HELLENIC REPUBLIC
HELLENIC BUREAU FOR MARINE CASUALTIES INVESTIGATION

MARINE CASUALTY SAFETY INVESTIGATION REPORT 06/2013

Collision between M/V Consouth & M/V Pirireis

78 n.m WSW of Peloponnese-Greece

Foundering of M/V Pirireis

Loss of ten crew members of Pirireis

April 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 29th of April 2013 and resulted in the examined very 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´ times (UTC +2) unless otherwise stated.

Under the above framework HBMCI as the lead investigating State in cooperation with the respective Office of Maritime Cook Islands have been examining the collision between M/V Consouth and M/V Pirireis occurred on the 29th of April 2013, in the sea area approximately 78 nm WSW of Sapientza Islet at the Southwest end of Peloponnese, Greece that resulted in the foundering of M/V Pirireis and in the loss of ten of her crew members.

This report is mainly based on information and evidence that have been derived from the interview process, 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.

Pirireis´ S-VDR was not able to be recovered and Consouth S-VDR offered limited data.

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.	CEC	Certificate of equivalent competency
6.	CoC	Certificate of Competency
7.	COLREGS	International regulations for preventing collisions at sea, 1972, as amended
8.	Conning position	The places of a ship´s bridge with a view to the sea area when navigating, controlling, or maneuvering
9.	CPA	Closest point of approach
10.	°	degrees (of angle)
11.	‘	minutes (of angle)
12.	DOC	Document of compliance
13.	EBL	Electronic Bearing Line
14.	GMDSS	Global maritime distress and safety system
15.	GOC	General Operators´ Certificate for GMDSS
16.	GPS	Global positioning system
17.	gt	gross tonnage
18.	HCG	Hellenic Coast Guard
19.	Integrated Marine Data Environment (IMDatE)	a technical framework that collects and combines data from EMSA's maritime applications and other external sources
20.	IMO	International Maritime Organization
21.	ISM	International Management Code for the safe operation of ships and for pollution prevention
22.	kW	Kilowatt
23.	LT	local time
24.	Marine Traffic Service	Marine Traffic displays real time AIS ship positions and information about vessels´ movements. Data is based on collecting transmissions of Automatic Identification System (AIS).
25.	nm	nautical miles
26.	O(s)OW	Officer(s) on the watch
27.	Olympia Radio	National Coastal Station covering the maritime safety sector (GMDSS) for receiving and transmitting distress, urgency and safety signals and commercial maritime communications world widely.
28.	OS	Ordinary seaman (deck crew)
29.	rpm	revolutions per minute
30.	SMC	Safety management certificate
31.	SMS	Safety management system
32.	SOLAS	Convention for the Safety of Life at Sea 1974, as amended
33.	STCW	International Convention on Standards of Training, Certification and Watchkeeping for seafarers
34.	S-VDR	Simplified Voyage Data Recorder
35.	TCPA	Time of Closest Point of Approach
36.	UMS	Unmanned Machinery Space
37.	UTC	Universal co-ordinated time
38.	VDR	Voyage data recorder
39.	VHF	Very high frequency (radio)
40.	VRM	Variable Range Marker: an electronic mark or ring that can be placed over any target on a vessel´s radar display indicating the precise range, in nautical miles, between the target and the vessel.

1. Executive summary

At 0443 on 29 April 2013 M/V Consouth under Antigua and Barbuda flag and M/V Pirireis under Cook Islands Flag collided in open sea in position lat: 36° 10´.07 N long: 020° 09´.14 E, approximately 78 nm WSW of Sapientza Islet at the SW end of Peloponnese - Greece). At the time of the marine casualty weather conditions were reported to be very good (wind force 2 bfrs, sea state calm with very good visibility) and it was still dark.

M/V Consouth was on the third day of her passage on ballast condition, en route to Marshaxlokk port of Malta after having departed from Tuzla shipyard in Turkey where she had undergone dry dock maintenance and repairs. By the time of the marine casualty the Chief Officer was on the watch and Look out was not posted. Pirireis was identified through ARPA with an almost reciprocal course at a distance of approximately 17 nm from Consouth´s bow. The Chief Officer altered Consouth´s course to port at a distance of roughly 11 nm and CPA was increased from 0.65 nm to 0.80 nm.

Pirireis had departed from Annaba port Algeria on 26 April 2013 loaded with 12577 MT of phosphate fertilizer and was on her third day of passage en route to Ukraine with a short transit stay at Marshaxlokk port of Malta for bunkering. It was reported that bridge navigational team was parted by the Second Officer, an AB as Look out watch and the Master. Consouth was firstly sighted at approximately 10 nm away of Pirireis port bow with an estimated course of 260° and speed of 14 knots.

Although the situation was apparently clear and safe for both vessels, Consouth collided with Pirireis penetrating her port aft quarter shell plating below the main deck causing an extended hole and resulting in massive sea water ingress. Pirireis started listing to port rapidly and sank within few minutes.

Consouth suffered extended structural damages at her fore section and none of her crew members was injured.
Seven of Pirireis´ crew members were rescued out of which four were pulled up on Consouth´s forecastle with the help of her crew during the time vessels remained in contact. Ten crew members including Master were lost and only two bodies were recovered.

A search and rescue operation was launched by the Hellenic Coast Guard. Consouth herself and vessels close to the vicinity of the casualty were involved as well as units of the Hellenic Coast Guard. Iridescent pollution was reported during Search and Rescue operations close to casualty scene from Pirireis bunkers however no pollution due to cargo was spotted as she was sunk at a depth of approximately 3000 m. Consouth remained afloated as damage affected only her fore section.

2 . FACTUAL INFORMATION
2.1 Involved ships particulars
2.1.1 Particulars of M/V Consouth

Name of Vessel	Consouth
Call Sign	V 2 B Y 7
Company (ISM Code A 1.1.2)	Reederei Erwin Strahlmann EK
Ownership	Strahlmann E
Flag State	Antigua and Barbuda W.I.
Port of Registry	St. John's
IMO Number	9145255
Type of Vessel	Cargo ship
Classification Society	Germanischer Lloyd
Year built	1997 /1998
Ship Yard	China Chang Jiang National Shipping Group
Loa (Length over all)	126.90m
Boa (Breadth over all)	20.00m
Deadweight	8965 (at summer salt water draft)
Summer Draft	7.900m
Gross Tonnage	7171
Net Tonnage	3580
Main Engine	Wärtsilä Finland Oy Model 6 L 46 C
Engine Power /Speed	6,300 kW / 17.0 knots
Document of Compliance	(Date of Issue) Hamburg,13 April 2011by GL
Safety Management Cert.	(Date of Issue) Hamburg, 31 October 2008 by GL
Last PSC Inspection (prior to casualty)	Marseille, 21 September 2012

Figure 1. *M/V Consouth at Kalamata anchorage*

Figure 2. *M/V Consouth at Kalamata anchorage*

2.1.2 Particulars of M/V PIRIREIS

Name of Vessel	Pirireis
Call Sign	E5U2400
Company (ISM Code A 1.1.2)	Emiroglu Shipping & Trading Istanbul, Turkey
Ownership	A & B Sea Transport & Trade Co. Turkey
Flag State	Cook Islands
Port of Registry	Avatiu
IMO Number	7916727
Type of Vessel	Dry Cargo
Classification Society	Class NK
Year built	1979
Ship Yard	Shin Kurushima Hiroshima Dockyard
LOA (Length over all)	133 m
BOA (Breadth over all)	20.60 m
Deadweight	13206 mt
Summer Draft	7.40 m
Gross Tonnage	8239
Net Tonnage	5070
Main Engine	Mitsubishi 7400 BHP / 17.4 knots
Engine Power /Speed	5,442 / 17.4 knots
Document of Compliance	(Date of issue) Ghiba,18 March 2011 by NKK
Safety Management Certificate	(Date of issue) Ghiba, 08 April 2011 by NKK
Last PSC Inspection (prior to casualty)	Ravenna 28-02-2013

Figure 3a. *M/V Pirireis*

Figure 3b*. M/V Pirireis*

2.2 Voyage Particulars

Vessel´s name	Consouth	Pirireis
Port of departure	Tuzla Turkey	Algeria (intermediate transit stay for bunkering at Marshaxlokk port Malta)
Port of arrival	Marshaxlokk port - Malta	Ukraine
Type of voyage	International	International
Cargo information	Ballast condition	12,577 MT of Phosphate fertilizers
Manning	16	17
Minimum safe manning	11	14

2.3 Marine casualty information

Vessel´s name	Consouth	Pirireis
Type of casualty	Very serious	
Date and time	29 April 2013 at 04:43	
Position – location	lat: 36° 10´.07 N - long: 020° 09´.14 E 78 nm WSW of Sapientza Islet at SW end of Peloponnese	
External environment	Wind force 1-2 Bfrs – sea state calm visibility very good – scattered clouds - night time	
Ship operation	en route on ballast condition	en route loaded with cargo
Voyage segment	open sea	open sea
Consequences (to individuals, environment , property)	• extended structural damages at fore section of forecastle deck intended and cracked transversely • forepeak tank damages at shell plating • structural damages and deformations at upper part of bulbous bow • extended structural damages and deformations at stem post • 12 meters longitudinal plating fracture at port bow • no crew injuries	• extended deformations at her port accommodation platting rails and extended damages to port rescue boat • extended hole at her port aft quarter under main deck • foundering total loss • 10 casualties - only two casualties recovered from sea • limited oil pollution

2.4 Emergency response

Piraeus Joint Search & Rescue Coordinating Center of the Hellenic Coast Guard (HCG) when casualty reported had immediately launched a Search & Rescue operation. Local Coastguard Authority of Kalamata was involved as casualty occurred within its Search & Rescue Area of responsibility.

Immediately after the collision and while vessels were still in contact two crew members of Consouth were deployed by Master to the forecastle in order to assess the situation. Four crew members of Pirireis were actually pulled over to Consouth´s forecastle by aforementioned crew and were rescued.

Following the sinking of Pirireis, Master of Consouth ordered the launching of her rescue boat and S&R operations were initiated. Three crew members were found at sea and were rescued by Consouth´s rescue boat and two casualties´ bodies were retrieved from the sea and were taken onboard Consouth.

No other survivors or bodies were found during the Search & Rescue operations that were carried out during the next 72 hours following the marine casualty.

S & R Units involved	
State´s Units	→ 01 HCG Offshore Patrol Vessel (OPV) → 01 HCG Search & Rescue Boat → 01 Hellenic Navy Helicopter → 01 Hellenic Air Force Helicopter → 01 HCG Surveillance Aircraft → 01 US Navy Aircraft
Vessels in vicinity	→ 09 Cargo vessels initially engaged → During the SAR operations vessels in vicinity of the casualty were alternately engaged

3. Narrative

At 0443 on 29 April 2013 M/V Consouth and M/V Pirireis collided in open sea approximately 78 nm WSW of Sapientza Islet at the NW end of Peloponnese - Greece. At the time of the marine casualty weather conditions reported to be very good (wind force 2 bfrs, sea state calm with very good visibility) and it was still dark.

3.1 M/V Consouth

Note: It should be noted that the following sequence of events and facts are based on data derived mostly from information of Consouth log books and documents or extracted from her S-VDR as well as to available information by the Hellenic Coast Guard as due to described circumstances no source of electronic information and evidence became achievable from Pirireis or nearby vessels.

M/V Consouth under Antigua & Barbuda Flag is a Cargo vessel engaged in international trading mostly operating in the Mediterranean Sea.
At 1900 UTC on 27 April 2014 she had sailed from Tuzla-Turkey on ballast condition with 16 crew members after having completed dry dock operations started on the 04th of April 2013 and was en route to Marshaxlokk port - Malta.
It was reported that while Consouth was in Tuzla the AIS and BNWAS units were replaced.
In the course of the interview process it was denoted by Consouth´s crew that dry dock operations had an impact on crew in relation to fatigue as the vessel had to complete repairs within a specific time window of twenty days in order to be reactivated in her trading operation.
Following her departure from Tuzla, Consouth had a short transit stay at Istanbul Roads for bunkering. She transited Marmaras Sea on 27 April 2014 and at night hours she entered Dardanelles Strait.
Consouth followed her passage planning in the Aegean Sea headed SSW to Kafireas Strait mostly during night hours. After crossing Kafireas Strait at around 0900 Consouth continued towards East of Kea Island and onto Cape Maleas at the SE end of Peloponnese altering her course at WP No 18 to 285º at around 1645 (1445 UTC).

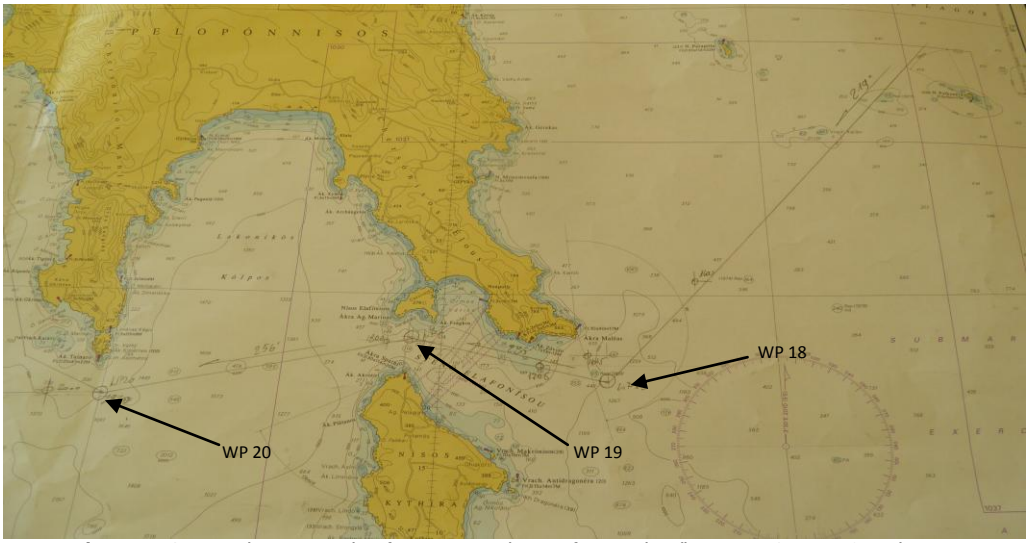

Figure 4. *Consouth voyage plan from WP 17 (East of Kea Island) to WP 18, WP 19 and WP 20 (SE and S of Peloponnese).*

At approximately 1750 Consouth arrived at WP No 19 and course was changed to 256º and headed towards to the sea area of Cape Tenaro.
At 1930 - WP No 20 – Consouth´s course was altered to 265 and proceeded westerly to open sea having to run approximately 385 nm to Malta (figure 4 & 5).

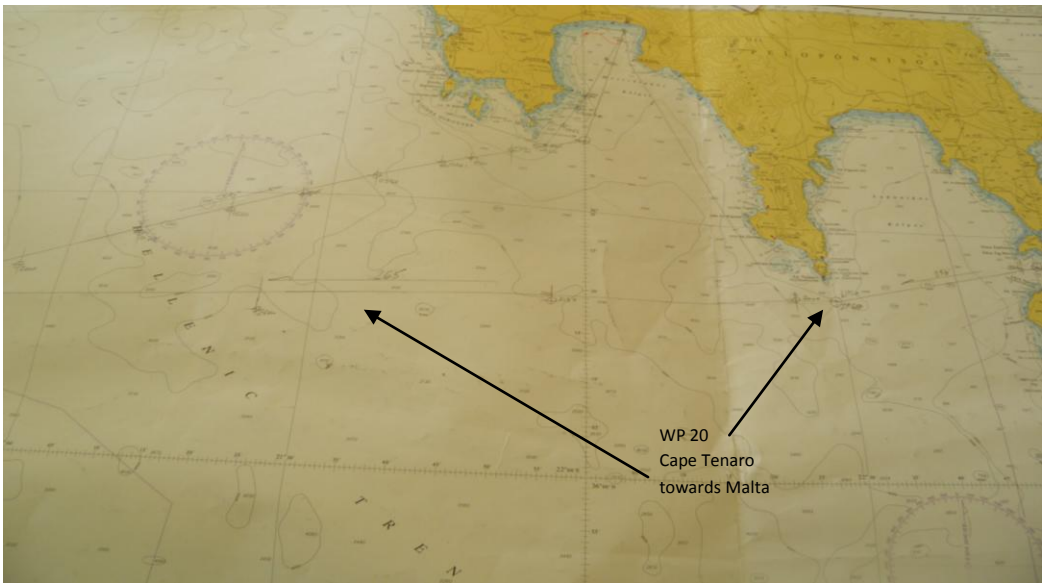

Figure 5. *Consouth voyage plan from WP 20 to open sea towards Malta.*

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Consouth´s passage involved sea areas with dense marine traffic as planned courses were regular routeings followed by vessels sailing from or to Dardanelles Strait to or from West Mediterranean Sea.

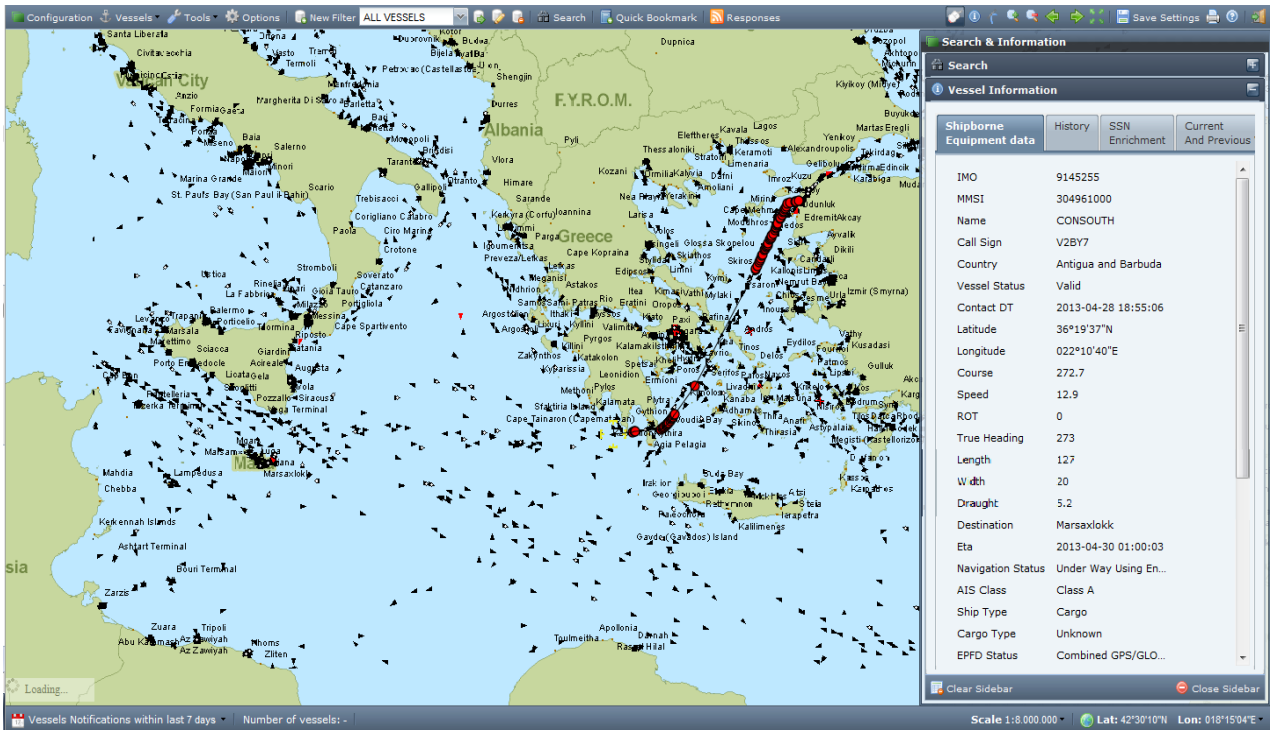

Figure 6. *Consouth Passage as recorded by AIS system of HCG.*

During Consouth´s passage her courses apart from any other monitoring systems open to public had been recorded by the Automatic Identification System of the Hellenic Coast Guard (figure 6).

