Marine Safety Investigation Unit

Transport Malta

MARINE SAFETY INVESTIGATION REPORT

Safety investigation into the grounding of the

Maltese registered bulk carrier

MARBELLA

in position 17° 06.8' N 111° 30.62' E

on 28 September 2017

201709/032

MARINE SAFETY INVESTIGATION REPORT NO. 18/2018

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 28 September 2017. 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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Crew members MV *Marbella*

Managers MV *Marbella*

VDR MV *Marbella*

ECDIS logbook - Chart system log (v 4.0)

GLOSSARY OF TERMS AND ABBREVIATIONS

°C	Degrees Celsius
AIS	Automatic Identification System
ARPA	Automatic Radar Plotting Aid
BNWAS	Bridge Navigational Watch Alarm System
E	East
ECDIS	Electronic Chart Display and Information System
ENC	Electronic navigation chart
GPS	Global Positioning System
GT	Gross Tonnage
ILO	International Maritime Organization
IMO	International Maritime Organization
ISM	International Safety Management
kW	Kilowatt
m	Metre
MSIU	Marine Safety Investigation Unit
N	North
nm	Nautical mile
OCIMF	Oil Companies International Maritime Forum
OOW	Officer of the Watch
RPM	Revolutions per Minute
SMS	Safety Management System
SOLAS	International Convention on the Safety of Life at Sea, 1974, as amended
STCW	International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended
UTC	Universal Time Coordinated
VDR	Voyage Data Recorder
XTD	Cross Track Distance

SUMMARY

At 2350 on 26 September 2017, *Marbella* departed Hong Kong for Tarahan Coal Terminal in Indonesia. The following day on, 27 September, the master instructed the second mate to amend the route in order to comply with the charterers' suggested route.

At 0000 on 28 September 2017, the second mate arrived on the bridge for his navigational watch. At the time, *Marbella* was making good a course of 205°. The speed was 11.7 knots. The second mate recalled that he did not see North Reef on the ECDIS and he therefore monitored traffic on the radar.

At 0145, he changed the course to starboard to pass a group of fishing vessels. He reported that while on this course, he saw lights ahead flashing. He judged them for fishing nets signal and set the course to port to pass between the flashing lights.

At 0327, *Marbella* shuddered to a complete stop as she grounded on North Reef in position 17° 06.80′ N 111° 30.62′ E. No injuries and pollution were reported but the vessel sustained structural damages in way of her double bottom tanks and bottom shell plating.

The Marine Safety Investigation Unit (MSIU) concluded that whilst steering a course to clear fishing vessels *Marbella* navigated into shallow waters and ran aground on North Reef, Paracel Islands. As a result of the safety investigation, two recommendations were made to the Company in order to address then use of electronic equipment on the bridge and the posting of a look-out on the bridge during the navigational watch.

1 FACTUAL INFORMATION

1.1 Vessel, Voyage and Marine Casualty Particulars

Name	*Marbella*
Flag	Malta
Classification Society	Koran Register of Shipping
IMO Number	9189782
Type	Bulk Carrier
Registered Owner	Dione Owning Co. Ltd.
Managers	TMS Bulkers Ltd.
Construction	Steel (Double bottom)
Length overall	225. 0 m
Registered Length	218.68 m
Gross Tonnage	37831
Minimum Safe Manning	14
Authorised Cargo	Dry bulk
Port of Departure	Hong Kong
Port of Arrival	Tarahan, Indonesia
Type of Voyage	International
Cargo Information	In ballast
Manning	14
Date and Time	28 September 2017 at 0327 (LT)
Type of Marine Casualty	Serious Marine Casualty
Place on Board	Ship / Other
Injuries/Fatalities	None
Damage/Environmental Impact	Bottom shell plating and internal structures in no. 1 ballast tank. No damage to the environment was reported.
Ship Operation	Normal Service – On passage
Voyage Segment	Transit
External & Internal Environment	Gentle breeze, slight seas and no swell. Visibility ten nautical miles
Persons on Board	14

1.2 Description of Vessel

1.2.1 Vessel

Marbella is a bulk carrier of 37,831 GT, built by Sasebo Heavy Industries Co. Ltd., Japan in 2000. The vessel's registered owners are Dione Owning Co. Ltd., and she is operated by TMS Bulkers Ltd. of Greece. Her classification society is Korean Register of Shipping and was authorised to issue Statutory certificates on behalf of the flag State.

Marbella has an overall length of 225 m, a beam of 32.2 m and a moulded depth of 18.7 m. Her summer deadweight is 72,561 tonnes, corresponding to a summer draft of 14 m. The deckhouse superstructure, bridge and engine-room are located at the aft section of the vessel. The cargo space, extending forward of the superstructure, consists of seven cargo holds. Propulsive power is provided by a 6-cylinder 6S60MC MARK II Mitsui-MAN-B&W engine, producing 8,826 kW at 92 RPM. The estimated speed of the vessel is 15 knots. *Marbella*'s general arrangement plan is shown in Figure 1.

1.2.2 Bridge layout and navigational equipment

Marbella is fitted with standard navigational equipment in compliance with the statutory requirements of her Safety Equipment Certificate. The navigational equipment included X and S band radars, an ARPA, AIS, magnetic and gyro compasses, an echo sounder, a GPS and BNWAS. On 03 March 2017, the vessel was fitted with dual MARIS ECDIS 900.

The Safety Equipment Certificate issued on 24 September 2017 confirmed compliance with the chart carriage requirements of Regulation V/19 and V/27 of the Convention on Safety of Life at Sea (SOLAS). Thus, ECDIS was the primary means of navigation and no paper charts were carried on board. The layout of navigational equipment in the wheelhouse is shown in Figure 2.

