HELLENIC REPUBLIC

HELLENIC BUREAU FOR MARINE CASUALTIES INVESTIGATION
MARINE CASUALTY SAFETY INVESTIGATION REPORT
03/2020

Contents

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 them 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 prepared 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.

Its purpose is to comprehend and present the sequence of the events that occurred on 11th November 2020 and resulted in the examined very serious marine casualty and aims to prevent and deter repetition.

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 in Annex I of the relevant law and references to times refer to local time (UTC +3).

Under the above framework HBMCI, in cooperation with the respective office of Transport Safety Investigation Center (TSIC) of Turkiye, has examined the collision occurred between M/T EPHESOS sailing under the Greek Flag and F/V POLAT BEY 1 sailing under the Turkish Flag, on the 11th of November 2020, in the sea area approximately 15 n.m South of Karatas/Adana Port Turkiye, which resulted in the capsizing of the fishing vessel and the loss of her 5 crew members.

This report is based on information derived from the interview process with the involved crew members of M/T EPHESOS, and evidence that have been extracted from EPHESOS' VDR and ECDIS positioning data. Due to the capsized fishing vessel and the death of her crew, where additional data were required concerning POLAT BEY 1 course and speed, including navigational data of the other fishing vessels at the casualty area, relevant VTS records[1] and screenshots have been used, as recorded by Akdeniz Vessel Traffic Station that covered the sea area where the marine casualty occurred.

[1] Marine traffic information and navigational details where required were obtained from the safety Investigation report prepared by the TSIC of Turkiye,(see also par. 3.6 of the current report) and were used to reconstruct the sequence of the events leading to the marine casualty, under the provisions of Chapter 14 par.3 of IMO Casualty Investigation Code, and par.5.7.3 of Res A.1075(28) "Guidelines to assist investigators in the implementation of the Casualty Investigation Code ".

Glossary of abbreviations and acronyms		
1.	AB	Able seaman
2.	AIS	Automatic identification system
3.	ARPA	Automatic radar plotting aid
4.	BCR	Bow Crossing Range
5.	BNWAS	Bridge Navigational Watch Alarm System
6.	CEC	Certificate of equivalent competency
7.	CoC	Certificate of Competency
8.	COLREGS	International regulations for preventing collisions at sea, 1972, as amended
9.	Conning position	The places of a ship´s bridge with a view to the sea area when navigating, controlling, or maneuvering
10.	CPA (TCPA)	Closest point of approach-Time of Closest point of approach
11.	°	degrees (of angle)
12.	‘	minutes (of angle)
13.	DOC	Document of compliance
14.	EBL	Electronic Bearing Line
15.	ECDIS	Electronic Chart Display Information System
16.	f/v	fishing vessel
17.	GMDSS	Global maritime distress and safety system
18.	GOC	General Operators´ Certificate for GMDSS
19.	GPS	Global positioning system
20.	gt	gross tonnage
21.	IMO	International Maritime Organization
22.	ISM	International Management Code for the safe operation of ships and for pollution prevention
23.	Knot	Knot is a unit of speed equal to one nautical mile per hour, exactly 1.852 km/h
24.	KW	Kilowatt-unit of mechanical power
25.	LT	local time
26.	m	meters
27.	M/T	Motor Tanker
28.	mt	metric tones
29.	nm	nautical mile (1nm is 1852 meters)
30.	O(s)OW	Officer(s) on the watch
31.	OS	Ordinary seaman (deck crew)
32.	SMC	Safety management certificate
33.	SMS	Safety management system
34.	SOLAS	Convention for the Safety of Life at Sea 1974, as amended
35.	STCW	International Convention on Standards of Training, Certification and Watchkeeping for seafarers
36.	VDR	Voyage Data Recorder
37.	TCPA	Time of Closest Point of Approach
38.	TSS	Traffic Separation Scheme
39.	UTC	Universal Coordinated Time
40.	VDR	Voyage data recorder

