

Report on the investigation into the grounding of  
mv LA BELLE DES OCEANS



near the Phi-Phi Islands, Thailand with hull rupture below the  
waterline on 25 November 2019.



## **Extract from European Directive 2009/18**

(26) Since the aim of the technical safety investigation is the prevention of marine casualties and incidents, the conclusions and the safety recommendations should in no circumstances determine liability or apportion blame.

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## GLOSSARY OF ABBREVIATIONS AND ACRONYMS

°	Degrees
Bft.	Beaufort
AB	Able Bodied Seaman
AO	Amongst Others
cm	Centimetres
CPA	Closest Point of Approach
ECDIS	Electronic Chart Display Information System
ESE	East South East
ETA	Estimated Time of Arrival
ETC.	Et Cetera
FW	Fresh Water
h	Hour
HDG	Heading
IMO	International Maritime Organization
kW	Kilo Watt
Lbpp	Length between Perpendiculars
LOA	Length Over All
LT	Local Time
m	Metres
M/v	Motor Vessel
S	South
Nm	Nautical Mile
OOW	Officer Of Watch
PS	Port Side
SA	Société Anonyme
SB	Starboard
SMS	Safety Management System
SOG	Speed Over Ground
UTC	Universal Time Co-ordinated
WT	Water Tight

# 1 MARINE CASUALTY INFORMATION

## 1.1 RESUME

During sea passage from Koh Lanta anchorage, Thailand, to Phang Nga Bay, Thailand , the passenger vessel mv LA BELLE DES OCEANS, IMO 8800195, hit a charted rock that ruptured her hull across a distance of two metres, and damaged the forward bulkhead between the pumproom and a fresh water tank.

Seawater entered the fresh water tank and further flooded the pumproom and to the crew deck above the pumproom.

When the tide rose, the vessel was moved on the rock and thereby a fuel tank got damaged as well. Seawater ran into the tank, but no pollution occurred.

The vessel, including all crew and passengers, sailed towards Phuket, Thailand by her own means where all passengers disembarked and where the vessel was temporarily repaired. Nobody got injured.

## 1.2 CLASSIFICATION OF ACCIDENT

According to Resolution A.849(20) of the IMO Assembly of 27 November 1997, Code for the investigation of Marine Casualties and Incidents, a serious marine casualty means a marine casualty involving a fire, explosion, grounding, contact, heavy weather damage, ice damage, hull cracking suspected hull defect, etc., resulting in:

- structural damage rendering the ship unseaworthy, such as penetration of the hull underwater, immobilization of main engines, extensive accommodation damage etc.;
- or pollution (regardless of quantity);
- and/or a breakdown necessitating towage or shore assistance.