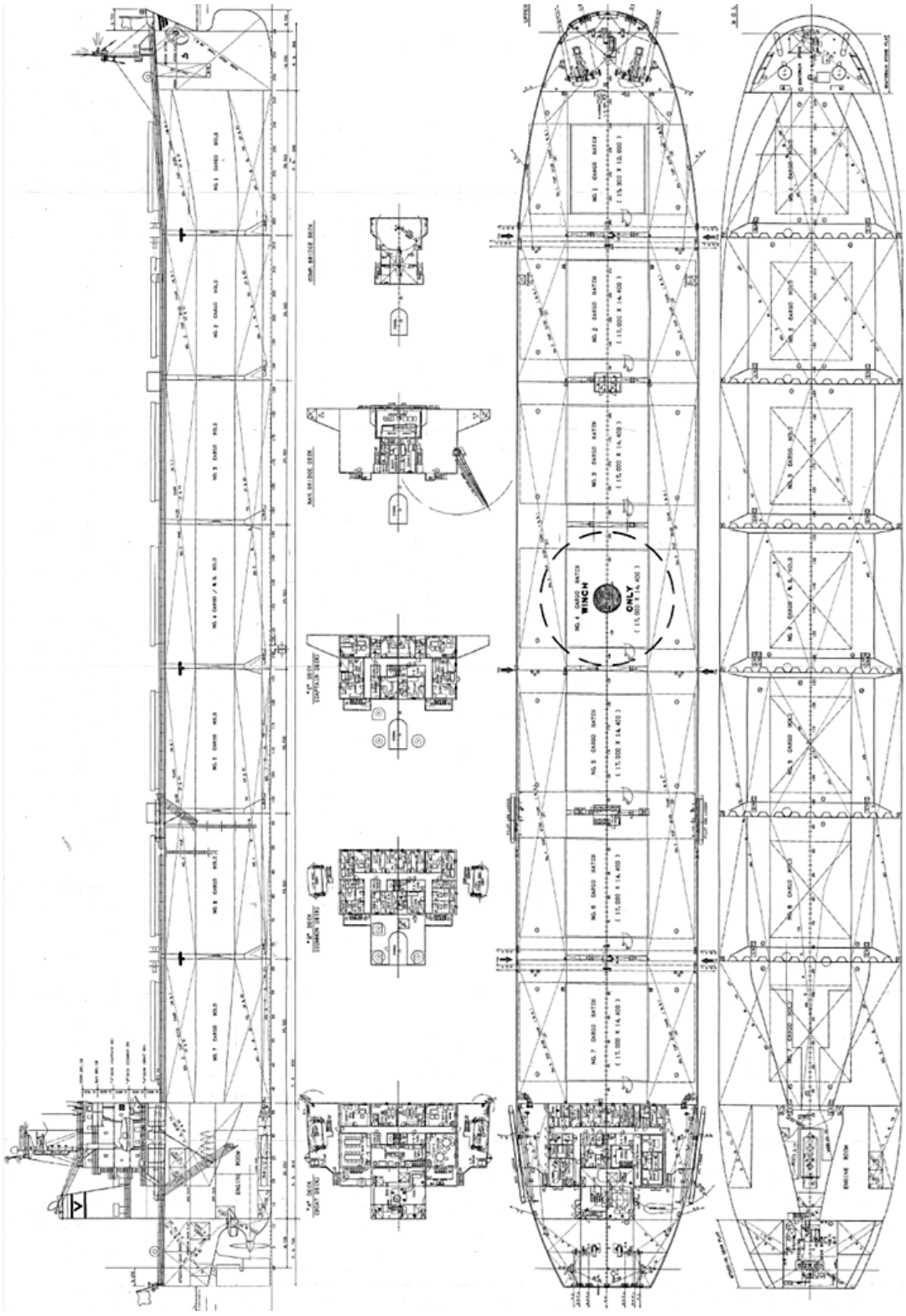

Figure 1: *Marbella* General Arrangement Plan

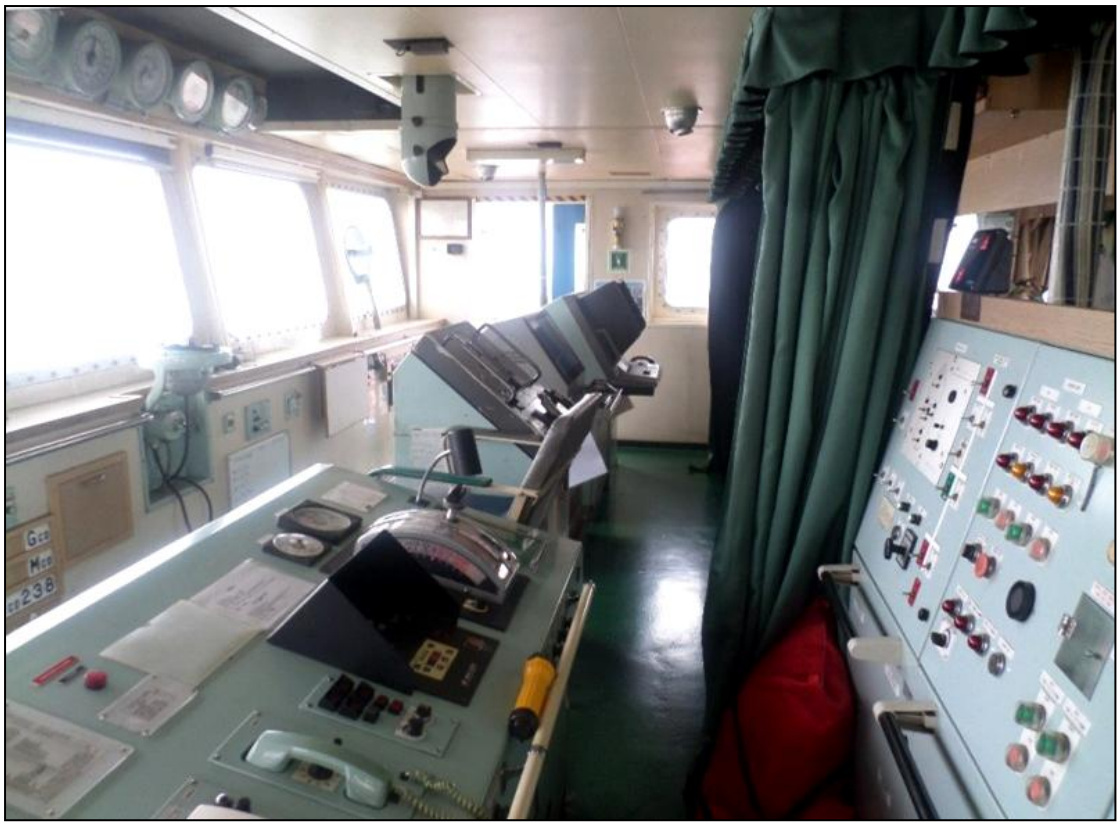

Figure 2: Layout of navigational equipment

1.3 Manning

The manning on board *Marbella* was in accordance with the Minimum Safe Manning Certificate issued by the flag State Administration. The master, engineers and deck officers were all from Romania and qualified in accordance with the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers 1978, as amended (STCW Convention).

1.3.1 Master

The master was 56 years old. He was first employed by the Company in July 2012. He was issued with a Certificate of Competency as master on ships of over 3,000 GT on 01 March 2017 by the Government of Romania. He had attended IMO model course 1.27[1], and before joining the vessel in Incheon, Korea on 14 March 2017, he completed type-specific ECDIS familiarisation course on MARIS ECDIS 900.

[1] IMO Model Course 1.27 is a generic ECDIS training which address the minimum standard of competency for officers in charge of a navigational watch.

1.3.2 Navigational officer

The second mate, who was from Romania, was the ship's navigational officer and on watch (OOW) at the time of grounding. He was 48 years old. His Certificate of Competency as officer in charge of a navigational watch on ships of over 500 GT was issued by the Government of Romania on 07 June 2017. He had attended IMO Model Course 1.27 in 2014 and ECDIS type-specific ECDIS familiarisation course on 31 August 2017. He joined *Marbella* on 02 September 2017.

1.4 ISM Audit

On 20 April 2017, a navigational audit (external) was carried out in the port of New Mangalore, India. The objective of the audit was to evaluate the implementation and effectiveness of the Company's Safety Management System. During the audit, all deck officers were found well familiarised with the ECDIS operations and with the Company's navigational procedures on passage planning and maintaining of a safe navigational watch at sea.

1.5 Environment

The weather was clear with visibility up to 10 nm. The wind was Southeast Beaufort Force 2. The sea was calm and there was no swell. The air and sea temperatures were 29° C and 26° C respectively.

1.6 North Reef

North Reef (Figure 3), which is located in position 17° 06' N 111° 30' E in the South China Sea, is approximately 35 miles North and 43 miles West Northwest respectively from the Crescent Group and Amphitrite Group of Paracel Islands. The natural features of the reef are largely submerged and the rocks around the reef are unevenly craggy and barely rise above the water.

