851*
Registered Power	*9099 kW*

Trading Area

UNLIMITED

Personnel

Grade/Capacity	Min mum STCW Reg	Number of Persons
Master	II/2	One
Chief Mate	II/2	One
OOW Navigational	II/1	Two
Chief Engineer	III/2	One
Second Engineer	III/2	One
OOW Engineering	III/1	One
Deck Rating	II/4	Four
Deck Rating	VI/1	Two
Engine Rating	III/4	Three

Minimum Qualifications and Requirements: *All Deck and Engine Room officers, are to be in possession of a Certificate of Competence and an Endorsement issued by the appropriate authority in compliance with the STCW Convention 78, as amended.*
Furthermore all officers are required to be holders of an Endorsement issued under Regulation I/10, by the Malta Transport; stating that the holder is competent to serve in a capacity on board ship with trading patterns, tonnage and registered power indicated.
Any shortages from the specified number of personnel should be referred to the Merchant Shipping Directorate, Malta Transport for approval.

Special Conditions
One OOW Engineering and one Engine Rating may be omitted if vessel holds UMS documentary evidence issued by the vessel's Classification Society.

At least two Deck Officers must be holders of a GMDSS General Operator's Certificate (G.O.C), or otherwise vessel must carry a dedicated Radio Operator, holder of at least a GMDSS General Operators Certificate (G.O.C).

Issued at Valletta Malta on the **15 July 2011**

This Certificate is valid until the **7 September 2016**

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Merchant Shipping Directorate

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