According to this definition, the accident was classified as

### **SERIOUS CASUALTY**

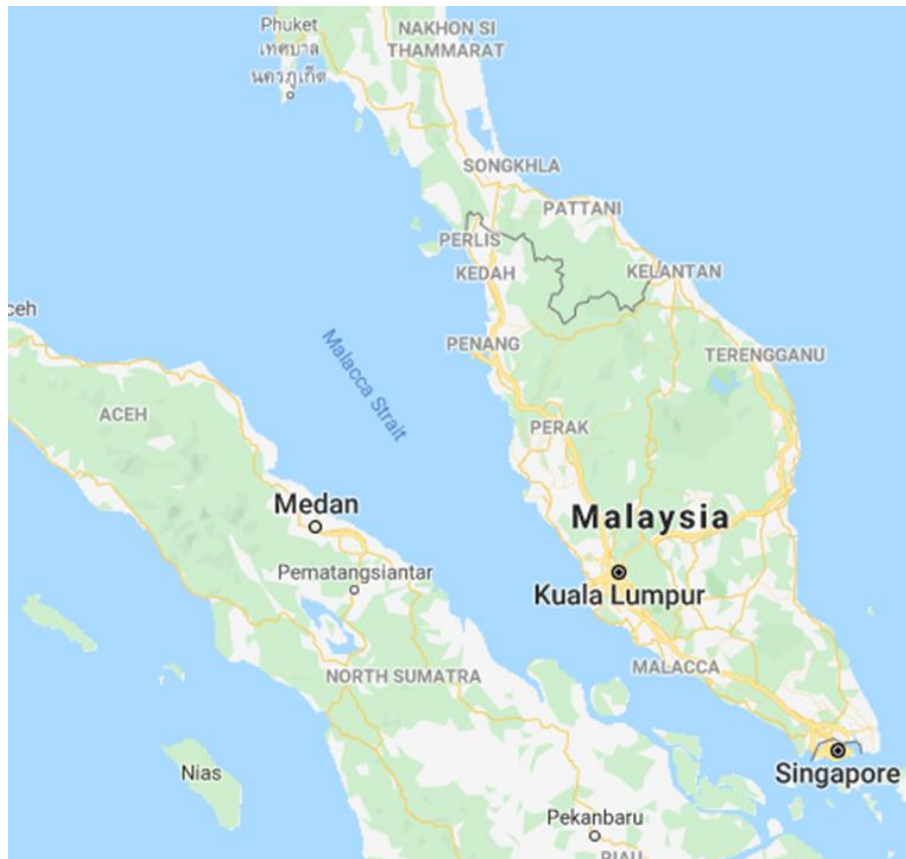
## 1.3 ACCIDENT DETAILS

Time and date	November 24 <sup>th</sup> , 2019, 2357 LT
Location	27nm ESE of Phuket, Thailand
Persons on board	159
Deceased	0

## 2 SYNOPSIS

### 2.1 NARRATIVE (LT, UTC+7, UNLESS SPECIFIED)

Passenger Ship mv LA BELLE DES OCEANS was a cruise ship managed by Croisieurope, organizing (among others) cruises from Singapore to Phuket, Thailand (and vice versa). This was the third cruise on this route in 2019.



*Figure 1 - Singapore – Phuket*

The cruise departed on November 19<sup>th</sup> 2019 in Singapore and was scheduled to arrive in Phuket on November 25<sup>th</sup> 2019, around 1500. There were seven stops during this voyage. In total 79 passengers and 80 crewmembers were on board.

On November 24<sup>th</sup> 2019 at 2210, the anchor was weighed at Koh Lanta anchorage, Thailand with destination Phang Nga Bay, Thailand (the last stop before arrival in Phuket). It was a voyage of 52nm with ETA 0730 on November 25<sup>th</sup> 2019, see Figure 2.





Figure 2 – Koh Lanta to Phang Nga

*In this figure, Koh Lanta is situated right under. Phang Nga bay is situated above in the middle.*

*This figure is a reproduction of the waypoints.*

A voyage plan had been prepared, based upon the instructions in the SMS, properly signed by the navigational officer, the officers of the watch and the master. The waypoints were programmed in the ECDIS. No paper charts were in use on board.

Watchkeeping on board was maintained by three second officers, each one having two navigational watches of 4 hours. Two extra hours were spent on other work. Each second officer worked 10 hours and had 14 hours of rest during a 24h period.

During a navigational watch, a second officer was assisted by two AB's (also working 10 hours/day). Every watch, the same AB's were assisting the same officer. One AB was always on the bridge together with the officer of watch (OOW).

Besides watchkeeping, one second officer was responsible for safety, another one for navigation and the third one for training.

The second officer responsible for navigation was on duty from 0800 to 1200 and from 2000 to 0000. He was on duty when the vessel grounded.

On November 24<sup>th</sup> at 2210, the OOW was heaving up anchor while the master was at the bridge. At 2220 the anchor was stowed and secured and the second officer went to the bridge, where he took over the conn from the master at 2230. At that moment, the course was 273°(as

indicated in the voyage plan) and the speed of the vessel was 6.1 knots, being the voyage speed for that part of the voyage. One main engine was switched off to save fuel. The vessel was only running the portside main engine. This was not unusual on board.