Seeking for electronic evidence in the course of the investigation process HBMCI requested Consouth´s positioning data as recorded by HCG AIS system. However it was found that from 2055 (1855 UTC) on the 28 April 2013 until the time of the occurrence Consouth´s AIS positions for unspecified reasons were not received by HCG AIS system (figure 7).

Figure 7. *Consouth and Pirireis passages as recorded by AIS System of HCG.*

Consouth was navigating under a navigational pattern of three watches performed by the Master (0800-1200/2000-2400), Second Officer (0000-0400/1200-1600) and Chief Mate (0400-0800/1600-2000). It was reported that although according to vessel´s SMS an AB or the Bosun should be posted as a Look out watch yet they were mainly working on deck for eight hours during day time and if required they were called on the bridge by the OOW in cases such as heavy traffic; when crossing TSS; OOW fatigue etc.

Having regard to referred practice ABs and Bosun were resting at their cabins during afternoon and night hours.

At 2000 on 28 April 2013 Consouth had already passed WP No 20 and was heading westerly towards Malta with course of 265º and speed of approximately 12.5 knots (figure 5). Master took over the watch from the Chief Officer and during his watch course was changed to 266°. His watch was normal without any navigational crossing situations or difficulties and no look out watch was posted.

Chief Officer was reported to had left the bridge shortly after the watch handover and went to his cabin to rest and slept at around 2300. It was also reported that on the same day prior to his afternoon watch (1600-2000) although it was Sunday, Chief Officer having finished his lunch assisted two Pilipino ABs in painting works that had not been completed during drydocking in Tuzla for almost two hours (from 1300-1500).

3.1.1 Watch handover (0000-0400 / 0400-0800)

Master was relieved from his watch by the Second Officer at 2355 and went to his cabin to rest. His watch was carried out as an one man watch since no Look out was posted.

The Second Officer had a quiet watch (0000-0400) and look out was not posted either. Both available radars were operating, X-band at a selected range of 6 nm and S-Band at 12 nm range and steering was in autopilot mode. At approximately 0235 Second Officer altered Consouth´s course from 266° to 265°. His watch was uneventful and at approximately 0400 he was relieved by the Chief Officer (0400-0800) who had entered the bridge fifteen minutes before the commencement of his watch.

During the watch handover the Second Officer passed to the Chief Officer all navigational information regarding marine traffic pointing out three vessels in the vicinity however with no significant navigational importance in relation to Consouth passage. Pirireis was the only target of concern as she was identified by ARPA 17 nm ahead of Consouth´s starboard bow with a nearly opposite course 087° and speed at approximately 10 knots.

As stated during the interview process, ARPA data showed a CPA of 0,653 nm nevertheless she was deemed as a distant target without any potential risk to Consouth´s safe navigation.
By that time Consouth was underway with a course of approximately 265° at a speed close to 12.5 knots while steering was in autopilot mode.

3.1.2 Chief Officer's actions on Watch

Having taken the command of his watch the Chief Officer proceeded to standard duties with Bridge Log recordings and observations on navigated sea area.
The monitoring of the plotted courses on navigational charts as were projected under the voyage plan was performed by entering Consouth positions on the navigational chart by latitude & longitude extracted through GPS on a two hours basis. The Chief Officer stated that occasionally he used to monitor the vessel´s course hourly depending mainly on marine traffic at navigated sea area and weather conditions. Apart from the above, standardized bridge performance included frequent checking and monitoring of marine traffic and interested targets as well as Consouth´s position by all available electronic navigational aids (AIS and both radars).
Look out was not posted on the 0400-0800 watch. According to the Chief Officer his mate watch, who was Consouth´s Bosun, was resting in his cabin and he was on call by telephone or VHF if it became necessary.
Both available radars were operating and Chief Mate was mainly utilizing ARPA Radar mounted at the port side of the bridge while consulting AIS System for navigational information related to interested targets, mounted next to the ARPA.

By that time and shortly before the collision navigational watch was quiet. At approximately 0414 while Pirireis was roughly 11 nm away of Consouth´s starboard bow the Chief Officer taking into consideration processed data of her passage extracted from ARPA, altered course 2° to port - from 265° to 263° - by adjusting the autopilot and in result as stated Pirireis CPA was increased from 0.65 to 0.8 nm.

It was emerged through the interview process that BNWAS was switched off during watches. As stated it was a practice on board to have BNWAS deactivated and if needed OOW or Master could switch it on. Chief Officer had the BNWAS to off mode during his watch as according to his statement he was not feeling tired.

Chief Officer stated that at approximately 0425 Pirireis became visible at a distance of roughly 7nm away off Consouth´s starboard bow and according to navigational information extracted through ARPA it was anticipated that vessels would not cross their courses and would have a green to green safe passage with a CPA of approximately 0.8 nm.

Chief Officer having evaluated ARPA data, had assessed a safe passage and continued his watch as normal without any concerns on the potential risk of the forthcoming close situation.

Furthermore it was stated that when Pirireis was approximately 3 nm away of Consouth starboard bow at approximately 0430, Chief Officer considered of contacting Pirireis on VHF Channel 16 nevertheless he finally decided not to do so as he was reassured of a safe green to green passage.

By that time as reported Chief Officer was standing between the steering wheel and the port radar (ARPA).

3.2 M/V Pirireis

Note: It should be noted that the following sequence of recorded events and facts are based on information derived from interviews of Pirireis rescued crew members; nevertheless they do not coincide with data and information derived from Consouth S-VDR and her crew interviews.
In addition documentation provided by the managers and Cook Islands Flag is also considered.

At approximately 1500 UTC (1600 LT) on 26 April 2013 M/V Pirireis under Cook Islands Flag crewed with 17 seafarers departed from Annaba port of Algeria loaded with 12577 MT of phosphate fertilizer. On 27 April 2013 she had a short transit stay at Marshaxlokk port, Malta for bunkering and at approximately 2200 she sailed from Malta continuing her voyage to open sea.
Pirireis was following a six on-six off hours watch pattern while underway performed by Chief Officer and Second Officer. Pirireis was equipped with two radars one X-Band and one S-Band and during night watches both were operated.

At 2355 on 28 April 2013 the Second Officer (0000-0600) relieved the Chief Officer (1800-2400) who went to his cabin. The Master was on the bridge too and according to rescued crew members´ statements he remained on the bridge during Second Officer´s watch as it was his first employment as a Deck Officer after having been graduated from a Lebanese Merchant Academy in 2011.
According to the Second Officer, navigational watch was quiet and Consouth was firstly sighted about 10 nm away of Pirireis port bow with estimated course of 260° and speed of approximately 14 knots. According to Second Officer's estimation based on navigational information extracted from the radar Consouth was expected to pass on Pirireis´ port bow on a red to red passage at a CPA of approximately 1 nm. According to his statement in the course of the interview process he assumed that the expected CPA of Consouth´s passage was not safe enough and had reported it to Master but Master replied that it was not a problem.

3.3 Collision

Note: The following sequence of recorded events and facts are based on data extracted from Consouth´s S-VDR as due to described circumstances it was the only source of electronic information and evidence.
Pirireis available positioning information shortly before the collision is based on data derived from HCG AIS System.
Only information regarding post collision actions such as distress alarm, communication with vessels and Authorities were verified through the evidence collection process.
Notwithstanding Consouth and Pirireis maintained almost parallel and reciprocal courses and OOWs on both vessels were reassured that a safe passage would follow, the two vessels collided at 04:43:12 on 29 April 2013.
A few minutes prior to the collision Consouth OOW, as he stated and mentioned above, was standing between ARPA and steering wheel. At 04:42:47, a few seconds before actions were taken to avoid the collision, a sound of a falling object hitting the bridge floor had been captioned by bridge microphones.
Consouth´s Chief Officer reported to had been shocked when he suddenly saw Pirireis red navigational light almost ahead of Consouth´s bow.
It was also reported that according to his estimation by the time Pirireis red light was sighted just ahead of Consouth, her port bow was passing approximately ½ cable away off Consouth´s stem post. His estimation was based on the presumption that Pirireis´ navigational lights were fitted close to her forward mast; a configuration similar to Consouth´s navigational lights installation at her forecastle.
However said allegation has not been confirmed as Pirireis navigational lights were mounted on the sides of her accommodation superstructure and in fact it was Pirireis´ aft

section tens of meters away off Consouth´s bow.

At 04:43:07 the Chief Officer having realized the imminent collision counteracted immediately by setting the autopilot to manual mode and rudder hard to starboard and pressed the general alarm button however the exact time he set main engine in stop position was not clarified.
It is noted that according to S-VDR extract, Consouth´s speed was reduced to 0,8 knots, 41 seconds following her Chief Officer´s counteract actions (04:42:53 until 04:43:34). Given the above it could be concluded that main engine was set in stop position seconds following the collision.
Chief Officer had also stated that while counteracting at the time of the collision due to the enormous impact he lost his balance and fell down.

At the time between 04:43:08 to 04:43:11 Pirireis OOW called Consouth on VHF Channel 16 by repeating four times the word “Captain”. Nonetheless it appeared to be too late as vessels were already in an inevitable collision situation that could not be avoided.
Pirireis´ Second Officer also stated that while anticipated a red to red passage at an estimated CPA of approximately 01 nm shortly before the collision he realized that Consouth course had been changed to port and he immediately reported to Master and counteracted by setting the autopilot to manual mode and steering wheel hard to starboard.

At 04:43:12 aforementioned vessels´ courses were cross tracked and vessels collided.
At the time of the collision Consouth´s rudder was hard to starboard and her heading was under continuous alternation.
However at collision time Consouth´s course was recorded at 277°.5 at a speed of 12.5 knots. Despite the fact that Pirireis actual course was not evident by electronic means it could be presumed that given Consouth´s course as extracted through her S-VDR and the formation of the sustained structural damages at her bow indicating a collision angle close to vertical, Pirireis heading is assessed to had been close to 190° at a speed of 10 knots.
Consouth´s bulbous bow penetrated Pirireis´ port aft quarter at the engine room compartment in an estimated extent of approximately 06 to 07 m in length and close to her waterline. The Third Engineer and the Oiler on engine watch were among the casualties.
Consouth stem post impacted Pirireis´ port side section of her superstructure at Chief Engineer´s cabin at a height of approximately 09 m above her waterline. Chief Engineer reported that his cabin´s salon was almost destroyed by the other vessel´s stem post.
Pirireis´ No 2 port life boat placed at boat deck was damaged by Consouth´s stem post and her aft section was detached.

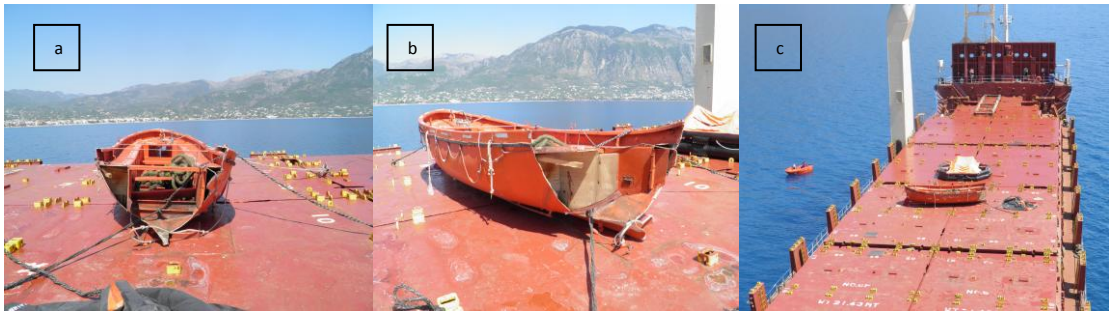

***Figure 8.a.b.c**. Pirireis No 2 life boat on board Consouth*

Pirireis was reported to had suffered major structural damages on her port aft quarter shell plating. The exact sections impacted cannot be determined.
Nonetheless taking under consideration:

- → the formation of Consouth´s sustained structural damages in relation to Pirireis rapid foundering, within a time window of 04:38 minutes; (figure 9)
- → the capsizing of Pirireis within 02:30 minutes;

it could be concluded that her engine room must had been holed presumably between frames No 20 and 30 close to No 2 cargo hold bulkhead.

Figure 9.a.b. *Consouth damaged morning hours on the day of the collision.*

Figure 10. *Consouth damaged port bow and her liferaft used following the collision.*

It is also estimated that probably due the severe impact on Pirireis aft quarter:

- → shell plating extended deformations and cracks should had been caused at No 2 cargo hold bulkhead,
- → huge quantities of sea water inflowed into No 2 cargo hold loaded with approximately 6000 MT of phosphate fertilizer,

leading to her expeditious capsize and foundering.

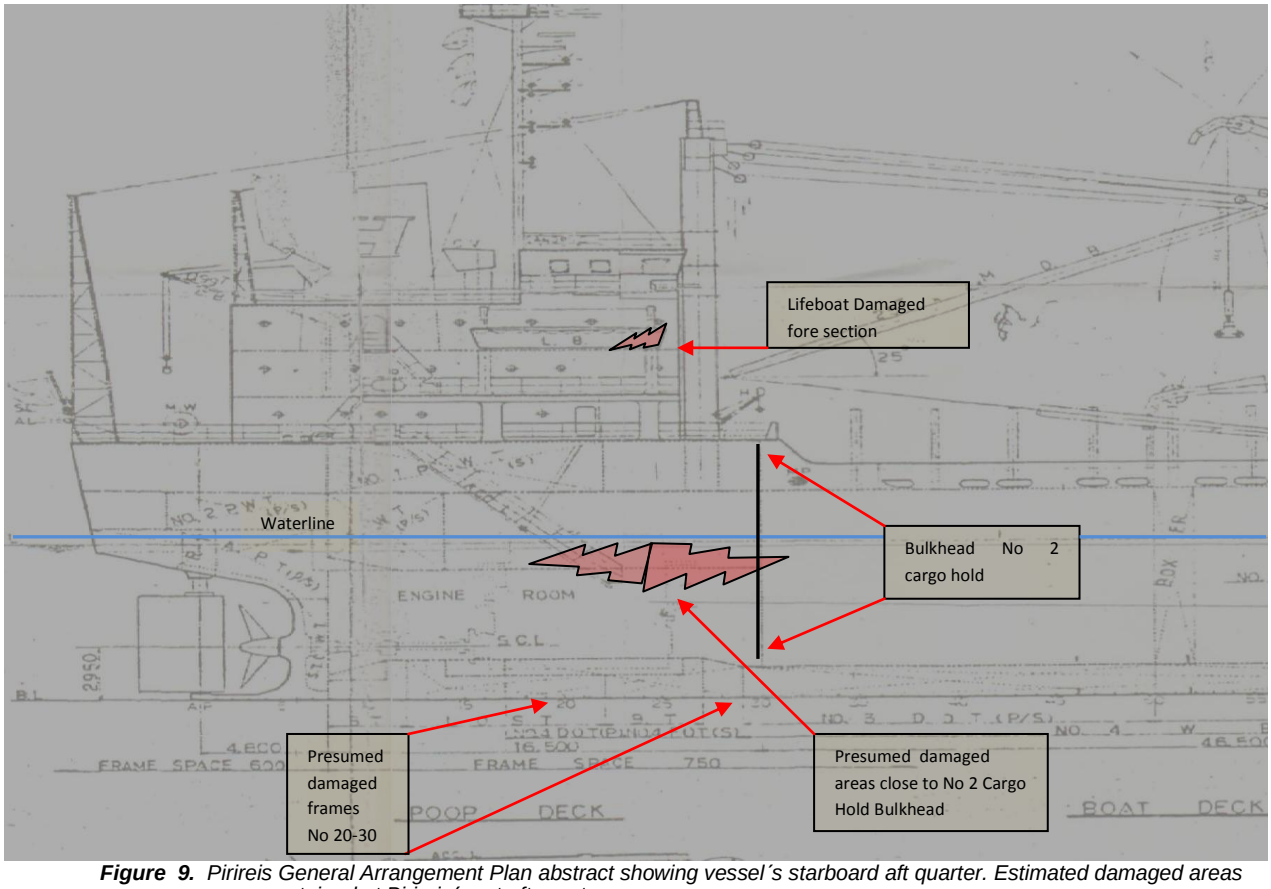

Figure 9. *Pirireis General Arrangement Plan abstract showing vessel´s starboard aft quarter. Estimated damaged areas were sustained at Pirireis´ port aft quarter.*

At the time of the collision smoke was released due to the forcible impact of the vessels´ shell plating and the friction forces developed.

Additionally it was reported by Consouth´s crew members that Consouth´s bow was squatted and a forward trim was perceptible leading to the conclusion that her damages had resulted in water ingress at forepeak compartments. The Second Officer inspected the forward compartments a few minutes post to the collision and no water inflow was confirmed.