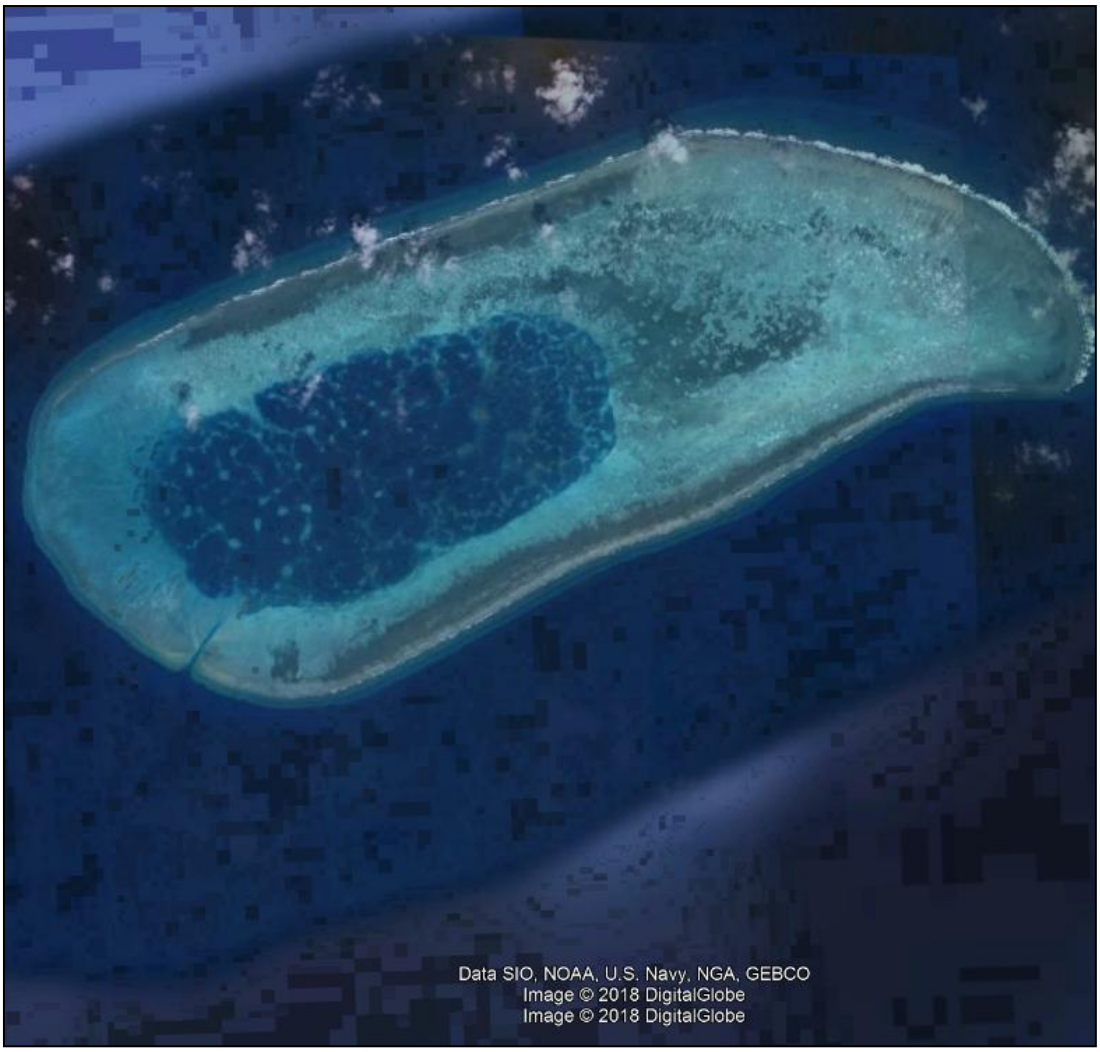

Figure 3: Satellite image of North Reef

1.7 Narrative[2]

At 2350 on 26 September 2017, *Marbella* departed Hong Kong for Tarahan Coal Terminal in Indonesia. She was in ballast and her sailing draft was 4.40 m forward and 7.83 m aft. A route with file name 'r_09_23_2017_17_22_24', and which was saved in the active route folder, was uploaded on the ECDIS. A print-out of the route was attached to the voyage plan WF/MRS/534 (**Annex 1**) and approved by the master. According to the plan, North Reef lay to the East of the course, between waypoints 6 and 7 (Figure 4).

[2] Unless otherwise stated, all times are ship's time (UTC + 8).

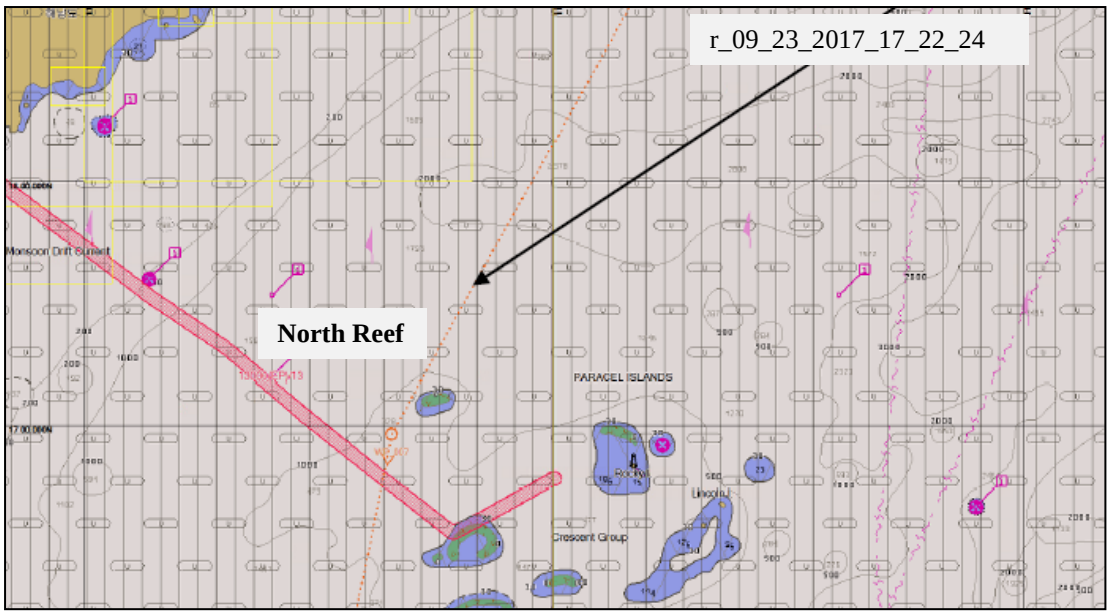

Figure 4: Route between waypoints 6 and 7

Source: Company documents

Prior to leaving Hong Kong, ECDIS Settings Checklist W/MRS/565 was completed by the navigational officer, in consultation with the master and co-signed by all the deck officers.

The following day on, 27 September, the master instructed the second mate to amend the route in order to comply with the charterers' suggested route. After his noon watch, the second mate amended the passage plan, which largely involved adjusting the route further West from North Reef and modifying waypoints in the South segment of the route. The master was informed when the changes were completed. A copy of the charterers' route plan RTE3 is at **Annex 2**. Between 1730 and 1900, the alternative routes to three discharging ports (given by the charterers) were checked. At 1900, the charterers provided the master new information on the loading port and the route to the destination port was finalised.

At 0000 on 28 September 2017, the second mate arrived on the bridge for his navigational watch. At the time, *Marbella* was making good a course of 205°. The speed was 11.7 knots. The ECDIS and radars were on but the echo sounder was not switched on. The ECDIS display was set in dusk light mode. The second mate recalled that he did not see North Reef on the ECDIS and he therefore monitored traffic on the radar. At 0145, he changed the course to starboard to pass a group of fishing vessels. He reported that while on this course,

he saw lights ahead flashing. He judged them for fishing nets signal and set the course to port to pass between the flashing lights.

1.7.1 Navigational Information[3]

Key navigational information extracted from *Marbella*'s ECDIS Chart System Log is tabulated in table 1[4].