41.	VHF	Very high frequency (radio)
42.	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.
43.	VTS	Vessel Traffic Service

1. Executive Summary

On 11th of November 2020 at approximately 01:18, M/T EPHESOS departed from Botas Ceyhan Terminal No.2, located in the north side of the Gulf of Iskenderun at the Eastern Mediterranean coast of Turkiye, under pilotage. She was loaded with 139,196.4 mt of crude oil and her next port of call was Dung Quat/Vietnam. At approximately 01:30 the pilot disembarked and EPHESOS proceeded to her voyage at open sea. At approximately 04:00 when EPHESOS exited Ceyhan TSS, traffic was clear, so the Master handed over the bridge con to the OOW and went to his cabin to rest. The lookout watch was also posted. At that time the steering was in autopilot with a course of 225° and speed 13 knots. ECDIS was the primary mean of navigation and two radars were operating at 6nm range. According to evidence extracted from EPHESOS VDR and ECDIS playback at approximately 05:15 the 2nd Officer observed six targets on EPHESOS ARPA, acknowledged as fishing vessels, at a distance of approximately 5 to 6 nm, while EPHESOS was sailing with heading 237.1°. At approximately 05:20 the OOW decided to alter gradually EPHESOS course to starboard to have a clear pass.

At 05:33:28 and 05:34:37, 2nd Officer called several times one of the fishing vessels under the name MAHMUTCAN 1 via VHF, due to the fact that she was not keeping a steady course, and was navigating towards EPHESOS heading, however he did not receive any reply. At that time EPHESOS was navigating in autopilot with a course of 247.9° and speed of 13.4 knots, while MAHMUTCAN 1 was sailing at a distance of less than 2 nm off EPHESOS port bow. Since MAHMUTCAN 1, was the “give away vessel”, she took effective actions and cleared away from EPHESOS course by altering her course to starboard. However at 05:35:31, nearby F/V POLAT BEY 1, was recorded with a heading of 035.3° towards EPHESOS course, at a distance of 3.23 nm off her port bow.

At 05:35:50, the OOW called POLAT BEY 1 two times, on VHF, without any response. Within the next minute POLAT BEY 1 was recorded to have altered her course to starboard by 10°. Her speed was recorded between 6.2 and 6.7 knots. At 05:37:56, EPHESOS had altered her course further to starboard. Her heading was at 249.8° (COG 250.6°), that is 13° in total to starboard from the initial course of 237°. At 05:38, OOW called again POLAT BEY 1 twice on VHF with no response. At 05:40:06 he signaled with the ALDIS lamp in order to attract POLAT’s BEY 1 attention. By that time POLAT BEY 1 was navigating 1.862 nm off EPHESOS port bow with course of 031.8° at 6.0 knots. At 05:41:01, the OOW called again POLAT BEY 1, on VHF which was recorded to sail with course 028.1° and speed of 6.1 knots at 1.553nm off EPHESOS port bow, however there was no reply. At 05:42:42 the OOW taking into account that POLAT BEY 1 was not responding to VHF calls, the signals made through ALDIS lamp and her course was not steady due to ample alterations, as at that time POLAT BEY 1 heading was recorded at 016.2°, instructed the lookout watch to switch to manual steering and ordered port 5^0. At 05:43:16, he signaled again to POLAT BEY 1 with the ALDIS. At 05:43:45, the OOW

ordered port 10^0 and at 05:44:06 called POLAT BEY 1 again with no response. At 05:44:16 the OOW ordered port 15^0, followed by an order of port 20^0 at 05:44:32. Due to the fact that EPHESOS was turning to port by setting the rudder 20° to port and POLAT BEY 1 had crossed her heading and had passed to her starboard side with heading NNE, it was deduced that the "crossing situation" had been cleared and the imminent danger of collision had been avoided.