3.4 Emergency response actions

3.4.1 Pirireis

Following the collision Pirireis´ crew on watch was alerted as well as the rest of her crew resting and sleeping in their cabins. It was reported that they immediately got out of their cabins carrying their life jackets.
At 04:45:29 exactly 2:17 minutes following the collision Master of Pirireis broadcasted an emergency call on VHF channel 16 calling Mayday three times yet without giving any more details or information.
In response to his call a number of ships called back requesting name of vessel that broadcasted the distress call and further details. It is inferred that by that time Pirireis bridge had been abandoned and thus no reply was made. Until that time the Second Officer was on bridge watch together with the Master according to crew statements.

At 04:45:56 Pirireis broadcasted a DSC emergency call on VHF.
Concurrently crew members had been assembled at port life boat deck. As the situation had rapidly become dangerous and Pirireis due to the massive quantities of water inflowing to the impacted compartments, had started listing to starboard, her foundering was imminent and inescapable. Any efforts for a controlled abandonment were not feasible.

Four of Pirireis´ crew members managed to climb up on Consouth´s bow with the assistance of two of her crew members and were rescued.
A life raft of Pirireis was thrown into the sea and Chief Officer after jumping into the sea managed to get on it and was rescued some time after by Consouth´s rescue boat.
Four crew members were recovered from the sea by the crew of Consouth´s rescue boat.
One crew member during his efforts to climb on Consouth´s forecastle was unfortunately dragged down by Pirireis while she was capsizing.
As a result to Pirireis rapid sinking 10 of her crew members including the Master were lost but only two bodies were found and recovered from the sea and were identified to be the Master and the Bosun. According to the information provided by the rescued crew members of Pirireis they were dragged by her as she was going down.
One of the rescued crew members reported to had actually been dragged for at least ten meters below sea level by the sinking vessel however he managed to swim to the sea surface.

3.4.2 Consouth

.1 Master and deck department response actions

At 04:43:42 the Master entered the bridge almost 45 seconds following the sound of the general alarm activated by the Chief Officer. Having assessed the situation and after a quick briefing by the Chief Officer he instructed him to go forward in order to evaluate the situation. The Second Officer and an AB were also deployed forward.
Chief Officer went directly to the forecastle and witnessed the situation and the severe damages on Pirireis. Vessels were in contact and still moving slowly while Pirireis was under a heavily increasing trim by stern with her main deck close to sea level.
At the same time the Motorman together with the Chief Officer assisted four crew members of Pirireis to get on Consouth´s forecastle. The Chief Officer together with the Motorman launched the inflatable life raft located at the fore section into the sea. Rescued persons were escorted to accommodation space by the Second Officer and an AB.
Thereafter, the Chief Officer following Master´s orders instructed the Bosun and two ABs to launch the rescue boat for initiating rescue operations.

Second Officer and an AB inspected the Bosun´s store and the forepeak spaces and confirmed that there was no flooding to the impacted compartments and prepared the pilot ladder for the rescue operations.

The Chief Officer reported that on his way to the rescue boat he felt that Consouth´s bow was slightly lifted up and shortly thereafter he saw Pirireis´ bow in vertical position sinking. The time was approximately 04:47:50.
According to Consouth S-VDR´s recordings from her wings microphones a sinking vessel sound was recorded for a period of approximately 11 seconds as Pirireis stern was sinking until her bow was lost under the sea level.
At 04:49:13 Master of Consouth had broadcasted a Mayday Relay to all vessels on VHF channel 16. Following the initial Mayday emergency call by Pirireis´ Master, Olympia Radio Coastal Station had immediately responded and got involved in SAR developments.

At approximately 0500 Consouth´s rescue boat was launched, boarded with the Chief Officer and the motorman and search and rescue operations were started. Two members of Pirireis crew were found at sea and rescued by the crew of the rescue boat.
Shortly afterwards Pirireis´ Chief Officer was found on a life raft and was rescued. Later on one body was spotted by the rescue boat of a nearby vessel engaged in SAR operations and was given to Consouth´s rescue boat. A second body was found by another vessel also engaged in SAR operations and was recovered from the sea by Consouth´s rescue boat. The operation of Consouth´s rescue boat reported to had been completed at approximately 1000.

.2 Chief Engineer and Engine department response actions

Following the collision the Chief Engineer immediately got up from his bed due to the heavy impact. Looking out of his window he saw Pirireis on Consouth bow and realized the collision and the emergency.
He went straight to the engine room to assess the situation. Together with the electrician on watch he stopped the shaft generator and started No 2 Diesel Generator.
By that time it was stated that he was about to evacuate the engine room together with the Electrician as he had felt a forward trim and thought that Consouth was also sinking. However shortly after, trim came back to normal. Directly after he realized that Generator No 2 was operating unstably due to the fact that following the collision some spare parts had fallen on the purifier fresh water tank causing water leakage on the electrical rotor of the generator.
Chief Engineer ordered to shut down D/G No 2 and to start D/G No 3. Soon after he called the bridge and reported the situation to Master. Master asked him to stop the engine.
By that time Chief Engineer stated that engine was operating with an amplitude of 480-520 rpm although the standard operation was 500 rpm. According to his estimation a sudden stop or a crash astern maneuver could have caused referred problem however he could not recall what was the executed maneuver by the bridge.
It should be noted that following R.O´s inspection at Kalamata anchorage an inaccuracy was found on the setting of zero pitch point of Consouth´s Controllable Pitch Propeller (CPP) Propulsion System.

3.4.3 OLYMPIA RADIO

Following Pirireis Mayday Distress call at 04:45:13 on channel 16 VHF, Olympia Radio Coastal Station replied by calling her several times on channel 16 VHF. However there was no response probably because the bridge was abandoned.
Olympia Radio reported the incident to the Joint Search & Rescue Coordinating Center of the Hellenic Coast Guard and broadcasted a Mayday relay. Furthermore Olympia Radio established communication with vessels in the vicinity of the casualty that were initially involved in the SAR Operations.

3.4.4 Hellenic Coast Guard SAR services

The Joint Search & Rescue Coordinating Center of the Hellenic Coast Guard was notified for the marine casualty by Olympia Radio Coastal Station as well as by the DSC Distress Emergency call broadcasted by Pirireis.
A Search and Rescue Operation was immediately launched and three nearby to casualty sea area cargo vessels and one container ship were instructed to participate.
An Offshore Patrol Vessel of the Hellenic Coast Guard was also deployed to casualty scene as well as a SAR Helicopter.
The SAR operations lasted for 72 hours however nor survivors were found neither bodies of the fatalities except of Master´s and Bosun´s.

3.5 Consouth at Kalamata Port

29 April 2013

At 1545 on the 29 April 2013 Consouth was released from the SAR operations following instructions by HCG Joint Search & Rescue Coordinating Center and set off from the casualty sea area at approximately 2200 headed to the nearest port of Kalamata (GREECE) in order to land Pirireis´ rescued crew members and fatalities.

30 April 2013

At 1010 on 30 April 2013 Consouth was approaching Kalamata anchorage at very low speed towards pilot embarkation position, 0.5 nm east of Kalamata port entrance. The Pilot contacted the Master advising him to approach pilot boarding position; however Master reported that due to main engine failure and steering gear malfunction he could not continue the procedure for entering the port and requested permission to anchor at current position. The pilot having pointed out that depths at the vessel´s current position were around 100m advised the Master to proceed to Kalamata anchorage.

At 1110 the Master reported to Coast Guard Authority via VHF Channel 12 that due to engine and bow thrusters malfunctions, Consouth is proceeding to Kalamata anchorage for anchoring.
At 1140 Consouth dropped her anchor at approximately 1.5 nm SW of Kalamata port entrance.
At 1200 Coast Guard Authority suspended Consouth departure until inspected by her Classification Society and a certificate for retaining her Class would be subsequently issued.

Furthermore under the relevant provisions of Paris MoU inspection regime and following vessel´s involvement into the marine casualty, Consouth was classified as Priority I vessel and was subjected to an inspection by the Port State Control Office of Kalamata.
At approximately 1455 Pirireis´rescued crew members and bodies of the two fatalities were transferred ashore.

At 1800 three inspectors of Kalamata Coast Guard Ships´ Inspection Office boarded Consouth in order to inspect her condition and structural damages. According to their report besides the description of her structural damages, failures on her Controllable Pitch Propeller (CCP) Propulsion System and thrusters were recorded.

01 May 2013

On 01 May 2013 a surveyor of Consouth´s Class boarded her at anchorage following her involvement in the casualty.
Class surveyor´s report recorded in detail the structural damages to Consouth´s fore section and also an inaccuracy on the setting of zero pitch point on her Controllable Pitch Propeller (CPP) Propulsion System while Consouth´s steering gear and thrusters were found to be operative and in satisfactory condition.
At 1850 on 01 May 2013 Consouth entered Kalamata Port with a pilot on board and berthed alongside the west commercial dock.

02 May 2013

Consouth was inspected by Port State Control Office of Kalamata and following the

issuance of her Class retaining Certificate a permission to sail was granted by the Local Coast Guard Authority for a single voyage to Rieka Shipyard in Croatia in order to undergo repairs.
At approximately 0130 on 03 May 2013 Consouth departed Kalamata Port.
The ship reported that came back in service in June 2013.

3.6 HBMCI Safety Investigation

Hellenic Bureau for Marine Casualties Investigation decided to launch a full safety investigation on said 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 substantially interested Flag States, HBMCI had immediately deployed an Investigation team of three investigators that arrived at Kalamata Port on 29 April 2013.

3.6.1 Cooperation

On 30 April 2013 Cook Islands Maritime Authority in regard to HBMCI´s initial notification for the conduct of a full safety investigation into the aforementioned marine casualty, confirmed the notification and agreed upon the conduct of a joint safety investigation. The Lead Investigating State´s Authority role was commonly agreed to be afforded to HBMCI.
One Investigator and two assistants, a naval engineer and a mechanical engineer appointed by Maritime Cook Islands Authority arrived at Kalamata Port on 30 April 2013.

Respective relevant correspondence had been sent to Antigua & Barbuda Maritime Authority however an agreement for the conduct of a joint safety investigation was not expressed as on 30 April 2013 Antigua and Barbuda ADOMS IID had notified to HBMCI and Cook Islands Maritime Authority the initiation of a safety investigation into respective marine casualty on their part.

On 01 May 2013 HBMCI´s Investigation Team together with the Investigation Team of Maritime Cook Islands Authority held the first meeting for the planning and progress of the safety investigation. A joint interview process was commenced on the same day targeted on rescued crew members of Pirireis.

At noon hours HBMCI and Cook Islands Investigation teams as per planned investigation actions got on a launch in order to board Consouth at anchorage, inspect her damaged areas and meet Master and key personnel involved in the marine casualty.
Nevertheless access to Cook Islands investigation Team to board Consouth was denied by vessel´s Flag on the grounds of a notice sent by ADOMS IID and was never granted during the investigation process.
As a result HBMCI was the only investigation team to board Consouth.

Having boarded Consouth HBMCI´s Investigation team met the Investigators appointed by Antigua and Barbuda ADOMS IID that had arrived at Kalamata on the same day.
Following discussions a consensus was reached to jointly go along with the interview process despite the fact that there was no official or any other sort of agreement on the conduct of a joint safety investigation.

Prior to the initiation of the interview process, HBMCI´s Investigators sought for a common interview planning in cooperation with ADOMS IID Investigators however it was stated that there was nothing to contribute.
Consequently ADOMS IID Investigators attended the interviews of Chief Officer and Master of Consouth as were carried out by the HBMCI Investigation Team.
In the course of the interview process and despite the fact that a few hours ago Maritime Cook Islands Investigators were not allowed to board Consouth, correspondence form ADOMS´ IID end was received through mailing expressing the desire for a close cooperation with both Investigation teams of HBMCI and Cook Islands.

Following the interviewing completion, interviews´ recordings were requested by ADOMS IID Investigators. In response to their request it was stressed that pursuant to art. 11 of Law 4033/2011 (art. 9 of Directive 2009/18/EU - *"Confidentiality"*), witnesses' statements or interviews are of confidential nature and remain for the evaluation of HBMCI and therefore could not be afforded to any Organization concerned. Additionally 14.2 of mentioned law (art.12 of Directive 2009/18/EU – "*Cooperation with substantially interested third countries"*) was underlined, providing that any participation of a substantially interested third country into a safety investigation conducted by HBMCI has to be governed by a common agreement acted hereupon. Aforementioned provisions were also brought to the attention of ADOMS IID.

Moreover it was pointed out that notes could have been kept by their part while attending the interview process whereas it was under their discretionary powers to reexamine Chief Officer and Master of Consouth which was under their representing Flag together with the rest of the vessel´s key personnel.
Nevertheless aforementioned options were not followed and said Investigators departed from Kalamata shortly thereafter. No interest of interviewing Pirireis´ rescued crew members was expressed at any time.

On 02 May 2013 HBMCI Investigation Team had finalized the interview process of Consouth´s key personnel and had completed the jointly interviews of Pirireis´ rescued crew members in cooperation with Cook Islands´ Investigators.

3.6.2 Consouth S-VDR Data & electronic evidence

HBMCI had promptly notified Consouth´s Owning Company for the deployment of the Investigation Team in order to conduct the safety investigation and had additionally requested S-VDR data to be delivered to its Investigators as soon as they boarded Consouth. It was also stressed that S-VDR extraction process should be carried out in the presence of the Investigation Team by an expert following necessary arrangements by the vessel´s Company.
Nevertheless and notwithstanding that HBMCI´s Investigation Team while on board Consouth had verbally requested to collect S-VDR data as it was crucial for the interview process and in particular on gaining a clear view for the sequence of events that led to the casualty as well as for the performance of involved parties and individuals, that failed to happen.
On 02 May 2013 and following Investigation Team´s persistent requests on aforementioned issue, a technician representative of Consouth´s S-VDR manufacturer came to Kalamata from Piraeus.
Having extracted S-VDR data it was found that AIS unit was not configured to sent the correct data from its output (wrong baud rate) and anemometer´s digital display sending the data to S-VDR was out of order.

It was also emerged that although AIS unit was fitted during Consouth´s stay at Tuzla for replacing the old unit by an authorized representative, the failure of the AIS interface to S-VDR was not checked or detected.
As a result no navigational data were available for nearby vessels to Consouth´s passage and consequently for Pirireis.
It should be noted that Consouth´s ARPA operability performance was not integrating data save and extraction.

3.6.3 External resources of electronic evidence data

On 29 April 2013 HBMCI investigation Team seeking for electronic evidence of the passages of the involved to the casualty vessels had requested a copy of the VDR recordings of one of the vessels that was on a nearby passage at the time of the marine casualty and was initially engaged in SAR operations. Following an established correspondence a copy of the VDR data was sent to HBMCI premises in Piraeus in July 2013. However it was found that due to missing files the copy was not readable.
HBMCI contacted experts of the S-VDR manufacturer representatives in Greece in order to provide expertise for reading the data but it was not achievable.

Following that, HBMCI sought for further assistance for resolving the problem and cooperated with a VDR expert of an EU Accident Investigation Body however with no positive results.
Apart from the above actions, HBMCI had also requested electronic evidence regarding involved vessels´ courses from the Hellenic Coast Guard AIS Monitoring system (Integrated Marine Data Environment - IMDatE). However, as already reported, it became evident that Consouth´s position was last recorded at 1855 UTC (2055 ship´s time) on 28 April 2013 heading at 272°,7 at 12.7 knots some 20 nm west of Cape Tenaro at South Peloponnese, approximately 120 nm before the collision position.
Moreover it was found that although Pirireis course tracking was being monitored and recorded through HCG AIS monitoring system, vessel´s positioning had been stopped from being recorded at 02:20:32 UTC (04:20:32 ship´s time) that is almost 20 minutes before the collision.

3.7 Consouth´s S-VDR data abstract

Aiming at comprehending the time series of the events that led to the collision an abstract of Consouth´s S-VDR data is quoted:

Table 1. *Consouth S-VDR abstract at the night of the collision.*

Time UTC	Time LT	Facts - Actions	Course		Speed
			Heading	COG	
02:14	**04:14**	Course is altered from 265° to 263°	263°	262°.8	12.5
02:30	**04:30**		263°.1	262°.8	12.8
02:35	**04:35**		263°.2	263°.3	12.7
02:40	**04:40**		263°	262°.8	12.5
02:42:47	**04:42:47**	Sound of a falling object is heard	262°.8	263°	12.6
02:42:53	**04:42:53**	Consouth´s autopilot to manual mode and hard to starboard			
02:43:07	**04:43:07**	General alarm is ringing			
02:43:08 to 02:43:11	**04:43:08 to 04:43:11**	Call on the VHF "Captain, Captain, Captain, Captain" with Arabic accent. As it was evident call was made by 2nd Officer of Pirireis	276°,7	257°.2	12.5
02:43:12	**04:43:12**	Vessels collided			
Exact time not determined		Stop engine action			
02:43:16	**04:43:16**	Vessels remaining collided	277°.5	255°.5	11.1
02:43:18	**04:43:18**	Vessels remaining collided	276°.3	255°.7	6.9
02:43:19	**04:43:19**	Vessels remaining collided	275°.4	254°.8	5.6
02:43:21	**04:43:21**	Vessels remaining collided	273°.7	244°.4	2.4
02:43:23	**04:43:23**	Vessels remaining collided	272°.1	215°.7	1
02:43:29	**04:43:29**	Vessels remaining collided	269°	158°.8	1.5
02:43:34	**04:43:34**	Vessels remaining collided	266°.7	141°	0.8
02:43:42	**04:43:42**	Consouth´s Master enters the bridge. First conversations			
02:44:57	**04:44:57**	Vessels remaining collided	236°.5	129°.7	0.4
02:45:29 to 02:45:34	**04:45:29 to 04:45:34**	Pirireis´ Master calling on VHF Mayday, Mayday, Mayday Mayday, Mayday, Mayday Vessels remaining collided	229°.3	131°.4	0.2
02:45:56	**04:45:56**	Distress Alarm from Pirireis' VHF DSC	223°.4	131°.8	0.1
02:47:50 to 02:48:01	**04:47:50 to 04:48:01**	Sound of a sinking vessel is recorded by Consouth´s wings microphones Pirireis is sinking	203°.5	41°.7	0.7
02:47:52	**04:47:52**	Coastal Station (Olympia Radio) is calling Pirireis			
02:48:05	**04:48:05**	Distant voices recorded by wings microphones			
02:49:13	**04:49:13**	Consouth Broadcasts a Mayday Relay to All Vessels			

3.8 Consouth´s and Pirireis´ available positioning data

As mentioned in the course of the investigation process positioning data of both vessels' courses involved in the marine casualty were obtained from different sources that is HCG AIS System and Consouth´s S-VDR.
The plotting process of the available data as referred in the analysis section (4.6), had shown that Consouth and Pirireis were sailing under practically reciprocal courses and anticipated abeam passages were considerably lower than the CPA stated to had been estimated or assessed by both OsOW.

