



HELLENIC REPUBLIC



HELLENIC BUREAU FOR MARINE CASUALTIES INVESTIGATION



**MARINE CASUALTY SAFETY INVESTIGATION REPORT
02/2014**

**GROUNDING OF INCE INEBOLU
ON ASTYPALAI A ISLAND ON 05-09-2014**



December 2015

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FOREWORD

The Hellenic Bureau for Marine Casualties Investigations was established by Law 4033/2011 (Government Gazette 264/12.22.2011), in the context of implementing EU Directive 2009/18/EC. HBMCI conducts technical investigations into marine casualties or marine incidents with the sole objective to identify and ascertain the circumstances and contributing factors that caused it through analysis and to draw useful conclusions and lessons learned that may lead, if necessary, to safety recommendations addressed to parties involved or stakeholders interested in the marine casualty, aiming to prevent or avoid similar future marine accidents.

The conduct of Safety Investigations into marine casualties or incidents is independent from criminal, discipline, administrative or civil proceedings whose purpose is to apportion blame or determine liability. This investigation report has been produced without taking under consideration any administrative, disciplinary, judicial (civil or criminal) proceedings and with no litigation in mind. It does not constitute legal advice in any way and should not be construed as such. It seeks to understand the sequence of events occurred on the 5th of September 2014 and resulted in the examined serious marine casualty. Fragmentary or partial disposal of the contents of this report, for other purposes than those produced may lead to misleading conclusions. The investigation report has been prepared in accordance with the format of Annex I of respective Law (Directive 2009/18/EC) and all times quoted are vessels' time that is Local Time (LT, UTC +3) unless otherwise stated.

Under the above framework HBMCI has been examining the grounding of Bulk Carrier (B/C) INCE INEBOLU, occurred on the 5th of September 2014, in the sea area South East of Astypalaia Island. This report is mainly based on information and evidence that have been derived from the interview process and information collected from those individuals involved in the marine casualty. Vessel's S-VDR data was not recovered and submitted for the scope of the safety investigation.

GLOSSARY OF ABBREVIATIONS AND ACRONYMS

1	AB	Able seaman
2	AIS	Automatic identification system
3	ARPA	Automatic radar plotting aid
4	BNWAS	Bridge Navigational Watch Alarm System
5	CoC	Certificate of Competency
6	COLREGS	International regulations for preventing collisions at sea, 1972, as amended
7	°	degrees (of angle)
8	GMDSS	Global maritime distress and safety system
9	GOC	General Operators' Certificate for GMDSS
10	GPS	Global positioning system
11	gt	gross tonnage
12	HCG	Hellenic Coast Guard
13	Integrated Marine Data Environment (IMDatE)	a technical framework that collects and combines data from EMSA's maritime applications and other external sources
14	IMO	International Maritime Organization
15	ISM	International Management Code for the safe operation of ships and for pollution prevention
16	KW	Kilowatt
17	LT	local time
18	nm	nautical miles
19	O(s)OW	Officer(s) on the watch
20	OS	Ordinary seaman (deck crew)
21	rpm	revolutions per minute
22	SMC	Safety management certificate
23	SMS	Safety management system
24	SOLAS	Convention for the Safety of Life at Sea 1974, as amended
25	STCW	International Convention on Standards of Training, Certification and Watchkeeping for seafarers
26	S-VDR	Simplified Voyage Data Recorder
27	UMS	Unmanned Machinery Space
28	UTC	Universal co-ordinated time
29	VDR	Voyage data recorder
30	VHF	Very high frequency (radio)
31	bfrs	Force of wind in beaufort scale
32	DOC	Document of Compliance
33	knots	unit of speed equal to one nautical mile (1.852 km) per hour
34	MLC	Maritime Labour Convention
35	CoG	Course Over Ground. The actual path of a vessel with regard to the seabed, measured in degrees. Course may be relative to true north (true course) or magnetic north (magnetic course)
36	HDG	Heading. The direction in which a vessel is pointed at any given moment. Heading may be relative to true north (true heading) or magnetic north (magnetic heading)

1. EXECUTIVE SUMMARY

On the 5th of September 2014, at approximately 0405, the Turkish registered Bulk Carrier Ince Inebolu grounded on the rocky coastline South East of Astypalaia Island, in position lat: 36° 34.6 N, long: 026° 27.5E, approximately 0,8 nm from Cape Exopetra light house, at the South East Aegean Sea. At the time of the marine casualty, weather conditions were reported to be very good with very good visibility, wind force 2-3 Bft, WNW, sea was calm and it was still dark.

Ince Inebolu was on the sixth day of her passage in ballast condition, en route to Novorossiysk Port in Russia. On 30 August 2014, she had departed from the Hodeidah port in Yemen, located in Red Sea, where she had discharged her grain cargo and headed towards Suez Canal. She had exited Suez Canal at afternoon hours on the 3rd of September.

Notwithstanding weather conditions were good and navigational watch was quiet at night hours on the 05 September 2014, Ince Inebolu ran aground under cruising speed of 12 knots.

The vessel suffered extensive cracks and indentations on her fore section, mostly lengthwise, about 21 meters in length and specifically at Forepeak tank, Collision bulkhead and No. 1 cargo Hold. Port and starboard side Ballast tanks and cargo Hold tank top were also affected and damaged due to the heavy contact with the rocky seabed. None of the crew was injured and no pollution was reported.

Following the incident Ince Inebolu's trim and stability condition was closely monitored by her crew and local Coast Guard Authority. Furthermore the owners contacted a Salvage Company to undertake vessel's refloating and removal and the anti-pollution response operation as well.

Ince Inebolu re-floated on 11 September 2014 and anchored with the assistance of Salvage Tug Megas Alexandros, close to Astypalaia port. On the 2nd of October Ince Inebolu was escorted by Salvage Megas Alexandros to Neorion Shipyard, Ermoupolis Syros, Greece in order to undergo permanent repairs.

The HBMCI launched a safety investigation into aforementioned marine accident. The investigation Team arrived at casualty site on the 6th of September 2014. Based on the finding of the investigation process it was evident that the OOW had shown a total disregard to COLREGS and relevant orders and instructions of Company's Safety Management System and was not monitoring the vessel's tracking positions in relation to the voyage plan. The safety investigation conducted has also highlighted additional contributing factors that led to the examined marine casualty as presented in the Analysis section.

Note:

- *This report is mainly based on information and evidence that have been derived from the interview process and information collected from those individuals involved in the marine casualty, as well as electronic positioning data provided by the competent authorities of the Hellenic Coastguard.*
Ince Inebolu's VDR could not offer any electronic information and data due to technical failures, as reported by its Manufacturer.
- *In respect to the above grounds, Commission Regulation (EU) No 1286/2011/Annex/paragraphs 4.2 & 4.3¹ have been generated in order to properly identify casual and contributing factors led to the marine accident.*

¹ **Abstract from COM. Regulation 1286/2011 "Common methodology for investigating marine casualties and incidents".**

4.2 Proper identification of causal factors requires timely and methodical investigation, going beyond the immediate evidence and looking for underlying conditions, which may be remote from the site of the marine casualty or incident, and which may cause other future marine casualties and marine incidents. Marine safety investigations should therefore in principle serve as a means of identifying not only immediate causal factors but also conditions that may be present in the whole operational process. To achieve this, the analysis of the evidence collected shall be thorough and iterative.

4.3 If a gap of information cannot be resolved and is filled in by logical extrapolation and reasonable assumptions, such extrapolation and assumptions shall be made clear in the wording of the report. A useful tool in this process can be the identification of all options and their analytical reduction to reach the most likely hypotheses.

2. FACTUAL INFORMATION

2.1 Vessel's Particulars

Name of vessel	INCE INEBOLU
Type of vessel	BULK CARRIER
Nationality/flag	TURKISH
Port of registry	INSTANBUL
IMO number	9254472
Call sign	TCPK7
DOC company	INCE DENIZCILIK VE TICARET A.S
IMO company no. (DOC)	1179757
Year built	11/2002
Shipyard	TSUNEISHI HEAVY INDUSTRIES (CEBU)
Classification society	NKK
Length overall	182.87 m
Breadth overall	32.26 m
Gross tonnage	30,011
Deadweight	46,955 t
Draught max.	12.216 m
Engine power	7800 kW
Service speed	13,5 knots
Hull material	Steel
Hull design	Double hull
Classification society	NKK
Last Port state Control Inspection	06-May-2014 Novorossiysk Russia (detained)



Figure 1. Ince Inebolu anchored at Astypalaia anchorage.

2.2 Bridge navigational equipment

Ince Inebolu's bridge navigation equipment included:

Equipment	Details
1 st Radar	9Ghz fitted with ARPA
2 nd Radar	3Ghz fitted with ARPA
S-VDR	DANELEC MARINE-DM 300
AIS	JRC JHS-182
Echo sounder	Type NA
Bridge Navigational watch Alarm System	Navitron NT990

2.3 Weather data

Wind – direction	WNW
Wave height	calm
Visibility	good
Light/dark	Dark
Current	Unknown

2.4 Voyage particulars

Port of origin	Hodeidah, Yemen
Port of call	Novorossiysk, Russia
Type of voyage	International
Cargo information	No cargo, in ballast
Manning	22
Pilot on board	No
Number of passengers	0

2.5 Marine incident information

Type of marine incident	Grounding
IMO Classification	Serious marine casualty
Date, time:	05 September 2014 at 04:05 LT
Location	SE of Astypalaia Island, SE Aegean Sea, Greece
Position	36° 34.6 N – 026° 27,5 E
Ship's operation, voyage segment	At sea
Place on board	Fore section & bottom - structural damages
Human factor data	Yes
Consequences to individuals	No injuries
Consequences to environment	no pollution
Consequences to property	Structural damages to vessel's fore section

3. Narrative

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Ince Inebolu's VDR could not offer any electronic information and data due to technical failures, as reported by its Manufacturer.*
- *In respect to the above grounds, Commission Regulation (EU) No 1286/2011/Annex/paragraphs 4.2 & 4.3² have been generated in order to properly identify casual and contributing factors led to the marine accident.*

On 30 August 2014, Bulk Carrier Ince Inebolu sailed from Hodeidah (Yemen). She was in ballast condition with a forward draught of 4.20m and aft draught of 6.50m and was bound for Novorossiysk, Russia, with almost 1.500tons of bunkers on board.

At 0600, on 03 September 2014 Ince Inebolu reached the Suez Canal and following the pilot's embarkation she commenced the transit of the fairways from the southbound entrance of the Canal.

It was reported that due to the fact that the BNWAS was disturbing the pilot and the navigational team during the passage of the Suez Canal, the Master ordered to switch it off, following the pilot's request.

At approximately 1830 she exited the northbound fairway and continued with her passage plan in the Mediterranean Sea heading towards the Greek Islands.

3.1 Voyage plan

The voyage plan, according to Ince Inebolu "Shipboard operation procedure" was prepared by the 3rd Officer, was signed by the 2nd Officer and Chief Officer and approved by the Master.

Having exited the Suez Canal, Ince Inebolu had to run approximately 425 nm to the next waypoint, NW of Kinaros Islet keeping a continuous course of 318°.

Following the commencement of the passage at open sea, watches were carried out following the navigational watch schedule.

Ince Inebolu was navigating under a navigational pattern of three watches performed by the 3rd Officer (0800-1200/2000-2400), the Second Officer (0000-0400/1200-1600) and the Chief Officer (0400-0800/1600-2000). Each navigational watch also consisted of an AB as a Look out watch, according to International Regulations for Preventing Collisions at sea (rule 5), STCW Code/Chapter VIII/Part 4 & Part 4-1 and to vessel's Safety Management System. Ince Inebolu was navigating with the X-band radar in use, set in head-up display at 12nm range scale.

BNWAS was deactivated during the last two days prior to the marine accident.

² **Abstract from COM. Regulation 1286/2011.**

4.2 *Proper identification of causal factors requires timely and methodical investigation, going beyond the immediate evidence and looking for underlying conditions, which may be remote from the site of the marine casualty or incident, and which may cause other future marine casualties and marine incidents. Marine safety investigations should therefore in principle serve as a means of identifying not only immediate causal factors but also conditions that may be present in the whole operational process. To achieve this, the analysis of the evidence collected shall be thorough and iterative.*

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3.2 The cargo holds preparation and cleaning operation

As already reported, Ince Inebolu was in ballast condition en route to Novorossiysk, Russia, having discharged her cargo at Hodeidah, Yemen.

The cargo cleaning operations had been started following the departure from Yemen (30-08-2014) and were ceased during the Suez Canal transit on the 3rd of September.

Having exited the Canal, at late afternoon hours on the same day, the cargo holds cleaning operation had to be relaunched on the morning of the next day (04-09-2014) while Ince Inebolu would be navigating at open sea.

The Chief Officer, competent Officer for the deck operations, under Master's supervision, orders and instructions, was authorized by the Master to use the available deck crew personnel, for the cargo hold cleaning, meaning the Bosun and all four ABs, that is the one AB already exclusively working on deck and the three ABs that were forming part of the navigational watch, as look-outs. The two deck cadets that were serving on Ince Inebolu were also participating in the operation.

According to statements during the interview process, the deployment of all deck crew became necessary, due to the fact that the cargo holds cleaning operation required 4 to 5 days of work to be completed and there was little time before the arrival at the loading port of Novorossiysk, that was estimated at noon hours on the 8th of September 2014.

Apart from the above the management and disposal limitations of cargo holds wash water and residues were also taken into account under the applied MARPOL Annex V provisions.

At approximately 0800, on 04 September 2014, the cargo hold cleaning operation was launched under the Chief Officer's and Master's supervision with all the available deck crew personnel and was ceased in the afternoon, at around 1930.

Resultantly, the ABs that were forming part of the navigational watch were released from Look-out watch duties and were allowed to rest in their cabins after having completed their working day.

3.3 The Chief Officer 0400-0800/1600-2000 watch

The Chief Officer was performing the 1600-2000/0400-0800 navigational watch.

Having completed his 0400-0800 watch on the 4th of September, he was also engaged with the cleaning of cargo holds by supervising the operation, after having his hourly lunch break at 1200.

At 1550 he went on the bridge and took over the navigational watch following the procedures established through Safety Management System internal procedures.

It was stated that the navigational watch was quiet, sailing at open sea and look out watch was not posted. The Master came on the bridge at around 1830, as usual and stayed for almost an hour. They discussed the cargo cleaning operation progress and at approximately 1930 the Master left the bridge and went to his cabin to do paperwork.

At around 2010, the Chief Officer, having handed over the navigational watch to the 3rd Officer left the bridge and went to his cabin to rest and slept at approximately 2100.

3.4 The 3rd Officer 2000-2400 watch

The 3rd Officer went on the bridge almost five minutes before 2000 in order to relieve the Chief Officer. The Chief Officer handed over the watch to the 3rd Officer without reporting any noteworthy remarks in relation to navigation, as there was not any traffic in the navigated sea area. Consequently, no need of altering the steering course for avoiding other vessel's courses was reported to have been forced and steered course was following the charted one.

The 2000-2400 navigational watch was normal and uneventful and look out watch had not been posted, either. At approximately 2330, just prior to its completion, Ince Inebolu was entering the SE Aegean Sea, sailing through the sea area between the Islands of

Rhodes and Karpathos. She was running at approximately 13.5 knots, steering was in autopilot, set to 318° and her COG was recorded to 319° (figure 2).

The Master was reported to have visited the bridge at approximately 2340 and stayed till five minutes after midnight.

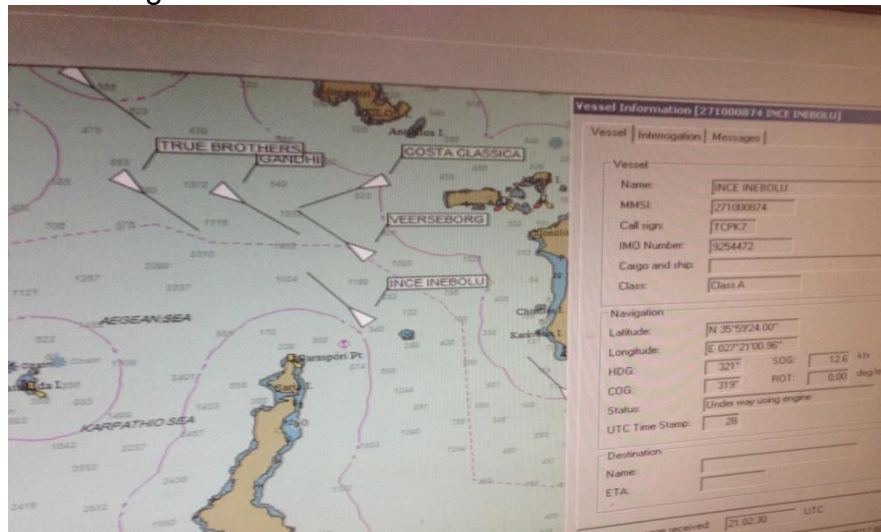


Figure 2. Ince Inebolu position at 2400 entering the Aegean Sea. (source HCG AIS).

3.5 The 2nd Officer 0000-0400/1200-1600 watch

On 04 September 2014, the 2nd Officer having completed his night watch 0000-0400 watch and went to his cabin to sleep. He woke up at approximately 1130, had lunch and went on the bridge to take over his navigational watch (1200-1600). Ince Inebolu was sailing at open sea and watch was in general uneventful. Look out watch was not posted as the AB was engaged with the cargo hold washing. Having handed over the navigational watch to the Chief Officer, he remained on the bridge until 1800, in order to carry out paperwork, related to the pre-arrival documents required at the destination loading port.

Following, he had dinner and watched TV in the mess-room. He went to his cabin to rest at approximately 2200, however he spent some time tidying up his cabin and was reported to have watched a movie on his personal laptop, until watch time.

Consequently, despite the fact that he was in his cabin practically resting he did not get any sleep.

At approximately 2350 the 2nd Officer went on the bridge and took over the navigational watch from the 3rd Officer. The watch handover was carried out normally under the procedures practiced on board according to the "Bridge Checklist for changing over the watch" that was completed and signed by him. Lookout watch was not posted.

The 2nd Officer stated that he was in good physical condition and capable of carrying out his duties.

Having taken the command of the watch, he proceeded with the standard recordings on the bridge log book and observations of vessel's course and condition.

The monitoring of the charted course as was projected under the passage plan was performed by plotting Ince Inebolu's position (Latitude & Longitude), extracted from her GPS on an hourly basis.

At approximately 0010, the 2nd Officer reported that he observed Ince Inebolu course and position and her track was found to be slightly off course, that is 0.61 nm to starboard, however considering the extent of drifting, he decided not to counteract by adjusting the autopilot and continued with the same heading (figure 3).