When the second officer took the conn, the master left the bridge. A fishing boat with a fishing net over the stern was visible on the SB bow. The length of the fishing net could not be determined. The own course was altered to PS to keep well clear of the net with the intention to retrun towards the initial course once the fishing boat was cleared.



Figure 3 - Sailed course South of planned route

The dotted line indicates the planned route, the thin red line indicates the sailed course. The magenta marked X represents Bitu Rock, where the vessel grounded

After the fishing boat was passed, another two small fishing boats became visible. Additionally some smaller white lights were visible in the water, indicating the presence of fishing nets. Reportedly, it was decided to make a small alteration in course to SB of a few degrees to return to the initial course and thus stay South of the planned route, as explained in Figure 4.

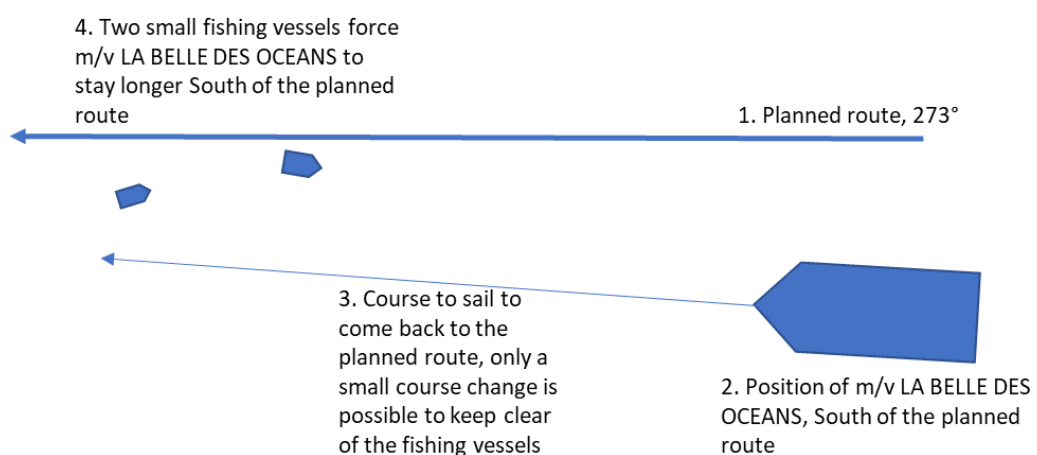
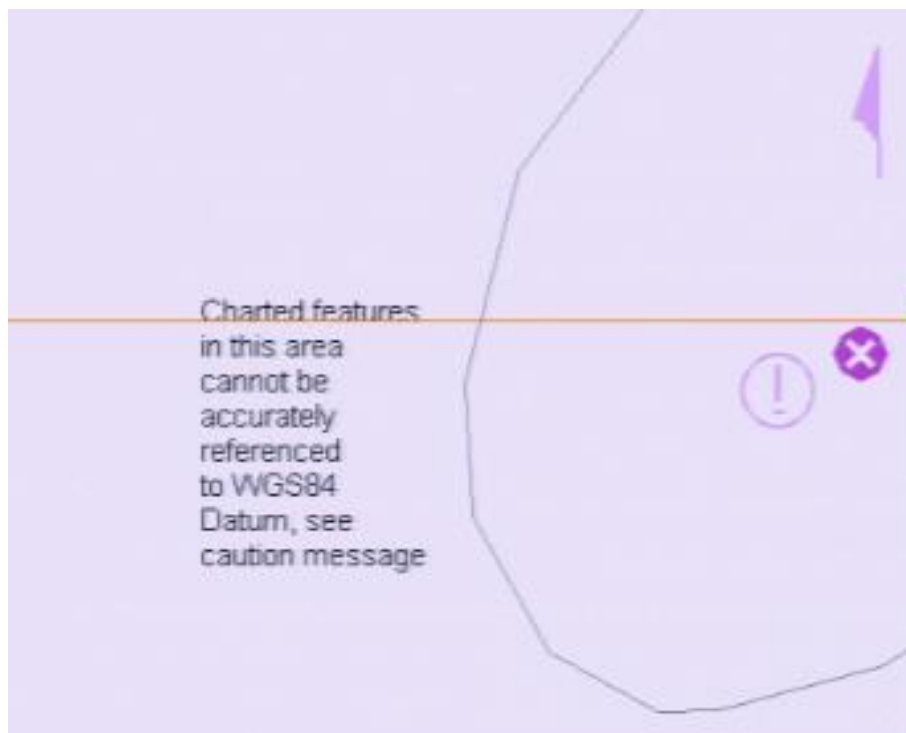


Figure 4 - Drawing of traffic situation

This drawing only gives an indication of the maneuver and is not based on real positions.