4. Analysis

The analysis of the examined marine casualty aims to identify and determine the factors and causes that contributed to the occurrence, taking into account the sequence of events and the collection of investigation information and data focusing both on specific points of the temporal evolution of these, as well as to the root causes 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 been derived from the interviewing process of rescued crew members of Pirireis as well as crew members of Consouth. Consouth´s S-VDR offered limited data and information due to technical issues as mentioned above.

4.1 Consouth

4.1.1 Consouth´s crew

Consouth was operating under a crew of three nationalities mostly Polish deck and engine Officers as well as engine crew and Filipino deck crew while one deck Officer was Russian. The working language on Consouth was English.
Consouth´s Owning Company was 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 its vessel operation and working conditions.
The policy of the Company was implementing a rotating seagoing service especially for Officers namely, 03 months on – 03 months off service or 04 months on – 03 months off service.

4.1.2 Minimum safe manning

According to Consouth´s Minimum Safe Manning Certificate issued by her Flag pursuant to Regulation V/14.2 SOLAS as amended, a minimum crew of 11 seafarers was required. Consouth was manned with 05 crew members in excess of Flag requirements.
The redundant personnel was including capacities only of the engine department and specifically 02 electricians, 02 motormen and one engine cadet.

4.1.3 Deck and Engine Department

.1 Engine Department

Consouth´s Engine Department personnel numbered a total of 08 seafarers including an engine cadet and consequently as referred above exceeded by 05 crew members the required number under her safe manning.
In particular, although Consouth´s engine room was UMS operated, the engine department crew was composed by 04 Officers and 03 crew members and according to her “Shipboard watch and working arrangement (VA-038 form of her SMS)” watchkeeping hours were performed as appears in table 2.

***Table 2**. Consouth Engine Department Shipboard watch and working arrangement*

	Position/rank	Watchkeeping hours	Day working duties´ hours
1.	Chief Engineer	0600-1200 / 1800-2400	-
2.	2nd Engineer	1200-0600 / 2400-0600	-
3.	Electrician	-	0800-1200 /1300-1700
4.	Electrician	-	0800-1200 /1300-1700
5.	Motorman	1500-1900 / 0300-0700	-
6.	Motorman	1000-1200/1300-1600/2300-0300	-
7.	Fitter	-	0800-1200 /1300-1700
8.	Engine Cadet	-	0800-1200 /1300-1700

However in the course of the interview process it was found that Chief Engineer was not engaged in engine watches arrangement as he was superintending daily tasks and maintenance and was involved if required in engine´s department works.

.2 Deck Department

Deck department consisted of only 03 Officers including Master, 03 ABs and 01 OS. The senior AB was assigned with Bosun´s duties.

According to Consouth´s "Shipboard watch and working arrangement (VA-038 form of SMS)" as listed below in table 3 all ABs were part of the bridge watch team during navigational watches and were posted as look out watch.

Table 3. *Consouth Deck Department Shipboard watch and working arrangement*

	Position/rank	Watchkeeping hours	Day working duties´ hours
1.	Master	0800-1200 / 2000-2400	-
2.	Chief Officer	1600-2000 / 0400-0800	-
3.	2nd Officer	1200-1600 /	Safety Officer
4.	AB / Bosun	0000-0400	-
5.	AB	0400-0800	-
6.	AB	2000-2400	
7.	OS	-	0800-1200 /1300-1700

Nevertheless in the course of the interview process it was emerged that ABs were mostly working on deck during day time. During their night watches they were resting in their cabins, available on call at any time, if considered necessary by the OOW.

4.1.4 Consouth´s key personnel

.1 Master

Consouth´s 57 years old Master began his seafarer´s career back in 1975 as crew and skipper on fishing vessels operating in USA, Alaska and South Africa waters. On 01 January 1990 having reoriented his career he served for the first time on a small coaster as a Second Mate. Shortly after he was recruited as a Chief Mate mostly on cargo coasters.

In 2003 he held his Master Certificate and served on several small containers as a Master mostly owned by a Norwegian Shipping Company. He had also occasionally served as a Captain on Private yachts mainly during summer periods.

In 2010 he had his first contract with the Owning Company of Consouth as a Master on its general cargo vessels.

His first service on Consouth was on 09 August 2012 and at the date of the marine casualty he was on his third contract running his 82nd day on board. His contract was based on a three months on – three months off service.

Having regard in his seagoing career and years of service he was an experienced seafarer and Master.

.2 Chief Officer

The 33 years of age Chief Officer had been graduated from Baltic State Academy in Kaliningrad (Russia) in 2004 and got his first COC as a Second Officer. He served as watchman and Second Officer on cargo vessels and similar to Consouth types of vessels, mostly operating in European waters.

In 2008 he had his first contract with Consouth´s Owning Company and had worked mostly on Consouth as a Second Officer.

He had gained his Chief Officer´s certificate in 2009 and in January 2010 he became a Chief Officer on board Consouth. It was reported that after completing his running contract on Consouth he was scheduling of getting his Master Certificate.

His contract pattern was based on a four months on - three months off service and he had joined Consouth on 10 March 2013.

.3 Second Officer

The 50 years of age Second Officer had been contracting with Consouth´s Owning Company since 2008 initially as a Third Officer and was soon promoted to Second

Officer. He had joined Consouth on 24 January 2013 performing Safety Officer´s duties too and it was his first contract on board said vessel. However his two previous services were on Consouth´s sister ships. He was serving with the Chief Officer for the second time.
His contracting pattern was on a basis of four months on - three months off service.

.4 Chief Engineer

By the time of the casualty Chief Engineer had approximately three months on board Consouth. It was his first contract with the Company.
He had been serving as a Chief Engineer on Deep Sea Offshore Dredges for almost four years.
During his seagoing career he had also served on ROPAX vessels for six years operating between ports of North East Europe and for almost ten years on cargo vessels trading mostly at European ports.

4.1.5 Bridge watch pattern

Consouth while underway maintained a rotated 1 to 3 navigational system. According to her SMS navigational watches were performed by the OsOW including Master whereas ABs were forming part of the watch as Look Out.
The investigation process has found that it was a practice on board to conduct a single watch only by the Master and the Deck Officers.
It was also reported that ABs were called on the bridge watch, during navigation at sea areas with high marine traffic or if visibility was restricted or with adverse weather conditions or in cases when an OOW would feel tired.
Additionally it was concluded that Consouth´s ABs had not participated in any of the navigational watches since the commencement of her passage from Tuzla whilst their participation during watches in general was very limited due to the increased deck tasking.
It is deemed likely that the participation of the AB as a look out on the navigational watch at the night of the marine casualty would had strengthened the navigational bridge team and consequently could have alerted the OOW for a timely counteraction in order to avoid the collision.

4.1.6 Main bridge equipment arrangement – conning position´s vision

.1 Main Bridge equipment

Consouth had a standard ergonomic bridge arrangement. Consoles, located on the sides of the steering control system, were fitted with the main bridge equipment.
The ship´s engine control lever was on the starboard console and close to rudder and autopilot unit and a VHF was also fitted.
A Bridge Navigational Watch Alarm System (BNWAS) system was installed on the port console.
Consouth´s bridge was also fitted with two radars. One S-Band (3 GHz) radar was mounted at the starboard end of the console and one X-Band (9 GHz) radar fitted with an automatic radar plotting aid (ARPA) was located at the end of the port console.

Two GPS and one Navtex were installed at the chart room located at the back starboard side of the bridge. A S-VDR unit was also provided.

***Figure 11**. Consouth bridge arrangement view.*

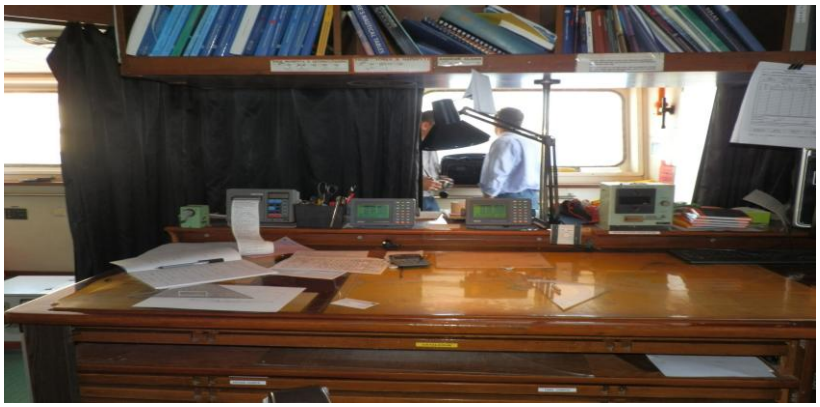

***Figure 12.** Consouth´s chart table.*

***Figure 13**. Consouth main bridge equipment. Main engine control lever, ARPA, AIS, BMWAS.*

.2 Conning position´s vision

Consouth´s wheelhouse structural arrangement offered a very good horizontal field of vision from the conning position to the navigated sea area ahead.

The OOW could maintain a very good visual contact and monitoring of head on vessels with almost reciprocal or nearly reciprocal courses on her starboard bow or abeam yet two cargo cranes located on the her port side were causing minor arcs of blind sectors which could be administered by the continuous movement of the OOW.

***Figure 14**. Consouth´s bridge horizontal field of vision.*

In the view of the above the OOW could observe and monitor Pirireis´ almost reciprocal course on Consouth´s starboard bow at all times before the collision.

4.1.7 Main Navigational Aids

.1 Navigational Charts

Consouth was navigating under standard Nautical paper Charts of British Admiralty.
According to applied practice Consouth´s passage at open sea was being monitored by plotting GPS positions on the chart on a two hours basis. However Chief Mate reported that his practice was to plot vessel´s position almost every hour while he was constantly controlling navigated areas by ARPA and Radar.

.2 Radars

The S-Band JRC radar was operated by turns with the X-Band JRC ARPA as reported by Master however at the time of the collision both radars were operating.
Consouth´s OsOW were mostly utilizing the ARPA radar, especially during night watches due to the fact that it was offering automatic advanced utilities for safe navigation while improving standards for collision avoidance and additionally due to its proximity to AIS unit by which watchkeeping was being facilitated.
Chief Officer at the time prior to the collision was mostly utilizing ARPA radar.

.3 Automatic Identification System

The Furuno AIS system was fitted on the port end of the console and next to ARPA. Its LCD panel displayed listed text information about data for ARPA acquired vessels, vessels data in navigated sea area, voyage related data and short safety-related messages.

.4 Bridge Navigational Watch Alarm System

The Legurdian 2025 BNWAS unit was fitted during drydocking operations in Tuzla replacing the old unit.
Its main function is to monitor bridge activity and to detect OOW standstill or disability within a specified time window (3min, 6min, 9min) that could lead to marine accidents. It can also provide an emergency call by the OOW if required.
The system monitors the awareness and activity of the OOW. It automatically alerts him and if he is not responding, then alerts the Master or another qualified person in case the OOW becomes incapable of performing duties for any reason.
Based on statements in the course of the interview process it was found that it was a practice on board Consouth to keep BNWAS deactivated, although SOLAS Ch. V Reg.19.2.3 (RES.MSC.282(86)) provides that:
“The bridge navigational watch alarm system shall be in operation whenever the ship is underway at sea;”
OOW could activate it if he took the view that it was necessary.
During the navigational watches on the 28 and 29 of April 2013 BNWAS was deactivated.

.5 Simplified –Voyage Data Recorder

Consouth was fitted with the Rutter 100-G2/S 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.
Consouth´s S-VDR was interfacing with various data sources of her navigational equipment through sensors that were recorded and stored by the Rutter unit as listed in the following table 4 in relation to the selection of data to be recorded by a S-VDR under par. 5.4 of Res.MSC.163(78).

Table 4. *Consouth´s S-VDR data*

	Res.MSC.163 (78) Data items to be recorded	Rutter S-VDR Consouth Data items recorded	
1.	Date and time	Date and time	
2.	Ship's position	Ship's position	
3.	Speed	Speed	
4.	Heading	Heading	
5.	Bridge Audio	Bridge Audio	Microphones on the bridge
6.	Communications Audio	Communications Audio	& wings
7.	Radar data, post-display selection	Not available	
8.	AIS Data	Not available	Not interfacing VDR
9.	Other items Res. A.861(20)	Not available	

As reported during the interview process AIS unit was fitted at Tuzla. Notwithstanding following the installation an operational check of AIS unit had been carried out, it became apparent that no check had been conducted in order to ensure that S-VDR sensor was connected to the AIS device.
During the extraction process of Consouth´s Rutter data it was found that AIS unit was not connected properly to her S-VDR and consequently no AIS data of nearby to her passage vessels were recorded and saved.
It follows that Pirireis´ position and data related to her passage were not recorded by Consouth´s S-VDR and the circumstances of the occurrence could not be clearly determined thereupon.

4.1.8 Chief Officer on the watch

.1 BNWAS

Chief Officer having relieved the Second mate proceeded with standard navigational procedures however he did not appear to be concerned that the BNWAS was deactivated as he was not feeling tired.

.2 Look out watch

Look out watch was not called on the bridge as it was a customary practice on board to have the ABs resting in their cabins during night hours in order to be fully capable for day time work on deck**.**

.3 Navigational awareness

The Chief Officer was reported to had established a clear assessment and evaluation of Consouth´s passage in relation to Pirireis´ course.
However according to his statement during the time Pirireis was close to 3nm ahead of Consouth and she was anticipated to have a passage with a CPA 0.8 nm on Consouth starboard side, for unspecified reasons he lost his vigilance with Pirireis either through ARPA or by sight despite the fact that he was standing almost in the middle of the bridge. It is estimated that time concerned from that moment to the collision was less than two minutes.
The Chief Officer´s detachment or disruption from what was going on has been inferred to be a key timing issue in the sequence of the evolving events leading to the collision. If the Chief Officer had himself focused on navigational duties and Pirireis´ course he could had identified that the close head on situation as has been derived through the available collected technical data, presented in par. 4.6 had been rapidly altered to a crossing situation.
He would then had had ample time to establish that the situation had extremely changed to an imminent danger of collision and could had been able to take appropriate actions in order to avoid the collision.

.4 Communication

Chief Officer stated that he had considered of contacting Pirireis´ bridge when she was at a distance of approximately 3nm away of his starboard bow. Nonetheless having evaluated the situation and the expected green to green passage of both vessels at a CPA of 0.8 nm he decided not to.

It is presumed that if he had determined to contacting Pirireis on the VHF[1] and given that a comprehensible communication between the two vessels would had been established the collision could had been avoided based on the fact that clear intentions of both OsOW could had been identified for eliminating the risk of any dangerous situation.

4.1.9 Master´s Standing Orders

.1 The 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. That is to say that the standing orders are in-force and applicable at all times the ship is at sea, at port or at anchor.

Master´s Standing Orders on Consouth, specified many issues regarding navigational and vessel´s operational procedures and amongst others stated:

"When the automatic pilot is in use the regular helmsman will remain on the bridge as a look out or to do work around the bridge at the watch officer´s discretion".

It is inferred that even though standing orders were signed by the Chief Officer and were well understood, AB on watch was not called on the bridge.

Chief Officer´s disregard to Master´s Standing Orders is considered to be a contributing factor to the marine casualty.

.2 Apart from the above it was also highlighted that Master´s Standing Orders did not comprehend any explicit instructions on precautionary or preventive measures and on early actions in relation to safety of navigation in cases Consouth encounters variable navigational situations. Such situations could include head on with reciprocal courses, cross track, undertaking, close quarter with minimum CPA etc or the timely establishment of communication with vessels at specific CPA or TCPA situations.

The lack of detailed instructions and guidance in Consouth´s Master´s Standing Orders for a systematic bridge watch management suggests to have been a contributing factor to the marine casualty.

.3 In consideration of the above Master´s Standing Orders were not followed by the Master and the OsOW and consequently by Chief Mate.

4.1.10 Night orders Book

.1 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 pertaining 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, temperature/pressure reading intervals and so forth.

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[1] Reference to: SOLAS/Chapter IV/Reg. 12 - Res.MSC.131(75)

.2 Consouth´s Night Orders were mainly focusing on instructions such as safe watches at anchorage, notices to Authorities at the ports of call, notices to engine room before arrivals, change of vessel´s time, use of engine or/and steering gear to avoid heavy rolling or pitching etc.
However in regard to navigation a permanent order was recorded:
"Follow Standing Orders. If doubt call Captain".
At the night of the collision the abovementioned permanent order was written as weather conditions were very good and Consouth was sailing at open sea.
The lack of explicit navigational instructions defining safe distances of CPA in various situations or early communication with vessels involved in Consouth´s safe passage may have led the OOW to a complacency status.

4.1.11 The voyage form Tuzla to South Peloponnese

.1 Following the departure from Tuzla Consouth sailed in Marmaras Sea and passed through Dardanelles Strait at night hours. Her voyage towards Malta included standard routeings through sea areas of occasionally increased marine traffic that is crossing the Aegean Sea towards the southeast Peloponnese and Elafonissos Strait.
Having navigated the sea area of South Peloponnese, Consouth continued her passage to Malta at open sea.
Consouth´s followed courses as recorded by HCG AIS system appear in figure 15.

Figure 15. *Consouth passage from Marmaras Sea to south Peloponnese recorded by HCG AIS system.*

.2 Consouth´s voyage plan from Tuzla (Turkey) to South Peloponnese included passages that appears to be ordinary routes followed by vessels trading between ports of Mediterranean Sea, Marmaras Sea and Black Sea.
An indicative general view of marine traffic at Consouth followed passages is demonstrated in Marine Traffic AIS Density Maps (figures No 15, 16, 17) according to data from Marine Traffic Service Statistics during the last semester of 2013.

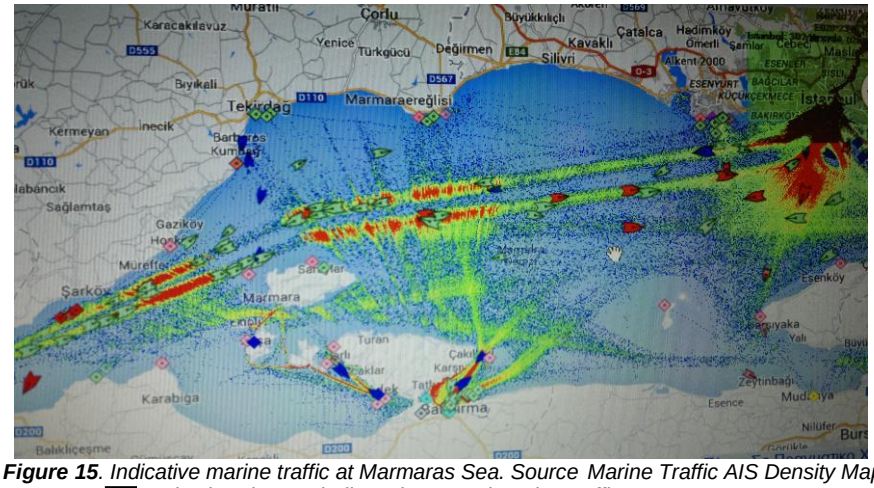

Figure 15. *Indicative marine traffic at Marmaras Sea. Source Marine Traffic AIS Density Maps.*
red colored areas indicate increased marine traffic.
green colored areas indicate low marine traffic.