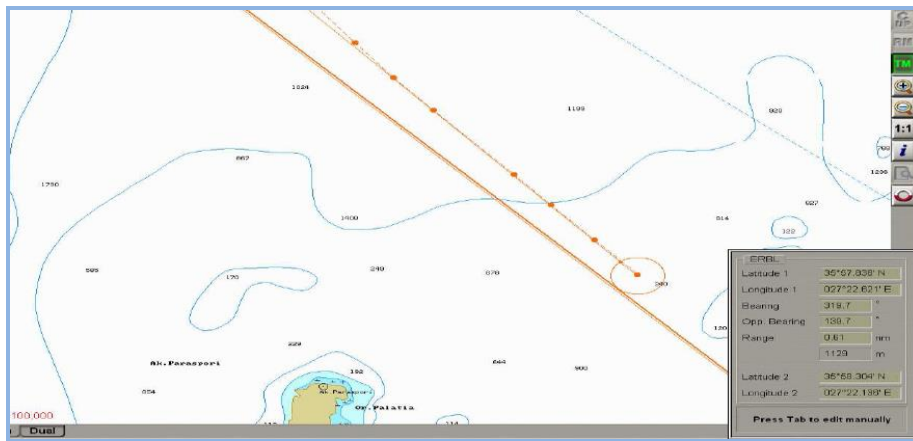


Figure 3. Ship's position at hand over of the watch (0000).VRM shows the extend of drifting to starboard (source HBMCI plotting chart).

By that time, Ince Inebolu had to run approximately 75nm to the next waypoint for the new setting of the course that was anticipated to be carried out by the Chief Officer during his night watch.

Almost half an hour post to the watch changeover, Ince Inebolu was approaching a slightly increased traffic area with a head-on and cross-track situation (figure 4).

Just prior to 0100, the 2nd Officer, having cleared the navigational situations, entered the ship's position on the navigational chart and observed that Ince Inebolu was still drifting to starboard, approximately 1.5 nm off her charted course (figure 5).

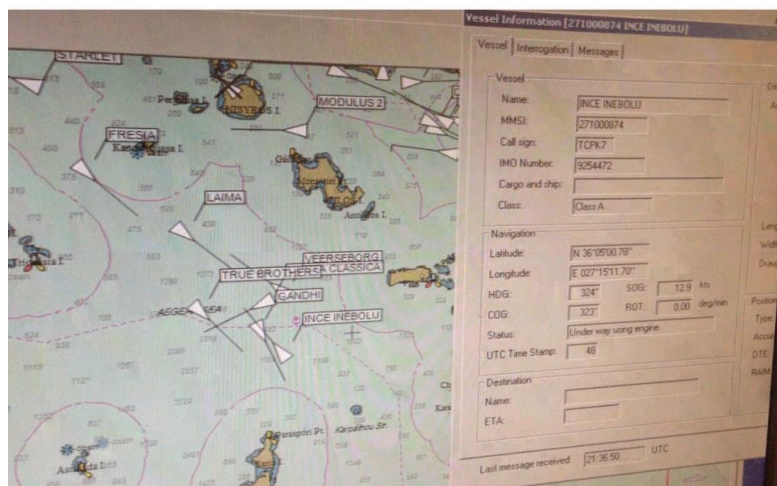


Figure 4. Ince Inebolu sailing in slightly increased traffic at 0035.(source HCG AIS).

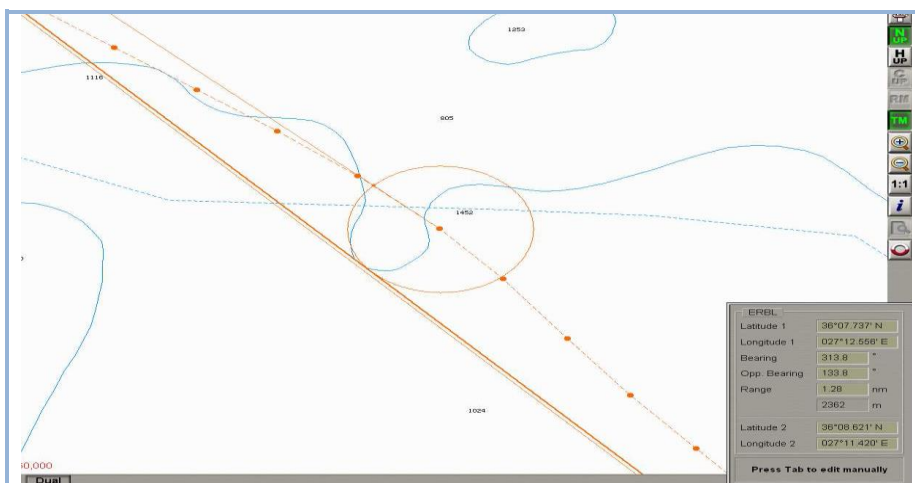


Figure 5. Ince Inebolu off course position at approximately 0100 following the adjustment by the 2nd Officer. VRM indicates the drift offset close to 1.5 nm (source HBMCI plotting chart).

He decided to readjust her course by setting the autopilot to 314° heading, that is 4° to port from the original keeping course (318°), in order to bring Ince Inebolu back on the charted course. A view of Ince Inebolu navigational status by that time, showing Ince Inebolu navigational data, as recorded by HCG AIS information system, is presented in following figure 6.

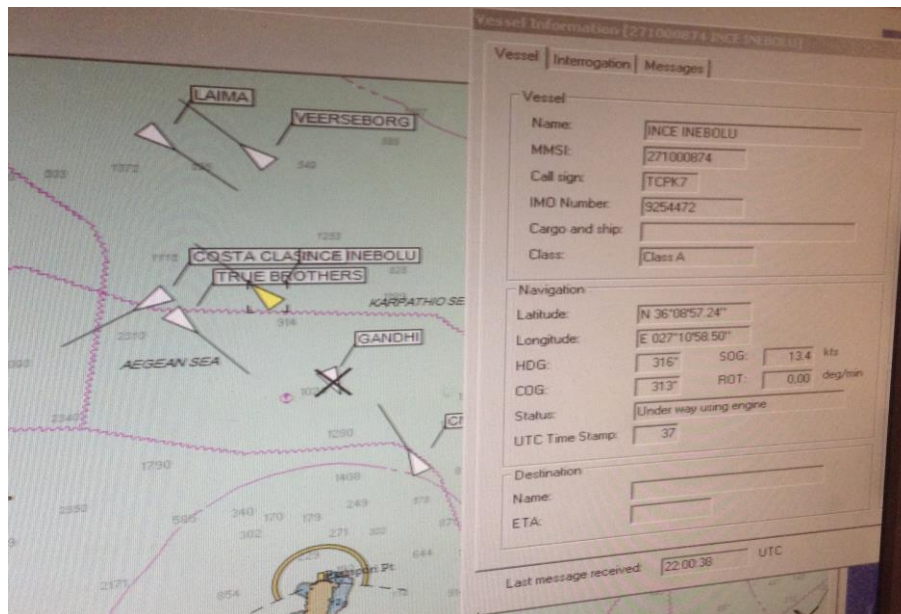


Figure 6. Ince Inebolu's position slightly after 0100. HDG 316° (COG 313°) running with 13.4 knots (source HCG AIS).

According to the 2nd Officer's statement, he carried on with the paperwork in the chart room while closely monitoring vessel's passage. By that time, as stated by the 2nd Officer, Ince Inebolu was underway running at 13.4 knots and maintaining a course set of 314°. However his allegation in relation to course was not confirmed, as based on the electronic data from HCG AIS, by that time, Ince Inebolu HDG was recorded to 310° and her COG to 306°, that that is 04° offset and further to port from the believed course by the 2nd Officer, probably due to encountering drift (figure 7).

The fact that the ship's reported, by the 2nd Officer, keeping course (314°) varied from the one recorded by HCG AIS (310°), denotes that the information given during the interview process, was not reliable, probably due to imprecise observations and false appraisal. Resultantly, Ince Inebolu was speedily coming back on the charted course, mainly affected by both drift and course setting.

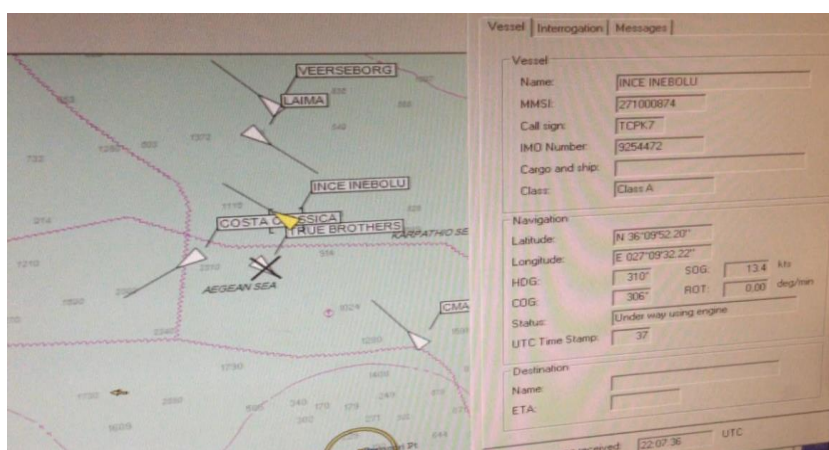


Figure 7. Ince Inebolu position at 0107, HDG 310° (COG 306°), speed at 13.4 (source HCG AIS).

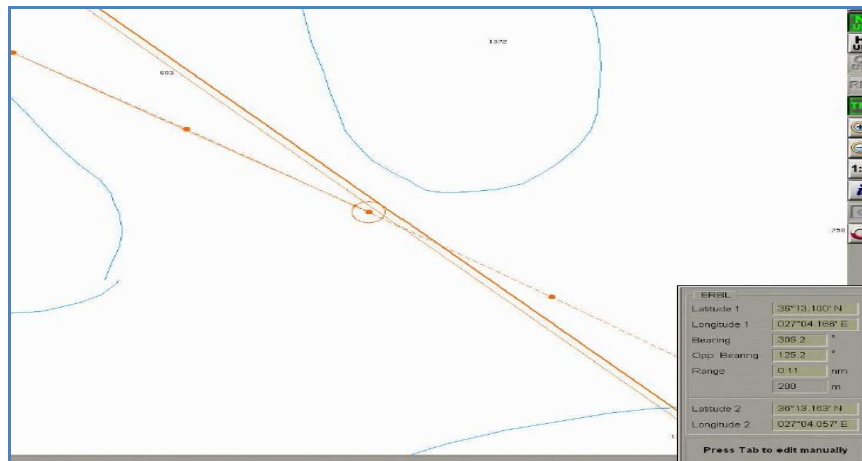


Figure 8. Ince Inebolu off course position to port at 0131(source HBMCI plotting chart).

At approximately 0130, Ince Inebolu heading course (figure 8) had crossed the plotted course (318°), as was projected on the chart under her passage plan, however it was not observed by the 2nd Officer.

At approximately 0150, he reported to had checked the keeping course on the radar and saw no changes and sat on the chair at the center of the bridge between the steering wheel and the operating X-Band radar (figure 9).



Figure 9. The chair placed at the center of the bridge.

Nonetheless his statement could not be confirmed based on the electronic data of HCG AIS, as by 0203 Ince Inebolu's Heading course and Course Over Ground were respectively recorded at 310° and 304° , probably due to Ince Inebolu's continuous drifting (figure 10).

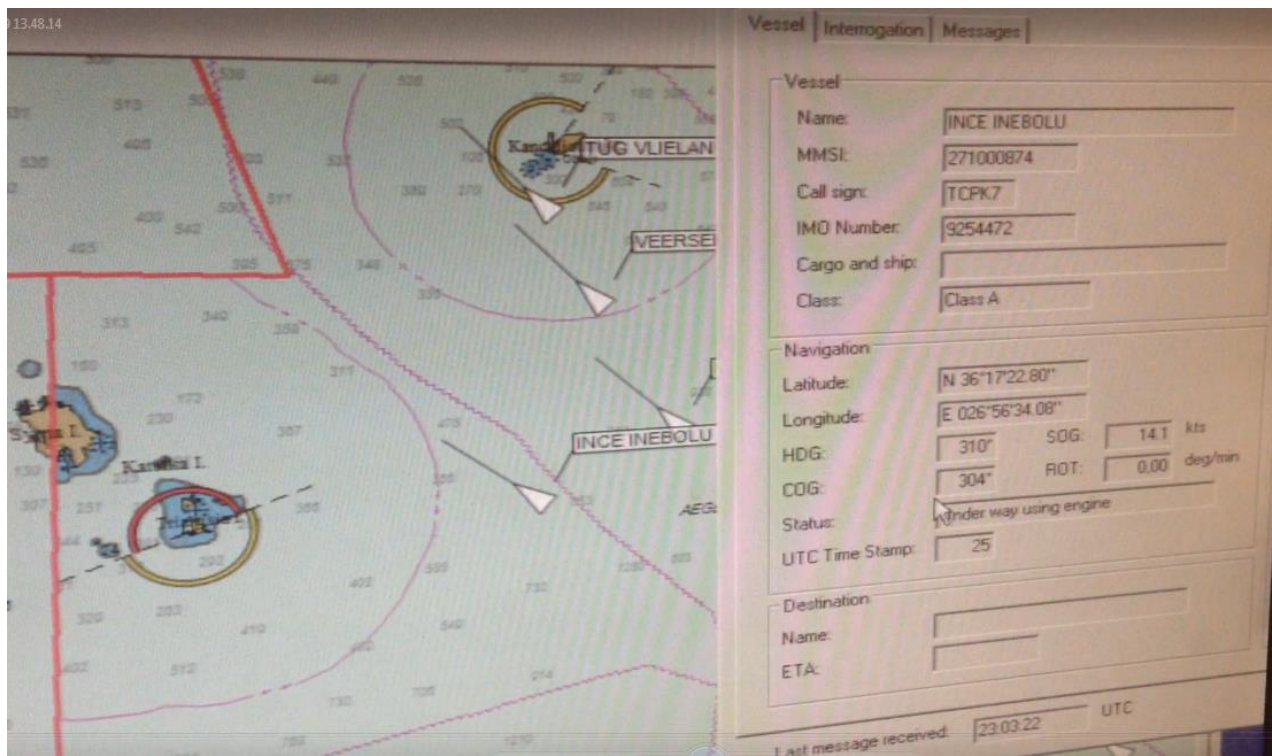


Figure 10. Ince Inebolu passage & navigating data at 0203 while bridge was unattended. HDG 310° and COG 304° at 14.1 knots (source HCG AIS).

The 2nd Officer reported that he intended to plot vessel's position on the chart and record it in the logbook at around 0200. However, shortly afterwards he fell asleep.

From that time and until the time of the grounding at approximately 0405, the 2nd Officer fell asleep, possibly due to lack of sleep that generated fatigue likely deepened by the absence of stimulation and action. Resultantly the Chief Officer was neither called for relief nor came on the bridge prior to 0400.

During the investigation process on board Ince Inebolu and the meetings held between the Investigation Team, the Company's representatives and vessel's Officers, it was generally striking and mystifying how the OOW slept for over two hours sitting on the bridge chair, in an almost upright and not so comfortable position.

3.6 The grounding

Ince Inebolu maintained the course set by the 2nd Officer at 0100 for the next two hours, a time period during which the bridge remained unattended (figures 10, 11 & 12) .

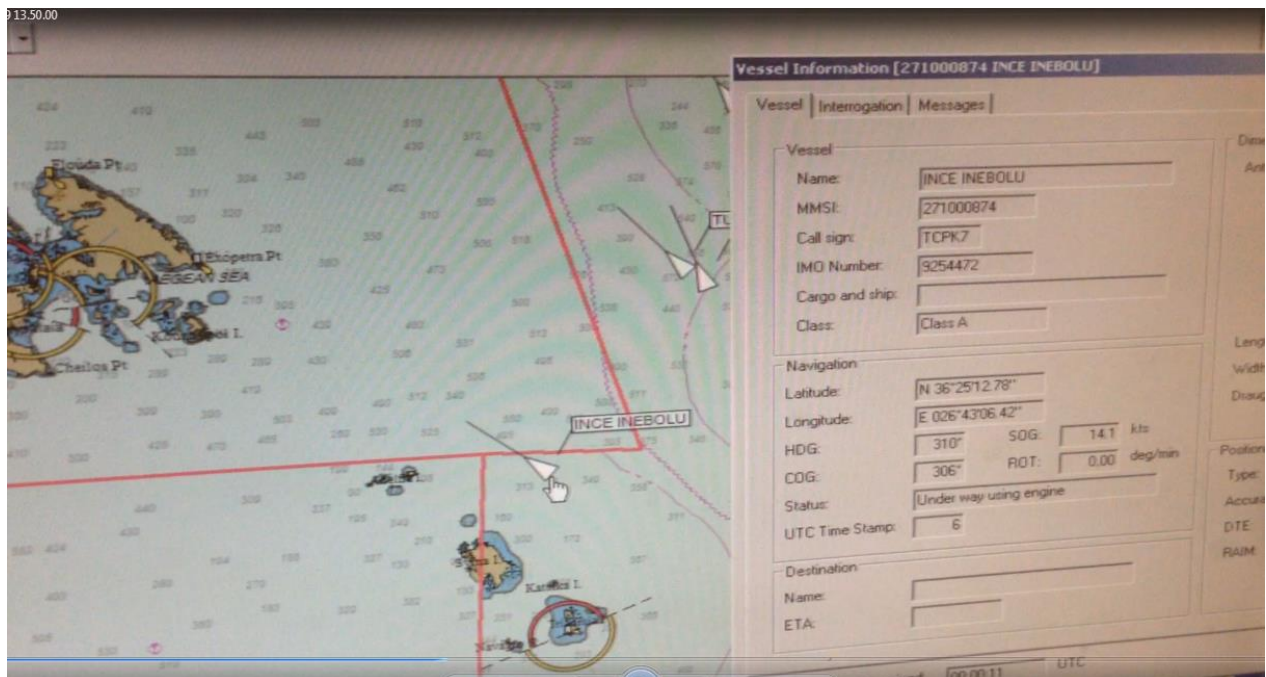


Figure 11. Ince Inebolu passage & navigating data at 0300 while bridge was unattended. HDG 310° and COG 306° at 14.1 knots (source HCG AIS).