Around 2330 mv LA BELLE DES OCEANS passed the two small fishing boats on SB. The vessel was now sailing 0.5Nm South of the planned route and was approaching Bita Rock (Hin Bida). This rock was charted with a additional navigational warning concerning the accuracy of the charted objects in that area.



*Figure 5 – ECDIS warning*

The OOW noticed the rock on the chart, indicated with a magenta “X”, see Figure 5, but he was convinced that he would pass clear of the charted obstruction at a distance of two cables. He did not further follow-up the situation.

At 2351, the ECDIS gave an alert for a navigational hazard which the OOW did not notice as all ECDIS alerts on board were muted.



Figure 6 - ECDIS screen, alarms muted

In the meantime, the bridge team for the watch from 0000 and 0400 had entered the bridge. The watchkeeping officer of the watch from 2000 till 0000 lost his focus on the job and entered into a conversation with his relief officer.

At 2357, the vessel hit the rock with a speed of 6 knots.

The master was awoken by the shaking of the vessel when she hit the rock and ran to the bridge. He immediately stopped the engine and took over the con.

The chief engineer, also awoken by the noise of the grounding, ran to the engine control room. The temperatures and pressures of the port main engine and of the two generators were normal. The bilge level alarm in the pump room was activated.

When checking the condition of the pump room, water ingress was noticed on portside forward in the pump room from the FW tank, see Figure 7.



Figure 7 - Water ingress from FW tank into the pump room

The engineers tried to stop the leak, but the first attempts were not successful. All available portable pumps were brought to the pump room as the water level was quickly rising.

The chief electrician isolated the electricity for the pump room.

The water was still rising and when the pump room was completely flooded, water entered the above crew deck , between watertight doors two and three until it reached sea level.

Tank soundings indicated that water was also flooding N°1 fresh water tank PS, see Figure 8, Figure 9 and Figure 10.

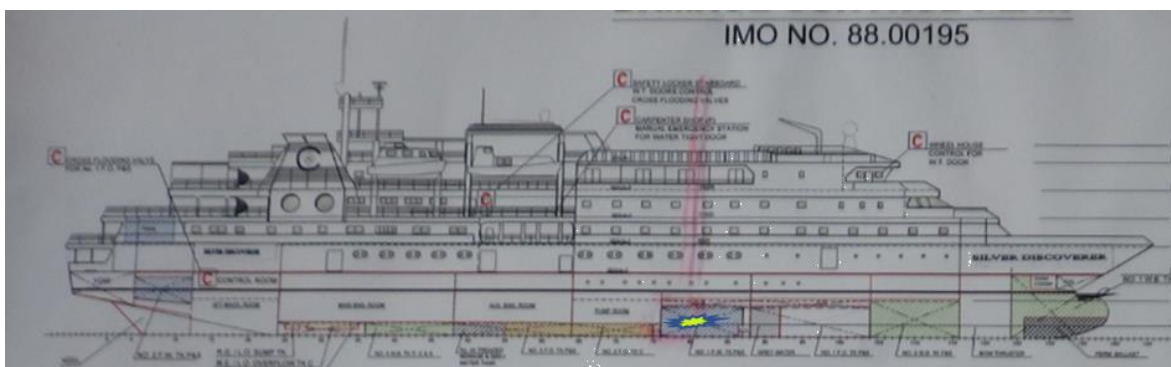


Figure 8 - Position of hull rupture

The position of the hull rupture is, in this picture of the on board control damage plan, indicated with a yellow spot.