Table 1: Navigational information

Source: Company documents

Ship Time (corrected) hh mm ss	***DGPS/WGS84 Lat ° Long °***	***Heading °***	***COG °***	***SOG Knots***	***ECDIS Logbook (v 4.0)***
17 00 33	18 55.39 N 112 26.85 E	201.6	204.2	11.08	
17 42 00	18 48.48 N 112 22.99 E				*Comment: 12:42:00 Lat = 18 48.482N Lon = 112 22.991E Activate route r_09_27_2017_08_01_09_Route Comment: 12:42:00 Lat = 18 48.482N Lon = 112 22.991E Activate WPT WP_004*
17 42 06					*XTD out limits alarm Acknowledged*
18 00 00	18 45.44 N 112 21.57 E	200	202.1	11.20	
18 09 26	18 43.79 N 112 20.84 E				*Comment: 13:09:26 Lat = 18 43.790N Lon = 112 20.842E Deactivate route*
18 30 00	18 40.23 N 112 19.16 E	200.6	204.3	11.30	
18 43 34	18 37.87 N 112 18.13 E				*Comment: 13:43:34 Lat = 18 37.879N Lon = 112 18.135E Activate route r_09_27_2017_08_01_09_Route Comment: 13:43:34 Lat = 18 37.879N Lon = 112 18.135E Activate WPT WP_004*
18 43 41					*XTD out limits (active) alarm Acknowledged*
19 00 02	18 34.97 N 112 16.88 E	200.3	203.6	11.50	
20 00 03	18 24.41 N 112 12.50 E	199.2	201.5	11.20	
20 00 56					*Comment: 15:56:10 Lat = 18 14.561N Lon = 112 08.514E Deactivate route*
21 00 10					*Comment: 16:00:10 Lat = 18 13.862N Lon = 112 08.242E Activate route r_09_27_2017_08_01_09_Route Comment: 16:00:10 Lat = 18 13.862N Lon = 112 08.242E Activate WPT WP_004*
22 00 07	18 03.95 N 112 02.85 E	208.5	209.7	11.00	
00 00 11	17 43.69 N 111 51.16 E	205.4	205	11.70	
02 00 00	17° 21.81 N 111° 40.23 E	215	217	12.1	
03 00 00	17° 11.85 N 111° 32.83 E	200.7	203.3	12.1	
03 15 16	17°09.06 N 111°31.6 E	199.6	203.5	11.9	
03 25 16	17°07.2 N 111°30.8 E	199.5	202.7	12.1	
03 27 47	17°06.8 N 111°30.63 E	203.2	210	0.0	

At 0327, *Marbella* shuddered to a complete stop as she grounded on North Reef in position 17° 06.80′ N 111° 30.62′ E (Figure 5).

[3] ECDIS replay of events was not available to the MSIU.

[4] A variance of five hours was noted between the ship's time and the time recorded in the ECDIS log.

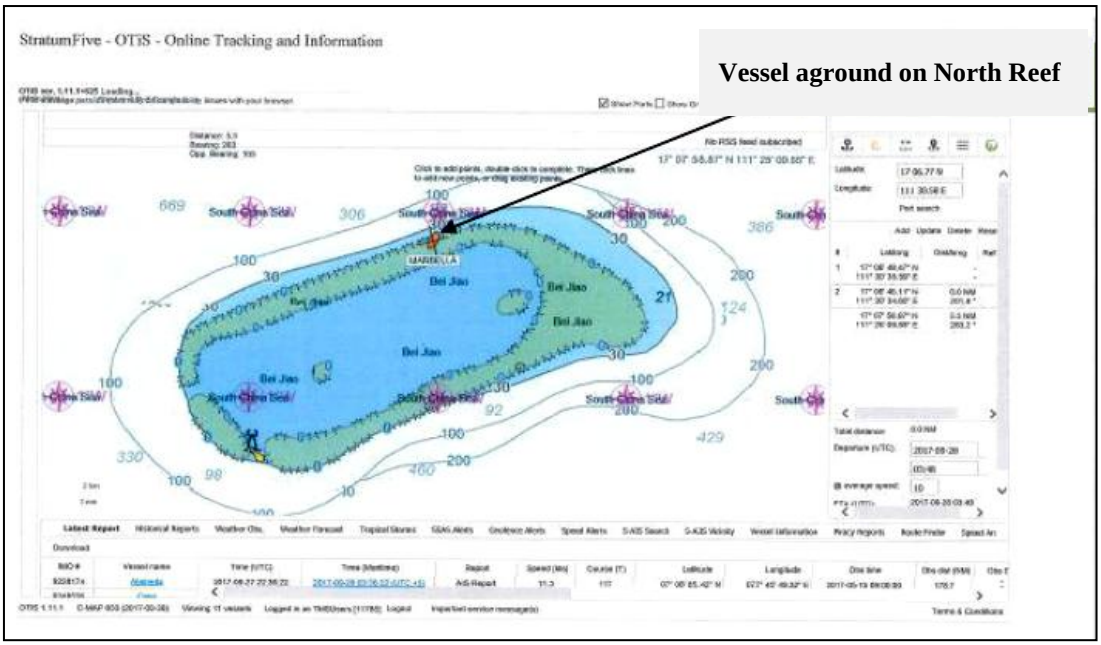

Figure 5: *Marbella* aground on North Reef

Source: Company documents

1.8 Post-grounding events

The master was woken up by the strong vibrations and shuddering noise. Within a minute of the second mate's phone call to him, he arrived on the bridge. He found the main engine running full ahead but the vessel was stationary. He reported sighting a lighthouse on the starboard side and a line of buoys marking the reef on the port side. The main engine was set to stop. The crew were woken up and all tanks and cargo holds were checked. No pollution and no injuries were reported. Although ballast tank no. 1 was breached, there was no water ingress in the cargo holds. There was also no damage to the propeller, steering gear and rudder.

The Company was informed of the accident and its emergency response team was initiated to assist the master to re-float the vessel. Ballast water in the after peak and topside tanks were regulated to raise the bow section. At 1340, the main engine was ready and the controls were transferred to the bridge. While de-ballasting the forepeak tank a slight change of heading was observed and the engines were run astern. At 1400, *Marbella* was afloat and clear of the reef. On reaching position 17° 25.40′ N 111° 36.70′ E at 1705, the main engine were stopped and a thorough

inspection of the vessel and machinery was carried. At 2300, the vessel proceeded to Hong Kong for a damage survey by the Classification Society.

1.9 Structural Damages

The following structural damages were reported by Class:

- Indentation of bottom plates between frame 234 and frame 256 in way of the fore peak tank and water ballast tanks nos. 1 port and starboard including internal structural members;
- Bottom shell plates between frame 217 and frame 234 in way of no. 1 water ballast tank port deformed and between frame 241 and 243 cracked;
- Bottom shell plates longitudinally torn from frame 220 to frame 225; and
- Bottom shell plates from frame 127 to aft section in way of fuel oil tanks nos. 1 and 2 port and starboard were found scratched and slightly indented.

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 Alcohol, Drugs and Fatigue

The Company recognised the harmful effects of alcohol and drug on the performance of ship board duties and had thus implemented recommendations contained in the OCIMF guidelines. No crew member was allowed to carry drugs or alcohol on board and its consumption prior to commencing of duties was strictly prohibited. Moreover, the Company's navigational policy directed watchkeeping officers not to hand over the watch to the relieving officer if he was incapable, for any reason, to perform his duties.

The second mate's 'Hours of Work and Rest' document submitted to the MSIU, showed that the hours of rest in the seven-day period and on the day before the accident were in accordance with the relevant IMO and ILO Conventions.

The use of alcohol, drugs and fatigue was not considered to be a contributing factor to this accident.

2.3 Look-out

The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, as amended (STCW) requires a proper look-out to be maintained at all times in compliance of Rule 5 of the International Regulations for the Prevention of Collisions at Sea. This requirement was also addressed in the Company's SMS on maintaining a safe navigational watch, standing orders and in the master's night orders, which stated that "lookout to be kept with all navigational equipment in operation."