At 05:44:56 despite the fact that POLAT BEY 1had passed clear off EPHESOS stem post and heading, navigating at approximately 16.2° (NNE), suddenly altered her course to starboard and started heading to 82.4°. By that time approximately 05:44:56, as recorded in the VDR, the OOW called POLAT BEY 1 on VHF: "POLAT BEY, POLAT BEY not change course all the time", however no response was received. At 05:45:05, the OOW took the ALDIS and signaled again towards POLAT BEY 1. The distance from EPHESOS stem post was 0.297 nm (555m). At 05:45:33, the OOW called POLAT BEY 1 on VHF and shouted: "POLAT BEY, change course". No reply was recorded by the bridge VDR microphones. POLAT BEY 1 had altered his course further to starboard, steering to 116.6° with the speed of 5.9 knots. She was 0.193 nm off EPHESOS bow that was under continuous maneuver to port. At 05:45:42, the OOW ordered port 30° and the helmsman confirmed the steering order. At 05:46:16, POLAT BEY 1 and EPHESOS collided in position Lat: 036° 19.5 N - Long: 035° 12.4 E, approximately 15 nm South of Karatas/Adana Port Turkiye. The F/V capsized after the collision and all crew members were later recovered dead.

Investigation of the accident showed that no proper avoiding actions were performed to prevent collision and no safe speed was kept according to COLREGs by the fishing vessel. Furthermore EPHESOS Master standing orders were not followed by the OOW before the collision and Bridge Resource Management (BRM) procedures were not implemented effectively by the bridge team of M/T EPHESOS.

Due to the corrective actions implemented by the company of M/T EPHESOS, after the collision, no safety recommendations were issued to the managers/operator of the vessel. Moreover since the Investigation Authority of Turkiye had issued its own investigation report including safety recommendations addressed, among others, to the responsible Authorities of the coastal state, no further safety recommendations were issued concerning the operation of the VTS.

2 FACTUAL INFORMATION

2.1 Involved ships particulars

2.1.1 Particulars of the F/V POLAT BEY 1

Name of Vessel	POLAT BEY 1
Official No.	33A2063
Company	Polat Balikcilik
Flag state	Turkiye
Type of Vessel	Trawler
Year built	2016
Construction	Steel
Place of Build	Karatas/Adana
Loa (Length over all)	21.5 m
Breadth	7.2 m
Gross Tonnage	95
Main Engine / Power	Caterpillar / 480 BHP (Brake Horse Power)

Figure 1. F/V POLAT BEY 1 under salvage operation

Figure 2.F/V POLAT BEY 1 capsized at the casualty area

2.1.2 Particulars of M/T EPHESOS

Name of Vessel	EPHESOS
Call Sign	SVBL3
Manager/Operator	Andriaki Shipping Co Ltd
Ownership	ELIA NAVIGATION
Flag State	Greece
Port of Registry	ANDROS
IMO Number	9607423
Type of Vessel	Crude Oil Carrier
Classification Society	DNV GL
Year of Delivery & Place Build	2012 Hyundai Samho Shipyard, Mokpo, South Korea
LOA (Length over all)	274.18 m
BOA (Breadth over all)	50 m

Deadweight (Summer)	164,732 mt
Summer Draft	17.171 m
Gross Tonnage	84.850
Net Tonnage	54.304
Main Engine	Hyundai – B&W 6S70 ME-C8
Engine Power /Service Speed	1860 KW / 15.4 knots
Document of Compliance	(Date of issue) 06 February 2020 by Flag
Safety Management Certificate	(Date of issue) 06 February 2020 by DNV GL

Figure 3.M/T EPHESOS at the casualty area

2.2 Voyage Particulars

Vessel´s name	**Polat Bey 1**	**EPHESOS**
Port of departure	Mersin /Turkiye	Botas Terminal/Ceyhan, Turkiye
Time / date of departure	13:18 / 9th of November 2020	01:18 / 11th of November 2020
Port of arrival	Unknown	Dung Quat/Vietnam
Type of voyage	Near coastal	International
Cargo information	Unknown	139,196.4 mt of crude oil
Manning	5	27
Minimum safe manning	2	12