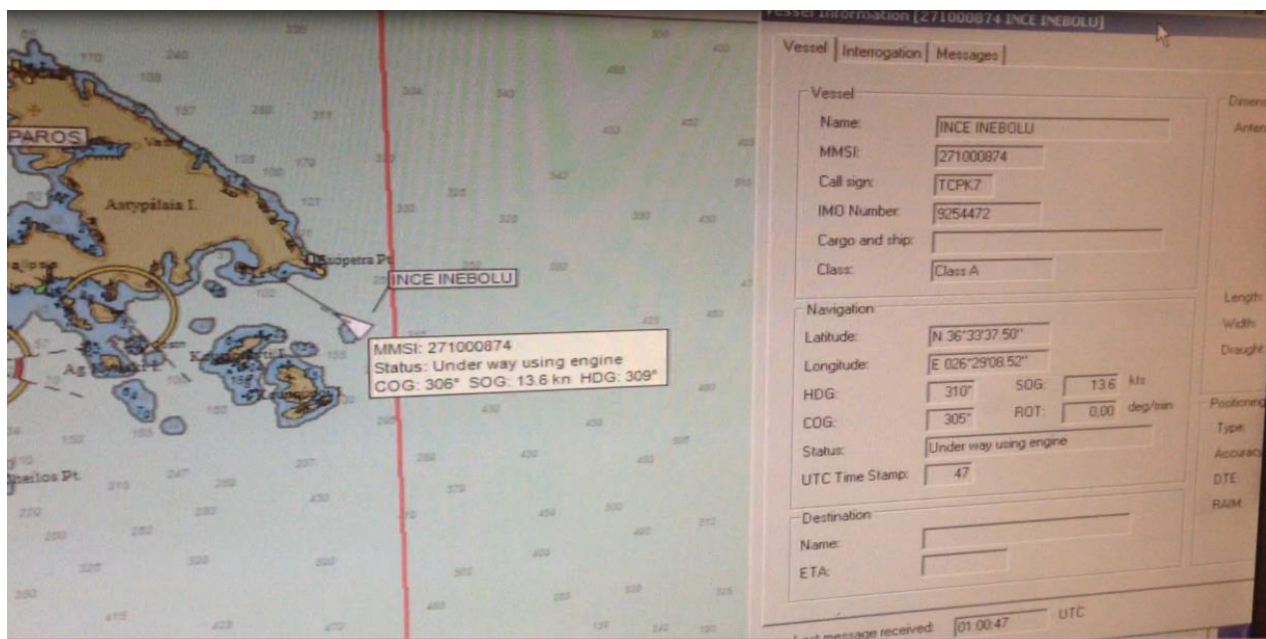


Figure 12. Ince Inebolu passage & navigating data at 0400 while bridge was unattended. HDG 310° and COG 305° at 13.6 knots (source HCG AIS).

At approximately 0405, the 40,000 tons bulk carrier impacted with her fore section on the rocky shoal at the coastline of Astypalaia Island and run aground while navigating at 13.6 knots and was actually cast ashore (figures 13).

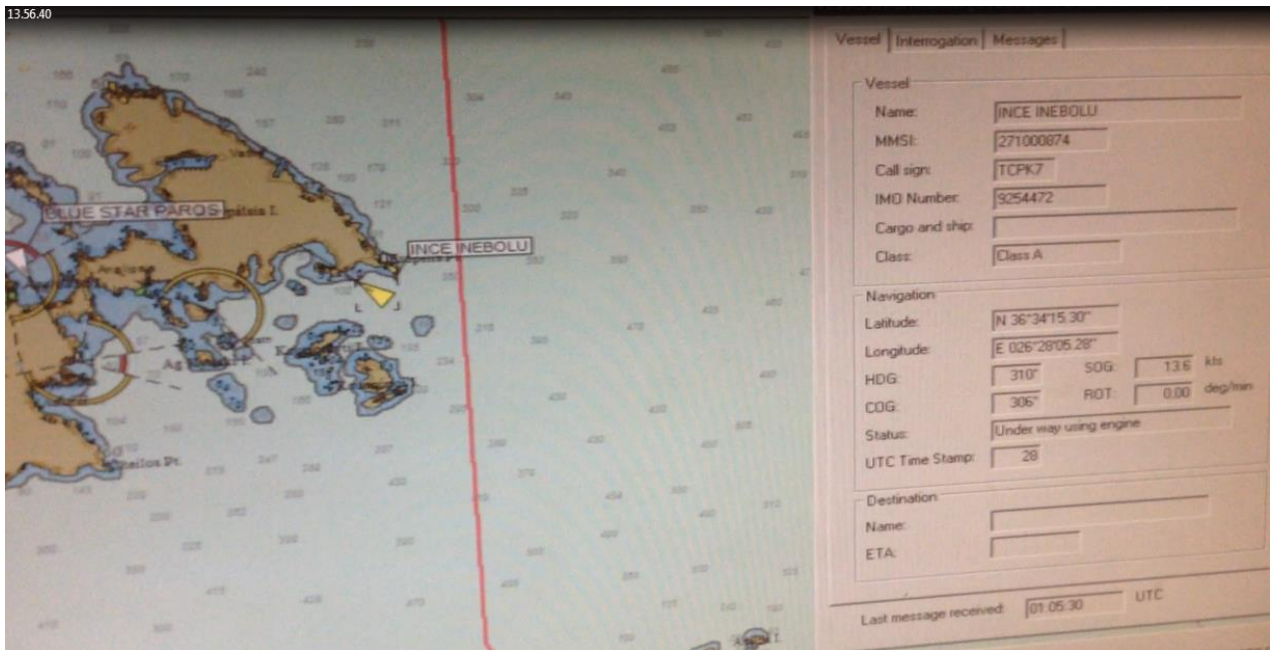


Figure 13. Ince Inebolu navigating data at 0405, seconds before grounding. HDG 310° and COG 306° at 13.6 knots (source HCG AIS).

It was furthermore concluded that the extend of the structural damages Ince Inebolu had suffered from grounding were not actually corresponding to the severity of the impact, mostly due to the fact that, likely, at the grounding position the depth is gradually decreasing from a 50m contour, leading to a rising sloped shoal reef (figure 14, 15, 16, 17, 18 & 19).

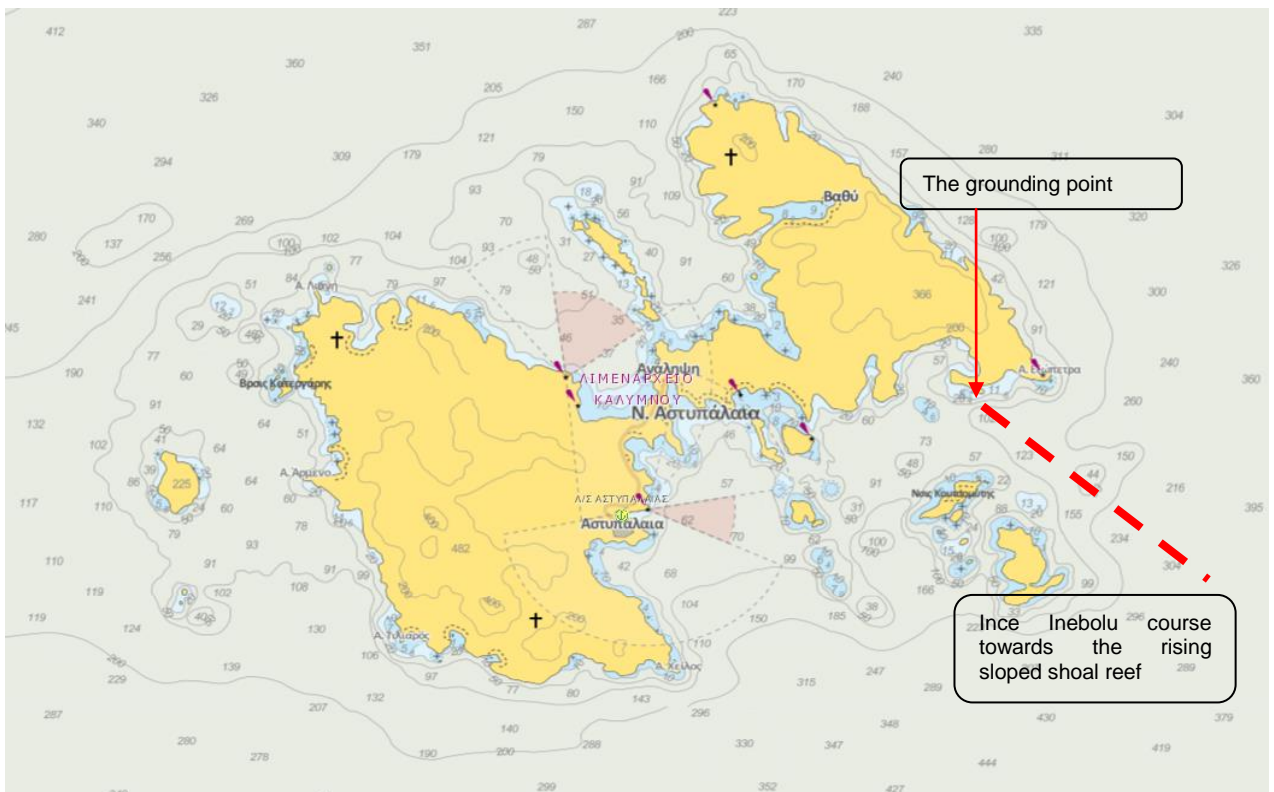


Figure 14. The grounding point and the sketched course towards it.



Figure 15. Stranding point seen from forecastle's port side, stem post and starboard side



Figure 16. Ince Inebolu grounded on the rocky coastline.



Figure 17. Ince Inebolu bulbous bow casted ashore



Figure 18. Ince Inebolu bulbous bow casted ashore.



Figure 19. Ince Inebolu grounded at Astypalaia coastline.

The hit was extremely heavy and awakened the Master and the crew members. The 2nd Officer reported that got shocked due to the vibration caused by the heavy impact and ship's fore section dragging on the seabed and almost fell off the chair. It was considered very fortunate that while Ince Inebolu was approaching the coast line with her bridge unattended, running close to 13.5 knots she did not encounter any dangerous navigational situation with another vessel, sailing yacht, trawler or fishing boat.

3.7 Emergency Response Actions by Ince Inebolu

Immediately after the grounding, the Master woke up and came on the bridge. He ordered the 2nd Officer to switch on all deck lights and set the engine control lever at stop position. The engine's operation was stopped by the Chief Engineer at approximately two minutes after the grounding, following the Master's orders to the Engine Control Room. By that time the Chief Officer was already on the bridge.

The Master having assessed the situation of the grounding, ordered the Chief Officer to assemble all the crew on the main deck and to report any injuries. Shortly afterwards, he went on the main deck to personally ascertain crew's condition. No injuries or health problems of crew were reported. By that time the Chief Engineer, that had woken up and had gone directly to the engine room, came on the main deck and reported that there was no water ingress in the engine room and that the machinery equipment was apparently found in operating condition.

In parallel, the Master ordered the Chief Engineer and Chief Officer respectively, to inspect and take soundings from all bunker/ballast tanks and cargo holds bilges and to check for leakages or water ingress as well as to check and verify if marine pollution has occurred.

Directly after, the Master together with the Chief Officer went to the forecastle to witness the damages and to evaluate the situation.

At approximately 0440, having returned on the bridge, the Master called the Company's DPA and reported the grounding with the information available, nevertheless he did not report the marine accident to the local Coastguard Authorities or to the Rescue Operational Centre of the Hellenic Coastguard, as provided.

Following Master's orders, the stability condition of Ince Inebolu was monitored every 4 hours by taking cargo holds soundings and using the trim and stability electronic program available on board.

3.8 Hellenic Coast Guard Response Actions

At approximately 0530, the accident was reported to the Hellenic Coast Guard Authorities at approximately 0530 by a telephone call from a small fishing vessel skipper, fishing nearby the area of the grounding.

At 0600, the local Coast Guard Authority's personnel came on scene from land while at 0700 a patrol boat of the Hellenic Coast Guard, approached the grounding area. The Master of the vessel was officially instructed by the Coast Guard Authority, to take all precautionary actions in order to maintain the vessel afloat, to prevent marine pollution and was urged to make all necessary arrangements for the refloating and removal of the vessel.

3.9 Salvage Operations³ - refloating

The Owners of Ince Inebolu contracted with a Salvage Company to carry out the refloating and removal operations.

³ Source: Tsavlis Salvage Operations List 2014, B/C INCE INEBOLU (www.tsavlis.com)

Salvage tug Megas Alexandros (640 GRT, 73 BP), (figure 21), together with the Oil recovery/rescue vessel "Aegis 1" (1400GRT, 1900 DWT), (figure 20) were dispatched from Piraeus and arrived on the grounding site on 06 September 2014.



Figure 20. Oil recovery/rescue vessel "Aegis 1" and HCG SAR alongside Ince Inebolu at grounding site.



Figure 21. Rescue Tug Megas Alexandros alongside Ince Inebolu at grounding site.

On the same day, the team of salvage experts that had arrived on scene, conducted an inspection on board the casualty vessel whilst divers assessed the underwater situation and damage.

The grounding had caused significant indentations and cracks and had ripped the plating from the forward end of the bulbous bow up to midway through cargo hold no 1, causing

progressive flooding up to the sea level. Moreover, rocks had penetrated the forward part of the same hold's tanktop.

The Salvage and refloating plan was generally based on considerably trimming Ince Inebolu by stern in order to refloat her, under favorable weather conditions.

The operations performed included:

- the deployment of antipollution floating booms.
- the transfer of roughly 800 metric tons of bunkers from No 1 & 5 Fuel Oil tanks, to No 3 FOT (centre) and 4 (port side).
- The deballasting of 2000 mt from No 2 double bottom tank (port side) and the pumping out of 500 mt of seawater from No 1 cargo hold.

Resultantly, Ince Inebolu was trimmed about 8 metres by her stern and subsequently refloated on 11 September 2014. She anchored close to Astypalaia port with the assistance of Salvage Tug Megas Alexandros.

Temporary repairs were also carried out to the tank top of No 1 cargo hold and a yokohama fender (protected by tyres) was wedged and secured in front of the collision bulkhead (Figure 22).



Figure 22. The yokohama fender secured on Ince Inebolu bulbous bow (source Tsavliris Salvage).

On the 1st of October 2014, at night hours, Ince Inebolu anchor was dragged during prevailing gale force winds. On the next day, she was delivered to Owners and sailed for Neorion Shipyard in Syros Island, Greece by her own means, escorted by Salvage Tug Megas Alexandros, in order to undergo permanent repairs.

3.10 Ince Inebolu at Astypalaia anchorage

On 12 September 2014, Ince Inebolu, having refloated on the previous day, was inspected by the Port State Control of the Hellenic Coast Guard, as following the marine casualty she was classified as “Priority 1” vessel under the relevant provisions of Paris MoU inspection regime. Her departure was sustained by order of the Hellenic Coast Guard until the conduct of temporary repairs to the satisfaction of her Class and the issuance of a seaworthy certificate for a single voyage to the nearest shipyard.

The findings of the PSC inspection identified navigational deficiencies that led to the grounding and furthermore reported the extent of the structural damages as quoted below (indicatively figures 23, 24 & 25):

- the forward section from stem post to frame 195 was found dented, for approximately 21 meters in length and 4 meters higher than the waterline base line. The area was deformed and structural items had collapsed.
- No 1 Ballast Tank at port and starboard side was totally deformed.
- The inner bottom plate of No 1 cargo hold suffered a crack of approximately 5 meters in length and 0.50 meters wide (figures 23).
- A crack was also caused extending from frame 208 (Collision Bulkhead) to frame 195 (See Appendix 1).

Following the completion of the temporary repairs carried out by the Salvors and salvage team as well as the Class inspection, Ince Inebolu was released from detention on 25 September 2014. Her total stay in Astypalaia Island last for 28 days.



Figure 23. The crack at inner bottom plate of No 1 cargo hold as seen from inside .



Figure 24. Deformed starboard fore section.



Figure 25: Forward bulbous bow structural damages.

3.11 HBMCI Safety Investigation

The Hellenic Bureau for Marine Casualties Investigation launched a safety investigation on the examined marine casualty on the grounds of respective provisions of Directive 2009/18/EC, as incorporated in national legislation by Law 4033/2011 (government gazette A' 264) and IMO Casualty Investigation Code. Having notified all interested parties involved in the marine casualty as well as the vessel's Flag State, HBMCI immediately deployed an investigation team of two investigators and one trainee, that arrived in Astypalaia Island, on 11 September 2014.

HBMCI had promptly advised and instructed Ince Inebolu Owners and Master to take every necessary actions in order to save and preserve S-VDR data as well as to ensure that data will be downloaded by manufacturer's technician, in order to avoid any loss of data and the notice was respectively acknowledged.

Nevertheless, in the morning following the grounding, the Master attempted to download the S-VDR data but were unfortunately lost.

On 24 September 2014 and after HBMCI's persistent requests on aforementioned issue, a technician of Ince Inebolu S-VDR manufacturer came to Astypalaia from Turkey. The service report submitted to HBMCI stated that there were two incidents recorded in the back up disk.

- The first one started at 09:03:22UTC, on the 5th of September 2014 and recorded 3.30 min of data.
- The second, started at 07:49:17 UTC, on the 18th of September 2014 and included a complete set of data (lasting 12 hours).

According to the Master's report, while the marine casualty occurred at 0105 UTC (0405 LT), he tried to download a backup of data at 08:58UTC (1158 LT), however an alarm message "back up not complete" was activated.

He furthermore stated that he tried for a second time to download the data and he observed to his satisfaction a successful download completion. He transferred the data to his computer and then S-VDR was switched off.

On the 17th of September he switched on the S-VDR again and on the 18th of September he checked the system for downloading process.

The Master also gave to the technician two incident records from the 05th of September 2014. The first of them extends from 08:57:42UTC to 08:59:12UTC. The second one extends from 08:59:12UTC to 09:03:42 UTC. According to the technician, it shows that some software bug has been detected at that time.

Based on the above information it was identified that the S-VDR data was not saved and downloaded, as requested by HBMCI. According to the technician's report submitted to HBMCI, the reason of the failure was to be further investigated and analyzed by the manufacturer of the unit, however no further report has been received, so far.

3.12 External electronic Information of Ince Inebolu positioning data

Having in mind that Ince Inebolu S-VDR data were practically lost and therefore were not submitted for the purpose of the safety investigation, HBMCI requested electronic data regarding Ince Inebolu's course from the Hellenic Coast Guard AIS Monitoring system (Integrated Marine Data Environment - IMDatE).

Based on the afforded tables of positioning data as well as on the video of the monitored courses, the Investigation team plotted the progressive course of the casualty vessel on electronic chart, in order to reconstruct Ince Inebolu's passage leading to her grounding. An overview of the plotted positions that reconstructed her passage is presented in following figure 26, while figure 27 shows Ince Inebolu's passage as recorded by HCG Ais Information System.