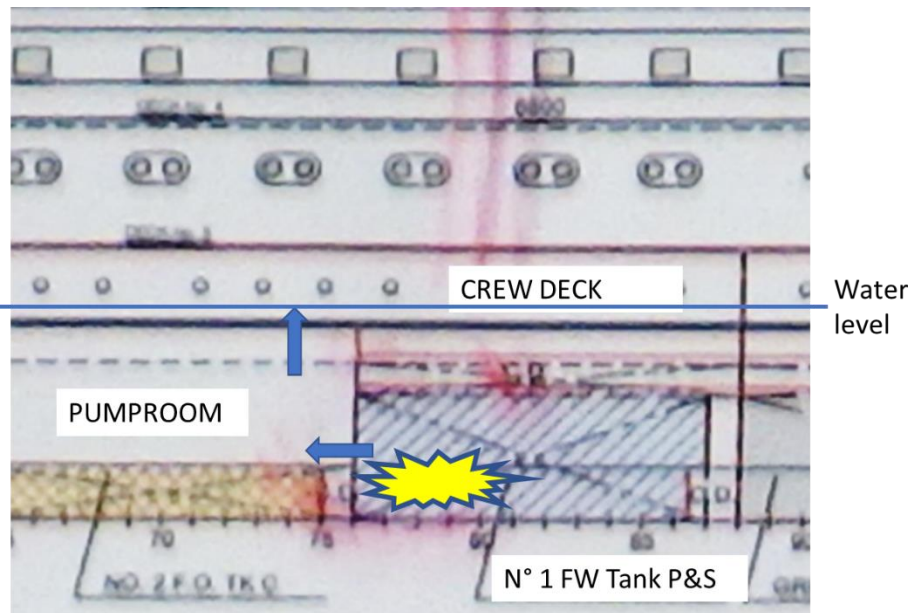


Figure 9 - Flow of seawater from FW tank to Crew Deck



Figure 10- Temporarily repaired damage inside FW tank

Meanwhile all crew and passengers were informed about the situation by tannoy. The crew deck was evacuated before water entered the cabins.

Due to the water ingress in the pump room, all the equipment inside, such as airconditioning units, fresh water pumps and other, was shut down affecting the on board comfort for crew and passengers.



*Figure 11 – General impression of the pump room*

*The pump room was completely flooded, in this picture, repairs were already going on.*

Authorities at Phuket were informed of the incident and subsequently the appointing of divers, a tug boat and passenger transfer was initialized by the Royal Thai Navy.

One of the inflatable ribs of mv LA BELLE DES OCEANS was lowered into the water to monitor the ship's draughts and to check if any pollution occurred.

Damage control plans and stability information on board indicated that there was no imminent danger for sinking. The situation as it occurred was described in the stability booklet as one of the flooding scenarios: a flooding between WT doors 2 and 3.

The following hours, the vessel remained stuck on the rock and the situation was monitored very closely. Watertight doors were kept closed and the engine room department was constantly controlling the water ingress. Daylight was waited for (0600) to assess the damage. The passengers, who stayed calm and cooperative, were kept on board.

At the time of grounding, the tide was falling. The lowest tide level was expected between 0300 and 0400. Around 0600 in the morning the tide would arrive to the same level as during the grounding.

From 0630 onward the wind was gaining in strength and consequently the ship started moving sideways and up and down on the rock. The heading of the vessel changed from 270° to 280°. Since the ingress of water was under control, it was decided to start the engines in order to sail off the rock to prevent further damage to the vessel.

Around 0705 the vessel maneuvered astern and turned her bow to SB, away from the rock. At 0715 the vessel refloated by her own means.

At the same time, Royal Thai Navy vessel “SRIRACHA” arrived on scene in order to transfer the passengers ashore if necessary, but as the inflow of water was under control, it was decided to keep all passengers remaining on board and to sail to Phuket by own means.