2.3 Marine casualty information

Vessel´s name	**POLAT BEY1**	**EPHESOS**
Type of casualty	Very serious	
Date and time	11 November 2020 at 05:46:16	
Position – location	Lat: 036° 19.5 N - Long: 035° 12.4 E 15 nm South of Karatas /Adana, Turkiye	
External environment	Overcast Sky-Visibility Good, NE Wind 3-4 bf , moderate breeze, night time	
Ship operation	en route not engage in fishing	en route loaded with cargo
Voyage segment	open sea	open sea
Consequences to individuals, property.	• Vessel capsized. • Port side from bridge superstructure up to mid	• MT EPHESOS sustained several scratches in the stem and on the Port Bow side below the hawse

	ship of the main deck deformed and cracks observed. • The net davit on the port side was broken & the crane net on the port side was detached.	pipe of the port anchor but no structural damage.
Consequences to the environment	No pollution was reported at the casualty area.	

2.4 Emergency response actions

Following the close quarter situation and the possible collision as perceived by the OOW, EPHESOS turned and proceeded towards the casualty scene. At 05:47:05, the OOW called the Master on the bridge and called also on VHF, POLAT BEY 1 and nearby fishing vessel MAHMUTCAN 1. No reply was received. The Master came immediately on the bridge and after a short discussion with the OOW, about the collision situation with POLAT BEY 1 and the actions performed to avoid the nearby F/V MAHMUTCAN 1, called POLAT BEY 1 on VHF. At 05:50:45 a public announcement was made concerning the Engine room to be manned and additional lookouts to be posted on the bridge and deck to search for POLAT BEY 1.

At 05:57:15 EPHESOS reported to VTS AKDENIZ sector a possible close quarter situation with the fishing vessel POLAT BEY 1, approximately 15 n.m south of the port of Karatas, and stated that they had hesitations for a collision, since they could not contact the fishing vessel. They also informed that EPHESOS will turn back to the collision position and requested information from VTS, whether a close quarter situation was reported to Akdeniz sector by nearby fishing vessels. The reply was negative.

At 06:48:02 the Second Officer reported to Master that he spotted a capsized target on the port bow. At 06:51:32, Master ordered the Chief Officer to prepare the port rescue boat and at 06:51:54 informed VTS about the position of the capsized target.

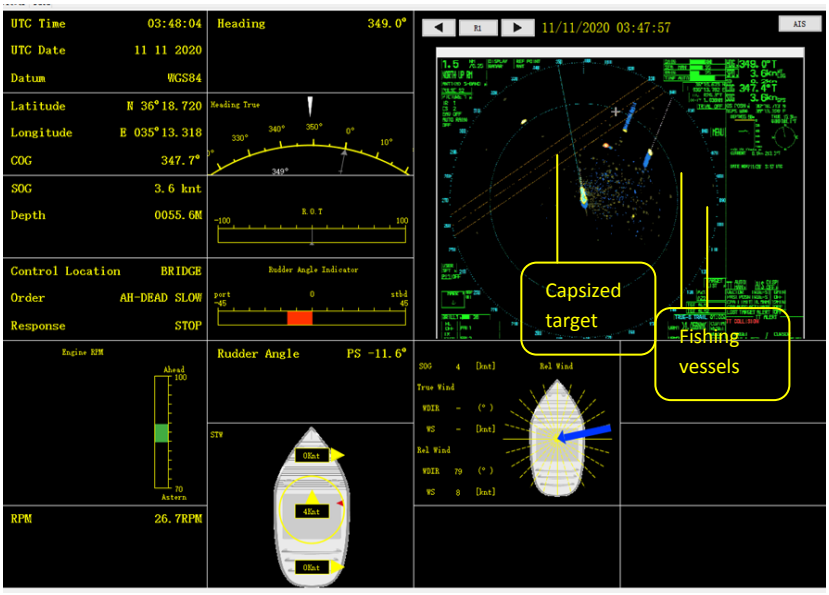


Figure 4: VDR coning recording at approximately 06:48 when the Second Officer spotted a capsized target. Targets on starboard side are assessed to be F/V MAHMUTCAN 1 and/or KUMRULAR 3.