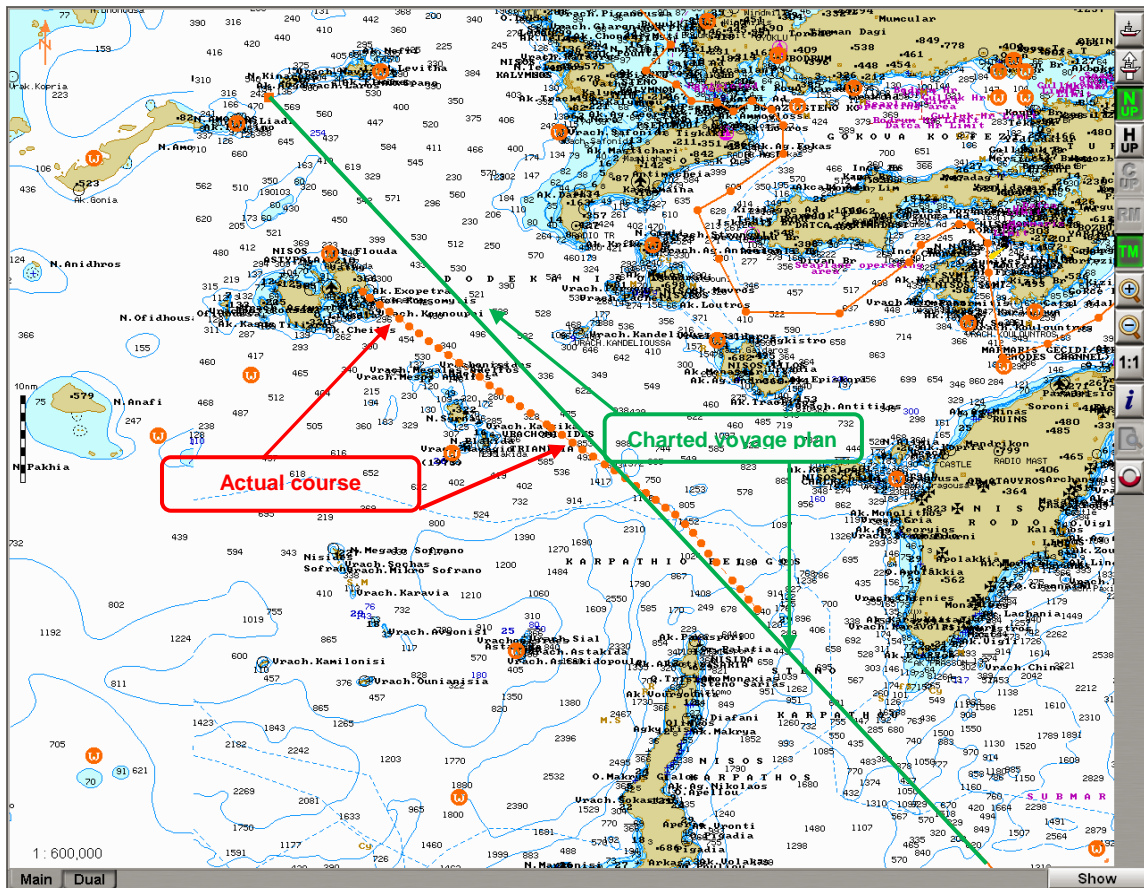


Figure 26. Ince Inebolu positioning data as plotted on electronic chart. Charted voyage plan and actual course.

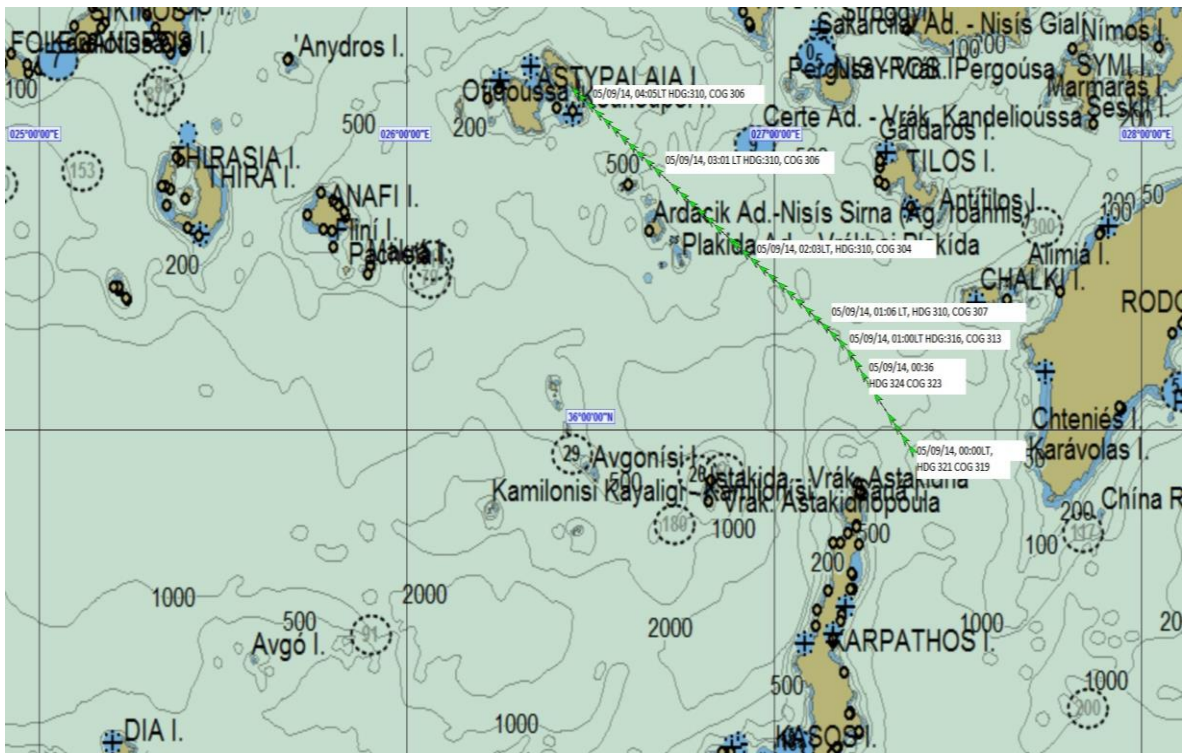


Figure 27. Overview of Ince Inebolu passage as recorded by HCG Ais Information System.

4. ANALYSIS

The analysis of the examined marine casualty aims to identify the factors and causes that contributed to the marine casualty, taking into account the sequence of events and the collection of investigation information in order to draw useful conclusions leading to safety recommendations. However, it should be noted that during the investigation process the majority of the information have derived from the interviewing process of crew members of Ince Inebolu as well as from AIS Information since the vessel's S-VDR offered no information due to technical issues as already mentioned in par. 3.11.

4.1 Ince Inebolu Crew

Ince Inebolu was operating under a crew complement of 22 seafarers including Master, all of Turkish nationality. The working language was Turkish.

Ince Inebolu's managing Company was not cooperating with a crew Agency for manning its vessels and most of the contracting seafarers were employed on a permanent rotating basis and were familiar with the vessel's operation and working conditions. The recruiting policy of the Company was implementing a rotating seagoing service especially for Officers mainly up to six or seven months on service and two to three months off.

4.1.1 Deck and Engine department Minimum Safe Manning

Ince Inebolu's Minimum Safe Manning Document was issued by her Flag, pursuant to SOLAS Regulation V/14 as applied, providing a minimum crew of 17 seafarers. However, she was manned with 05 crew members in excess of Flag requirements, that is 22 mariners, in total. The supernumerary crew in relation to the Minimum Safe Manning Document encompassed the positions of 01 Cook, 01 Steward, 02 Deck Cadets, 01 Electrician and 01 Engine Cadet.

The crew complement also included 01 Bosun and 01 AB that were assigned with deck duties, satisfying the required number of two deckboys (deckhands), as accommodated through the respective Minimum Safe manning Document.

Taking into consideration the exemptions provided, (i.e a radio officer was not required since 02 Deck Officers were holding the General Operator's Certificate), the ship was in full compliance in terms of safe manning as determined by her Flag.

4.1.1.1 Deck Department

The Deck Department numbered 04 Officers including the Master, 01 Bosun, 04 ABs, and 02 Deck Cadets. According to vessel's "Shipboard working arrangement", as shown in below Table 1, the watch keeping schedule at sea was performed under a three-watch pattern during daytime and nighttime, assigned to the Chief Officer, the 2nd Officer and the 3rd Officer, while an AB was forming part of each navigational watch respectively, as a lookout watch. The AB that was not performing look out watch duties together with the Bosun were tasked with maintenance and repairs activities of deck department.

Table 1: Ince Inebolu shipboard watch and working arrangement.

	Position/rank	Watchkeeping hours	Non Watch keeping Duties
1	Master	-	0800-1200/1300-1700
2	Chief Officer	0400-0800/1600-2000	1300-1500
3	2 nd Officer	0000-0400/1200-1600	1600-1800
4	3 rd Officer	2000-0000/0800-1200	1300-1500
5	BOSUN	-	0800-1200/1300-1700
6	AB 1	-	0800-1200/1300-1700
7	AB 2	0800-1200/2000-0000	-
8	AB 3	0000-0400/1200-1600	-
9	AB 4	0400-0800/1600-2000	-
10	Deck Cadet	-	0800-1200/1300-1700
11	Deck Cadet	-	0800-1200/1300-1700

Nevertheless in the course of the interview process it was emerged that at least two days before the marine accident, all ABs were working on deck during daytime and consequently no lookout watch was posted during night watches from the 3rd until the 5th of September, as they were allowed to rest and sleep in their cabins.

It is deemed likely that the participation of the AB as a look-out on the navigational watch on the night of the marine casualty would have strengthened the navigational bridge team and consequently could have deterred the OOW from falling asleep.

The absence of the AB forming part of the 2nd Officer's navigational watch is considered to have been a contributing factor to the grounding of Ince Inebolu.

4.1.1.2 Engine Department

Ince Inebolu's Engine Department personnel counted a total of 09 seafarers, including the Chief Engineer and 01 Engine Cadet. In particular, due to the fact that the engine room was UMS operated, all engine personnel were involved in day working duties and was comprised of 01 Chief engineer, 02 Engineer Officers, 01 Electrician, 03 Oilers, 01 Motorman and 01 Engine Cadet according to her "Shipboard watch and working arrangement", as appearing in Table 2.

Table 2: Ince Inebolu Engine Shipboard watch and working arrangement.

	Position/rank	Watchkeeping hours	Non Watch keeping Duties
1	Chief Engineer	-	0800-1200/1300-1700
2	2 nd Engineer	-	0800-1200 /1300-1700
3	3 rd Engineer	-	0800-1200 /1300-1700
4	Electrician	-	0800-1200 /1300-1700
5	Motorman	-	0800-1200/1300-1700
6	Oiler	-	0800-1200 /1300-1700
7	Oiler	-	0800-1200 /1300-1700
8	Oiler	-	0800-1200 /1300-1700
9	Engine Cadet	-	0800-1200 /1300-1700

4.1.2 Ince Inebolu Working and Resting hours Records

Based on the IMO/ILO Guidelines for the "Development of Tables of Seafarers Shipboard Working Arrangements and Formats of Records of Seafarers' Hours of Work and Rest", Ince Inebolu's Safety Management System under "Crew Management Procedures" section, incorporated a "Shipboard Working Arrangement" table as well as a "Personnel rest hours" table, on ship's working language and in English, as summarized below:

- **"Shipboard Working Arrangement" table**

The "Shipboard and Working Arrangement Table" was recording the servicing crew and its capacities along with the hours of working duties, namely "watchkeeping" duties and "non-watchkeeping duties" (daytime work) at sea or at port.

- **"Personnel rest hours" table**

The monthly illustrated "Personnel rest hours" table, was recording the working or watchkeeping hours as well as the resulting resting hours for each crew member. The daily recordings were entered and signed by the crew member considered. The table was also signed and approved by the Chief Engineer or the Chief Officer at the end of every month and was countersigned and endorsed by the Master.

The examination of said records indicated that the "Shipboard watch and working arrangement" implemented on board Ince Inebolu, was complying with the relevant regulations of ILO 180 Convention (Seafarers' Hours of Work and the Manning of Ships

Convention) and IMO STCW Convention and were reflecting the work schedule followed on board Ince Inebolu.

Additionally, the working and resting hours recordings were consistent with work schedule practiced on board and especially the working hours of the ABs, engaged with the cargo holds cleaning operations, on 04 September 2014.

4.1.3 Crew information

The navigational Officers had attended training courses on the use of Electronic Chart Display and Information Systems (ECDIS) and were familiarized with its utilities and functions, however Ince Inebolu was not equipped with Electronic Charts.

4.1.3.1 The Master

The 37-year-old Master had been graduated from a maritime academy in Turkey, in 2002. He acquired his Chief Officer's COC certificate, in 2005 and he was a holder of the Master's Certificate issued by the Turkish Maritime Administration, since 2009. He had worked as Master on board cargo ships for almost 5 years. His working experience was mainly on Bulk Carriers while he had also a limited experience on a Chemical tanker as a 2nd Officer under a five months contract.

It was his first contract with the Shipping Company of Ince Inebolu and he had joined her on 18 May 2014.

4.1.3.2 The Chief Officer

The Chief Officer was 31 years old. He had been graduated from a maritime academy in Turkey, in 2007. He had obtained his Chief Officer's certificate, in 2012. His seagoing career included only Bulk Carriers and he was experienced with their operation. He had been contracting with Ince Inebolu Shipping Company since 2010. He had joined Ince Inebolu on 17 July 2014 and he was running his fifth contract with the Company. In addition to his watch-keeping duties, he was tasked with the safety and environmental Officer's duties and was in charge of the cargo operations.

4.1.3.3 The 2nd Officer

The 25 years of age, 2nd Officer had completed his academic studies, in 2013 and he was a holder of the STCW II/I certificate, issued on the same year by the Turkish Maritime Administration. His experience was limited to 12 months in total as a Cadet Officer on Bulk Carriers of the Company during his academic courses while following his graduation he had served for almost 7 months, as a 2nd Officer on a Bulk Carrier of the same Company. He had joined Ince Inebolu, on 16 April 2014 and was running the fifth month of his contract.

4.1.3.4 The 3rd Officer

The 3rd Officer, aged 27, had been graduated from the Near East Maritime University in Nicosia, in 2010. He had previous working experience on board ships for at least 03 years, that is 01 year as a Deck Cadet during his academic courses and 02 years as an Deck Officer on board tankers. He was a holder of STCW II/I certificate, issued by the Turkish Maritime Administration, in 2012. He had joined Ince Inebolu on 04 March 2014 and it was his first contract with the Company while he was about to sign off.

4.1.3.5 The Able Seamen

The ABs servicing on Ince Inebolu, were holding an STCW II/4 Certificate of Competency, enabling them to participate in navigational watches, as look-out watch. It was reported that they had many years of sea service, mainly on bulk carriers and they were considered experienced enough.

Their contracts were mostly based on eight months service periods.

4.2 Main Bridge equipment arrangement - Conning Position view

4.2.1 Main Bridge equipment arrangement

SOLAS Convention, as applied, in Chapter V/Reg.15 “Principles relating to bridge design, design and arrangement of navigational systems and equipment and bridge procedures”, amongst others, states that:

“...bridge design, the design and arrangement of navigational systems and equipment on the bridge and bridge procedures shall be taken with the aim of:

...
 .2 promoting effective and safe bridge resource management;

...
 .7 minimizing the risk of human error and detecting such error if it occurs, through monitoring and alarm systems, in time for the bridge team and the pilot to take appropriate action.”.

Ince Inebolu had an ergonomic bridge arrangement. Her bridge was installed with only one console mounted on the starboard side next to steering and autopilot unit. The console was fitted with the ship’s engine control lever and the intercommunication handsets (figures 28 & 29).

Two radars were fitted at the port side of the bridge, the X-Band (9 GHz) radar was installed next to the rudder unit and the S-Band (3 GHz) radar was next to it. Both of them were featuring ARPA utilities (figure 26). One more radar was installed on the starboard side console offering basic radar utilities (figure 27).

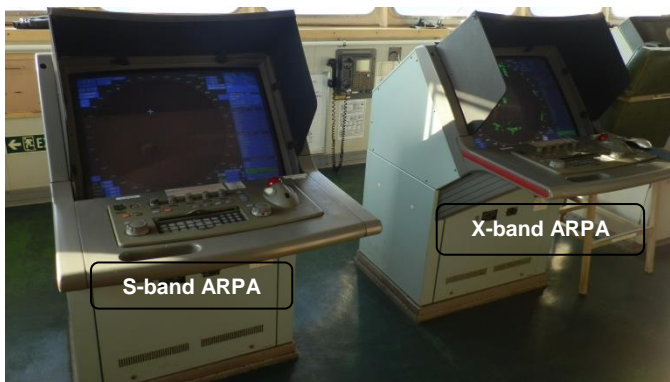


Figure 26. Advanced ARPA radars mounted at bridge port side



Figure 27 Basic operating radar fitted on starboard console.

Two VHF devices were fitted under the bridge main windows. Navtex, GPS and AIS units were installed in the chart room. The Bridge Navigational Watch Alarm System (BNWAS) system was mounted on the aft wheelhouse bulkhead in the chart room. An S-VDR unit was also provided.

Ince Inebolu was also equipped with one GPS unit that was fitted on the starboard side of the chart table.



Figure 28. Ince Inebolu main bridge room arrangement.



Figure 29. Bridge starboard console.

4.2.2 Conning position view

Ince Inebolu's wheelhouse structural arrangement offered a good visibility from the conning position to the navigated sea area. The OOW could maintain a very good visual contact and monitoring of surrounding vessels and land. However, her cargo cranes located in line amidships, created a limited blind horizontal sector, as usually exists on same ships' type, which could be administered by the continuous movement of the OOW (Figure 30).



Figure 30. Ince Inebolu conning vision.

4.3 Main Navigational Aids

4.3.1 Navigational Charts

Paper charts were the primary means of navigation on board Ince Inebolu. The navigational Chart No. 1099 (Eastern Approaches to the Aegean Sea) was used during the night of the marine accident, corrected up to week 37/14.

According to the Master's night order book, the vessel's position had to be checked every hour, usually by plotting GPS positions on the chart. In case of navigating through a high risk critical zone, the ship's position should be checked in less than 1-hr intervals and recorded on the chart using extra fixes (bearing and distance) from the radar and ARPA. Examination of ship's paper chart showed that positions were marked every hour, except from the time period from 0100 to 0400 during which no positions were plotted until her grounding.

4.3.2 Radars

As stated Ince Inebolu was equipped with two radar devices, one X-Band and one S-Band.

The "X" band, providing a higher resolution and a clear image because of its higher (9 GHz) frequency, was mostly operating during day or night time under good weather conditions, usually at open sea and at 12nm range scale.

The "S" band Radar, operating at 3 GHz, was mostly used during night time or under restricted visibility due to rain and fog and in coastal passages or congested waters.

At the time of the navigational watch prior to the marine accident, the OOW was operating the X-Band Radar, although navigating in coastal waters with anticipated increased marine traffic, notwithstanding that according to Master's Night Orders both radars had to be operated during night time.

.1 Radar Guard Zones

The installed radars on board Ince Inebolu were both featuring standard ARPA utilities including the “Guard Zones” function.