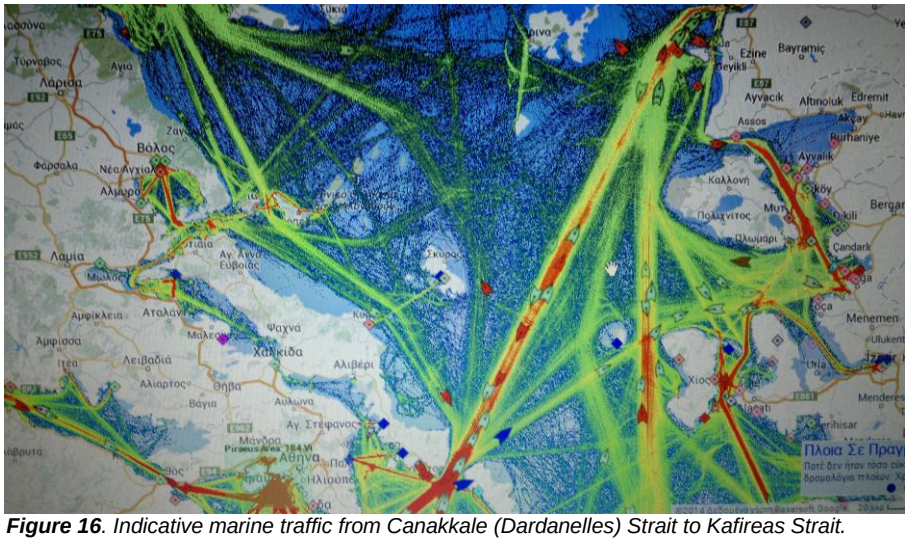

***Figure 16**. Indicative marine traffic from Canakkale (Dardanelles) Strait to Kafireas Strait.*
Source Marine Traffic AIS Density Maps.
red colored areas indicate increased marine traffic.
green colored areas indicate low marine traffic.

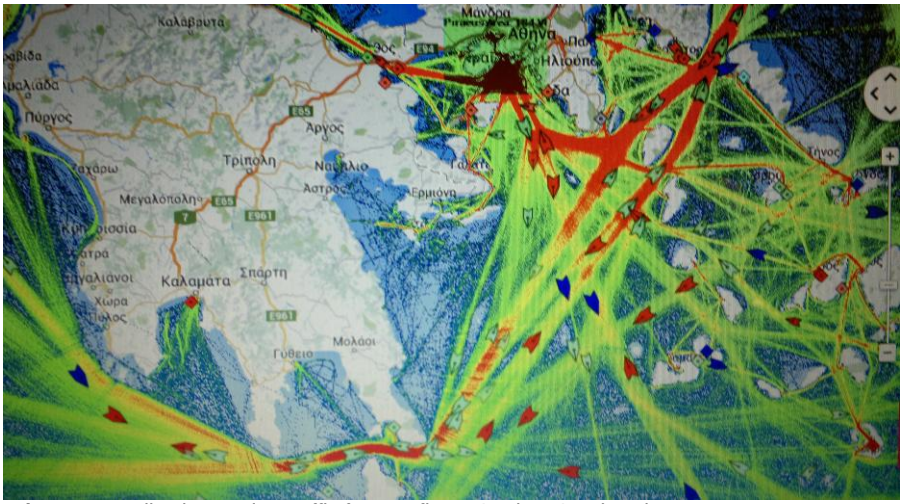

***Figure 17**. Indicative marine traffic from Kafireas Strait to South Peloponnese.*
Source Marine Traffic AIS Density Maps.
red colored areas indicate increased marine traffic.
green colored areas indicate low marine traffic.

.3 Taking under consideration the above it is considered that Consouth´s Navigational Officers had active watches during the passages from Tuzla towards the sea area of South Peloponnese, in view of vessels following the same routeings or crossing said routes (ROPAX, cargo, coasters) at the sea area south of Kafireas Strait when navigating to or from Piraeus.

.4 On referred grounds it could be suggested that the passage in open sea area since afternoon hours on 28 April 2013 and afterwards may had created a sense of security and relaxation or complacency to navigational Officers due to the fact that Consouth was navigating at open sea with very low marine traffic.
Consequently Chief Officer could had been self assured of the evolving situation and guided to undervalue and misjudge the potentially dangerous navigational situation.

4.1.12 Working Language

Consouth´s working language as recorded in her Log Book was English. Master and Officers could speak and communicate fluently in English and were interviewed in English language.

4.1.13 Fatigue

In the course of the interview process it was denoted that during Consouth´s dry dock operations in Tuzla crew was affected by fatigue.
Furthermore practice on board to exempt the ABs from navigational watches indicates that they were affected by fatigue generated by their daily tasking on deck operations.
However according to the record of working and resting hours as well as Chief Officer´s statement, at the night prior to the marine accident he had enough time to rest and therefore it is not concluded that he was affected by fatigue.

4.2 PIRIREIS

4.2.1 Pirireis crew

Pirireis was operating under a crew of Syrian nationality and according to Second Officer´s statement the working language on board was English. However communication between crew was conducted in Arabic.
Pirireis´ Owning Company was cooperating with a crew Agency for manning its vessels. Most of Pirireis´s crew members´ contracts had long durations and it is considered that the crew was familiar with the Company´s vessel´s operation and working conditions.
It was inferred that the policy of the Company in respect to crew recruitment and seafarer´s shipborne service was based mostly on contracts with long durations.

4.2.2 Crew Minimum safe manning

According to Pirireis´ Minimum Safe Manning Certificate issued by her Flag pursuant to Regulation V/14.2 SOLAS as amended, a minimum crew of 14 seafarers was required. Pirireis was manned with 03 crew members in excess of Flag requirements.
The extension to Pirireis´ total number of crew members concerned the capacities of 01 Bosun, 01 AB and 01 Galley staff.
The capacity of Radio Officer provided in her Minimum Safe Manning Certificate was not required as it was replaced by the Chief Officer and Master holding a GOC (General Operator´s Certificate).

4.2.3 Deck and Engine Department

.1 Deck Department

Deck department was composed by 03 Officers including Master, 01 Bosun and 04 ABs all of Syrian Nationality.
According to statements and Pirireis´ “Shipboard watch and working arrangement” navigational watches were conducted by Chief Officer and Second Officer and two ABs were performing Look out duties.
The rest of the deck crew was working on deck on a daily basis. Watchkeeping and working hours were performed as appear in table 5:

Table 5*. Pirireis Deck Department Shipboard watch and working arrangement.*

	Position/rank	Watchkeeping hours	Day working duties´ hours
1	Master	-	-
2	Chief Officer	1800-2400 / 0600-1200	GMDSS Operator
3	2nd Officer	0000-0600 / 1200-1800	Safety Officer
4	Bosun		0800-1200 /1300-1700
5	AB	1800-2400 / 0600-1200	-
6	AB	0000-0600 / 1200-1800	
7	AB	-	0800-1200 /1300-1700
8	AB	-	0800-1200 /1300-1700

.2 Engine Department

Pirireis´ Engine Department personnel numbered a total of 07 Syrian seafarers.
Pirireis´ engine room was not UMS operated and was monitored under watches on a 24 hours basis.
It was composed by 03 Officers and 04 crew members and according to “Shipboard watch and working arrangement”, working and watchkeeping hours were performed as shown in table 6:

Table 6. *Pirireis Engine Department Shipboard watch and working arrangement.*

	Position/rank	Watchkeeping hours	Day working duties´ hours
1	Chief Engineer	-	-
2	2nd Engineer	1800-2400 / 0600-1200	-
3	3rd Engineer	1200-0600 / 2400-0600	0800-1200 /1300-1700
4	Fitter	-	0800-1200 /1300-1700
5	Oiler	1800-2400 / 0600-1200	-
6	Oiler	1200-0600 / 2400-0600	-
7	Oiler	-	0800-1200 /1300-1700

4.2.4 Pirireis´ key personnel

.1 Master

The 35 years of age Master gained his Certificate of Competency as a Master (STCW Reg. II/1) on 09-11-2011 issued by the Arab Republic of Egypt.
He was also holder of a Master COC issued by the Republic of Panama on 02 February 2011. He had also applied to Maritime Cook Islands for the endorsement of his COC. An acknowledgement of his application had been issued by the Registrar of Cook Islands dated on 26 February 2013 with three months of validation allowing him to serve on board Cook Islands´ registered ships.
He had signed an employment contract with the Owning company of Pirireis on 16 November 2012 for a period of 10 months.
Detailed information regarding his seagoing carrier was not obtained as he was one of the casualties.
Pirireis´ rescued crew stated that he was an experienced Captain.

.2 Chief Officer

Chief Officer started his seafarer´s career in 1988. It was his second service on Pirireis and by the time of the marine casualty he had been on board for almost 18 months. His first contract on board a vessel owned by the same Company had lasted for 16 months.
He was on a rotating 0600-1200 navigational watch pattern. As stated during navigational watches an AB was posted as a Look out watch.

.3 Second Officer

The 22 years of age Second Officer of Pirireis had been graduated from a Lebanese Merchant Marine Academy in 2011. On 17 July 2011 he acquired his Certificate of Competency (STCW II/1) as a Deck Officer issued by the Republic of Lebanon/Ministry of Public Works and Transport/Directorate General of Land & Maritime Transport.
Maritime Cook Islands had endorsed his COC on 30-11-2011.
Second Officer joined Pirireis in Algeria on 18 April 2013 and it was his first contract as a Deck Officer on board cargo a vessel.
Deck and navigational Officer´s duties were undertaken on the same day as the former second officer had already disembarked.

It was reported that Master was periodically staying on the bridge during Second Officer´s watches due to his inexperience.
He was on a rotating 1200-0600 navigational watch pattern and Safety Officer´s duties were also assigned to him.
According to statements by the rescued Chief Officer he had been through a familiarization period with Pirireis safety and navigational equipment however it was stated that the previous Second Officer had disembarked before the new Officer got on service.
Furthermore in the course of the Second Officer´s interview process it was revealed that neither he had been through any familiarization procedure nor such a procedure was recorded or documented. Additionally it became apparent that he was not able to communicate in basic English and to use the IMO Standard Marine Communication Phrases as provided in STCW/Part A/ Chapter II/Section A-II/1.
Notwithstanding that Second Officer was a new seafarer he had been assigned to conduct the navigational watch during night time (2400 to 0600), a high risk time period as most of navigational marine accidents occur at late night or early morning hours.

.4 Crew servicing

The interview process of Pirireis´ rescued crew members has shown that servicing was under long periods. Apart from Chief Officer´s service on board Pirireis for almost 18 months, rescued Cook and an AB reported that had been on Pirireis for almost 12 months.
Although Master and Second Officer directly involved with the marine casualty had been servicing on Pirireis for a short period of time, it should be noted that long servicing on board vessels could have an impact on seafarer´s performance due to chronic fatigue directly affecting seafarer´s mental and physical condition and consequently his performance.

.5 Company´s recruiting practice

Taking under consideration MSC/Circ.1014(MSC 74) and annexed guidelines when developing, implementing or improving safety management systems under the ISM Code it is suggested that:
"*Management when developing fatigue management policies and systems should consider, amongst others, the length of service and leave ratios as long service on board a vessel could result to chronic fatigue".*
The recruiting practice of Pirireis´ Company does not ensure an efficient fatigue management policy in relation to length of service and leave ratios.

4.2.5 Bridge watch pattern

At the time period prior and during the marine casualty Pirireis was implementing a six hours rotating navigational watch system performed by the newly recruited Second Officer (1200-0600) and Chief Officer (0600-1200).
Following Second Officer´s taking up of navigational duties on the day he joined Pirireis it was stated by Chief Officer that Master was staying on the bridge when needed or if required during Second Officer´s watch due to his inexperience.
At the time of the collision it was also stated that Master was on the bridge with the Second Officer despite the fact that Pirireis was navigating at open sea and under very good weather conditions.
In the view of the above it could be presumed that Master had to monitor his Officer´s watch performance without being able to have sufficient resting hours as he could be called or stay on the bridge at any time regardless weather conditions, marine traffic or restricted visibility and so forth.

4.2.6 Main bridge equipment arrangement – conning position vision

.1 Main Bridge equipment

Pirireis having been built in 1979 had a simplified wheelhouse based on earlier arrangements. Her bridge was ergonomic with the steering unit located in the middle.
Pirireis wheelhouse was fitted with an Engine Telegraph located in front of the steering wheel for ordering the vessel´s speed and direction to the engine room where the engine propulsion was controlled.
Pirireis´ bridge was also fitted with two X-Band (9 GHz) radars mounted on both sides of the steering wheel.
Long Range Identification and Tracking System was also provided.
Two GPS and one Navtex were installed at the chart room located at the back port side of the bridge. A S-VDR unit was also provided.

.2 Conning position´s vision

Pirireis´ wheelhouse structural arrangement offered a very good horizontal field of vision from the conning position to the navigated sea area ahead.
OOW could maintain a very good visual contact and monitoring of head on vessels on her starboard or port bow with almost reciprocal or nearly reciprocal courses.

***Figure 19**. Pirireis´ bridge windows*

***Figure 20**. Pirireis´ horizontal field of vision*

***Figure 21**. Pirireis´s conning vision*

4.2.7 Main Navigational Aids

.1 Navigational Charts

Pirireis´ preliminary means of navigation were standard Nautical paper Charts of British Admiralty.

It was reported that OOWs when at open sea maintained the monitoring of vessel course by plotting positions on the chart extracted from GPS on a hourly basis.

.2 Radars

The X-Band radars of Pirireis was stated that were both operated at the night of the marine casualty.

Second Officer at the night of the collision was using both radars and mostly utilizing the VRM and EBL cursors in order to extract information about vessels sailing at Pirireis navigated sea area as no automatic data processing was available.

.3 Automatic Identification System

Pirireis was equipped with a L-3 Protec AIS system fitted on the chart room. Provided information was displayed on a listed text with vessels´ data in navigated sea areas, voyage related data and short safety-related messages.

.4 Bridge Navigational Watch Alarm System

Bridge Navigational Watch Alarm System was not mandatory as Pirireis was exempted from the provisions of SOLAS Ch. V, Reg. 19.2.3 (RES.MSC.282(86)) and was not fitted.

.5 Simplified –Voyage Data Recorder

Pirireis was fitted with a S-VDR pursuant to relevant provisions of SOLAS as amended (Res.MSC.163(78)). Following her foundering in deep waters of approximately 3,000 m it was extremely difficult and rather impractical to recover data.

4.2.8 Second Officer on the watch

.1 Look out watch

In the course of the interview process it was stated that navigational watches on Pirireis were performed by the OOW with the participation of an AB as a Look out watch. It was additionally reported that at the night of the collision Master was on the bridge together with the Second Officer due to his inexperience aiming at strengthening the navigational watch.

In the view of the above it is presumed that at the night of the collision Pirireis´ navigational bridge team was composed in excess of the standard bridge manning.

.2 Navigational awareness

Second Officer was reported to have identified Consouth on a head on situation at a distance of approximately 10 nm close to his port bow. Following data extracted from Pirireis´ radar and processed by the bridge navigational team, a port to port passage situation was assessed to be anticipated with a CPA of approximately 01 nm.

Nevertheless it was not clarified when and why Second Officer or the Bridge navigational Team had stopped observing Consouth as she was the only interesting target, particularly with the presence of Master on the bridge.

Neither it was elucidated what instructions and orders were given to the look out watch.

Second Officer stated that he had reported the expected CPA of Consouth to Master and it was considered as a safe distance.

It was reported that Consouth had suddenly altered her course to port and headed towards Pirireis port side.

However under the condition of the above it appears to had been an ample time for actions to avoid the feasible danger of collision.
Second Officer´s report that he had seen nothing of Consouth until moments before the collision, indicates that neither him and the look-out watch nor the Master were observing out of the bridge windows or monitoring traffic through radar or AIS for a time period of less than 02 minutes and while Consouth was on a short distance passage.
If an effective look out would had been kept by Pirireis Bridge navigational Team it is highly possible that the collision would had been prevented.

.3 Communication

No action was taken by Second Officer or Master of Pirireis to contact Consouth on VHF until seconds before the collision.
Despite the fact that Master was on the bridge by the time of the collision he only tried to call a Mayday Emergency Call almost 2 minutes post to the marine accident.
Poor judgment and failure of following basic practices at sea generated by COLREGS is presumed to have led to poor bridge performance.

4.2.9 Master Standing Orders / Night Orders Book

In the course of the interview process it was reported that Master´s Standing Orders provided a set of instructions for Pirireis´ safe navigation and for operational procedures at port.
It was stated that no specific framework of bridge management procedures were introduced regarding communication with vessels or safe distances (CPA & TCPA) on specific navigating situations such as head on, cross courses or overtaking, apart from a general instruction of keeping a safe distance.
The lack of specific framework in Standing Orders suggests that had established a context of complacency and ambiguity and did not generate any preventive actions at any time prior to the collision.
At the night of the collision no specific night orders was reported to had been recorded or instructed by Master.

4.2.10 The voyage from Algeria to Ukraine

.1 Pirireis having departed from Annaba port of Algeria had sailed at open sea towards Malta. Following her short transit stay at Marshaxlokk anchorage in Malta she continued her passage towards open sea and according to her passage plan she would had sailed through the Aegean Sea to Dardanelles Strait and Marmaras Sea towards the Black Sea.
Her voyage plan until Malta included sea areas of occasionally and potentially increased marine traffic in specific parts yet the passage at open sea following Malta transit stop was considered to be without significant navigational situations.
An indicative general view of marine traffic at Pirireis followed passages from Annaba port towards South Peloponnese is demonstrated in Marine Traffic AIS Density Maps (figures No 22, 23) according to data from Marine Traffic Service Statistics during the last semester of 2013.