At the time of the accident, the navigational OOW was alone on the bridge. No names of look-outs were recorded in the logbook. It was also stated that the bridge was solely manned by one person. The absence of a dedicated look-out at night meant a missing a safety barrier for one-person error.

2.4 Voyage Plan and ECDIS Settings

According to the User Manual, MARIS ECDIS900 can display several routes on the ECDIS but only one route can be active at any one time. When a new route is activated, the previous active route is de-activated, route legs change to pecked red line and the route monitoring mode is switched on. Moreover, the route is automatically checked for navigational dangers in the ENC database and user defined alerts. If any segment of the route is breached, navigational hazards are displayed on the ECDIS. Moreover, during route monitoring, the XTD out of limits, safety warnings and waypoint alerts are active and trigger visual and audible alarm.

The ship's navigational procedures, however, warned of the risk of data misinterpretation and highlighted that special consideration should be given to unintended actions in the ECDIS setup. Navigational OOWs are instructed to check the passage plan uploaded on the ECDIS for accuracy and completeness before it is used for the voyage. In addition, once the plan has been reviewed and approved, the master was required to brief and familiarise the watchkeeper with its contents.

Documentary evidence submitted to the MSIU showed that route r_09_23_2017_17_22_24 (Figure 6) was activated upon departure Hong Kong and the ECDIS settings checklist was completed by the master and navigational officer. According to the checklist, the safety depth/contour was 12 m, cross-track distance was five cables and the guard zone (anti-grounding alarm) was set for 22° and 12 minutes. Even though the voyage plan was approved and co-signed by the watchkeepers, 'no-go' area/limiting danger lines were drawn around the reef or its position disclosed in the written voyage plan.

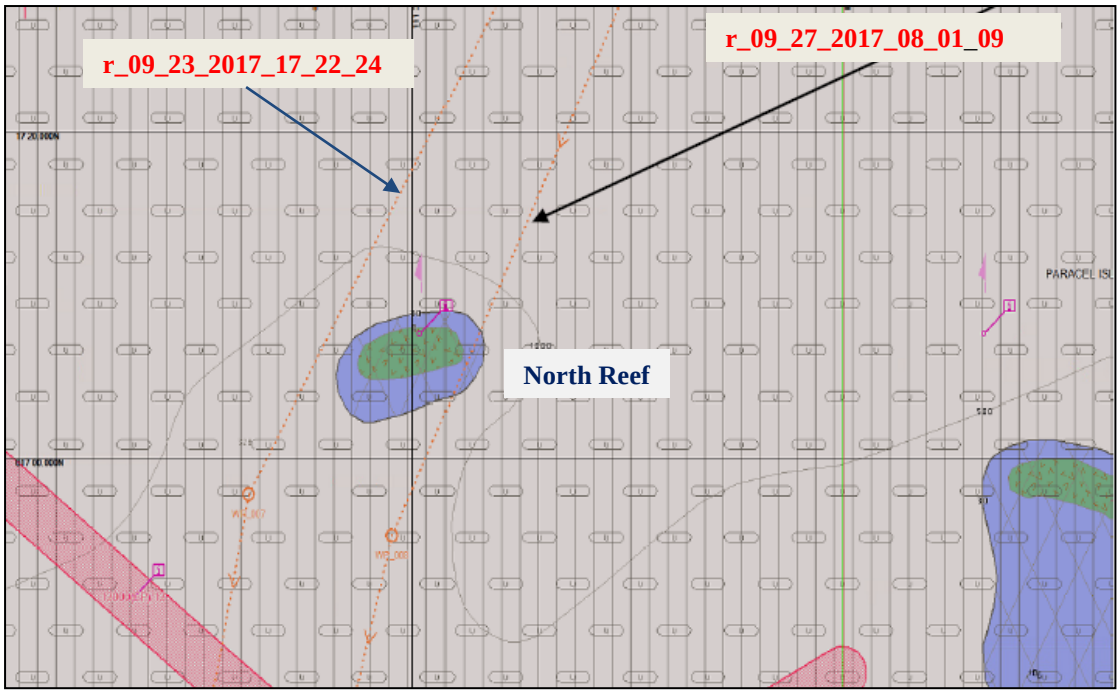

Figure 6: Reconstructed ECDIS image showing route r_09_27_2017_08_01_09 (test route) and original route r_09_23_2017_17_22_24

Source: Company documents

2.5 Events Leading to the Grounding

While the application of navigational procedures at the start of the voyage satisfied the SMS requirements, there were no detailed guidelines in the SMS Manual as to how changes in the original passage plan should be affected while at sea or implemented on the ECDIS. It is apparent and the evidence available to the MSIU is also suggestive that the activation of the revised route did not raise concern. Shortly after the charterers recommended changes; route with file name r_09_27_2017_08_01_09 (Figure 6) was activated.

Route r_09_27_2017_08_01_09 (Figure 6) had been created earlier and saved in the active route folder as a test route to Indonesia. It appears likely that on the changeover of the route at sea, the test route was inadvertently clicked and uploaded on the ECDIS. It remains unclear, however, to the safety investigation as to why the route was deactivated and activated during the chief mate and third mate's navigational watch.

As noted in Figure 6, (test route) r_09_27_2017_08_01_09 appears outside the Eastern limit of the reef and across the 30 m depth contour, which may account for no navigational dangers highlighted on the ECDIS by the system's automatic route scan. Consequently, ENCs were not checked for visual verification and the potential danger of sailing in the close proximity of the reef was not recognised. Furthermore, the

master, who had indeed authorised changes in the original plan, was not involved in its activation on the ECDIS. Moreover, he did not envisage incorrect route activation and must have assumed that the route monitored by the watchkeepers was the charterers' defined route RTE3 (Figure 7). It is plausible that directional similarity of the route with the original and charterers route on this leg of the passage may not have been easily discernible and the erroneous route displayed on the ECDIS was not detected by the bridge team.

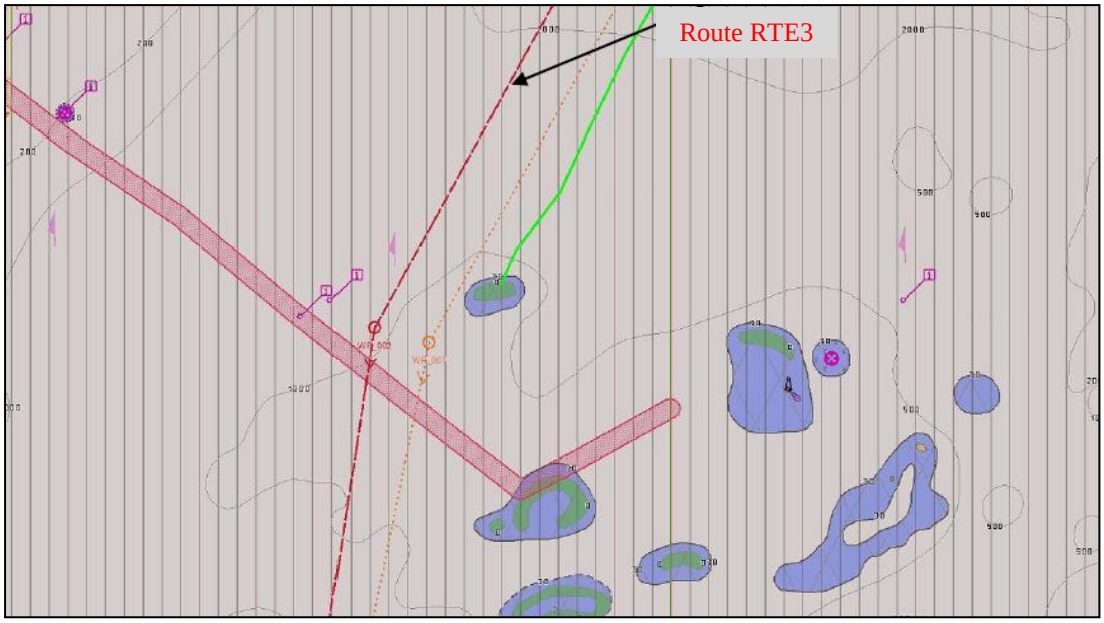

Figure 7: Reconstructed ECDIS image showing charterers' route plan RTE3 and track covered by *Marbella* (green).