Guard zones function offers the ability to the operator to customize zones acting as a shield to the vessel. If utilizing the function and the unit receives radar returns inside the guard zone or a target enters the guard zone, visual and audible alarm are activated to alert the OOW in order to take actions as appropriate. Yet, it is noted that guard zones should not in any way construed as the sole means for detecting the risk of collision or grounding possibilities.

Guard zones could be an additional safeguard for a vessel’s safe navigation to avoid the risk of collision or grounding.

During the interview process it was emerged that although all duty Officers were aware of the radar’s utility however they were not using it, as they were not instructed to and no initiative was taken by their part to do so.

It is highly suggested that had the 2nd Officer utilized the guard zone feature during his watch the marine accident would had not occurred.

The omission of the 2nd Officer to set the guard zone utility on the operating Radar is considered to have been a contributing factor in the marine accident.

4.3.3 GPS

The advantages offered in GPS navigation in the marine sector are extensive. GPS units enhance the operation performance of the Navigator, namely by providing vessel’s position accuracy as well as a wide range of utilities in several display modes such as plotting the planned route effectively and observing the location of the next waypoint.

It can also automatically monitor the vessel’s track on plotted routes by setting customized audible “off course alarms” for desirable off course distances. Once the vessel is running off the preset boundaries, an audible alarm is activated and alerts the Duty Officer to take immediate actions.

Similar feature could be utilized for reaching arriving points or waypoints.

In regard to the aforementioned, GPS “off course alarms” could be an additional safeguard for vessel’s safe navigation assisting the OOW by optimizing and facilitating the course monitoring duties.

During the interview process on board Ince Inebolu, it was stated that the voyage plan routes were plotted on the GPS however no “Off course alarm” was customized and set for the monitoring of vessels course and potential drift from the intended plotted route.

It is considered highly possible that if the 2nd Officer had set a GPS “off course alarm”, its activation when Ince Inebolu was drifted to port off her intended course could had alerted him in order to readjust her course back on the plotted route.

The 2nd Officer’s disregard to utilize the GPS “off course alarms” is suggested to have been a contributing factor in the marine accident.

4.3.4 Bridge Navigational Watch Alarm System

A BNWAS is required to be fitted on all new and existing ships, in accordance with the amendments to SOLAS Chapter V, Regulation 19, Res. MSC.282(86) (adopted on 5 June 2009). The deadline for fitting the system was targeted before 1 July 2011, not later than the first survey⁴ after 1 July 2012 for vessels 3000gt and upwards.

SOLAS regulation V/19.2.2.3 also requires that Bridge Navigational Watch Alarm System (BNWAS) shall be in operation whenever the ship is under way at sea.

⁴ Refer to the Unified interpretation of the term first survey as referred in SOLAS regulations (MSC.1/Circ.1290).

.1 BNWAS general operation

The bridge navigational watch alarm system (BNWAS) monitors bridge activity and detects Watch Officers disability or incapacitation which could lead to marine accidents. The system also monitors the awareness of the Officer of the Watch (OOW) and automatically alerts the Master or another qualified Deck Officer if for any reason the OOW becomes incapable of performing the watchkeeping duties.

This purpose is achieved by a series of indications, sensors and alarms to alert first the OOW in case he is unable to reset the system's during the preset timeout period (dormant period - set between 3min to 12min) and, if he is not responding, then to alert the Master or another qualified Officer.

BNWAS units may also offer an automatically reset function through motion or action sensors fitted on the bridge. This function may relieve the Watchkeeping Officer from the burden of manually resetting the system before the timeout period is elapsed by detecting the motion or action of an individual on the bridge.

Additionally, the BNWAS may provide the OOW with a means of calling for immediate assistance if required.

.2 BNWAS performance standards

The performance standards for a BNWAS were outlined in IMO Res. MSC.128 (75) as well as by the technical standards as specified by the International Standards of IEC⁵ 62616:2010 (E). IMO performance standards amongst others, namely provides that the BNWAS should have three modes of operation:

- Automatic (Automatically brought into operation whenever the ships heading or track control system is activated and inhibited when this system is not activated) (*should not be used*⁶);
- Manual ON (In operation constantly whenever the ship is underway at sea. (SOLAS V/19.2.2.3);
- Manual OFF (Does not operate under any circumstances).

IMO Res. MSC.128 (75) also foresees that the means of selecting the Operational Mode and the duration of the Dormant Period should be security protected so that access to these controls should be restricted to the Master only. It is furthermore provided that all items of the equipment, forming part of the BNWAS, should be tamper-proof so that no member of the crew may interfere with the system's operation.

Said technical requirements are incorporated in the IEC standards and access to BNWAS from unauthorized personnel is protected by a password or a key-lock.

Aforementioned specific technical specifications are considered a safeguard for the system's proper and continuous operation according to the respective legal framework in force, highlighting its contributing importance to the watchkeeping personnel for maintaining a proper and effective vigilance during bridge watch.

.3 Ince Inebolu BNWAS

Ince Inebolu was fitted with a Navitron Systems NT990 BNWAS, in compliance with the above mentioned technical specifications & standards (figure 31 & 32).

The unit had a ON/OFF key to secure the controls and prevent changes to settings. As reported in par. 4.2.1, the unit was installed on the wheelhouse's aft bulkhead and included three remote reset buttons. Two of them were mounted on port and starboard bridge bulkheads, near the navigating workstation (Radars) and bridge console, respectively (figure 33 & 34) and the third one was mounted on the starboard end of the

⁵ International Electro technical Commission - Maritime Navigation and Radio communication Equipment and Systems

⁶ See reference in MSC.1/Circ.1474/23 May 2014

"NOTE: The Automatic mode is not suitable for use on a ship conforming with regulation SOLAS V/19.2.2.3 which requires the BNWAS to be in operation whenever the ship is underway at sea".

wheelhouse bulkhead, separating the bridge from the chart room (figure 35). All BNWAS remote reset buttons were within the perception monitoring area of the OOW. Once the unit was activated, a Bridge visual alarm with 15secs duration would be automatically generated following the completion of the specified and selected timeout (dormant) period (3-12mins). If the visual alarm was not manually cancelled by the Watchkeeping Officer, a Bridge audible alarm with 15secs duration would automatically follow. The OOW had to acknowledge the alarm by pressing the reset button from any installed Remote Reset Unit or from the main unit, depending on his position in order to manually cancel the activated alarm. The reset action would lead to the commencement of a new timeout monitoring period.



Figure 31. The BNWAS mounted on aft bridge Bulkhead.



Figure 32. The NT 990 main display Unit.

Remote reset units (buttons)



Figure 33. The Remote Reset Unit on starboard bulkhead.



Figure 34. The Remote Reset Unit on port bulkhead.



Figure 35. The Remote Reset Unit on chartroom starboard bulkhead.

The installed BNWAS unit on Ince Inebolu was not featuring motion or activity detection sensors although such sensors were optionally provided by the manufacturer. The investigation process, as already reported, identified that the BNWAS was not operating during the night the grounding occurred, as it had been set in "off mode" during the Suez Canal transit.

It is therefore concluded that neither the Master nor the OsOW had fully appreciated the functionality and the advantages of the system offered to safety of navigation especially during night watches and without lookout watch posted on the bridge.

It is deduced that if BNWAS had been reactivated following Ince Inebolu's exit from the Suez Canal the 2nd Officer, even on a single watch, would not have been in any state of incapacitation such as drowsiness that led to falling asleep. The operation of the BNWAS would have kept the watchkeeping Officer in the state of awareness in the course of his watch and the grounding would not have occurred.

In the unlikely event and for any reason, the 2nd Officer would have been incapable to reset or respond to the system's alarm, the alarm would have sounded in Master's cabin and would have waked the Master up, enabling him to take corrective actions. The BNWAS deactivation during the navigational watches has been a contributing factor to the examined marine accident.

.4 BNWAS deactivation

During the interview process it was highlighted that BNWAS alarming and resetting, was occasionally considered annoying and disturbing that tended to interfere with other important duties.

It could further be noted that the need to reset the BNWAS alarm button, prior or post to its automatic activation, while performing other tasks such as position plotting, RADAR/ARPA setting or monitoring of targets, bridge log entries etc, may generate stress and inconvenience or even distract the OOW.

Based on the above it could be considered that Ince Inebolu's BNWAS although deactivated by the Master on 03 September 2014, following the Pilot's demand or request while transiting the Suez Canal, was never reactivated after exiting the Canal, most likely due to the inconvenience or distraction it was causing to OOW or the Master.

The allegation stated by the interviewed Navigational Officers and the Master that it was forgotten switched off, is questionable taking into account that BNWAS is an alarming unit when operating that requires OOW attention and actions on a permanent periodical basis.

It is very unlikely to be considered that during the time period from late afternoon hours on September the 3rd to approximately 0100 on September the 5th, neither the Watchkeeping Officers nor the Master realized or became aware that the Unit was remaining deactivated.

In the light of the above it is suggested that BNWAS was intentionally switched off, believably on the grounds that it was causing inconvenience or distraction to Navigational Officers.

The action to deactivate the BNWAS and not to reactivate, is considered to have been a contributing factor to the examined case.

4.3.5 Simplified Voyage Data Recorder (S-VDR)

Ince Inebolu was fitted with Danelec DM-300 S-VDR, in order for the requirements under the relevant provisions of Res.MSC.163(78) to be met, whereby a selection of data items are to be recorded and stored concerning the position, movement, physical status, command and control of a vessel over the period leading up to and following a marine casualty.

As already reported the Master failed on his efforts to download VDR data and consequently the exact evolution of the events leading to the grounding could not be electronically supported by Ince Inebolu's electronic navigation equipment that were interfacing the VDR.

IMO guidelines MSC/Circ.1024⁷ on Voyage Data Recorders (VDR) set out the provisions for the Ownership and Recovery of VDR data. Under the respective provision it is inferred that the recovery of the VDR information should be undertaken as soon as

⁷ Recovery of VDR and relevant information

2 Recovery of the VDR is conditional on the accessibility of the VDR or the information contained therein.

.1 Recovery of the VDR information should be undertaken as soon as possible after an accident to best preserve the relevant evidence for use by both the investigator¹ and the ship owner. As the investigator is very unlikely to be in a position to instigate this action soon enough after the accident, the owner must be responsible, through its on-board standing orders, for ensuring the timely preservation of this evidence.

possible after an accident and the owner must ensure that this is achieved through its on-board standing orders, for ensuring the timely preservation of this evidence.

Vessels should ensure that immediately after a casualty or the occurrence of a near miss, the VDR data is saved and the records are copied in the appropriate manner by competent Officers.

Said issue is also related to the Safety Management Code under the training requirements denoted in Chapter 6 "Resources and Personnel".

In view of the aforesaid it is inferred that the failure to effectively retrieve VDR data is highlighted as a safety issue, directly related to lack of familiarization and training.

4.4 Bridge resource management

.1 STCW Convention & Codes, Manila Amendments 2010/Chapter II/Section A-II/1 sets out the "*Mandatory minimum requirements for certification of officers in charge of a navigational watch on ships of 500 gross tonnage or more*".

Table A-II/1 of said section specifies the "*minimum standard of competence for officers in charge of a navigational watch on ships of 500 gross tonnage or more*".

The respective Columns of the Table in "*Function: Navigation at the operational level*" determines the subjects of competency for OsOW in respect to safety of navigation and watch.

.2 **Bridge Resource Management⁸ (BRM)** principals, as stated in respective Table, introduce an important aspect for Masters and Officers in Charge of navigational watch. BRM is the effective management and integration of all resources, human and technical, available to the bridge team, to navigate the vessel in a safe and efficient manner.

In conclusion optimized bridge resource management shields safe navigation by fully utilizing all the technical advantages of bridge navigational equipment, maintaining the situational awareness of the watchkeeping Officers as well as appropriate communication and exchange of information at all levels of the bridge team.

More specifically, under STCW Code/Part A/Chapter VIII/Part 3 "*Watchkeeping Principles In general*" the Bridge Resource Management principals have been introduced while Chapter VIII/Part 4-1 have laid down a set of mandatory "*principals to be observed in keeping a navigational watch*".

Aforementioned provisions incorporate instructions to ensure that Masters take all the appropriate actions for the bridge watch arrangement and management, and the the Navigational Officers perform their duties effectively. To that end the bridge team is assisted for the command decision making and possible failures are blocked and counteracted to avoid or lessen consequences of a likely to occur marine accident.

In the examined case it was emerged that certain obligations, duties, tasks and functions, as foreseen and emanating through said STCW Code applicable standards, were disregarded by the Master and the watchkeeping personnel.

An abstract of the provisions, as numbered in the respective parts of the Code, that is considered not to have been followed or implemented by Ince Inebolu Master and Navigational Officers and are pertinent to the sequence of events leading to Ince Inebolu's grounding, is presented in below table 3.

⁸ Bridge Resource Management (BRM) or Engine-room Resource Management (ERM) training is not required to be completed until 1 January 2017 (STCW.7/Circ.17-24 May 2011).

Table 3 .STCW applicable standards not followed or implemented.

STCW Code Part A/Chapter VIII/Part 3	
Watchkeeping Principles In general	
8.	Watches shall be carried out based on the following bridge and engine-room resource management principles:
.3	understanding of watchkeeping personnel regarding their individual roles, responsibility and team roles shall be established;
.4	the master, chief engineer officer and officer in charge of watch duties shall maintain a proper watch, making the most effective use of the resources available, such as information, installations/equipment and other personnel;
.7	information from the stations/installations/equipment shall be appropriately shared by all the watchkeeping personnel;
.8	watchkeeping personnel shall maintain an exchange of appropriate communication in any situation; and
.9	watchkeeping personnel shall notify the master/chief engineer officer/officer in charge of watch duties without any hesitation when in any doubt as to what action to take in the interest of safety.
STCW Code Part A/ Chapter VIII/Part 4-1	
Watchkeeping at sea / Principles applying to watchkeeping generally	
9.	Parties shall direct the attention of companies, masters, chief engineer officers and watchkeeping personnel to the following principles, which shall be observed to ensure that safe watches are maintained at all times.
10.	The master of every ship is bound to ensure that watchkeeping arrangements are adequate for maintaining a safe navigational or cargo watch. Under the master's general direction, the officers of the navigational watch are responsible for navigating the ship safely during their periods of duty, when they will be particularly concerned with avoiding collision and stranding.
Look out	
15.	The lookout must be able to give full attention to the keeping of a proper lookout and no other duties shall be undertaken or assigned which could interfere with that task.
17.	In determining that the composition of the navigational watch is adequate to ensure that a proper lookout can continuously be maintained, the master shall take into account all relevant factors, including those described in this section of the Code, as well as the following factors:
.9	the operational status of bridge instrumentation and controls, including alarm systems;
Watch arrangements	
18.	When deciding the composition of the watch on the bridge, which may include appropriately qualified ratings, the following factors, <i>inter alia</i> , shall be taken into account:
.4	use and operational condition of navigational aids such as ECDIS, radar or electronic position indicating devices and any other equipment affecting the safe navigation of the ship;
Taking over the watch	
22.	Relieving officers shall personally satisfy themselves regarding the:
.1	standing orders and other special instructions of the master relating to navigation of the ship;
.3	prevailing and predicted tides, currents, weather, visibility and the effect of these factors upon course and speed;
.5	navigational situation, including, but not limited to:
.5.1	the operational condition of all navigational and safety equipment being used or likely to be used during the watch;
Performing the navigational watch	
27.	The officer in charge of the navigational watch shall not be assigned or undertake any duties which would interfere with the safe navigation of the ship.
32.	It is of special importance that at all times the officer in charge of the navigational watch ensures that a proper lookout is maintained. In a ship with a separate chartroom, the officer in charge of the navigational watch may visit the chartroom, when essential, for a short period for the necessary performance of navigational duties, but shall first ensure that it is safe to do so and that proper lookout is maintained.
36.	Officers of the navigational watch shall be thoroughly familiar with the use of all electronic navigational aids carried, including their capabilities and limitations, and shall use each of these aids when appropriate and shall bear in mind that the echo-sounder is a valuable navigational aid.
Watchkeeping under different conditions and in different areas	
In hours of darkness	
46.	The master and the officer in charge of the navigational watch, when arranging lookout duty, shall have due regard to the bridge equipment and navigational aids available for use, their limitations, procedures and safeguards implemented.

Taking into account the aforementioned it is concluded that instructions and procedures were not in place for an effective Bridge Resource Management on board Ince Inebolu.

No procedures or instructions were found pertaining to the utilization of the features offered by the bridge equipment and the navigational aids available for use (ARPA, GPS, BNWAS), by which safeguards could be set for assisting and ensuring safety of navigation.

- .3 Taking into account par. 4.3.2 and 4.3.3 in relation to navigational aids available features and functions, it is concluded that had Ince Inebolu's bridge technical resources been utilized effectively by the Master and the watchkeeping Officers, it is highly possible that the 2nd Officer on the watch would had been alerted, woken up and would had taken prompt actions to correct the course or avoid the grounding or at least mitigate its consequences.

The poor bridge resource management in relation to technical resources is considered to have been a contributing factor to the examined case.

- .4 Based on the collected information through the interview process, it was derived that BNWAS operation was under the full responsibility of the Master.

The BNWAS key was not found on the unit, making it inoperative during watches. Said practice was actually limiting the safeguards to Navigational Officers and could had refrained them from bringing forward to Master's attention the necessity to operate the BNWAS for the interest of safety of navigation during their watches.

It is to be noted that the performance standards and technical requirements referred in par. 4.3.4.2 (key lock) aim to protect the system from tampering and not to hinder its operation.

The described practice is considered to have created a sense of impassivity and unconcern to the bridge teams since the OsOW were relying solely on the Master's action for monitoring the proper operation of the navigational equipment available on their watch.

On above grounds it is concluded that exchange of information between the watchkeeping personnel was poor while it was inferred that Navigational Officers had not fully apprehend their individual and team role as well as their responsibility for the safe operation of Ince Inebolu.

In the light of the above as well as of the aforementioned in par. 4.3.4.3 & 4.3.4.4, it is concluded that Bridge navigational Officers and Master's poor performance in terms of Bridge resource management have been a contributing factor in the marine accident.

4.5 Ince Inebolu Safety Management System

It is essential for an effective bridge organization to efficiently manage all resources available on the bridge and to promote good communications and teamwork. The bridge organization should be properly supported by a clear navigation policy incorporating shipboard operation procedures, in accordance with the company's safety management system onboard ships as required by the ISM Code.

In pursuance to ISM Code Chapter 7 "Shipboard operations", procedures, plans and instructions, including checklists, as appropriate, should be established by the Company concerning the personnel's and ship's safety and the protection of the environment. The various tasks should be identified and assigned to qualified personnel.

Said procedures could be directly related to the set of the instructions stemming from the "Bridge Resource Management" requirements correlated also with Master's Standing Orders.

Procedures and instructions were laid down on Ince Inebolu, for carrying out the key shipborne operations, related to watchkeeping, under the aforementioned provisions.

The established procedures were ensured that were being followed through the completion of related check lists by the relieving Duty Officer.