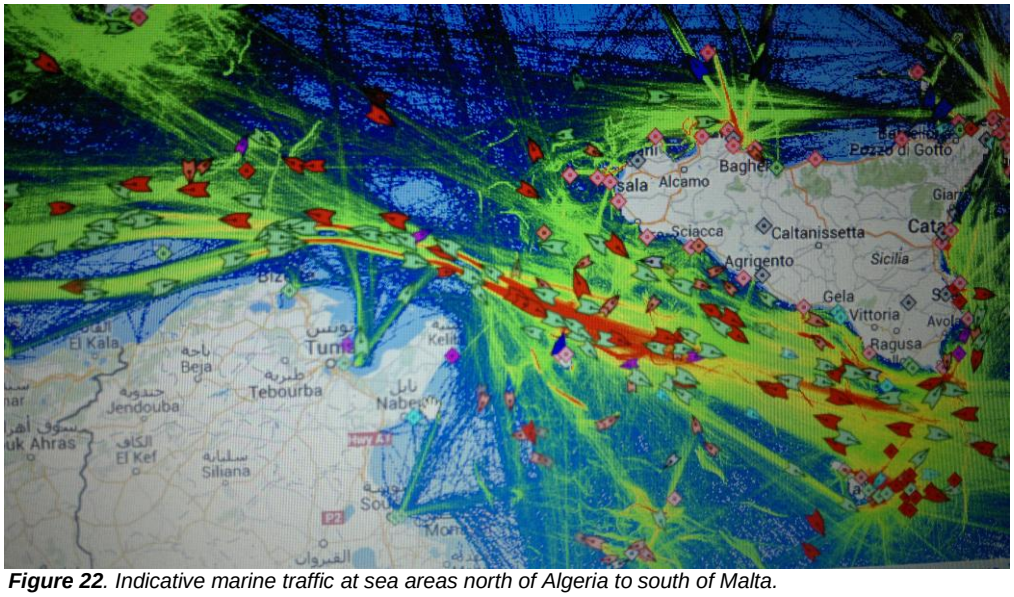

***Figure 22**. Indicative marine traffic at sea areas north of Algeria to south of Malta.*
Source Marine Traffic AIS Density Maps.
red colored areas indicate increased marine traffic.
green colored areas indicate low marine traffic.

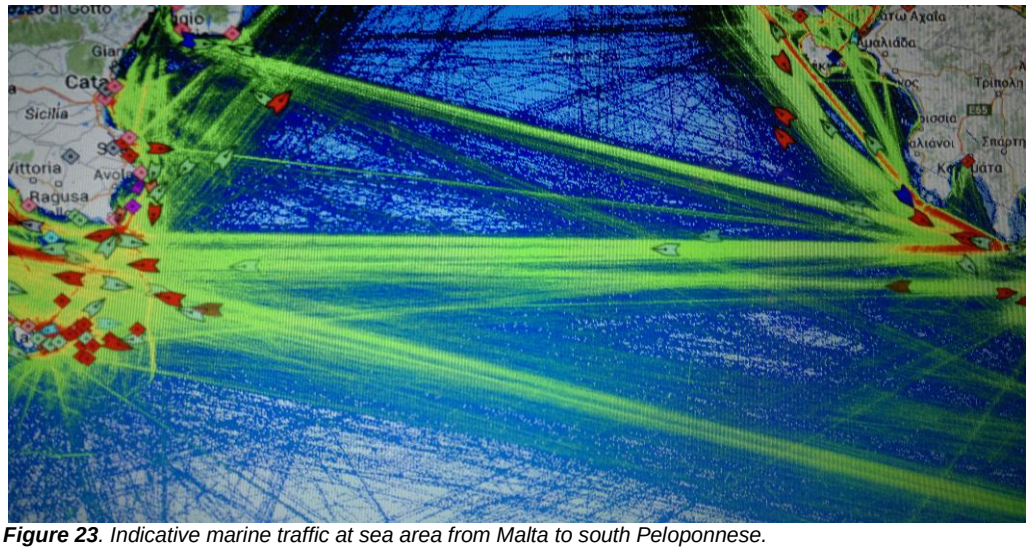

***Figure 23**. Indicative marine traffic at sea area from Malta to south Peloponnese.*
Source Marine Traffic AIS Density Maps. (Green lines indicate low marine traffic)
red colored areas indicate increased marine traffic.
green colored areas indicate low marine traffic.

.2 Given the above mentioned it is considered that Pirireis´ Navigational Officers had active watches during the passages from Annaba port to Malta due to the fact that said sea areas may be under increased or moderate marine traffic. However the passage following the departure from Malta was uneventful.

.3 In the view of the above it could be suggested that the existing circumstances since afternoon hours on 28 April 2013 and afterwards may had created a sense of security, complacency or relaxation to Pirireis´ navigational Officers and self assurance due to the fact that she was navigating at open sea with very limited marine traffic.
Consequently Pirireis bridge team including Master, being self assured although aware of the evolving situation, could had been led to undervalue and misjudge any potential dangerous navigational situation failing to perceive the encountering extremely close head on situation and the imminent danger.

4.2.11 Working Language

According to SOLAS Chapter V Safety of Navigation Reg. 14.3 & 4 working common language has to be established on board all vessels determined by Master or Company and to be recorded in a vessel´s Log Book in order to ensure effective crew performance in safety matters. Each seafarer is required to understand and, where appropriate, give orders and instructions and to report back in that language.
English language is to be used as the working language for bridge-to-bridge and bridge-to-shore safety communications as well as for communications on board between the pilot and bridge watchkeeping personnel, unless those directly involved in the communication speak a common language other than English.
Pirireis working language that was stated to had been recorded in her Log Book was English, however due to the fact that all crew members were Syrians the actual working language was Arabic. Nevertheless a requirement of basic knowledge and use of English language was applied to Officers of Deck and Engine department of Pirireis.
Notwithstanding the above mentioned requirement, the interview process highlighted that there was an apparent and remarkable lack of knowledge of the working English language of the rescued interviewed crew members.
Although Chief Officer had a good level of communication in English language the Second Officer had a very poor level and a translator was required during his interview. It was also found that it was very difficult for him to perform bridge to bridge communications under the standardized IMO Marine communications phrases (IMO Res. 918 (22)). On the grounds of the above Second Officer may have been deterred from establishing a proper communication with Consouth.
It was concluded that respective provisions of STCW A-IV/2 and SOLAS Chapter V/Reg.14.3&4 were not satisfied in full for the Second Officer.

4.2.12 Second Officer familiarization

In the course of the investigation process Second Officer stated that following his sign-on agreement, apart from a general familiarization on the first day he had joined Pirireis, no specific training procedure and no hand over was carried out by the former second officer in respect to his duties.
It is highlighted that chapter 6 of ISM Code “Resources and Personnel” provides amongst others that :
“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”.
Based on collected information it has arisen that despite the fact Second Officer had gained his COC in 2011 and he had been recruited as a Second Officer for his first time onboard Pirireis in 2013 there was no procedure for ensuring or assessing his skills and qualifications prior to the assignment of his duties on board Pirireis or before his recruitment.

4.2.13 Fatigue

According to statements by Pirireis´ Chief Officer and Second Officer the working routine followed was normal without causing fatigue to navigational Officers.The navigational watch pattern practiced was not considered to had caused fatigue to OsOW.
Nevertheless and despite the fact that Master was not typically part of the bridge team it should be noted that his continuous monitoring of Second Officer´s performance even

during navigation under good weather conditions and low marine traffic may indicate that he had been adversely affected by fatigue.
In the view of the above it could be suggested that Master being on the bridge at the night of the collision had misjudged the navigational situation and underestimated the forthcoming danger.

4.3 International Regulations for Preventing Collisions at Sea, 1972

COLREGS abstract for collision prevention that could be basically applied and pertinent to the sequence of events at the night of the collision are given below in table no 6.

***Table 6**. COLREGS that may apply on examined case.*

1.	**Rule 1** ***Application***	**(a). These Rules shall apply to all vessels upon the high seas and in all waters connected therewith navigable by seagoing vessels.**
2.	**Rule 2** ***Responsibility***	(a). Nothing in these Rules shall exonerate any vessel, or the owner, master or crew thereof, from the consequences of any neglect to comply with these Rules or of the neglect of any precaution which may be required by the ordinary practice of seamen, or by the special circumstances of the case. (b). In construing and complying with these Rules due regard shall be had to all dangers of navigation and collision and to any special circumstances, including the limitations of the vessels involved, which may make a departure from these Rules necessary to avoid immediate danger.
3.	**Rule 5** ***Look-out***	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.
4.	**Rule 7** ***Risk of collision***	(a). Every vessel shall use all available means appropriate to the prevailing circumstances and conditions to determine if risk of collision exists. If there is any doubt such risk shall be deemed to exist. (b). Proper use shall be made of radar equipment if fitted and operational, including long-range scanning to obtain early warning of risk of collision and radar plotting or equivalent systematic observation of detected objects. (c). Assumptions shall not be made on the basis of scanty information, especially scanty radar information.
5.	**Rule 8** ***Action to avoid collision***	(a). Any action to avoid collision shall be taken in accordance with the Rules of this Part and shall, if the circumstances of the case admit, be positive, made in ample time and with due regard to the observance of good seamanship. (b). Any alteration of course and/or speed to avoid collision shall, if the circumstances of the case admit, be large enough to be readily apparent to another vessel observing visually or by radar; a succession of small alterations of course and/or speed should be avoided. (c). If there is sufficient sea-room, alteration of course alone may be the most effective action to avoid a close-quarters situation provided that it is made in good time, is substantial and does not result in another close-quarters situation. (d). Action taken to avoid collision with another vessel shall be such as to result in passing at a safe distance. The effectiveness of the action shall be carefully checked until the other vessel is finally past and clear. (e). If necessary to avoid collision or allow more time to assess the situation, a vessel shall slacken her speed or take all way off by stopping or reversing her means of propulsion. (i). A vessel which, by any of these Rules, is required not to impede the passage or safe passage of another vessel shall, when required by the circumstances of the case, take early action to allow sufficient sea-room for the safe passage of the other vessel. (ii). A vessel required not to impede the passage or safe passage of another vessel is not relieved of this obligation if approaching the other vessel so as to involve risk of collision and shall, when taking action, have full regard to the action which may be required by the Rules of this part. (iii). A vessel the passage of which is not to be impeded remains fully obliged to comply with the Rules of this part when the two vessels are approaching one

		another so as to involve risk of collision.
6.	**Rule 11** ***Application***	Rules in this section apply to vessels in sight of one another.
7.	**Rule 14** ***Head-on situation***	(a). When two power-driven vessels are meeting on reciprocal or nearly reciprocal courses so as to involve risk of collision each shall alter her course to starboard so that each shall pass on the port side of the other. (b). Such a situation shall be deemed to exist when a vessel sees the other ahead or nearly ahead and by night she could see the masthead lights of the other in a line or nearly in a line and/or both sidelights and by day she observes the corresponding aspect of the other vessel. (c). When a vessel is in any doubt as to whether such a situation exists she shall assume that it does exist and act accordingly.
8.	**Rule 15** ***Crossing situation***	When two power-driven vessels are crossing so as to involve risk of collision, the vessel which has the other on her own starboard side shall keep out of the way and shall, if the circumstances of the case admit, avoid crossing ahead of the other vessel.
9.	**Rule 16** ***Action by give-way vessel***	Every vessel which is directed to keep out of the way of another vessel shall, so far as possible, take early and substantial action to keep well clear.
10.	**Rule 17** ***Action by stand-on vessel***	(a).(i). Where one of two vessels is to keep out of the way the other shall keep her course and speed. (ii). The latter vessel may however take action to avoid collision by her manoeuvre alone, as soon as it becomes apparent to her that the vessel required to keep out of the way is not taking appropriate action in compliance with these Rules. (b). When, from any cause, the vessel required to keep her course and speed finds herself so close that collision cannot be avoided by the action of the give-way vessel alone, she shall take such action as will best aid to avoid collision. (c). A power-driven vessel which takes action in a crossing situation in accordance with subparagraph (a)(ii) of this Rule to avoid collision with another power-driven vessel shall, if the circumstances of the case admit, not alter course to port for a vessel on her own port side. (d). This Rule does not relieve the give-way vessel of her obligation to keep out of the way.

Taking under consideration the evolution of the events in the examined case it is suggested that Consouth´s OOW and Pirireis Bridge Navigational Team had shown a disregard to respective COLREGS for collision avoidance.

4.4 Environmental conditions

Weather conditions were reported to be very good on the 28th and on the 29th of April 2013.
Consouth´s Log Book had recorded:

Sea state	almost calm
Wind speed	1 knot
Air temperature	18 ° C
Barometric pressure	1013 mb
Visibility	Very good

Although reported weather conditions cannot directly be considered to have been a contributing factor on examined marine casualty it could be suggested that they could had caused a sense of security and complacency on Consouth´s OOW and Pirireis´ navigational bridge team.

4.5 Effective look out watch

Consouth´s OOW and Pirireis´ navigational bridge team were of the view that a safe passage was anticipated. Nonetheless it became evident that aforementioned estimation was groundless as vessels collided. Both vessels are alleged to have disregard Rule 5 of COLREGS and to had established a misguided perception of the evolving situation based on poor judgment disrespecting COLREGS Rule 7.
Consouth´s Chief Officer on a single watch was not keeping an effective look out due to the fact that, as stated, he had only seen Pirireis´ maneuver seconds before the collision. His actions to avoid Pirireis were too late pointing out that he was complacent and not under constant monitoring (Look Out) of Pirireis disregarding COLREGS and good seamanship.
Pirireis´ Bridge team despite the fact that was consisted of the Master, the Second Officer and a Look Out watch had additionally disregarded COLREGS and good seamanship. It is concluded that they had erroneously assumed that Pirireis would have a clear port to port passage with Consouth being under reciprocal courses.
On the grounds that Consouth had not altered her course but seconds before the collision and the close to vertical angle of collision it is considered apparent that it was Pirireis´ course that was changed shortly before vessels collided probably due to the false perception of Consouth aspect by Pirireis Bridge team. It is noted that in practical terms it could be difficult to determine a vessel´s aspect at night by visual observations and an assessment could be misleading by various factors such as experience, complacency, mental stress or physical condition etc.

4.6 Analyzing courses´ available data

Taking under consideration that Pirireis and Consouth procured two different scenarios of the events leading to the collision, available positioning data of both vessels were plotted on electronic chart.
It is noted, as already indicated above, that Consouth´s S-VDR was not interfacing her AIS Unit hence no AIS data were recorded although, under the respective provision of par. 5.4.8 MSC.163 (78) as amended, such as obligation was applied inasmuch no radar recording to S-VDR was available.
Having regard to the foregoing it follows that Consouth´ Safety Management System did not include any procedures or measures to ensure that data from AIS unit or from any other sensors (units) connected to it were being recorded.

4.6.1 Pirireis

Pirireis navigating data as extracted through AIS monitoring system of the HCG were plotted on an electronic chart.
Pirireis´s plotted positions, 59 in total as appear in table 7 below, correlate a time period from 12:16:15 *(position no 00)* on 28 April 2013 to 04:20:32 *(position no 59)* on the 29 April 2013, which was the last position received in HCG Operational Center, that is approximately 20 minutes before the collision.

***Table 7**. Pirireis positioning data extracted from HCG AIS.*

No	Date / UTC		Ships time UTC +2	Heading	Latitude	Longitude	Speed	OOW
59	2013-04-29	02:20:32	04:20:32	84.80	36° 10' 57.47	20° 4' 30.84	9.80	2nd Off.
58	2013-04-29	02:08:42	04:08:42	86.19	36° 10' 49.92	20° 2' 08.16	9.69	2nd Off.
57	2013-04-29	02:02:02	04:02:02	87.59	36° 10' 46.02	20° 0' 47.22	9.89	2nd Off.
56	2013-04-29	01:37:32	03:37:32	84.80	36° 10' 27.36	19° 55' 42.59	10.19	2nd Off.
55	2013-04-29	01:31:23	03:31:23	84.30	36° 10' 21.60	19° 54' 24.84	10.19	2nd Off.
54	2013-04-29	01:24:32	03:24:32	83.69	36° 10' 14.87	19° 52' 58.44	10.19	2nd Off.
53	2013-04-29	01:10:53	03:10:53	84	36° 09' 59.52	19° 50' 06.23	10.19	2nd Off.