*Figure 12 - Mv LA BELLE DES OCEANS underway to Phuket after grounding*

At 1000 the vessel approached the pilot station. The vessel entered Phuket port and berthed. Upon arrival of the vessel at Phuket port, a navy commander boarded the vessel to organize diving operations and the first repairs to the hull.





*Figure 13 - Arrival in Phuket with list over PS*

*Picture: thephuketnews.com*

Around 1100, all passengers disembarked.

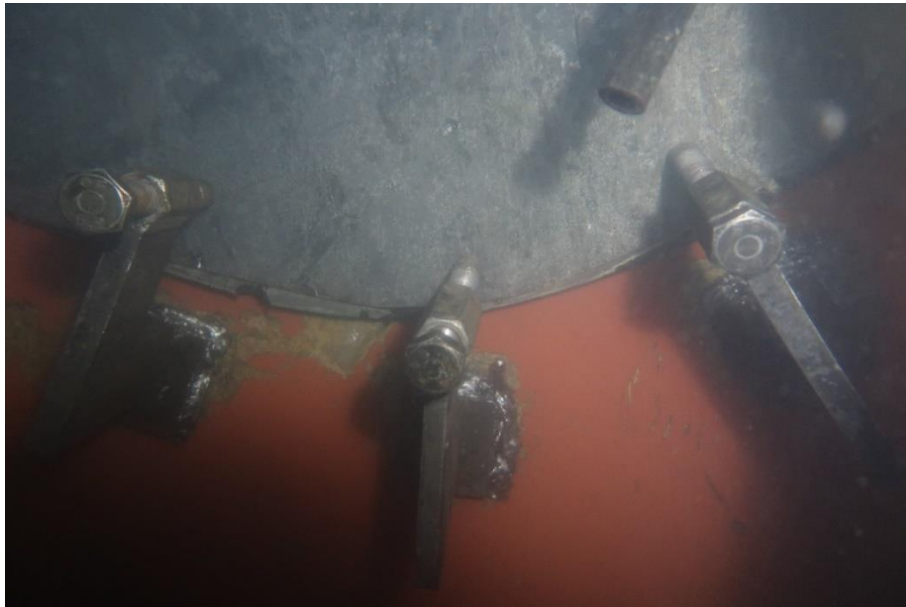
At 1125, as diving operations started, it became obvious that a hole of 0.5 by 2 metres in PS FW tank N°1 caused the water ingress into the vessel.

The water ingress into the pump room was caused by damage to the bulkhead between pump room and fresh water tank. There was no direct ingress of seawater into the pumproom.

Further, smaller damages to fuel tank N°1 PS were noticed, with consequential water ingress into the fuel tank. No fuel was leaking.

After some initial repairs, a contractor was hired to execute temporary repairs under supervision of the vessel's classification society, see Figure 14.

On December 3<sup>rd</sup> 2019, the vessel set sail towards Singapore where definitive repairs of the hull plating would be done and to have a refurbishment of the crew deck performed and have a repair of all equipment in the pump room.



*Figure 14 – Temporary repairs of the ruptured hull carried out*

### 3 FACTUAL INFORMATION

#### 3.1 VESSEL'S DETAILS



Figure 15 – LA BELLE DES OCEANS

Picture : Croisieurope

Type: Passenger Ship	Main engine power: 2 x 2600 kW
Flag: Belgium	Main engine type: Wärtsila Vasa 16V22HF-D
Port of registry: Bruxelles	Auxiliary engine: Wärtsila Vasa 4R22HF-C, 3x560kW
Call Sign : ONKI	
IMO N°: 8800195	
Shipyard : TSU Work, Nippon KokanK.K., Tokyo, Japan	Bow Thruster: Taiyo Electric, 300kW
Year of built : 1988	Emergency generator : Caterpillar3406, 344kW
Current owner: Belle de l'Océan SA	
LOA: 102.695m	Service speed : 14 knots
Lpp: 93.19m	Hull: Steel
Breadth: 19.40m	Passenger capacity: 120 persons
Moulded depth: 6.2m	Total capacity: 216 persons
Summer draught: 4.468m	
Air draught: 28m	
Gross tonnage: 5218	
Net tonnage: 1565	

## 4 ANALYSES

### 4.1 FAMILIARIZATION AND TRAINING

The second officer who was on duty during the grounding joined the vessel for the first time on October 30<sup>th</sup> 2019. It was his first employment with the company. The vessel was undergoing repairs at that moment. It was his first experience on board of passenger vessels. Previously, he had been sailing as a first officer on board cargo vessels.