4.5.1 Changing over the watch procedure

The Company Safety Management System in relation to watch handover was implemented under the "Bridge Check List form 531-12" that was completed and signed by the Duty Officer and countersigned by the Master.

Aforementioned process was mainly focusing on four navigational aspects required to be controlled and evaluated by the relieving Duty Officer by marking ticking boxes.

A reference of the check list is quoted below:

1. Reading of the Standing Orders, Supplementary Master's Instructions and navigational warnings.
2. Members of the relieving watch are capable of carrying their duties.
3. The relieving Officer has been acquainted with:
 - the position, course and draught
 - Supplementary Master's instructions
 - Prevailing/predicted tides, current, weather and visibility
 - Operational condition of all navigational and Safety Equipment on bridge
 - Gyro/magnetic compass errors
 - Movement of vessels in vicinity/effect on own ship
 - Identification of shore lights, buoys etc.
 - Conditions/hazards likely to be encountered on watch
 - Possible effect of any heel, trim, squat, etc. on underkeel clearance
4. The vision of the relieving officer adjusted to the prevailing conditions.

Having scrutinized the provided procedures it is inferred that, although they were concurrent with the basic directions provided by STCW Code/Part A/Chapter VIII/Part 4-1 (Taking over the watch, par. 19 to 23), yet they were rather generic, as no specific instructions related to the Bridge Resource Management were incorporated.

Indicatively, it is noted that the "operational condition of all navigational and Safety Equipment" ticking box could include a list with the main and critical Navigational and Safety equipment such as (radar, ARPA, GPS, AIS, BNWAS, VDR), in order for their operational status and effective utilization (alarm, warning settings) to be confirmed and acknowledged by the relieving Officer or that the Look Out watch is posted and on duty.

Based on the above it is suggested that the lack of incorporating explicit instructions to the Navigating Officers during the watch changeover procedure have been a contributing factor in the marine accident.

4.5.2 Calling the relief

Calling the relieving Officer on the watch does not fall under any specific requirement to be incorporated in a documented procedure, although pertinent to the watchkeeping operation and with the "taking over the watch" procedure that requires the relieving watch Officer to fully adjust his vision to the light conditions and carry out prior checks related to ship's navigation.

It is a customary practice on board ships that the OOW calls the relief on his cabin's telephone and wakes him up. The time of calling is normally communicated and prearranged between the watch keepers, usually 20 to 30 minutes before the watch change over. It is also a practice to send the rating of the look-out watch, if feasible, to the relief cabin to wake him up.

The prescribed practice is mostly based on the requirements of the respective parts in STCW, providing that the relieving Officer has to get used to night vision, be briefed for the navigational situation by the OOW for all the aspects concerning the safe operation and navigation of the vessel.

As previously reported, at the night Ince Inebolu grounded, the bridge remained unattended until the time of the occurrence, as the 2nd Officer had fallen asleep and the look-out watch had not been posted and practically said facts led to the failure of notifying and calling the relieving Officer.

Taking into account that Ince Inebolu grounded at approximately 0405, that is 5 minutes post to watch change over, it is highly possible that if the Chief Officer had entered the bridge to take over his watch at the regular time, possibly 10 minutes before 0400, then he could have observed the navigational situation and the imminent danger of grounding, while Ince Inebolu was sailing almost 2 to 2.5 nm away from Atypalaia coastline. In that case the Chief Officer could have had enough time to counteract and avoid the grounding. Said assumption could have been materialized only in case the Chief Officer had an own practice to set his own alarm by any available personal means such as an alarm clock, personal cell phone etc., or such a practice had been advisable through written guidelines or instructions.

4.5.3 Master's Standing Orders⁹

International Safety Management Code in Part A/Chapter 5 "*Master's Responsibility and Authority*", inter alia, provides that the Company should clearly define and document the Master's responsibility with regard to issuing appropriate orders and instructions in a clear and simple manner.

Under the above context, the Company, through the Safety Management Manual, had given the necessary authorities to the Master under "Master's Authority" documented procedure and had additionally charged him with responsibilities, including: "*the issuance of his own Standing Orders appertaining to his vessel and the trade/service in which it is engaged*".

Despite the fact that during the investigation process on board Ince Inebolu, Master's Standing Orders, were requested, they were not handed over to the Investigation team.

It is noted that the Night Orders that were available the investigation team were presenting general instructions that are pertinent to Standing Orders.

Taking under consideration the above it is considered that the lack of specific Standing Orders issued by the Master in relation to safety of navigation and bridge watch directives and instructions have been a contributing factor to the marine accident.

4.5.4 Night Orders

The Night Orders are a supplement to the Standing Orders that come into force as the Master proceeds to take rest during the night. The Standing Orders are in force at all times whereas the Night Orders add specific points to the withstanding Standing Orders. The Master writes the Night Orders every night, with specific regard related to the existing state of the weather, sea and traffic. These are generally handwritten and duly signed by every OOW. One should read these orders carefully because the Master uses his experience and expertise to determine safe navigation in his absence and therefore lays down instructions as to the plotting intervals, pressure and temperature reading intervals, navigational practices and so forth.

Ince Inebolu's Night Orders were prepared by Master for the passage from Suez to Istanbul Strait and were mainly focusing on safe navigation during the Aegean Sea

⁹ Master's Standing Orders are a set of instructions to ensure safe ship navigation and operations whether at sea or at port. These set of directives by the Master encompasses a very wide list of aspects of navigation and rules for the Officers. Standing Orders are to be followed at all times by the Officer on duty and are duly signed by every Officer on board, making them liable to adhere to the orders.

passage, by stressing the attention to OsOW for fishing vessels and yachts sailing nearby vessel's passage.

Fixes intervals were also specified to be plotted on a hourly basis and if required, less than an hour along with methods used for entering ship's position.

It was also stressed to operate both radars during night time.

Night Orders were furthermore incorporating instructions for listening to Channel 16 on the VHF and communication with other ships while a general order to call Master if any doubt occurred, in relation to navigation or if encountering increased traffic, restricted visibility or problems in decision making was also recorded.

In addition to the above it was instructed to report directly to the Master any defect of the electronic equipment.

Having regard to the above, the investigation process highlighted that during the navigational night watches in the night prior to the grounding, the OsOW were not using both ARPA radars while the deactivated BNWAS was not considered as a significant equipment that was not in function and had to be reported to the Master.

The failure of the navigating Officers to follow Master's Night Orders and more specifically to operate both ARPA radars and to report or record that BNWAS was inoperative in the "bridge Check list – changing over the watch" form is considered to have been a contributing factor in the marine accident.

4.6 Look-out watch

COLREGS '72, rule 5 requires that: *"Every vessel shall at all times maintain a proper look-out by sight and hearing as well as by all available means appropriate in the prevailing circumstances and conditions so as to make a full appraisal of the situation and of the risk of collision"*.

STCW/Part A/Chapter VIII / Part 4-1 states that:

"13. The officer in charge of the navigational watch is the master's representative and is primarily responsible at all times for the safe navigation of the ship and for complying with the International Regulations for Preventing Collisions at Sea, 1972, as amended."

Look out watch aspect is also regulated in followings par. 14 and 15 of aforementioned STCW Code, stating that:

"14. A proper lookout shall be maintained at all times in compliance with rule 5 of the International Regulations for Preventing Collisions at Sea, 1972, as amended and shall serve the purpose of:

- .1 maintaining a continuous state of vigilance by sight and hearing, as well as by all other available means, with regard to any significant change in the operating environment;*
- .2 fully appraising the situation and the risk of collision, stranding and other dangers to navigation; and*
- .3 detecting ships or aircraft in distress, shipwrecked persons, wrecks, debris and other hazards to safe navigation.*

15. The lookout must be able to give full attention to the keeping of a proper lookout and no other duties shall be undertaken or assigned which could interfere with that task."

Following, par. 16 of said Instrument provides the discretion to Master to decide the composition of a sole watch:

"16. ...the officer in charge of the navigational watch may be the sole lookout in daylight provided that, on each such occasion:

- .1 the situation has been carefully assessed and it has been established without doubt that it is safe to do so;*
- .2 full account has been taken of all relevant factors, including, but not limited to:*

- *state of weather;*
- *visibility;*
- *traffic density;*
- *proximity of dangers to navigation; and*
- *the attention necessary when navigating in or near traffic separation schemes; and*

.3 *assistance is immediately available to be summoned to the bridge when any change in the situation so requires.”*

However single man bridge watch is not allowed under any conditions during nighttime. Based on the interview process and according to Ince Inebolu “Personnel rest hours” table, it was evident that look-out watch was not posted after she exited the Suez Canal, at afternoon hours on 03 September 2014, until the time of the grounding, as the Master had decided to exempt and relieve the ABs from the look-out watch duties in order to deploy them for the deck operations that had to be carried out during the day time.

The Master’s decision to relieve the ABs from their look-out watch duties had notably weaken the navigational bridge effective watch by removing a safeguard of paramount importance, as it is considered highly possible that the AB as look out watch, if present on the bridge, would had kept the 2nd Officer active and the grounding would had been avoided.

The Master’s disregard to aforesated COLREGS and STCW principal provisions has been a contributing factor to the examined marine accident.

4.7 Cargo hold cleaning operation

4.7.1 General Cargo hold cleaning operation

Bulk Carriers cargo cleaning is an important shipboard operation, carried out following a vessel’s departure from the discharging port, that mainly requires, inter alia structured procedures, knowledge, good practice, efficient manpower, etc., whilst additionally depends on the type of the discharging cargo together with the requirements emanating from the specifications of the cargo to be loaded, the charter party conditions and terms and so forth.

Bulk Carriers loading, carriage and discharging operations in relation to cargo holds clean up requirements are basically regulated under the IMSBC¹⁰ Code, as applied based on the loaded cargo properties and substances. More specific issues regarding loading and unloading operations are provided under the BLU Code¹¹ whilst requirements for ships carrying grain as well as loading and unloading operations are set out in Grain Code¹².

Cargo cleaning operation demands that all holds should be thoroughly cleaned by sweeping, scraping and high-pressure sea water washing to remove all previous cargo residues and any loose scale or paint, paying particular attention to any residues that may be trapped behind beams, ledges, pipe guards, or other fittings in the holds.

The Cargo holds cleaning operation on Bulk Carriers is of paramount importance for the their trading operation, as large claims have arisen when cargo holds have not been cleaned sufficiently and their condition has caused contamination.

In principal, the requirements for cleaning the holds are dependent upon the previous cargo carried, the next cargo to be carried, charterers' requirements, the requirements of shippers and receivers and/or the authorities at the port of loading.

¹⁰ The International Maritime Solid Bulk Cargoes Code that was adopted by resolution MSC.268(85). The requirements for the transport of grain are covered by the International Code for the Safe Carriage of Grain in Bulk (International Grain Code, MSC.23(59) 1991).

¹¹ Code of Practice for the Safe Loading and Unloading of Bulk Carriers

¹² International Code for the Safe Carriage of Grain in Bulk under reg. 8 & 9 of chapter VI of the 1974 SOLAS Convention, as amended.

It is becoming common practice for receivers to have an inspector at the loading port in order to inspect the holds for cleanliness and infestation and issue a certificate stating that holds are fitted for loading cargo.

In consideration of the above it could be generally deduced that Owners and Charterers should have a good understanding of:

- the respective hold cleanliness obligations under the charterparty;
- the time required to get the holds cleaned;
- required personnel and equipment to carry out an efficient hold cleaning operation;
- what can practically be achieved in hold cleaning and having the ship ready to load

while Masters should not take any risks in trying to comply with unrealistic dates for the ship's readiness.

4.7.2 Ince Inebolu Cargo hold cleaning operation

As already stated, Ince Inebolu had discharged her grain cargo at the port of Yemen and was en route to Russia to load wheat.

In view of the Bulk Carrier practice¹³ the cargo hold washing operation on Ince Inebolu could fall under the cleaning standards for Bulk carriers¹⁴, called "Grain Clean" and under the following common requirements:

"Holds must be clean, swept and washed down with fresh water. They should be free from insects, odour, residue of previous cargo, lashing material, loose rust scale and paint flakes etc. They must be dried, well ventilated and ready to receive the intended cargo subject to shippers and relevant surveyor's inspection."

Based on the information derived from the interview process, Ince Inebolu cargo cleaning operations included washing of the cargo holds by sea water and following, rinsing with fresh water and draining the holds by pumping the bilges. The procedure was completed by restoring flaking paints.

Due to the fact that deballasting bilges at sea is not allowed in Red Sea, Marmara Sea and Black Sea, deballasting operation had to be carried out while she was sailing in the Aegean Sea. Resultantly, the cargo holds washing had to be commenced after exiting the Suez Canal.

According to Ince Inebolu's crew complement, the Bosun and one AB were the deck ratings solely used for deck maintenance and activities during day time that could also be assisted by the two Deck Cadets. Said ratings that were not "forming part of the navigational watch" were available to perform the cargo washing operation.

¹³ Bulk Carrier practice, Second edition published by the Nautical Institute

¹⁴ **Hospital clean, or 'stringent' cleanliness** requiring the holds to have 100% intact paint coatings on all surfaces, including the tank top, all ladder rungs and undersides of hatches. Usual cargoes, for example kaolin/china clay, mineral sands, chrome ore, soda ash, rice in bulk etc.

grain clean, or high cleanliness: the most common requirement for the majority of bulk and break bulk cargoes such as all grains, soya meal and soya products, alumina, sulphur, bulk cement, bauxite, concentrates, and bulk fertilizers.

normal clean: holds are swept clean, with no residues of the previous cargo, and washed down olds are swept clean, with no residues of the previous cargo and washed down for taking cargoes similar to or compatible with the previous shipment.

shovel clean: all previous cargo that can be removed with a 'Bobcat' or a rough sweep and clean with shovels by the stevedores or crew.

load on top: the cargo is loaded on top of existing cargo residues, commonly be required where a ship is trading continuously with the same commodity and grade of that commodity.

Info available: <http://bulkcarrierguide.com/cargo.html>

However, the Master, considering the limited time to reach Canakkale entrance, decided to strengthen the available crew capacity for the cargo cleaning operation with the ABs that were exclusively performing watch keeping duties, look outs.

In consideration of the above the Master's decision to engage the ABs that were forming part of the navigational watch, with the cargo washing operation has been a contributing factor to the grounding of Ince Inebolu.

4.8 Crew Complement

4.8.1 Minimum Safe Manning Principals

SOLAS '74/ Chapter V / Reg. 14, as applied, principally regulates crew manning issue by providing that:

“Contracting Governments undertake, each for its national ships, to maintain, or, if it is necessary, to adopt, measures for the purpose of ensuring that, from the point of view of safety of life at sea, all ships shall be sufficiently and efficiently manned.”

IMO Assembly¹⁵ Resolution A.1047(27) introduces guidelines that should be used in applying the principles of minimum safe manning to ensure the safe operation of ships, their security and the protection of the marine environment.

The objectives of the guidelines mainly focus on the sufficiently, effectively and efficiently manning of a ship to provide:

- safety and security of the ship;
- safe navigation;
- safe operations at sea;
- safe operations in port;
- prevention of human injury or loss of life;
- avoidance of damage to the marine environment and to property;
- ensure the welfare and health of seafarers through the avoidance of fatigue;

based on goal-base approach, standard procedures for effective implementation and effective enforcement.

Furthermore, capabilities, abilities and on board functions are highlighted as principals to be considered in determining the minimum safe manning of a ship, whilst it is stressed that the ship's crew grades and capacities should be based on the performance of the functions at the appropriate levels of responsibility, as specified in the STCW Code.

The Company, responsible for the operation of a ship, may submit its proposal of a minimum safe manning in numbers and grades/capacities to the Administration to be evaluated and accepted to its satisfaction, if the proposed ship's complement is established in accordance with the principals, recommendations and guidelines of Resolution A.1047(27) and is adequate in all respects for the safe operation and the security of a ship and for the protection of the marine environment.

4.8.2 Ince Inebolu Complement

Ince Inebolu was operating under a crew complement in excess of the required under the Minimum Safe Manning Document that numbered an overall of 17 crew members.

The supernumerary personnel that was six in total, was including two ratings for the accommodation department (Cook and Steward), two Deck and one Engine Cadets and one Electrician.

The deck department Minimum Safe Manning requirements, apart from those referred to the Deck Officers and Master, in respect to the rest of the deck personnel, were divided in two “Groups”, that is “group 1”, comprising the ratings of Ordinary Seaman, Able Seaman and Boatswain and “group 2”, comprising the ratings of Deck Rating and Deck

¹⁵ The highest Governing Body of the Organization. It consists of all Member States.

Boy, as marked under the "Special Requirements and Conditions" note of the issued Minimum Safe Manning Document.

Taking under consideration the aforementioned, it was emerged that "group 2" was counting ratings that were not based "on performance of the functions at the appropriate levels of responsibility, as specified in STCW Code", meaning the "*Mandatory minimum requirements for certification of ratings as able seafarer deck*", under Section A-II/5 that establishes the minimum standards of competence of ratings as able seafarer deck. In consideration of the above, the provisions foreseen in Res. A.1047(27), as generally presented in previous paragraph (4.8.1), were not taken in full regard.

4.8.3 Ince Inebolu deck resources

As already reported Ince Inebolu deck manning levels were in compliance by numbers with the minimum required, as the Bosun and the AB were counting the ratings included in "group 2". Additionally the supernumerary two Deck Cadets were participating in shipborne operations. Resultantly, four crew members were available to perform the cleaning and washing operation.

Nonetheless the Master decided to deploy the ABs, forming part of the navigational watch, for the hold cleaning operation, under the pressure of the remaining time before transiting Canakkale in relation to the time required for the operation to be conducted and his liability to present Ince Inebolu fit for loading at the loading port.

In view of the above as well as in conjunction with the aforesaid in par. 4.7, it is inferred that, in practical terms, Ince Inebolu deck resources were insufficient and scanty in numbers to carry out demanding deck operations under the voyage limitations in time and navigation to the loading port.

In such cases tradeoffs between safety and ship commercial operation could result to marine accidents.

In relation to the aforementioned safety issue, by Res. MSC.353(92) amendments to ISM Code were adopted that entered in force on 01 January 2015, by introducing new requirements and conditions for determining manning levels.

More specifically the related amendment¹⁶ addresses that Companies should ensure that the vessel is appropriately manned with qualified, certificated and medically fit seafarers, in order to encompass all aspects of maintaining safe operations on board based on the principals of Res. A. 1047(27). Amongst the amendments and supplements referred in said Res. MSC.353(92), a new paragraph¹⁷ is added to the foreword of the Code regarding the effect of footnotes.

Based on the above it is enunciated that compliance with minimum safe manning may not be sufficient when taking into account the operational requirements and demands of the ship.