52	2013-04-29	01:04:12	03:04:12	82.80	36° 09' 52.61	19° 48' 41.58	10.30	2nd Off.
51	2013-04-29	00:57:03	02:57:03	82.69	36° 09' 44.15	19° 47' 11.87	10.19	2nd Off.
50	2013-04-29	00:43:44	02:43:44	85.19	36° 09' 28.37	19° 44' 24.89	10.19	2nd Off.
49	2013-04-29	00:33:02	02:33:02	82.90	36° 09' 16.37	19° 42' 10.56	10.19	2nd Off.
48	2013-04-29	00:26:23	02:26:23	85.30	36° 09' 09.35	19° 40' 47.34	10.10	2nd Off.
47	2013-04-28	23:49:23	01:49:23	86.40	36° 08' 38.33	19° 32' 59.70	10.30	2nd Off.
46	2013-04-28	23:26:12	01:26:12	89.5	36° 08' 29.16	19° 28' 09.18	10.10	2nd Off.
45	2013-04-28	23:06:52	01:06:52	87.69	36° 08' 22.19	19° 24' 07.92	10.10	2nd Off.
44	2013-04-28	23:00:02	01:00:02	85.59	36° 08' 17.69	19° 22' 43.01	10	2nd Off.
43	2013-04-28	22:53:52	00:53:52	88.30	36° 08' 13.43	19° 21' 26.34	10.10	2nd Off.
42	2013-04-28	22:47:12	00:47:12	85.19	36° 08' 09.05	19° 20' 03.29	10.10	2nd Off.
41	2013-04-28	22:33:22	00:33:22	86.19	36° 07' 57.78	19° 17' 11.76	10	2nd Off.
40	2013-04-28	22:26:43	00:26:43	84.5	36° 07' 52.9	19° 15' 49.74	10	2nd Off.
39	2013-04-28	22:05:43	00:05:43	84.90	36° 07' 36.48	19° 11' 30.23	10	2nd Off.
38	2013-04-28	21:58:03	23:58:03	85.40	36° 07' 29.28	19° 09' 55.85	10	Ch. Off.
37	2013-04-28	21:44:42	23:44:42	83.59	36° 07' 15.78	19° 07' 12.42	9.89	Ch. Off.
36	2013-04-28	21:38:04	23:38:04	83.59	36° 07' 9.41	19° 05' 51.54	9.89	Ch. Off.
35	2013-04-28	21:23:14	23:23:14	85.5	36° 06' 55.68	19° 02' 48.59	10	Ch. Off.
34	2013-04-28	21:10:23	23:10:23	85.59	36° 06' 44.33	19° 00' 10.38	9.89	Ch. Off.
33	2013-04-28	21:04:13	23:04:13	84.80	36° 06' 39.60	18° 58' 54.89	9.80	Ch. Off.
32	2013-04-28	20:51:23	22:51:23	84.59	36° 06' 28.20	18° 56' 17.51	9.89	Ch. Off.
31	2013-04-28	20:45:23	22:45:23	84.80	36° 06' 22.85	18° 55' 04.08	9.89	Ch. Off.
30	2013-04-28	20:39:13	22:39:13	84.59	36° 06' 17.46	18° 53' 48.53	9.89	Ch. Off.
29	2013-04-28	20:19:23	22:19:23	84.90	36° 06' 0.59	18° 49' 47.34	9.89	Ch. Off.
28	2013-04-28	20:12:14	22:12:14	85.30	36° 05' 54.66	18° 48' 19.97	9.80	Ch. Off.
27	2013-04-28	20:04:53	22:04:53	85.69	36° 05' 48.66	18° 46' 50.87	9.80	Ch. Off.
26	2013-04-28	19:31:55	21:31:55	85.90	36° 05' 22.32	18° 40' 05.82	10	Ch. Off.
25	2013-04-28	19:25:13	21:25:13	86.09	36° 05' 17.51	18° 38' 43.86	10	Ch. Off.
24	2013-04-28	19:18:12	21:18:12	86.09	36° 05' 12.24	18° 37' 17.64	10	Ch. Off.
23	2013-04-28	19:12:02	21:12:02	86.40	36° 05' 7.97	18° 36' 01.14	10	Ch. Off.
22	2013-04-28	18:44:05	20:44:05	83.69	36° 04' 44.39	18° 30' 13.38	10	Ch. Off.
21	2013-04-28	18:29:33	20:29:33	84.30	36° 04' 31.44	18° 27' 15.17	10	Ch. Off.
20	2013-04-28	18:21:12	20:21:12	85.59	36° 04' 23.75	18° 25' 32.27	9.89	Ch. Off.
19	2013-04-28	17:28:52	19:28:52	82.69	36° 03' 24.78	18° 14' 47.46	10	Ch. Off.
18	2013-04-28	17:22:52	19:22:52	83.90	36° 03' 17.94	18° 13' 33.11	10.10	Ch. Off.
17	2013-04-28	17:16:43	19:16:43	84.30	36° 03' 10.20	18° 12' 16.85	10.10	Ch. Off.
16	2013-04-28	16:00:55	18:00:55	84.19	36° 01' 34.38	17° 56' 55.91	9.89	Ch. Off.
15	2013-04-28	15:54:54	17:54:54	81.09	36° 01' 25.92	17° 55' 42.78	9.89	2nd Off.
14	2013-04-28	15:27:55	17:27:55	83.30	36° 00' 50.70	17° 50' 17.34	9.69	2nd Off.
13	2013-04-28	15:15:35	17:15:35	82.69	36° 00' 33.90	17° 47' 49.91	9.89	2nd Off.
12	2013-04-28	15:08:03	17:08:03	82.30	36° 00' 23.27	17° 46' 20.63	9.60	2nd Off.
11	2013-04-28	15:01:53	17:01:53	83.30	36° 00' 14.94	17° 45' 07.62	9.60	2nd Off.
10	2013-04-28	14:41:23	16:41:23	84.19	35° 59' 47.39	17° 41' 08.46	9.5	2nd Off.
19	2013-04-28	14:25:54	16:25:54	81.09	35° 59' 26.28	17° 38' 06.06	9.80	2nd Off.
08	2013-04-28	14:13:43	16:13:43	82.19	35° 59' 9.29	17° 35' 40.61	9.69	2nd Off.
07	2013-04-28	13:32:35	15:32:35	83.69	35° 58' 20.21	17° 27' 23.93	9.89	2nd Off.
06	2013-04-28	13:18:44	15:18:44	82.80	35° 58' 06.41	17° 24' 34.85	10	2nd Off.
05	2013-04-28	13:12:05	15:12:05	83.59	35° 57' 59.8	17° 23' 13.4	10	2nd Off.
04	2013-04-28	13:05:35	15:05:35	85.40	35° 57' 53.8	17° 21' 53	10	2nd Off.
03	2013-04-28	12:57:05	14:57:05	86.59	35° 57' 46.37	17° 20' 06.9	10.19	2nd Off.
02	2013-04-28	12:46:05	14:46:05	83.19	35° 57' 35.15	17° 17' 49.73	10	2nd Off.
01	2013-04-28	12:28:53	14:28:53	83.80	35° 57' 15.53	17° 14' 17.88	10	2nd Off.
00	2013-04-28	10:16:15	12:16:15	85.09	35° 54' 51.24	16° 47' 58.01	9.60	2nd Off.

Pirireis plotted positions based on above table are shown in figure no 24 while figures no 25, 26 and 27 demonstrate the respective passage segments of the OsOW.

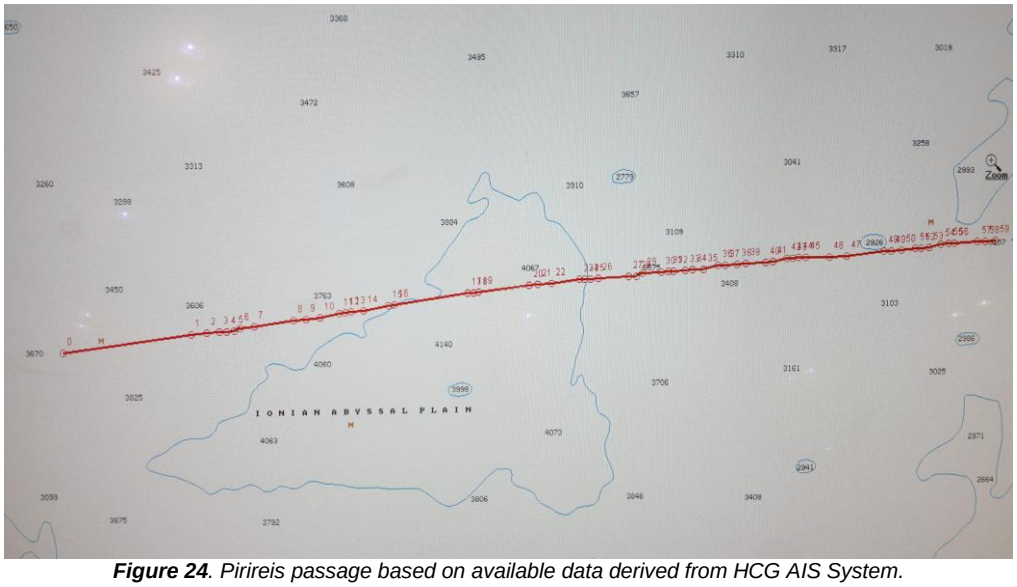

***Figure 24**. Pirireis passage based on available data derived from HCG AIS System.*

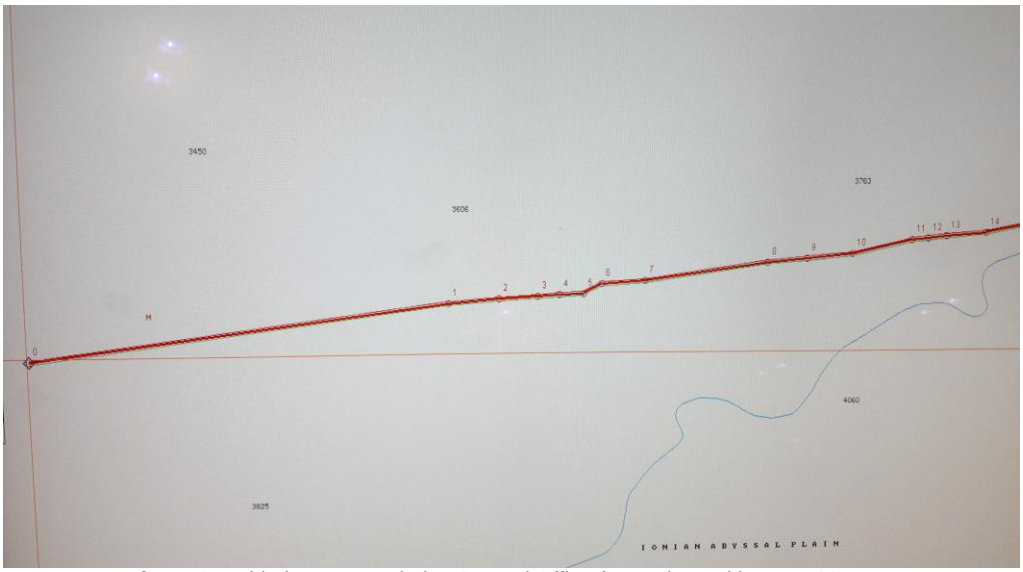

***Figure 25.** Pirireis passage during Second Officer´s watch. Positions No 00 to 14.*

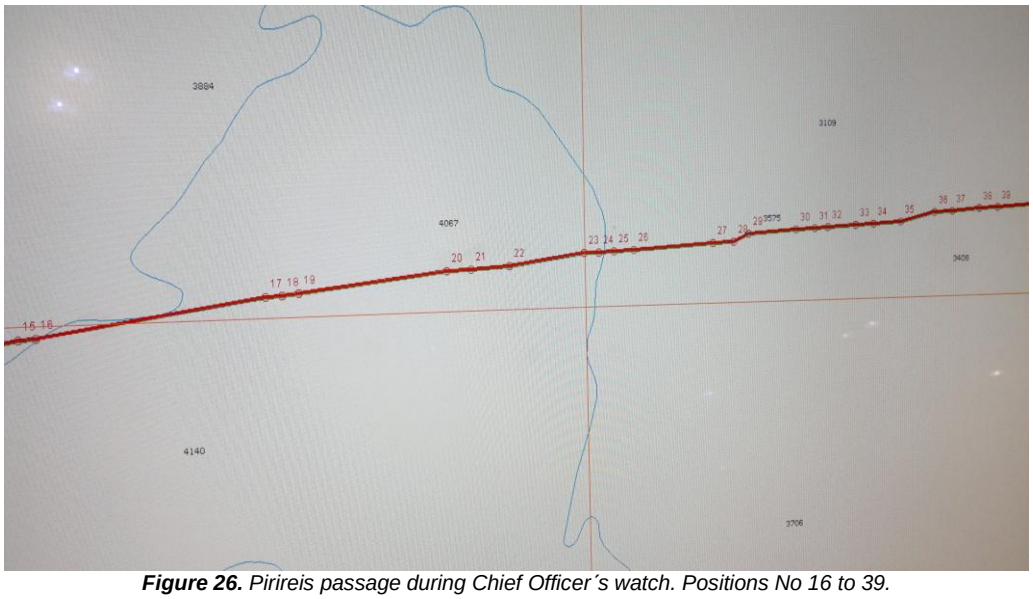

***Figure 26.** Pirireis passage during Chief Officer´s watch. Positions No 16 to 39.*

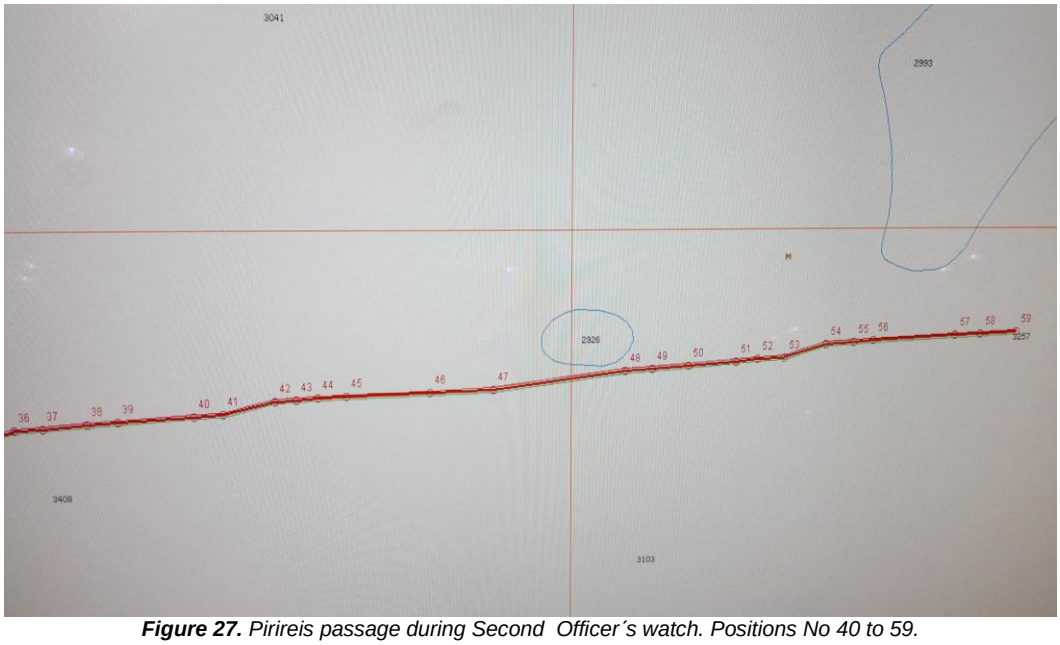

Figure 27. *Pirireis passage during Second Officer´s watch. Positions No 40 to 59.*

4.6.2 Consouth

Consouth´s navigating data was extracted from her S-VDR with a time sequence of approximately 15 minutes as shown in table 8 below and correlates a time period from 23:20:41*(position no 00)* on 28 April 2013 to 04:43:12 *(position no 23)* on 29 April 2013, that is the exact time the collision occurred. It is reminded that HCG AIS monitoring system received Consouth´s last position at 1855 UTC on 28 April 2013.

Table 8*. Consouth positioning data extracted from her S-VDR.*

No	Date / UTC		Ship´s time UTC +2	Heading	Latitude	Longitude	Speed	OOW
23	29-04-2013	02:43:12	04:43:12	275.5	36°10.7	20º 09'.14	12.5	Ch. Off.
22	29-04-2013	02:42:03	04:42:03	263.1	36°10.74	20º 09'.43	12.6	Ch. Off.
21	29-04-2013	02:40:00	04:40:00	263	36º 10'.79	20º 09'.96	12.5	Ch. Off
20	29-04-2013	02:30:00	04:30:00	263,1	36º 11'.04	20º 12' .55	12.8	Ch. Off
19	29-04-2013	02:15:00	04:15:00	262,7	36º 11'.43	20º 16' .46	12.6	Ch. Off
18	29-04-2013	02:00:00	04:00:00	265,1	36º 11'.68	20º 20' .33	12.7	Ch. Off
17	29-04-2013	01:45:00	03:45:00	264,9	36º 11'.91	20º 24' .25	12.8	2nd Off.
16	29-04-2013	01:30:00	03:30:00	264,8	36º 12'.16	20º 28' .24	12.8	2nd Off.
15	29-04-2013	01:15:00	03:15:00	265,3	36º 12'.44	20º 32' .18	12.8	2nd Off.
14	29-04-2013	01:00:00	03:00:00	264,9	36º 12'.71	20º 36' .15	12.8	2nd Off.
13	29-04-2013	00:45:00	02:45:00	265,2	36º 13'.02	20º 40' .10	12.7	2nd Off.
12	29-04-2013	00:30:00	02:30:00	265,0	36º 13'.28	20º 44' .00	12.5	2nd Off.
11	29-04-2013	00:15:00	02:15:00	266,1	36º 13'.49	20º 47' .91	12.7	2nd Off.
10	29-04-2013	00:00:00	02:00:00	265,7	36º 13'.72	20º 51' .84	12.7	2nd Off.
09	28-04-2013	23:45:00	01:45:00	266,0	36º 13'.99	20º 55' .74	12.6	2nd Off.
08	28-04-2013	23:30:00	01:30:00	266,3	36º 14' .25	20º 59' .64	12.5	2nd Off.
07	28-04-2013	23:15:00	01:15:00	265,9	36º 14' .49	21º 03'. 51	12.6	2nd Off.
06	28-04-2013	23:00:00	01:00:00	265,8	36º 14' .73	21º 07'. 37	12.4	2nd Off.
05	28-04-2013	22:45:00	00:45:00	266,0	36º 14' .98	21º 11' .19	12.4	2nd Off.
04	28-04-2013	22:30:00	00:30:00	266,1	36º 15' .25	21º 15' .02	12.3	2nd Off.
03	28-04-2013	22:15:00	00:15:00	265,8	36º 15' .52	21º 18' .78	12.3	2nd Off.
02	28-04-2013	22:00:00	00:00:00	265.2	36º 15' .81	21º 22' .55	12.3	2nd Off.
01	28-04-2013	21:45:52	23:45:52	266.2	36º 16' .07	21º 26' .19	12.4	Master
00	28-04-2013	21:20:41	23:20:41	265	36º 16' .57	21º 32' .63	12.5	Master

Given the above Consouth´s positions her course as plotted until the time of the collision is shown in figure 28 while figures 29 and 30 represent the passage segments of the OsOW.