He was to relieve the second officer who was to go on leave on November 18<sup>th</sup> 2019. Between October 30<sup>th</sup> 2019 and November 18<sup>th</sup> 2019, both aforementioned second officers were scheduled in in the same watch. This overlap period of training and familiarisation covered a few days of repairs until November 4<sup>th</sup> 2019, and a cruise voyage until November 18<sup>th</sup> 2019.

The SMS included a familiarization procedure for watch officers, but the familiarization with the assigned duties and tasks board was more intensive than prescribed by the SMS. The hand-over and familiarization documents were in place and signed off.

Reportedly, the second officer felt comfortable and well familiarized with the vessel and the navigational equipment after this overlap period.

The vessel was manned with one master, one staff captain and three second mates. One second mate was responsible for navigation, another one was responsible for safety and the third one was responsible for training. Every second officer was capable of taking any responsibility as second officer, but during a stay on board, the same responsibility was maintained with the same second officer.

The second officer on duty during the grounding was responsible for the navigation of the vessel in general, as was the officer he had relieved.

The navigational responsibilities included amongst others the preparation of passage plans, follow-up of the weather forecasts, the tides, the current and the updating of navigational charts.

The second officer was well informed about the voyage and the navigational dangers in the area.

The OOW and the AB that were both on the bridge during the grounding felt well rested. Working hours and hours of rest were respected and a regular working schedule was maintained on board.

The OOW had been a first officer on board cargo vessels before he joined this cruise vessel as second mate. As first officer, he was granted a lot of faith and confidence of the master. On board mv LA BELLE DES OCEANS, the OOW was one of the three second mates on board and his responsibilities were more limited than in his previous company.

The OOW was holder of a TRANSAS training certificate stating that he was trained for working with the on board ECDIS equipment o/b the mv LA BELLE DES OCEANS.

## 4.2 VOYAGE PLANNING AND NAVIGATIONAL STANDING ORDERS

The basis for the voyage plan, from Koh Lanta anchorage, Thailand to Phang Nga Bay, Thailand, was prepared by the second mate who left the vessel on November 18<sup>th</sup>. Since the same route was sailed every cruise, only minor details of the previous voyage plan had to be altered, but nevertheless, every voyage, a new voyage plan was prepared and duly signed by the watchkeeping officers and the master.

The waypoints were transferred into the ECDIS equipment by the navigation officer. The navigational settings in the ECDIS equipment, such as safety parameters such as shallow depth contours, safe depth, and others, see Figure 16, always remained the same. Reportedly, the master's permission was necessary to change aforementioned parameters, but there was no written procedure or standing order about the use of ECDIS on board the vessel or within the company.

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*Figure 16 - ECDIS safety parameters*

On the voyage plan on paper, there was no mentioning of any of the aforementioned settings, nor was there any overview of the different settings and the enabled/disabled alarms.

All the voyage plans on board mentioned that a minimum distance of one nautical mile had to be maintained from land. It was not clear whether or not obstructions to navigation were included in the definition of land.

The passage plan did not contain an overview of obstructions where the minimum safe distance away from could be less than one nautical mile.

It was not possible with the intended route to sail in straight lines and keep a safe distance of more than 1Nm from land in this area, with a lot of small islands present.

The master's navigational standing orders, signed by all officers on November 3<sup>rd</sup> 2019, did not foresee in any requirements concerning the use of ECDIS and still referred to the use of paper charts. It still stated that charts should not be rubbed off for at least 24 hours.

The master's standing orders further did not differ a lot from the general company navigational standing orders as mentioned in the SMS.

The standing orders further mentioned that parallel indices should be applied at all times.