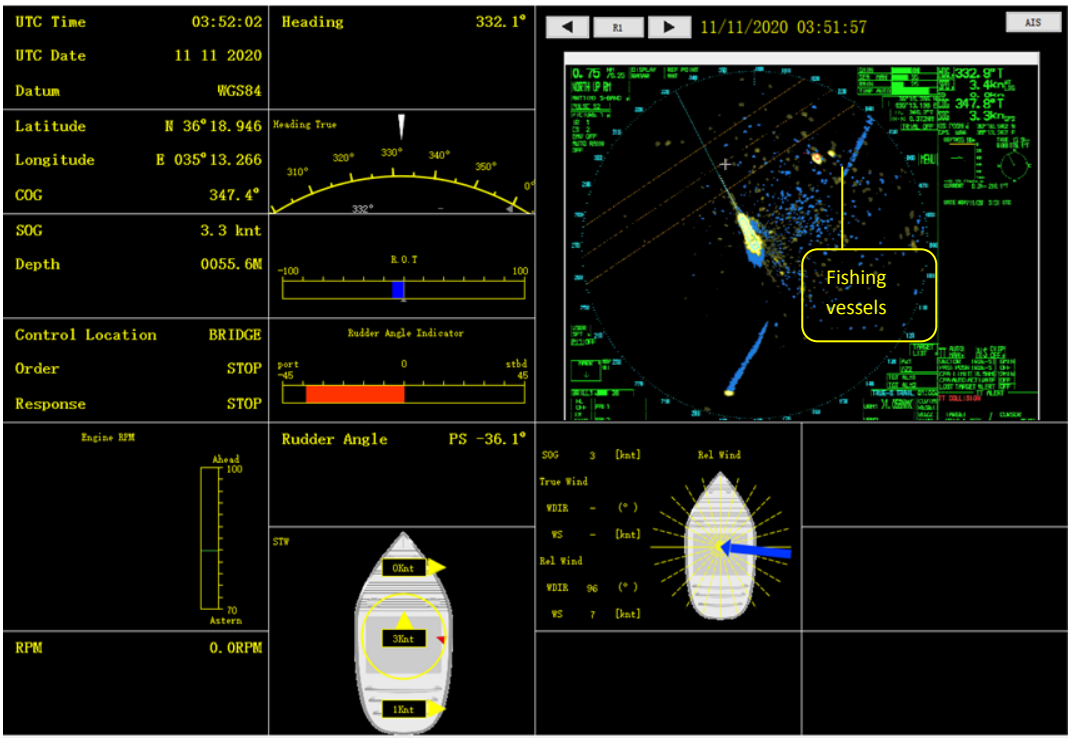


Figure 5: VDR coning recording at approximately 06:52 when EPHESOS reported to AKDENIZ VTS the capsized target. Targets on starboard side are assessed to be F/V MAHMUTCAN1 and/or KUMRULAR 3.

Meanwhile from 06:01until 06:54, several VHF calls were made to nearby fishing vessels (e.g. MAHMUTCAN 1, KUMRULAR 3 and KERIM KAPTAN1) by AKDENIZ VTS and M/T EPHESOS with no reply being received.

At 06:54 AKDENIZ VTS called EPHESOS and informed that had finally contacted nearby fishing vessels, KUMRULAR 3 and MAHMUTCAN 1, which they reported that no problem or dangerous situation was noticed or realized. EPHESOS confirmed that she had a close quarter situation and reported that she was heading to a target that seemed to be a wreck. She also informed that MAHMUTCAN 1 was close.