***Figure 28**. Consouth´s passage as extracted from her S-VDR.*

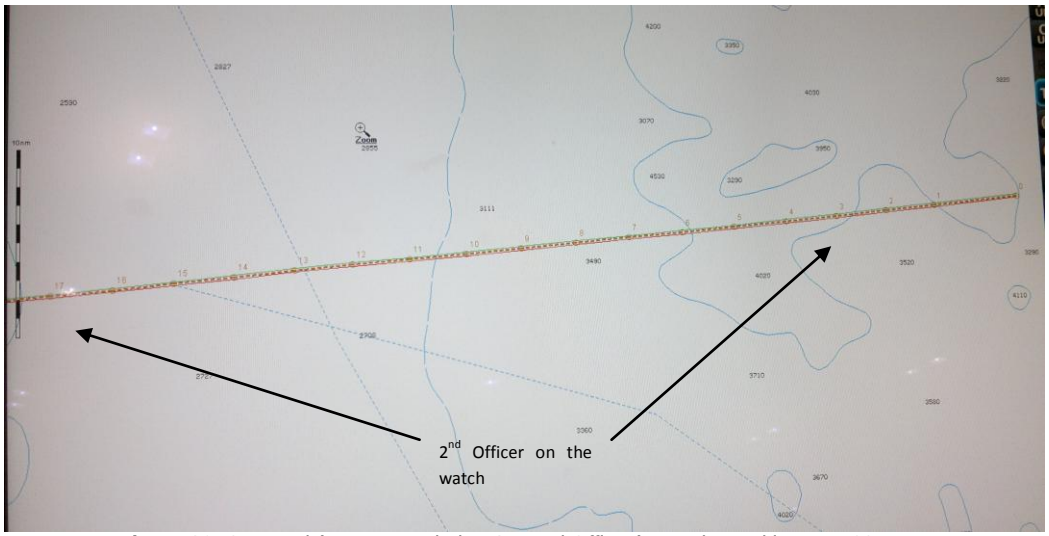

***Figure 29**. Consouth´s passage during Second Officer´s watch. Positions No 03 to 17.*

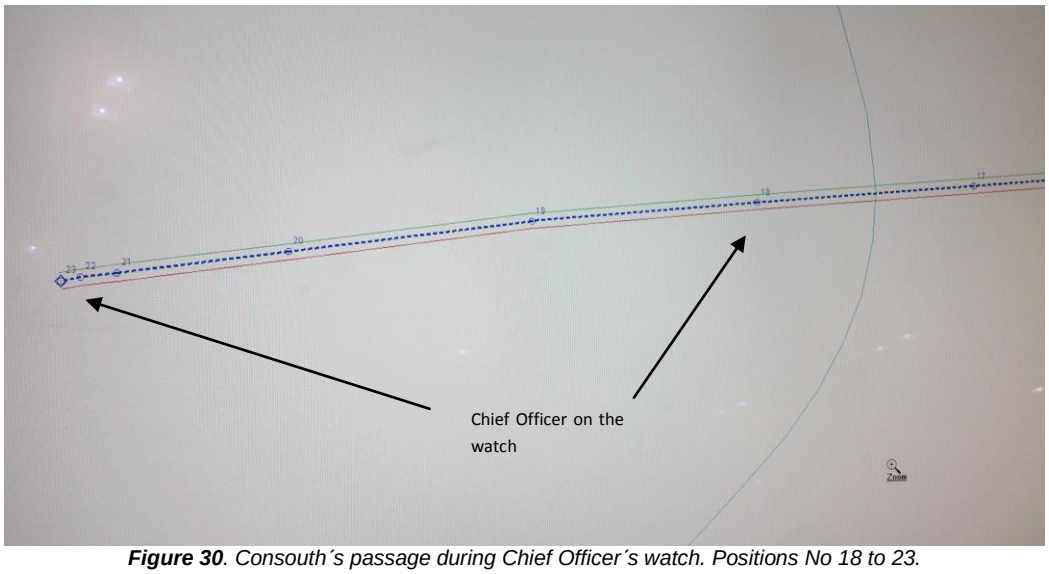

***Figure 30**. Consouth´s passage during Chief Officer´s watch. Positions No 18 to 23.*

4.6.3 Findings from vessels´ plotted courses

The plotting of Pirireis´ and Consouth´s positions on electronic chart has highlighted the following:

- → Pirireis has altered her course to port three times during the specified time window at a range of 3° to 4° maintaining the same speed.
- → Pirireis course was not steady although steering, as stated, was in autopilot.
- → Consouth was keeping a course very close to 265° while at 0414 her course was altered to 263° maintaining the same speed.
- → Consouth course was changed less than half a minute (approximately 20 seconds) before the collision.

Figure 31a. *Consouth and Pirireis almost reciprocal courses*

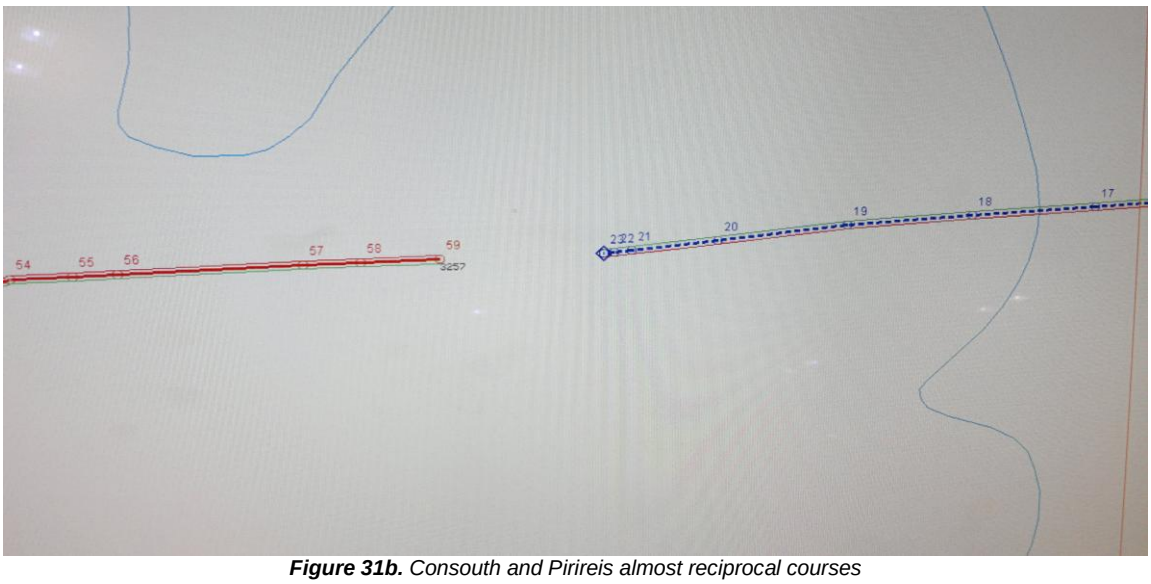

Figure 31b. *Consouth and Pirireis almost reciprocal courses*

On the grounds of the data appeared in tables 7 and 8 and having scrutinized in comparison both vessels´ plotted courses as shown in figures 31(a,b), 32 and 33 the following allegations could be considered:

- Consouth and Pirireis maintained extremely practically reciprocal and extremely close courses.
- Vessels´ actual CPA of abeam passage was significantly lower than the CPA alleged by Consouth´s and Pirireis´ OsOW. The exact CPA could not be determined due to lack of technical factual data.
- While Consouth was underway at position no 20, that is approximately 13 minutes before the collision, Pirireis´ anticipated green to green abeam passage with a CPA of 0.80 nm, as alleged by Consouth´s Chief Officer, is not apparent (figure 32).
- While Pirireis was sailing at position no 59, that is approximately 20 minutes prior to the collision, Consouth´s anticipated red to red abeam passage with a CPA of 1 nm, as alleged by Pirireis´ Second Officer, is not resulted (figure 33).

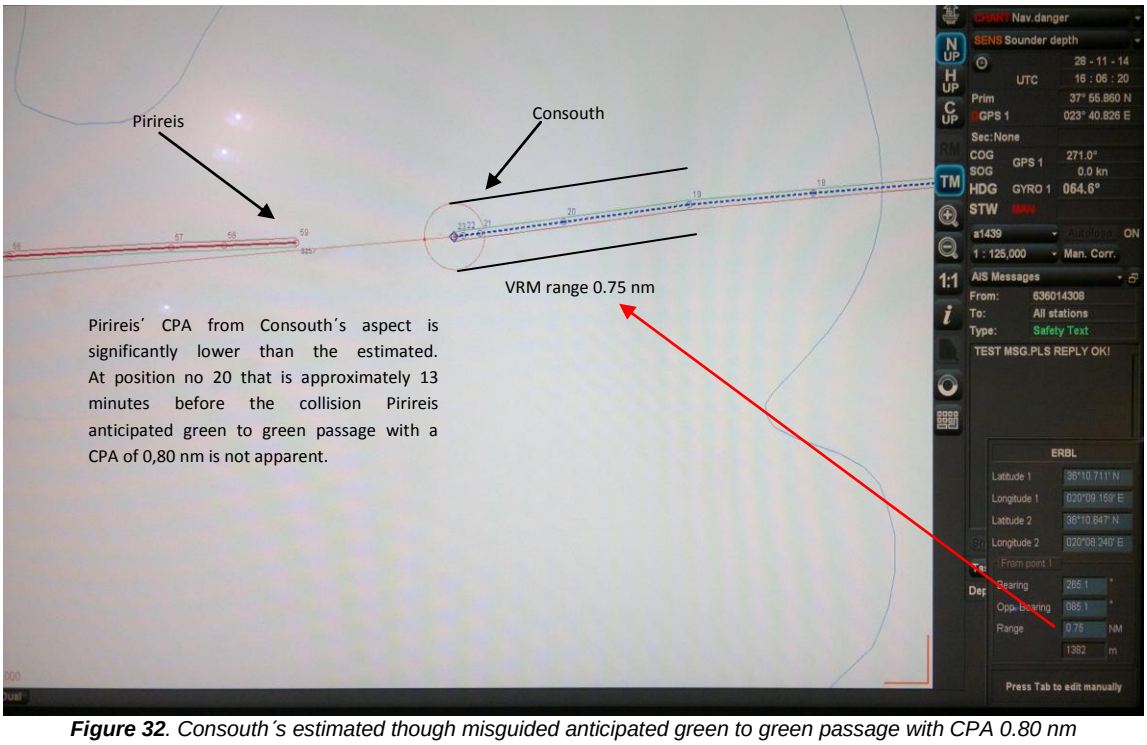

***Figure 32**. Consouth´s estimated though misguided anticipated green to green passage with CPA 0.80 nm*

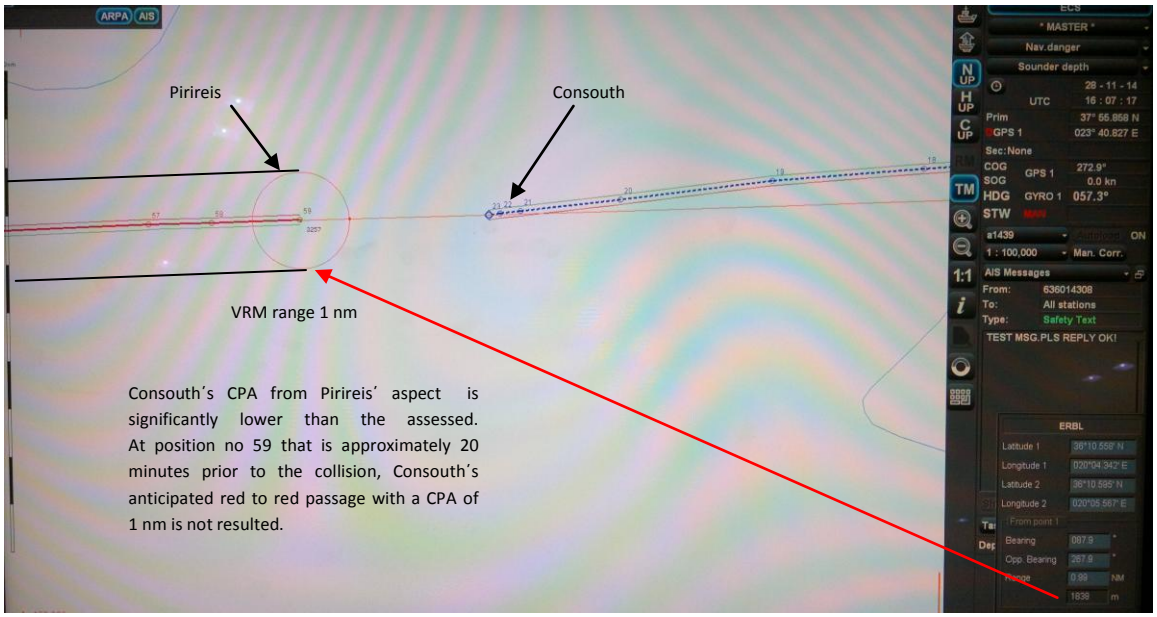

***Figure 33**. Pirireis´ assessed though misguided anticipated red to red passage with CPA 01nm*

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

5. Conclusions

5.1 Conclusions and safety issues leading to safety recommendations

5.1.1 Consouth

5.1.1.1 Consouth actual crew manning was in excess in relation to minimum safe manning only in capacities of Engine Department (par. 4.1.2 & 4.1.3).

5.1.1.2 Engine watches on board Consouth were not conducted according to Company´s SMS "Shipboard watch and working arrangement" (par. 4.1.3.1).

5.1.1.3 Deck watches on board Consouth were not conducted according to Company´s SMS "Shipboard watch and working arrangement" (par. 4.1.3.2 & 4.1.5 & 4.1.8.2).

5.1.1.4 BNWAS unit was deactivated during navigational watches (par. 4.1.7.4 & 4.1.8.1).

5.1.1.5 Master´s Standing Orders on board Consouth in relation to Navigational watches were not abided by OsOW (par. 4.1.9).

5.1.1.6 Master´s Standing Orders on board Consouth did not accommodate any explicit instructions and guidance for a systematic bridge watch management (par. 4.1.9.2).

5.1.1.7 Consouth´ s Night Orders Book did not comprehend any detailed instructions related to safety of navigation and watchkeeping (par. 4.1.10).

5.1.1.8 The Safety Management System of Consouth´s Company was not fully implemented in relation to Navigational Watchkeeping and safe navigation (par. 4.1.5, 4.1.7.4, 4.1.8.1 & 4.1.8.2).

5.1.1.9 The Safety Management System of Consouth did not include any procedures or measures to ensure that data from sensors (units) and AIS unit connected to S-VDR are properly and corrected recorded to it, following maintenance, repair or replacement of the sensors means (par. 3.1, 3.6.2, 4.6, 4.7.1.5).

5.1.2 Pirireis

5.1.1.10 Pirireis Second Officer had not been under efficient familiarization (par. 4.2.4.3 & 4.2.12).

5.1.1.11 The recruiting policy of Pirireis Company´s SMS did not accommodate in full procedures according to chapter 6 of ISM Code (par. 4.2.12).

5.1.1.12 The Company of Pirireis had not developed a fatigue management policy regarding length of servicing and leave ratios (par. 4.2.4.4 & 4.2.4.5).

5.1.1.13 Pirireis Master´s Standing Orders did not incorporate any explicit instructions and guidance for a systematic bridge watch management (par. 4.2.9).

5.1.1.14 The respective provisions of STCW A-IV/2 and SOLAS Chapter V/Reg.14.3 & 14.4 were not satisfied in full for the Second Officer (par. 4.2.11).

5.1.1.15 Pirireis´ Second Officer was not able to communicate by using the IMO Standard Marine Communication Phrases (par. 4.2.12).

5.1.1.16 Pirireis´ Second Officer despite his inexperienced was assigned to perform the navigational watch during night hours (2400-0600) (par. 4.2.12).

5.2 Conclusions and safety issues that did not lead to safety recommendations

5.1.2 Consouth´s Chief Officer and Pirireis´ navigational team were not keeping a proper watch in relation to navigational awareness and effective look out (par. 4.1.8.3 & 4.2.8.2).

5.1.3 Both vessels´ OsOW did not try to establish appropriate and prompt communication via VHF prior to the collision (par. 4.1.8.4 & 4.2.8.3).

5.1.4 Both vessels´ OsOW are considered that had been complacent or self assured when navigated at open sea (par. 4.1.11, 4.2.10.3).

5.1.5 Pirireis´ Second Officer stated that the Master was on the bridge during his navigational watch nevertheless it could not be unconditionally confirmed.

5.1.6 Pirireis´ Master had to monitor Second Officer´s bridge navigational performance (par. 4.2.4.3, 4.2.8.1 & 4.2.8.2).

5.1.7 Consouth´s Chief Officer and Pirireis´ bridge navigational team had apparently shown a disregard to respective COLREGS for collision prevention and avoidance (par. 4.1.8, 4.2.8, 4.3, 4.5 & 4.6).

5.1.8 Prevailing reported weather conditions could be suggested that had created a sense of security and complacency on Consouth´s and Pirireis´ navigational teams (par. 4.4).

6. Actions taken

The Hellenic Bureau for Marine Casualties Investigation having regard to par. 6.2 of Commission Regulation (EU) 1286/2011 circulated the draft report of the examined case to involved vessel´s owners/managers, however no information concerning actions taken following the marine casualty on their behalf were notified.

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 Consouth are recommended to:

29/2013 Revise the Master´s Standing Order stressing that “A safe Look Out” shall be maintained at all times in priority to other vessel´s operations.

30/2013 Take appropriate and necessary measures in order to ensure that bridge navigational team adhere Master´s Standing Orders at all times.

31/2013 Take effective actions, if appropriate, in order to strengthen deck personnel in capacities related to safety of navigation and navigational watch.

32/2013 Take effective actions in order to ensure that Masters follow the Company´s policy in regard to safety of navigation.

33/2013 Ensure that safeguards are in place for the implementation of “Shipboard and working arrangements”.

34/2013 Take appropriate actions to ensure that Masters are fully dedicated to Company´s policy and comply with legal requirements of STCW for keeping a safe look out at all times.

35/2013 Supplement fleet´s SMS so as to ensure that equipment interfacing to VDR/S-VDR systems are properly and correctly transferring data following maintenance, repair or replacement.

7.2 The Owners/Managers of Pirireis is recommended to:

36/2013 Review your vessel´s SMS in relation to Chapter 6 of ISM Code focusing on effective familiarization or training for newly recruited personnel on board your vessels.

37/2013 Take appropriate actions to ensure that STCW A-IV/2 and SOLAS Chapter V/Reg.14.3 & 4 requirements are fully satisfied by recruited watch keeping personnel.

38/2013 Take effective actions in order to ensure that an adequate hand over period is followed during crew engagement.

39/2013 Supplement fleet´s SMS, if needed, so as to ensure that equipment interfacing to VDR/S-VDR systems, are properly and correctly transferring data following maintenance, repair or replacement, if a lack of said provision exists.

7.3 The competent directorates of the Shipping Administration of Greece, Antigua & Barbuda and Maritime Cook Islands involved into the examined marine casualty are kindly invited to:

40/2013 Consider of proposing to the competent European and International Instruments interested, the necessity of supplementing existing provisions of MSC.163 (78) as amended by MSC.214 (81) by adding a similar provision to par. 5.1.3 of MSC.333 (90).
MSC.333 (90) par 5.1.3 : "The System should include functions to perform a performance test at any time, e.g. annually or following repair or maintenance work to the VDR or any source providing data to the VDR. This test may be conducted using the playback equipment and should ensure that all the required data items are being correctly recorded."

41/2013 Consider of bringing to the attention of competent European and International Instruments the need of supplementing existing provisions of VDR & S-VDR performance standards with additional requirements concerning alarm utilities when equipment configured and connected to VDR/S-VDR systems are not interfacing the system.

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