No parallel index was mentioned in the passage plan. No parallel index was visible on the electronic chart.

The vessel was sailing 0.5Nm South of the intended course during more than one hour, due to fishing vessel activity in the area intended to sail through.

The charted rock that the vessel struck upon, was visible in ECDIS, but no attention had been paid to the minimum , by the standing orders required, safe passing distance from this rock.

### 4.3 USE OF ECDIS

All officers and master on board had received the required ECDIS training.

The SMS did not include any requirement, nor description, nor instruction or procedure or risk assessment concerning the use of ECDIS.

When using ECDIS during navigational watchkeeping, a lot of alarms sound regularly. Every alarm normally generated a sound signal and a visual signal on the ECDIS equipment.

Reportedly, many alarms were generated when using ECDIS on board the mv LA BELLE DES OCEANS and thus it was decided to mute the audible ECDIS alarms on board the vessel. All officers used the ECDIS in the same way.

At 2351, the ECDIS generated an alarm named "navigational hazard". This alarm was generated when the vessel approached Bite Rock within a distance of 1Nm.

23:51:11	<b>ALERT SET Navigational hazard</b>			
07:00E	07°37'952 N	098°49'514 E	NO SECONDARY	GPS 1 / None
	HDG: 281.1°°	LOG: 6.1 kn	COG: 276.6°°	SOG: 6.5 kn
CHARTS:	th300308 (ENC, 13-12-2018)			
	Wnd: 62.5°° - 5.2 m/s m/s			

*Figure 17 - ECDIS alert*

*Extraction from the log with ECDIS alerts*

The navigational hazard warning alarm on the ECDIS equipment was missed during the navigational watch.

## **5 CAUSE OF THE ACCIDENT**

A lack of situational awareness when the safe passing distance to Bite Rock was not met, and the fact that the ECDIS system was not used at optimum lead to the not respecting the minimum safe passing distance from Bite Rock and the consequential grounding onto it.

The non-following of navigational instructions on board remained unnoticed and contributed to the grounding. The approved voyage plan mentioned a minimum safe passing distance from land that could not be respected on the intended route and parallel indexing was mentioned as part of the approved voyage plan.

ECDIS as means of navigational aids was implemented on board the mv LA BELLE DES OCEANS and all watchkeeping officers and master had received the necessary training for the use of it, however the use of ECDIS was no part of the SMS of the vessel. Consequentially, navigational orders, voyage plans and watchkeeping responsibilities did not take the use of electronic charts into account which on its turn lead to a suboptimal use of the ECDIS, which contributed to the accident.

## **6 CONCLUSION**

### **6.1 SAFETY ISSUES**

The OOW was confident that the CPA to the rock was outside the minimum required. The situation was not further checked or followed up upon and the ECDIS alert was missed. When the bridge team of the next watch came on the wheelhouse, the focus onto navigation was lost.

ECDIS was used in muted mode as many alarms were constantly sounding. This was a generally accepted behaviour on board. The safety parameters of ECDIS should contribute to safe navigation and needed to be adapted to the voyage.

The SMS of the vessel did not mention the use of ECDIS. There were no procedures nor instructions or risk assessments taking the use of ECDIS into account. Reference was still made to navigation on paper charts.

Passage plans should be realistic and navigational orders should be clear. A minimum safe passing distance from land of 1 nautical mile was not realistic. The use of parallel indices was mandatory according to company and master's instructions, but this was not incorporated in the passage plan.

## 7 RECOMMENDATIONS

The company is recommended to:

1. Align the SMS with on board practices taking into account the company safety standards.

Familiarization of new officers is more intensive than prescribed in the SMS. Standards regarding voyage planning could not be met during the voyage and there is little added value to the Master's standing orders as they do not differ from the Company's standing orders. ECDIS is used on board, but not implemented in the SMS.

2. Assess the use of ECDIS on board.

Define who is responsible for voyage specific settings according to the voyage plan and implement a usage of ECDIS that contributes to safe navigation. Awareness needs to be created to prevent overconfidence in the system.