Source: Company documents

At midnight, the second mate arrived on the bridge to relieve the third mate. The navigation checklist on watch handover was completed and logged in the logbook. At the time of watch changeover, *Marbella* was in position 17° 43.69' N 111° 51.16' E. The course was 205° and speed over the ground 11.70 knots. As there had not been any significant deviation of course displayed on the ECDIS, the second mate did not call the master.

The visibility was good and the traffic was light to moderate. There was no lookout[5] and the OOW was navigating mainly by sight and by ship's radar. North Reef, which lay close to the route and identifiable in dusk mode setting (Figure 8), was not seen by the second mate. It is possible that the scale was not optimised and the reef was not

[5] *Marbella*'s managers reported that BNWAS active in manual mode.

viewable on the ECDIS displaying the ENC. It would appear that although the ECDIS was the primary means of navigation, its innumerable functions were not used to their full potential. Throughout the period leading up to the grounding, the navigational OOW was unaware of the reef close ahead.

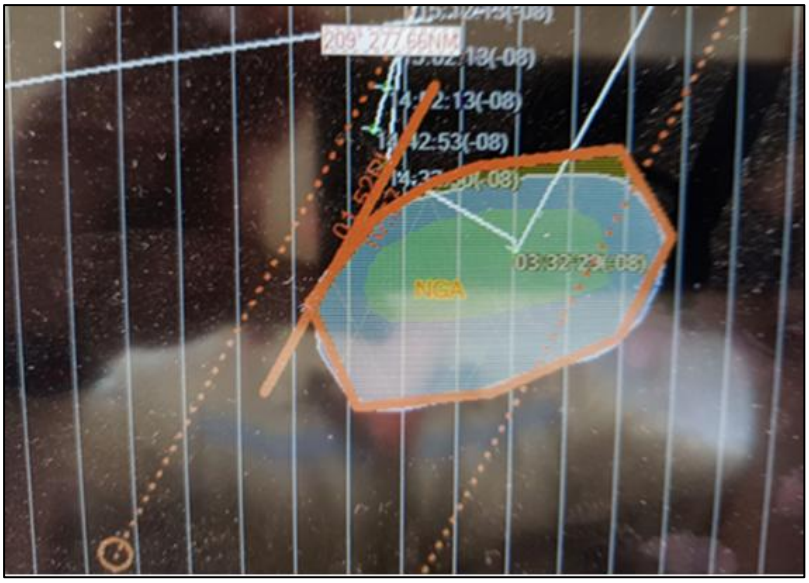

Figure 8: Reconstructed ECDIS image showing North Reef in dusk mode setting
Source: Company documents

Shortly after making an alteration of course to starboard to clear fishing vessels, the OOW reportedly sighted flashing lights ahead, which were mistaken for fishing nets signal. He set the autopilot on a course of 199° to pass amidst the flashing lights. No GPS positions were plotted and the vessel's track on the ECDIS was not the monitored. ARPA was not used and the navigational OOW's observations of the radar targets were perfunctory.

Examination of radar images captured by the VDR displayed a weak outline of North Reef at three nautical miles range (Figure 9). Since a landfall was not anticipated, it was unlikely that the OOW regarded the randomly reflected radar signals as coming from the reef and at no time considered the situation a risk to safe navigation.

Figure 9: Image showing North Reef at three-mile range on X-band radar (scale 12 nautical mile).

Moreover, an analysis of the ECDIS log and VDR submitted to the MSIU, underlined the fact that in the approaches to the reef, no record were entered of ECDIS guard zone alarm, which was intended to alert the OOW of impending grounding, captured on the VDR or logged in the ECDIS logbook[6]. With no advance warning from the ECDIS and no look-out on the bridge, the OOW's situational awareness was compromised as the vessel drew closer to the reef.

[6] In the post-accident examination, safety alarms - visual and audible – were found to be fully functional. Managers firmly believe in unauthorized access of ECDIS settings and the disabling/muting of ECDIS alarms.

THE FOLLOWING CONCLUSIONS 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 Whilst steering a course to clear fishing vessels *Marbella* navigated into shallow waters and ran aground on North Reef, Paracel Islands.

3.2 Latent Conditions and other Safety Factors

.1 The bridge was solely manned by one person;

.2 The absence of a dedicated look-out at night meant a missing a safety barrier for one-person error;

.3 'No-go' area/limiting danger lines were created around the reef or its position disclosed in the written voyage plan;

.4 It appears likely that on the changeover of the route at sea, the test route was inadvertently clicked and uploaded on the ECDIS;

.5 ENCs were not checked for visual verification and the potential danger of sailing in the close proximity of the reef was not recognised;

.6 The master, who had indeed authorised changes in the original plan, was not involved in its activation on the ECDIS;

.7 It is plausible that directional similarity of the route with the original and charterers route on this leg of the passage may not have been easily discernible and the erroneous route displayed on the ECDIS was not detected by the bridge team;

.8 It is possible that the scale was not optimised and the reef was not viewable on the ECDIS displaying the ENC;

.9 It would appear that although the ECDIS was the primary means of navigation, its innumerable functions were not used to their full potential;

.10 The OOW reportedly sighted flashing lights ahead, which were mistaken for fishing nets signal;

.11 Since a landfall was not anticipated, it was unlikely that the OOW regarded the randomly reflected radar signals as coming from the reef and at no time considered the situation a risk to safe navigation;

.12 With no advance warning from the ECDIS and no look-out on the bridge, the OOW's situational awareness was compromised as the vessel drew closer to the reef.

3.3 Other Findings

.1 The use of alcohol, drugs and fatigue was not considered to be a contributing factor to this accident;

.2 It remains unclear, however, to the safety investigation as to why the route was deactivated and activated during the chief mate and third mate's navigational watch.

4 RECOMMENDATIONS

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

TMS Bulkers Limited is recommended to:

18/2018_R1 Review and include in the SMS a detailed and comprehensive procedure on implementing changes to the approved passage plan at sea and activating on the ECDIS;

18/2018_R2 Ensure that all crewmembers are thoroughly familiar with safe navigational procedures including posting of a look-outs at sea.