¹⁶ IMO Resolution MSC.353(92)

"6.2 The Company should ensure that each ship is:

.1 manned with qualified, certificated and medically fit seafarers in accordance with national and international requirements; and

.2 appropriately manned in order to encompass all aspects of maintaining safe operations on board*.

* Refer to the Principles of minimum safe manning, adopted by the Organization by resolution A.1047(27)."

¹⁷ 8 The following new paragraph is added to the foreword of the publication of the Code:

"The footnotes given in this Code are inserted for reference and guidance purposes and do not constitute requirements under the Code. However, in accordance with paragraph 1.2.3.2, all relevant guidelines, recommendations, etc. should be taken into account. In all cases the reader must make use of the latest versions of the referenced texts of the document specified in a footnote, bearing in mind that such texts may have been revised or superseded by updated material."

ISM referred provision is in line with Regulation 2.7 of the Maritime Labour Convention 2006¹⁸, which also requires that all operational aspects are taken into account when reviewing manning levels.

In the light of aforesaid, it is presumed that the lack of deck numerically sufficient resources for carrying out shipborne operations related to the trading operations of Ince Inebolu loading is considered to have been a contributing factor to the examined marine accident.

4.9 The Second Officer

4.9.1 Recruiting procedure

STCW Code/Chapter I/ Section A-I/14¹⁹ lays down the “Responsibilities of the Companies” in relation to crew employment and assignment of duties. Said responsibilities and procedures are directly associated with ISM Code provisions/Chapter 6 “Resources and Personnel²⁰”.

Under the above framework the 2nd Officer had successfully been through the “Before joining familiarization training” process conducted by the Company, on 16 April 2014, based on the procedure of “Shipboard Training” under Company’s Safety Management System.

The familiarization topics were mainly focusing on the Company’s policy in Safety, Health, Environment etc. Having completed the procedure he was recruited with the capacity of the Officer in charge of the navigational watch and more specifically with the 2nd Officer’s duties, as recorded in the relevant procedure form.

Additionally, on the next day, that is the 17th of April 2014, when he joined Ince Inebolu in Yemen, he passed through the “Onboard familiarization training”, as provided by the

¹⁸ Regulation 2.7 – Manning levels

Purpose: To ensure that seafarers work on board ships with sufficient personnel for the safe, efficient and secure operation of the ship.

1. Each Member shall require that all ships that fly its flag have a sufficient number of seafarers employed on board to ensure that ships are operated safely, efficiently and with due regard to security under all conditions, taking into account concerns about seafarer fatigue and the particular nature and conditions of the voyage.

Standard A2.7 – Manning levels

1. Each Member shall require that all ships that fly its flag have a sufficient number of seafarers on board to ensure that ships are operated safely, efficiently and with due regard to security. Every ship shall be manned by a crew that is adequate, in terms of size and qualifications, to ensure the safety and security of the ship and its personnel, under all operating conditions, in accordance with the minimum safe manning document or an equivalent issued by the competent authority, and to comply with the standards of this Convention.

2. When determining, approving or revising manning levels, the competent authority shall take into account the need to avoid or minimize excessive hours of work to ensure sufficient rest and to limit fatigue, as well as the principles in applicable international instruments, especially those of the International Maritime Organization, on manning levels.

3. When determining manning levels, the competent authority shall take into account all the requirements within Regulation 3.2 and Standard A3.2 concerning food and catering.

¹⁹ Section A-I/14 Responsibilities of companies

1 Companies, masters and crew members each have responsibility for ensuring that the obligations set out in this section are given full and complete effect and that such other measures as may be necessary are taken to ensure that each crew member can make a knowledgeable and informed contribution to the safe operation of the ship.

2 The company shall provide written instructions to the master of each ship to which the Convention applies, setting forth the policies and the procedures to be followed to ensure that all seafarers who are newly employed on board the ship are given a reasonable opportunity to become familiar with the shipboard equipment, operating procedures and other arrangements needed for the proper performance of their duties, before being assigned to those duties. Such policies and procedures shall include:

.1 allocation of a reasonable period of time during which each newly employed seafarer will have an opportunity to become acquainted with:

.1.1 the specific equipment the seafarer will be using or operating;

.1.2 ship-specific watchkeeping, safety, environmental protection, security and emergency procedures and arrangements the seafarer needs to know to perform the assigned duties properly;

²⁰ 6. Resources and Personnel

6.3 The Company should establish procedures to ensure that new personnel and personnel transferred to new assignments related to safety and protection of the environment are given proper familiarization with their duties. Instructions which are essential to be provided prior to sailing should be identified, documented and given.

6.4 The Company should ensure that all personnel involved in the Company’s SMS have an adequate understanding of relevant rules, regulations, codes and guidelines.

6.5 The Company should establish and maintain procedures for identifying any training which may be required in support of the SMS and ensure that such training is provided for all personnel concerned.

“Shipboard training procedure” of vessel’s SMS and assumed his duties, on the same day.

The “On board familiarization training” was incorporating basic elements of the operation of Ince Inebolu, quoted in a check list form which was subdivided into three sections, under the following headings:

- Familiarization - section, with 12 fields to be evaluated;
- For Deck Officers - section, with 09 fields to be evaluated, out of which one was referred to the Chief Officer competency and responsibility and one was recording ECDIS competency which was not fitted on board;
- For Engine Officers - section, with 03 fields to be evaluated.

Taking under consideration the structure of the documented procedure it was viewed that it was rather generic, as it was addressed to recruiting Officers in general, regardless the department of competency and responsibility to be positioned.

It is considered that a detailed procedure incorporating the duties of Officers according to their capacities and functions, as emerge from STCW/Chapter I / Section A-I/14 “Responsibilities of companies” par. 1 & 2.1 and based on STCW/Chapter I/Section VIII/Part 4-1 could furnish a more in depth and adequate evaluation of the new recruited Officers, emphasizing for example on issues related to safe navigation such as on board existing navigational bridge equipment, familiarization, bridge resource management and situational awareness matters.

Having in mind ISM Code/Chapter 6/Resources and Personnel, it is construed that recruiting process should not be considered as a typical procedure but as a process to assess and evaluate the recruiting Officer tailored to the needs, requirements and equipment of a vessel’s safe operation.

4.9.2 Situational Awareness²¹

Situational awareness is considered a critical element for standard watch management and safe navigation, broadly involving human performance under the influence of environmental, personal, organizational and informational factors. It is the accurate perception of factors and conditions that affect the vessel’s safety during a specified period of time.

Situational awareness is one of the elements included in STCW/Chapter II/Section “Table A-II/1” for the function: “Navigation at the operational level”, related with the knowledge, understanding and proficiency of the navigational Officer whilst in Section/Table A-II/2 for the function: “Navigation at the management level” is pertinent to the knowledge, understanding and proficiency of the Master and the Chief Officer. The competency for both functions is demonstrated through seagoing experience and training.

Based on the collected data, It was emerged that the prevailing navigational conditions in relation to external environment such as the lacking of marine traffic and very good weather conditions were not assessed by the 2nd Officer and believably created a sense of complacency or relaxation due to lack of stimulation and action, as BNWAS was deactivated.

Subsequently the self-situational awareness of the 2nd Officer was seriously reduced and was depending only on his personal generating alertness and stimulation which was reduced to the minimum level, due to fatigue, leading to his incapacitation.

The loss of self-situational awareness by the 2nd Officer is presumed to have been a contributing factor into the grounding of Ince Inebolu.

²¹ **Situational awareness:** the perception of the elements in the external and internal environment, the understanding of their meaning and the projection of their status in the near future.

4.9.3 Experience reflecting Competency

By the time of the marine casualty, the 2nd Officer was running his fourth month of employment on board Ince Inebolu.

In regard to his credentials, he had started his seagoing career as a Deck Officer shortly after graduating from the Maritime Academy, in 2013. Based on his current service on board oceangoing cargo ships, by the time the marine accident occurred, his experience is considered limited, counting 11 months in total as a Deck Officer which is directly connected to his young age.

Nevertheless, he was assigned to perform the 0000-0400 navigational night watch, which is deemed to be a high risk time period, as most of the marine accidents occur during night hours and especially from 0000 to 0600 as highlighted in various safety studies²² and statistics, one of which is presented in par. 4.14.

The failures of 2nd Officer related to the navigational operation that have already been identified, and namely:

- failure to utilize the available functions of the navigational equipment;
- failure to follow Master's night orders;
- failure to monitor ship tracking in relation to offset drifting;
- failure to report his physical state under fatigue;

denote his lack of experience reflecting the efficiency of competency for the tasked duties. It is noted that the 3rd Officer already serving on Ince Inebolu and performing the 0800-1200/2000-2400 navigational watch had formerly served for almost two years on board tankers and could be reckoned that his professional profile had greater experience than the 2nd Officer's.

Taking into account the information collected and the findings of the investigation process it is perceived that the 2nd Officer on the Watch did not perform his duties in full regard to the competency²³ and proficiency standards, as deemed appropriate through STCW Code Functions in *Table A-II/1*.

On above grounds it is induced that the evaluation system of the new recruiting Officer implemented by the Company was not effective in full.

4.9.4 Fitness for duty

.1 As already reported the 2nd Officer, before taking over his navigational watch, had spent most of his non working evening time in his cabin resting, however without sleeping. It was not confirmed during the interview process whether he was not regularly having any sleep before his 0000-0400 night watch, however it was reported that he had regular sleep after completing his night watch until noon hours.

Taking under consideration the information and data collected during the investigation process, it is highly possible that the 2nd Officer on the night of the grounding fell asleep due to lack of sleep that generated fatigue, likely deepen by the absence of stimulation and action during his watch.

During the interview process, the 2nd Officer stated that before taking over his watch he was feeling fit for duty, nevertheless it was evident that while on watch he slept for more than two hours until the grounding. Said conclusion indicates that he could have been influenced by fatigue probably due to the fact that he had not slept since he had

²² "Bridge Watch keeping Study" by MAIB (2004): Nearly 50% (11 cases) occurred between 0000 and 0600 and out of these, fatigue was considered a contributing factor in 9 cases.

²³ **Competency:** A cluster of related abilities, knowledge and skills that enable a person to act effectively in a job or situation. Competence indicates sufficiency of knowledge and skills that enable someone to act in a wide variety of situations. Because each level of responsibility has its own requirements, competence can occur in any period of a professional or at any stage of his or her career.

woken up at approximately noon hours to take over his navigational watch at 1200-1600, as his resting hours record was found in order.

The 2nd Officer lack of sleep and his effort to withstand fatigue is considered to have been a contributing factor to the marine accident.

- .2 In relation to 2nd Officer's fitness for duty, the Master stated that based on the "night orders", an Officer could call the Master if, for any reason, was unable or incapacitated to perform his duties and in such case he could relieve him from watch.

Despite said option and taking under consideration the aforesaid, it is highly possible that the 2nd Officer refrained from reporting any concern or problem in relation to his fitness for duty and probably tried to overcome the feeling of fatigue, showing a "can-do" attitude as a new Deck Officer, so as not to generate a negative perception and judgment of his performance and proficiency to the Master and to the Company.

The 2nd Officer decision not to report his foreseeable physical incapacitation and to continue to perform his watch at the night the grounding occurred, is considered to have been a contributing factor to the marine accident.

- .3 Based on the information derived from the interview process it was reported that the 2nd Officer during his watch at the night of the occurrence, was engaged with clerical work and he was visiting and staying in the chartroom for short periods, although such undertaking is not allowed under STCW Code/Chapter VIII/Part 4-1 "*Principals to be observed in keeping a navigational watch*" par. 27:

"The officer in charge of the navigational watch shall not be assigned or undertake any duties which would interfere with the safe navigation of the ship."

In view of the above, apart from the fact that the 2nd Officer was not maintaining a full vigilance of the ship's navigation and position, it is likely that the progressive paperwork he undertook, following the completion of his watch from 1600 to 1800 and the paper work done during his night watch caused fatigue that led to drowsiness and falling asleep.

4.10 The master

4.10.1 Recruiting procedure

As already stated, the Master had joined Ince Inebolu on 18 May 2014. On the same day he had successfully completed the familiarization course in the head Office of the Company. The process governed by the "Shipboard Training" procedure incorporated the "Before Joining Familiarization Training" phase, based on Company's Safety Management System (Form No. Ince 202-14).

The familiarization areas included 19 topics²⁴ that were mainly focusing on the Company's Policies in regard to the operational management of its vessels by the employed Masters.

Following, the Company empowered the recruited Master with the liabilities, functions and commanding jurisdiction through the documented procedures of the "Responsibilities of the Master" as well as the "Master's Authority", under its Safety Management System.

²⁴ Familiarization topics:

- | | |
|---|---|
| 1. Safety Management & Company Policies | 11. Port Operation and Cargo Handling procedure |
| 2. Cash Accounts and Policies | 12. Ship particulars and Operation details |
| 3. Voyage Planning and Report | 13. Terrorism and Sabotage (ISPS) |
| 4. Company & Shipboard Emergency Procedures | 14. Certificates and Survey Status |
| 5. Company Organization Procedure | 15. Crew information |
| 6. Document Control Procedure | 16. Communication Procedure & sign of Bill of Loading |
| 7. Planning Maintenance Procedure | 17. Marine pollution prevention procedure |
| 8. Class & Insurance Company & Relevant Documents | 18. Suppliers & Provision Policy & Facilities |
| 9. Shipboard Service Procedure | 19. Hazardous occurrence & near miss |
| 10. Crew manning & Employment | |

4.10.2 Responsibilities of the Master

The “Responsibilities of the Master” on Ince Inebolu were grouped in 10 subjects²⁵ that were in general covering the aspects of the vessel’s operation in relation to her safety management and trading service.

Having scrutinized the responsibilities entrusted to the Master, it is concluded that he had disregarded ship safe navigation at the altar of the effective preparation of his vessel for the loading port, believably concentrating on the trading aspect of Ince Inebolu, on his effort to fulfill and to execute no 1 & 2 subjects of the “Master’s responsibilities”, by which the Master is respectively charged to:

- “1. (i) prosecute, with all possible dispatch, the voyage/service in which his vessel has been engaged by the principals/Managers/Charterers.
2. (i) fulfill the contract entered into by the principals/Managers/Charterers.
(ii) take all actions to protect the principals/Managers/Charterers interests in connection with the carriage of cargo.”

In regard to the above it is presumed that the Master’s actions were triggered by the perception of his performance by the Company, being a new recruited Master.

The Master’s disregard to follow and implement the International Rules and Regulations in relation to Ince Inebolu safe navigation is considered a contributing factor to the marine accident.

4.10.3 Watch Officers assignment

The STCW Code/Chapter VIII/Part 4 provides the “Principals applying to watchkeeping generally” while par. 10 states that:

“The master of every ship is bound to ensure that watchkeeping arrangements are adequate for maintaining a safe navigational or cargo watch. Under the master’s general direction, the officers of the navigational watch are responsible for navigating the ship safely during their periods of duty, when they will be particularly concerned with avoiding collision and stranding.”

Following, related requirements in Part 4-1 “Principals to be observed in keeping a navigational watch”, par. 17 states that:

“In determining that the composition of the navigational watch is adequate to ensure that a proper lookout can continuously be maintained, the master shall take into account all relevant factors, including those described in this section of the Code, as well as the following factors:

- ...
- .6 knowledge of, and confidence in, the professional competence of the ship’s officers and crew;
 - .7 the experience of each officer of the navigational watch, and the familiarity of that officer with the ship’s equipment, procedures, and manoeuvring capability;”

Under the aforementioned provisions, it follows that the watchkeeping arrangement responsibility rests for the Master to decide by ensuring that the watch Officers are adequately assigned to conduct watches based on their competency and seagoing experience.

The referred requirements were mostly empowered to Master through the “Responsibilities of the Master” document and more specifically in no 3 subject “The Navigation and handling of the ship”, specifying that the Master is responsible:

²⁵ Responsibilities’ of the Master with respect to:

- | | |
|---|--|
| 1. The employment of the ship | 6. Stores & Provisions |
| 2. The carriage of cargo | 7. Bunkers |
| 3. The Navigation and handling of the ship | 8. Ballast |
| 4. The Maintenance of the ship structure, equipment and machinery | 9. Administrative, Clerical, and general duties |
| 5. The preparing the vessel for sea | 10. Motivate all crew for Company Safety Management System |

- ii. *“to assign navigating officers to bridge watches and to satisfy himself that any such Officer is familiar with the equipment of the vessel and adequately briefed to effectively perform these tasks.*

In relation to the above, subject no 9 of Master’s Responsibilities *“Administrative, Clerical, and general duties”* par. (k) foresaw that the Master is responsible:

- *“to ensure that each member of the ships company receives the training, advice and assistance necessary to enable him to perform his duties effectively and safely and to develop professionally to his fullest potential, in particular, to ensure that instructions, on shipboard training, (issued by Managers), are carried out.”*

Furthermore par. (l), charged the Master with the responsibility:

- *“to satisfy himself that each Officer on board understands his duties as specified by that Officer’s position description and by the Master’s own instructions, to report to the managers any lack of ability or competence on the part of Officers that he the Master is unable to correct himself.”*

Taking under consideration the aforementioned it is concluded that the Master of Ince Inebolu disregarded his responsibilities entrusted by the Company in relation to watchkeeping assignment which could be based under his assessment and evaluation on the ship’s working environment.

4.11 Emergency response actions by Ince Inebolu

The International Safety Management Code, as applied, in Chapter 8 *“Emergency Preparedness”* provides that:

- “8.1 The Company should establish procedures to identify, describe and respond to potential emergency shipboard situations.*
- 8.2 The Company should establish programmes for drills and exercises to prepare emergency actions.*
- 8.3 The safety management system should provide for measures ensuring that the Company’s organization can respond at any time to hazards, accidents and emergency situations involving its ships.”*

Under said provisions, Ince Inebolu Safety Management System had incorporated *“Contingency Procedures”* to be followed in emergencies situations.

Following the grounding on 04 September 2014, the Master, as already reported in Narrative section, was alerted and immediately proceeded with actions according to good seamanship and Safety Management System procedures.

Nonetheless, despite the fact that the Master had promptly informed the Company and was in constant communication with it, his allegation that had in parallel reported the incident to the Authorities was not confirmed, as the grounding was actually reported by a fisherman, approximately one and a half hour post to its occurrence and it was the Coastal State’s Authority that contacted Ince Inebolu and was finally informed about the grounding.

Master’s obligation to report to the Authorities of the Coastal State the grounding of Ince Inebolu, under the respective provisions of MARPOL 73/78 Convention/Protocol I/article I *“Duty to report”* as well as SOLAS/Chapter I/Regulation 11 (c), that is to report to the appropriate Authorities any incident and accident, were not satisfied.

4.12 Environmental conditions

Environmental conditions were reported to be very good after Ince Inebolu exited the Suez Canal and during her passage towards the Aegean Sea.

At the night of the marine casualty prevailing weather conditions were reported to be very good with calm sea and very good visibility (table 4).

Table 4. Weather & environmental conditions.