ANNEXES

Annex 1 Passage Plan: Hog Kong, China to Tarahan, Indonesia r_09_23_2017_17_22_24

ITMS BULKERS LTD

PASSAGE PLAN
General Data

Work Form WF/MRS/534
Issue Date: 01.05.14
Revision No: 001
Authorised By: GM(B)

Voyage Number	52B
Port of Departure	HONG KONG SE LAMMA ANCH.
Date of Departure	26-Sep-2017
Time of Departure	22:00
Time Zone	8 HRS
Density	1.022
Allowance for density	N/A
Departure Draft (F)	4.40 m
Departure Draft (A)	7.83 m
Departure Air Draft	39.25 m
Departure Deadweight	24,009 MT
Departure Displacement	34,219 MT
DISTANCES	
Total Dist. Pilot to Pilot	2065 Nm
Outward Pilot Distance	0.0 Nm
Inward Pilot Distance	0.0 Nm
TOTAL DISTANCE	2065.0

Laden / Ballast	BALLAST
Port of Arrival	TARAHAN COAL TERMINAL
Date of Arrival	2-Oct-2017
Est. Time of Arrival	13:00LT
Time Zone	8 HRS
Density	1.022
Allowance for density	N/A
Arrival Draft (F)	4.43 m
Arrival Draft (A)	7.75 m
Arrival Air Draft	39.33 m
Arrival Deadweight	23,159 MT
Arrival Displacement	34,219 MT

STEAMING TIME	
Average Speed (KTS)	Voyage Steaming Time
13.50 Kn	06 d : 8 h : 57 m
13.00 Kn	06 d : 14 h : 50 m
12.50 Kn	06 d : 21 h : 12 m
12.00 Kn	07 d : 4 h : 05 m

SIGNATURE RECORD			
Prepared by Nav. Off.	[redacted]	Chief Officer	[redacted]
Approved by Master		2nd Officer	
		3rd Officer	
		Extra Officer	

Page 1 of 2

ENC GB collection status

Vessel Name: MARBELLA
Identifier: IMO 9189782
ENC Update Reference Date: 24 Sep 2017 : WK39/2017
Date of Report: 29 Sep 2017 (09:57)
Content: Filtered for route plan "r_09_23_2017_17_22_24_Route"
Start WP: HONG KONG LAMA [22.166667N, 114.158333E]
End WP: TARAHAN COAL JETTY [5.519167S, 105.305000E]

Chart Status Summary

Chart Status:	Count:
Total:	26
Up to Date:	21/26
Not Up to Date:	5/26
Withdrawn:	0/26
Unknown:	0/26

Data collection: GB					
Cell name	*Edition*	*Update*	Issue date	*Status*	*Permit status*
ID300425	2	0	10 Jul 2015	Up to Date	Valid till 31/12/2017
ID300426	4	3	14 Feb 2017	Up to Date	Valid till 31/12/2017
ID202868	4	1	10 Mar 2017	Up to Date	Valid till 31/12/2017
ID300428	2	5	14 Feb 2017	Up to Date	Valid till 31/12/2017
ID202869	7	0	21 Jun 2017	Up to Date	Valid till 31/10/2017

TMS BULKERS LTD

PASSAGE PLAN
Voyage Plan

Work Form WF/MRS/S
Issue Date: 01.05.
Revision No: 0
Authorised By: GM(

HONG KONG(C.O.S.P)- TARAHAN (PILOT STATION)

W.P. NO.	LATITUDE	LONGITUDE	TRUE COURSE	DIST. TO NEXT WP	DIST. TO GO	ETA TO W.P	ACTUAL TIME PASSED	MIN DEPTH	REMARKS	P.F.I	B. W. CAT.
01	22.°10'.00 N	114.°09'.87 E	211.9 °	1.8 Nm	2065 Nm	26-Sep-17 22:00		30.2	SOUTH LAMMA ISLAND		
02	22.°08'.51 N	114.°08'.87 E	267.2 °	2.7 Nm	2064 Nm	26-Sep-17 22:08		33	TSS		
03	22.°08'.38 N	114.°05'.98 E	200.6 °	14.3 Nm	2061 Nm	26-Sep-17 22:20		74	OUT TSS		
04	21.°54'.99 N	114.°00'.55 E	226.0 °	10.6 Nm	2047 Nm	26-Sep-17 23:26		323	BEIJIAN ISLAND		
05	21.°47'.65 N	113.°52'.37 E	194.1 °	47.2 Nm	2036 Nm	27-Sep-17 00:15		200	WP 015		
06	21.°01'.93 N	113.°40'.02 E	208.7 °	278.8 Nm	1989 Nm	27-Sep-17 03:53		800	WP 016		
07	16.°57'.79 N	111.°18'.61 E	192.3 °	586.4 Nm	1710 Nm	28-Sep-17 01:20		75	WP 013		
08	07.°25'.97 N	109.°10'.60 E	182.7 °	224.1 Nm	1124 Nm	29-Sep-17 22:26		45	WP 012		
09	03.°42'.50 N	109.°00'.20 E	229.8 °	67.0 Nm	900 Nm	30-Sep-17 15:41		38.0	WP 011		
10	02.°59'.32 N	108.°09'.08 E	218.5 °	175.8 Nm	833 Nm	30-Sep-17 20:50		37	WP 009		
11	00.°41'.99 N	106.°19'.77 E	155.5 °	59.5 Nm	657 Nm	01-Oct-17 10:21		25	WP 017		
12	00.°12'.09 S	106.°44'.38 E	136.7 °	149.9 Nm	597 Nm	01-Oct-17 14:56		25	WP 008		
13	02.°00'.97 S	108.°27'.02 E	106.1 °	54.6 Nm	447 Nm	02-Oct-17 02:28		34	WP 020		
14	02.°16'.12 S	109.°19'.42 E	154.7 °	31.4 Nm	393 Nm	02-Oct-17 06:40		24.0 m	WP 021		
15	02.°44'.45 S	109.°32'.80 E	179.8 °	62.5 Nm	361 Nm	02-Oct-17 09:04		49.0 m	WP 022		
16	03.°46'.82 S	109.°32'.98 E	241.3 °	202.1 Nm	299 Nm	02-Oct-17 13:53		47.0 m	WP 023		
17	05.°23'.63 S	106.°35'.38 E	230.1 °	29.2 Nm	97 Nm	03-Oct-17 05:26		23.0 m	SUNDA STRAIT IN		
18	05.°42'.29 S	106.°12'.92 E	243.8 °	35.5 Nm	68 Nm	03-Oct-17 07:40		26.0 m	SUNDA STRAIT		
19	05.°57'.94 S	105.°41'.01 E	315.4 °	32.2 Nm	32 Nm	03-Oct-17 10:24		25.0 m	WP 021		
20	05.°35'.08 S	105.°18'.36 E			0 Nm	03-Oct-17 12:52		24.0 m	TARAHAN PILOT STATION		

r_09_23_2017_17_22_24_Route
Chart system route: r_09_23_2017_17_22_24_Route.rtx

Route name: r_09_23_2017_17_22_24_Route

Route length: 2067.41
Number of waypoints: 24

Coordinates are printed in WGS84 datum.

WP	Name	Latitude	Lontitude	DIST to	Crs to
	RAD XTD	SOG TTG	ETA		Leg
1	WP_001	22 10.000N	114 09.500E	1.59	201.38
	N/A N/A	12.00 00:00:00	N/A		RL
2	TSS	22 08.518N	114 08.877E	2.69	267.13
	0.50 NM 0.10 NM	10.00 00:09:30	29/09 17:59:27(-08)		RL
3	OUT_TSS	22 08.383N	114 05.988E	14.26	200.74
	0.50 NM 0.10 NM	10.00 00:16:06	29/09 18:15:33(-08)		RL
4	BEIJIAN_ISLAND	21 54.998N	114 00.551E	10.55	226.11
	0.50 NM 0.10 NM	12.00 01:11:18	29/09 19:26:51(-08)		RL
5	WP_015	21 47.659N	113 52.379E	47.00	194.20
	0.50 NM 0.10 NM	12.00 00:52:44	29/09 20:19:35(-08)		RL
6	WP_016	21 01.935N	113 40.027E	277.66	208.85
	0.50 NM 0.10 NM	12.00 03:54:58	30/09 00:14:33(-08)		RL
7	WP_013	16 57.797N	111 18.610E	607.65	191.27
	0.50 NM 0.10 NM	12.00 23:08:17	30/09 22:22:50(-07)		RL
8	WP_012	06 59.210N	109 17.280E	196.50	184.97
	0.50 NM 0.10 NM	12.00 50:38:13	03/10 01:01:03(-07)		RL
9	WP_011	03 42.503N	109 00.205E	66.79	229.95
	0.50 NM 0.10 NM	12.00 16:22:30	03/10 17:23:33(-07)		RL
10	WP_009	02 59.320N	108 09.082E	175.08	218.69
	0.50 NM 0.10 NM	12.00 05:33:56	03/10 22:57:29(-07)		RL
11	WP_017	00 41.992N	106 19.770E	59.20	155.39
	0.50 NM 0.10 NM	12.00 14:35:24	04/10 13:32:53(-07)		RL
12	WP_008	00 12.096S	106 44.383E	149.36	136.50
	0.50 NM 0.10 NM	12.00 04:56:00	04/10 18:28:53(-07)		RL