Wind – direction	Light breeze / 4-6 knots - WNW
Sea state	Smooth / Almost calm
Visibility	Very good / 8-10 nm
Light/dark	Dark

The watchkeeping Officers stated that weather was not an issue to consider during their watches.

As already reported, the 2nd Officer on the watch was performing his duties mostly by monitoring Ince Inebolu passage and preparing the paperwork for the arriving port.

Based on the above it could be presumed that prevailing weather conditions affected his performance by reducing his watchfulness and by causing a sense of security and complacency in relation to ship's navigation that together with the identified factors as presented in the report, eventually led to the 2nd Officer's drowsiness and incapacitation.

In light of the above, the prevailing weather conditions during the 2nd Officer's watch is considered to have been a contributing factor in the marine accident.

4.13 Fatigue²⁶

The Maritime Labour Convention and the STCW Convention and Codes have tackled the subject of resting periods of seafarers as lack of resting hours has been considered one of the main factors leading to marine accidents.

The most common causes of fatigue are lack of sleep, poor quality of rest, stress and excessive workload.

4.13.1 Ince Inebolu deck crew fatigue

"Fatigue factors in manning and Safety" have been emphasized and have called the attention to stakeholders of maritime transports by IMO Resolution A. 772(18)²⁷ adopted on the 4th of November 1993. Said Resolutions set out the basic factors that should be taken into account in making operational decisions.

²⁶ **Fatigue** definition as found in IMO's MSC/Circ.813/MEPC/Circ.330:

"A reduction in physical and/or mental capability as the result of physical, mental or emotional exertion which may impair nearly all physical abilities including: strength; speed; reaction time; coordination; decision making; or balance", leading to degradation of human performance.

²⁷ Res. A. 772 (18) provisions pertain to manning levels:

1 INTRODUCTION

1.1 The purpose of this document is to provide a general description of fatigue, to identify the factors of ship operations which may contribute to fatigue, and to classify those factors under broad categories to indicate the extent to which the factors may be related.

1.2 The objective is to increase awareness of the complexity of fatigue and to encourage all parties involved in ship operations to take these factors into account when making operational decisions.

2 GENERAL DESCRIPTION OF FATIGUE

2.1 Fatigue results in the degradation of human performance, the slowing down of physical and mental reflexes and/or the impairment of the ability to make rational judgments.

2.2 Fatigue may be induced by factors such as prolonged periods of mental or physical activity, inadequate rest, adverse environmental factors, physiological factors and/or stress or other psychological factors.

4.1 Management ashore, aboard ship, and also the responsibilities of Administrations

4.1.1 The prevention of fatigue in the areas of scheduling of shipboard work and rest periods, manning levels, watchkeeping practices and assignment of duties could largely be accomplished by sensible shore-based management and on-board management techniques. It is also recognized that Administrations have an equally important role to play with respect to legislation leading to acceptance, implementation and enforcement in those areas covered by international conventions. Guidelines and provisions should take into account the relationships between work and rest periods to ensure adequate rest. These considerations should include a review of the voyage length, length of port stay, length of service of individual crew members, periods of responsibility and watchkeeping practices.

4.1.2 It is essential that management should provide clear, concise written policy guidance to ensure that ships' crews are familiar with ships' operational procedures, cargo characteristics, voyage length, destination, internal and external communication practices and ship familiarization procedures.

4.3 Crew-specific factors

4.3.1 Thoroughness of training is considered to be important in the prevention of fatigue. Fitness for duty, including medical fitness, proper working experience and the qualifications and quality of crew members are also considered important in this context.

In the examined case, as already reported in par. 4.1.2 Ince Inebolu's personnel resting hours were being recorded on a daily basis as provided by IMO and ILO recommended formats "Shipboard working arrangements table" and "Record of hours of rest".

During the investigation process the resting hours tables were found to be consistent with the working hours, at least for the last two days prior to the grounding that the absence of lookout watch from the bridge was evident.

Based on the interview findings, it was identified that Ince Inebolu operational requirements in relation to navigation, clerical tasks, cargo operational demands in conjunction with the trading areas and voyage duration were causing fatigue to deck crew personnel, although quantitatively it was exciding the minimum safe manning levels.

On above subject, the examined case as well as similar cases investigated or under investigation by our Office have furthermore brought to light that resting hours recorded in aforementioned "tables" may not actually correspond to the resulting hours of rest on board a vessel due to the fact that shipboard daily experienced working hours may exceed the working schedule prearranged by a vessel's plan.

Bearing in mind the above, it is presumed that Ince Inebolu manning levels were not taking in full account Res. A. 772 (18) in full to meet the peak workload situations and conditions with due regard to the number of hours of shipboard duties that may be assigned to the deck personnel and its rest periods.

4.13.2 Second Officer's fatigue²⁸

As already reported, the 2nd Officer despite the fact that before taking over his watch had spent his evening resting hours in the mess room and in his cabin, yet he did not have any sleep and consequently he went on the bridge to take over the navigational watch, potentially under the state of fatigue.

The lack of sleep or the poor quality of rest is attributed to be as the main factors that result in fatigue and exhaustion.

Fatigue has a direct detrimental impact on alertness which is the optimum state of the brain that enables an individual to make conscious decisions. Such state is to be performed when a person is required to maintain a period of concentrated and sustained attention, such as looking out and carrying out watchkeeping duties, particularly in night time.

When an individual's alertness is affected by fatigue, his duties' performance can be significantly impaired. Impairment will occur in every aspect of human performance (physically, emotionally and mentally) such as in decision-making, response time, judgment and so forth.

In view of the above, fatigued individuals become more susceptible to errors of attention and memory. (for example, it is not uncommon for fatigued individuals to omit steps in a sequence).

In conclusion, fatigue detrimentally affects an individual's and crew performance and may reduce their effectiveness and efficiency; decrease productivity; lower standards of work and may lead to errors being made, posing a hazard to ship safety.

Taking into account the aforementioned as well as the evidence collected during the interview process in relation to the 2nd Officer's resting periods, it derives that his performance was directly affected by fatigue that was generated due to assigned paperwork, to lack of sleep and poor quality of rest prior to undertake his watchkeeping duties.

The 2nd Officer's fatigue is considered as a contributing factor to the examined marine accident.

²⁸ References based on MSC/Circ.1014 (12-06-2001) Guidance on fatigue mitigation and management

4.14 Similar cases

A report published by MAIB in 2004, the “Bridge Watch keeping Study” has analyzed accidents involving merchant vessels greater than 500gt, underway and without a pilot, which had been the subject of either a “Full Investigation” or a “Preliminary Examination” between 1994 and 2003.

Initially, a review of the data examined, identified three principal areas of concern:

- One third of all groundings involved a fatigued officer alone on the bridge at night.
- Two thirds of vessels involved in collisions were not keeping a proper look-out.
- One third of all accidents that occurred at night involved a sole watch keeper on the bridge.

An analysis of data for 23 cases that involved grounding incidents showed a striking resemblance to that of Ince Inebolu:

- ✓ Nearly 50% (11 cases) occurred between 0000 and 0600 and out of these, fatigue was considered a contributing factor in 9 cases.
- ✓ In 8 out of the 9 fatigue related accidents, the vessels among others:
 - had not posted a look-out;
 - were being steered by autopilot;
 - were not fitted with, or were not using a watch alarm;
 - had an unaccompanied watch keeper who had fallen asleep.

The Study has highlighted, that although the bridge watchkeeping composition of 19 vessels was manned in accordance with the provisions for look-out, as set out in STCW 95, yet still failed to maintain a proper look-out.

In those cases contributing factors addressed the issue of lack of competency whilst fatigue was laterally observed.

On many ships, although ratings are usually available to provide an additional look-out, they are rarely used for this duty during daylight.

A common view supported is that ratings are generally of little value on the bridge, especially when the Master or other Officers are also present and their disposal for deck tasking and working is considered more beneficial for the ship’s operation. As a result, ratings working during daytime are usually relieved from their night time bridge watch, in order to rest.

5. Conclusions

The following conclusions, safety measures and safety recommendations should not under any circumstances be taken as a presumption of blame or liability. The juxtaposition of these should not be considered as an order of priority or importance.

5.1 Conclusions led to safety recommendations

- .1 The absence of the AB forming part of the 2nd Officer's navigational watch decided by the Master had notably weaken the navigational bridge effective watch disregarding COLREGS and STCW principal provisions (§ 4.1.1.1 & 4.6).
- .2 The omission of the 2nd Officer to set the guard zone utility on the operating Radar and utilize the GPS "off course alarms is considered to have been a contributing factor in the marine accident (§ 4.3.2.1 & 4.3.3).
- .3 The Master and the OsOW disregarded the advantages of the BNWAS system leading to the deactivation during the navigational watches (§ 4.3.4.3 & 4.3.4.4).
- .4 The failure to effectively retrieve VDR data, that hindered the investigation process, is related to the training requirements under Safety Management Code/Chapter 6 "Resources and Personnel" (§ 4.3.6).
- .5 Obligations, duties, tasks and functions, as foreseen and emanating through STCW Code applicable standards, were disregarded by the Master and the watchkeeping personnel (§ 4.4.2).
- .6 The bridge resource management in relation to technical resources was poor as Instructions and procedures were not in place (§ 4.4.2 & 4.4.3).
- .7 The operating practice of BNWAS created a sense of impassivity and unconcern to the bridge teams, disregarding the team role as well as their responsibilities for Ince Inebolu's safe operation (§ 4.4.4).
- .8 The "changing over the watch procedure" was rather generic, indicating a lack of incorporating explicit instructions to the Navigating Officers related to the Bridge Resource Management (§4.5.1).
- .9 Navigating Officers failed to follow Night Orders that were presenting general instructions pertain to Standing Orders whilst Standing Orders were not available on board (§ 4.5.3 & 4.5.4).
- .10 The Master failed to follow rules and regulations regarding safe navigation by deciding to strengthen the available crew capacity for the cargo cleaning operation with the ABs that were forming part of the navigational watch at the altar of Ince Inebolu effective trading operation (§ 4.7.2 & 4.10.2).
- .11 The provisions foreseen in Res. A.1047(27) in relation to the establishment of the minimum safe manning were not taken in full regard in relation to the "*performance of the functions at the appropriate levels of responsibility*" as specified in STCW Code" (§4.8.1 & 4.8.2).
- .12 Res. MSC.353(92) amendments to ISM Code/Chapter 6/Resources and Personnel in line with Regulation 2.7 of the Maritime Labour Convention 2006 for determining and reviewing manning levels as well as Res. A. 772 (18) to meet the peak workload situations and conditions, were not taken in full account by the Company (§ 4.8.3 & 4.13.1).
- .13 The evaluation system for the new recruiting Officers implemented by the Company was rather generic and was not effective in full (§ 4.9.1 & 4.9.3).

- .14 The 2nd Officer self-situational awareness was seriously reduced leading to his incapacitation (§ 4.9.2).
- .15 The 2nd Officer's credentials provided limited experience for undertaking the 0000-0400 night watch for satisfying the competency and proficiency standards, as deemed appropriate through STCW Code/Functions in *Table A-II/1* (§ 4.9.3).
- .16 The 2nd Officer had showed a "can-do" attitude refraining from reporting his foreseeable physical incapacitation, although under lack of sleep and not fit for duty (§ 4.9.4).
- .17 The 2nd Officer was affected by fatigue due to undertaken clerical work in conjunction with lack of sleep and poor quality of rest prior to his watch that led to drowsiness and falling asleep (§ 4.9.4 & 4.13.2).
- .18 The Master disregarded his responsibilities entrusted by the Company and STCW Code/Chapter VIII/Part 4 & Part 4-1 in relation to watchkeeping assignment (§ 4.10.3).
- .19 Master's obligation to report to the Authorities of the Coastal State the grounding of Ince Inebolu, under the respective provisions of MARPOL 73/78 Convention/Protocol I/article I "Duty to report" as well as SOLAS/Chapter I/Regulation 11 (c), were not satisfied (§ 4.11).
- .20 Prevailing weather conditions affected the 2nd Officer's performance by reducing his watchfulness and by causing a sense of security and complacency, that eventually led to his drowsiness and incapacitation (§ 4.12).
- .21 The Incident report analysis conducted by the DPA, presented in following "actions taken" section did not highlight in full safety issues and lessons learned related to the operational process of the ship and the Company (§ 6).

6. Actions Taken

Following the marine casualty on 05 September 2014, the Company's DPA prepared the Analysis Report into the marine casualty dated on 20 September 2014, according to internal procedures of Company's Safety Management System (*Hazardous Occurrences and Near Miss Procedure Form no: INCE 571-4*) under the «Guidelines for the operational implementation of the International Safety management Code ISM Code by Companies» MSC-MEPC.7/Circ.5. par. 4.2.3 & par. 6.

The root cause analysis conducted identified the following findings:

- Duty Officer fell asleep; lethargy; indiscipline; exhaustion;
- no watchman on the bridge; AB was tired; AB participated in hold cleaning operations during day time; wrong work planning;
- BNWAS was closed; Suez channel pilot ordered to close during Suez ch; less concentrate; the Master did not control after pilot left the bridge; not any action sensor; no mention BNWAS at changeover control list;

The main root causes identified were reported as below:

- ✓ The Duty Officer was alone;
- ✓ BNWAS was close;
- ✓ The Duty Officer was exhausted;
- ✓ The Master fully responsible;
- ✓ Cancelled all deck Officer;

The actions taken by the Company, as recorded in the Analysis report, are quoted below:

- Revise relevant procedures for not close BNWAS;
- Enter BNWAS relevant forms;
- Issue relevant instructions for BNWAS.

Notwithstanding HBMCI requested the “actions taken” to be documented as appropriate during the consultation period, the Company did not respond.

Apart from the above, the examination of the analysis report conducted by the Company is not considered to have been exhaustive and comprehensive focusing only on the immediate evidence and casual factors without looking for the underlined conditions which have been present in the whole operational process.

On above grounds a relevant safety recommendation is addressed therein.

7. Safety Recommendations

Taking into consideration the analysis and the conclusions derived from the safety investigation conducted, the following recommendations are issued:

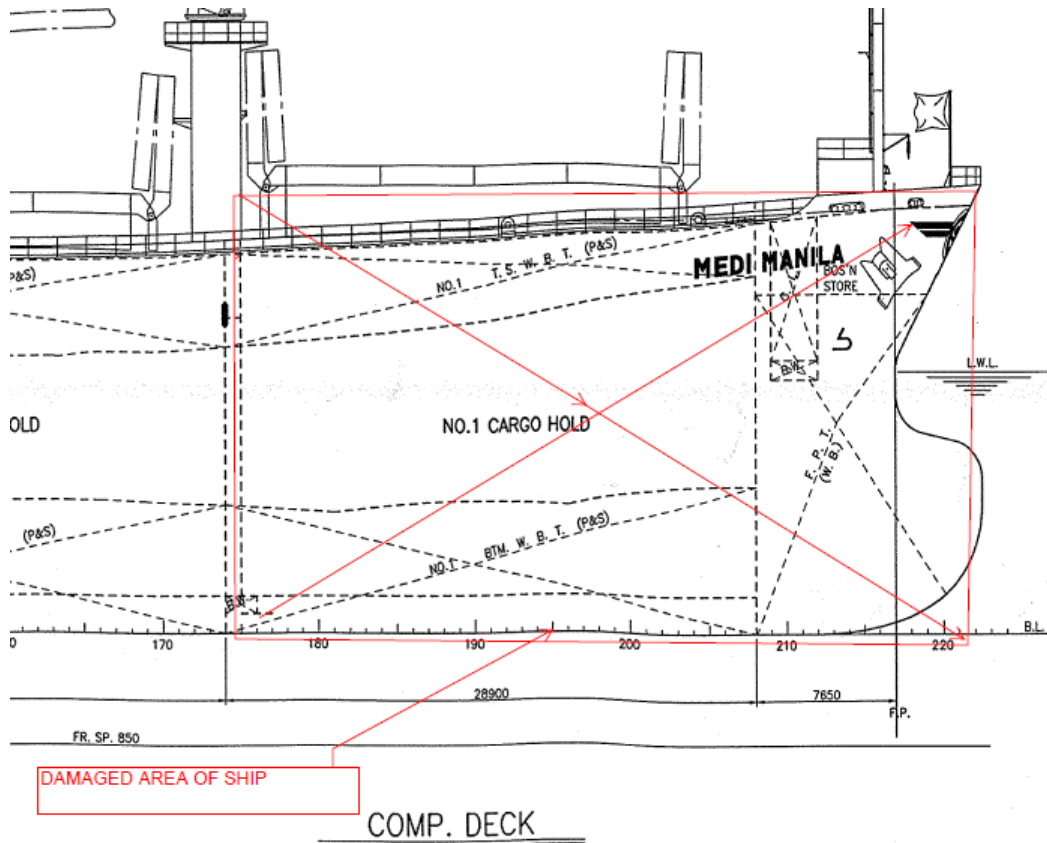
7.1 The Owners/Managers of Ince Inebolu are recommended to:

- 11/2014 take effective actions fleet-wide in order to ensure that Masters follow the Company’s policy in regard to safety of navigation and watchkeeping under COLREGS and STCW requirements at all times, in priority to vessel’s trading operations.
- 12/2014 revise the Safety Management System under the requirements for an effective Bridge Resource Management in relation to technical and human resources, including watchkeeping procedures.
- 13/2014 take appropriate measures through training in order to ensure that VDR data are saved and retrieved successfully, following a marine incident or casualty.
- 14/2014 ensure that safeguards are in place through documented procedures fleet-wide for controlling the operation of BNWAS while vessels are underway at sea.
- 15/2014 review Company’s recruiting policy targeting to the Competency, Proficiency and experience standards based on the levels of responsibilities of recruited personnel.
- 16/2014 take appropriate measures to ensure that Standing Orders are issued and in place and Night Orders are written on a daily basis and adhered by watchkeeping Officers.
- 17/2014 review the manning levels fleet-wide, taking into account the trading operations workload in relation to fatigue mitigation following provisions of relevant International Instruments and guidelines, as deemed appropriate.
- 18/2014 ensure that mandatory requirements for reporting marine casualties and incidents to the competent Authorities are in place and adhered by Masters or designated persons.
- 19/2014 reassess the Company training procedures of competent personnel for conducting marine accidents investigation analysis in consistence with ISM Code.

7.2 The Competent Authority of the Shipping Administration for issuing Minimum Safe Manning Document is kindly invited to:

- 20/2014 to consider the provisions foreseen under Res. A.1047(27) for establishing Minimum Manning Levels of Flagged vessels, concerning the minimum standards of competency as specified in STCW Code (*performance of the functions at the appropriate levels of responsibility*) for ratings under Group 2, as has been identified in Ince Inebolu’s Minimum Safe manning Document.

APPENDIX 1



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This report was written solely for the purposes of the investigation and is uploaded on the website of HBMCI (see below).

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