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r_09_23_2017_17_22_24_Route

13	WP_020			02 00.976S	108 27.026E	54.58	106.04		
0.50 NM	0.10 NM	12.00	12:26:47	05/10	06:55:40(-07)	RL			
14	WP_021			02 16.127S	109 19.422E	31.21	154.58		
0.50 NM	0.10 NM	12.00	04:32:53	05/10	11:28:33(-07)	RL			
15	WP_022			02 44.451S	109 32.804E	62.07	179.83		
0.50 NM	0.10 NM	12.00	02:36:01	05/10	14:04:34(-07)	RL			
16	WP_023			03 46.829S	109 32.985E	190.52	241.83		
0.50 NM	0.10 NM	12.00	05:10:22	05/10	19:14:56(-07)	RL			
17	WP_024			05 17.220S	106 44.816E	17.44	270.11		
0.50 NM	0.10 NM	12.00	15:52:35	06/10	11:07:31(-07)	RL			
18	WP_025			05 17.185S	106 27.330E	15.21	278.47		
0.50 NM	0.10 NM	12.00	01:27:13	06/10	12:34:44(-07)	RL			
19	WP_019			05 14.935S	106 12.251E	47.67	211.46		
0.50 NM	0.10 NM	10.00	01:31:15	06/10	14:05:59(-07)	RL			
20	WP_027			05 55.793S	105 47.304E	7.32	270.19		
0.50 NM	0.10 NM	12.00	03:58:20	06/10	18:04:19(-07)	RL			
21	WP_022			05 55.769S	105 39.961E	16.70	307.77		
0.50 NM	0.10 NM	10.00	00:43:53	06/10	18:48:12(-07)	RL			
22	WP_028			05 45.492S	105 26.716E	8.53	318.56		
0.50 NM	0.10 NM	12.00	01:23:29	06/10	20:11:41(-07)	RL			
23	WP_021			05 39.066S	105 21.052E	8.34	340.80		
0.50 NM	0.10 NM	10.00	00:51:11	06/10	21:02:52(-07)	RL			
24	Tarahan_Coal_Termina			05 31.150S	105 18.300E	0.00	0.00		
0.50 NM	0.10 NM	12.00	00:41:42	06/10	21:44:34(-07)	RL			

TMS BULKERS LTD

PASSAGE PLAN
Other Remarks

Work Form WF/MRS/53
Issue Date : 01.05.1
Revision No: 00
Authorised By: GM(E

A.	Vessel will be proceed from HONG KONG(SE LAMMA ANCH} to TARAHAN COAL TERMINAL{INDONESIA} in ballast condition for loading.
B.	**FOLLOW REPORTING SYSYTEM WITCH ARE CLEAR MARKED ON THE ELECTRONIC CHARTS**
C	**Garbage: Disposal of garbage to be made strictly according to MARPOL Regulation, as directed by Ch. Off. only.ALL PLASTIC to be collected as per C/O instructions.NO ANY DISPOSAL OVERBOARD IS PERMITED**
	Any waste disposal at sea is permitted only at distances than 24 nm from the above artificial baselines and outwards,while within the above areas no waste disposal at sea is permitted.(SAFETY BULLETIN No 348-CHINA WASTE DISPOSAL REGULATIONS)
	The MARPOL 73/78 must be strictly observed on board at any time,disposal of plastics overboard is strongly prohibited or any other substance without the full knowledge of the Master or Ch.officer in order to prevent unnoticed of garbage over board.All crew received instrctions regarding proper disposal of garbage.
	OWS to be used only as per MARPOL Regulation 73/78 and C/E to consult with bridge before start.
	Any waste disposal at sea is permitted only at distances than 24 nm from the above artificial baselines and outwards,while within the above areas no waste disposal at sea is permitted.(SAFETY BULLETIN No 348-CHINA WASTE DISPOSAL REGULATIONS)
D.	**Emergency Anchorage (HONG KONG):Anchorage area**
E.	In positioning method follow the Company Policy regarding positioning fixing by Double means.method such as Radar bearings and distances to landmarks and by GPS
F.	In all coastal waters position must be fixed primery by radar from land or islets and secondaty by GPS.
G.	In open sea position must be fixed primary by celestrial observations and secondary by GPS
H.	During passing coastal water and channels take 5 to 10 minutes positioning interval to avoid vsl run into danger!
I.	Be aware of fishing boats and keep good sharp look out.
J.	**No Go Areas indicated / marked on charts.**
	Parallel index, primary and secondary methods of fixing position should be apllied in every 20 minutes interval to avoid the
	vessel run into danger, during proceeding near coast and VSTZ(s) according to the plotting at the navigation charts.
K.	**ARRIVAL PORT INFORMATION:**
	BERTH No.III
	PILOT VHF CH.12/14
L.	**Abort Point**
M.	**Emergency Anchorage :**
N.	**Radiocommunication:**
	GMDSS areas: A1, A2, A3.
	For Distress, Urgency & Safery communication should be used the CRS from INDONESIA AND CHINA as listed in ADRS 1345 AREA 2 & ADRS 2 AREA 2

Annex 2 Charterers' Route Plan RTE3

Route Plan

C-MAP

WGS-84 Route name: RTE3

Port of departure: **HK**
Port of destination: **TARAHAN**
Ship Draft: **0.0 m**

WP	Name	LAT	LON	Radius	Deviation	Leg Length	Distance To Arrival	Bearing
1		22°06.630'N	114°05.320'E	100	50	347.5	1806.6	209.1°
2		17°00.269'N	111°09.309'E	100	50	60.5	1459.2	188.5°
3		16°00.226'N	111°00.005'E	100	50	810.5	1398.7	190.9°
4		02°39.983'N	108°28.116'E	100	50	283.2	588.2	190.1°
5		02°00.209'S	107°38.483'E	100	50	64.0	305.0	219.3°
6		02°49.973'S	106°57.933'E	100	50	10.2	240.9	167.5°
7		02°59.986'S	107°00.136'E	100	50	15.3	230.7	191.3°
8		03°15.085'S	106°57.122'E	100	50	115.3	215.4	205.1°
9		05°00.005'S	106°08.165'E	100	50	10.0	100.1	177.1°
10		05°09.997'S	106°08.675'E	100	50	12.2	90.1	183.4°
11		05°22.262'S	106°07.958'E	100	50	39.2	77.9	211.6°
12		05°55.793'S	105°47.322'E	100	50	7.2	38.7	259.1°
13		05°57.166'S	105°40.200'E	100	50	8.0	31.5	318.5°
14		05°51.168'S	105°34.907'E	100	50	3.9	23.5	289.7°
15		05°49.855'S	105°31.246'E	100	50	9.9	19.7	312.5°
16		05°43.148'S	105°23.937'E	100	50	9.8	9.8	325.3°
17		05°35.080'S	105°18.360'E	100	50			