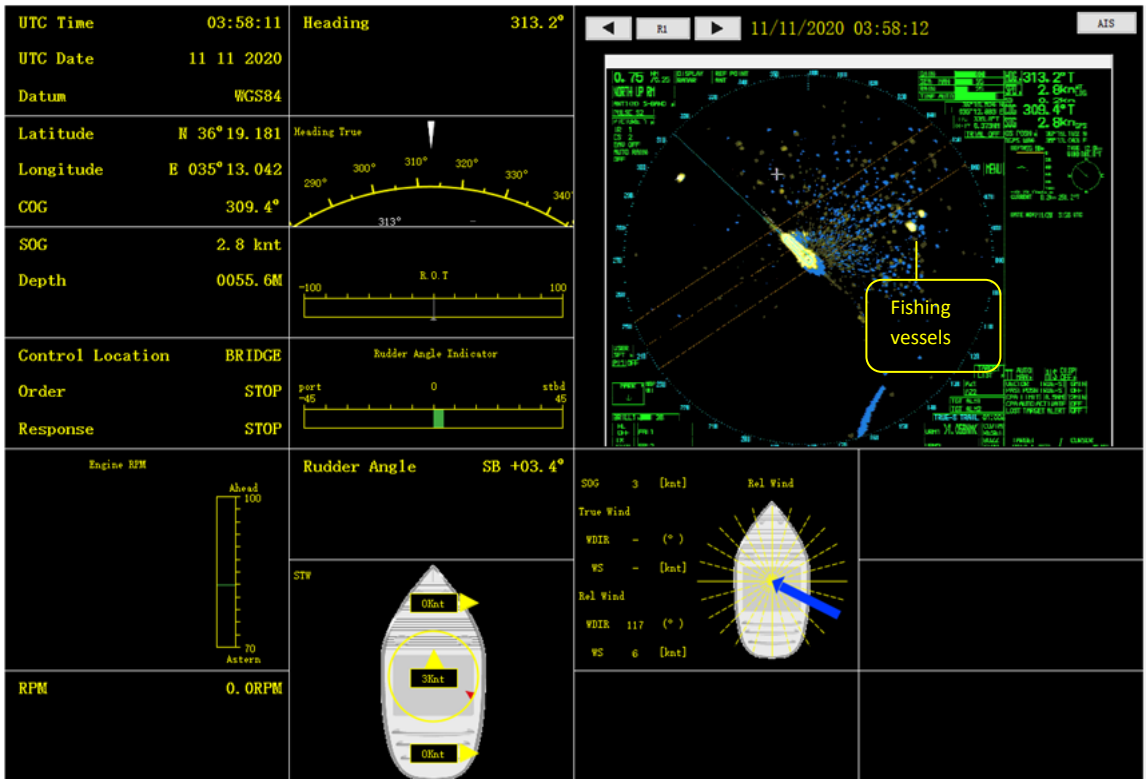


Figure 6: *VDR Coning recording at approximately 06:58, 4 minutes after it was reported to AKDENIZ VTS from MAHMUTCAN 1 and KUMRULAR 3, that there was no problem at the sea area. Targets on starboard side are assessed to be F/V MAHMUTCAN 1 and/or KUMRULAR 3.*

At 06:59:40 EPHESOS called again VTS and reported a capsize boat at the casualty area in position LAT: 36^0 19.5N-LONG: 035^0 12.4E. AKDENIZ VTS confirmed the position and situation and instructed EPHESOS to stay close. At 07:01:40 VTS called EPHESOS and the vessel confirmed the capsized boat. At 07:03:10 EPHESOS broadcasted a PAN PAN message on VHF.

At 07:03:30 AKDENIZ VTS called EPHESOS and informed that contacted again nearby fishing vessels and the capsized boat was confirmed. VTS requested EPHESOS help and assistance.

At 07:11 the Master ordered the chief Officer to lower the rescue boat. One minute later MACHMUCHAN 1 called VTS. At 07:17:56 AKDENIZ VTS called EPHESOS and requested information for persons in the water. EPHESOS replied that no persons were seen or spotted and reported that the rescue boat is going to the scene.

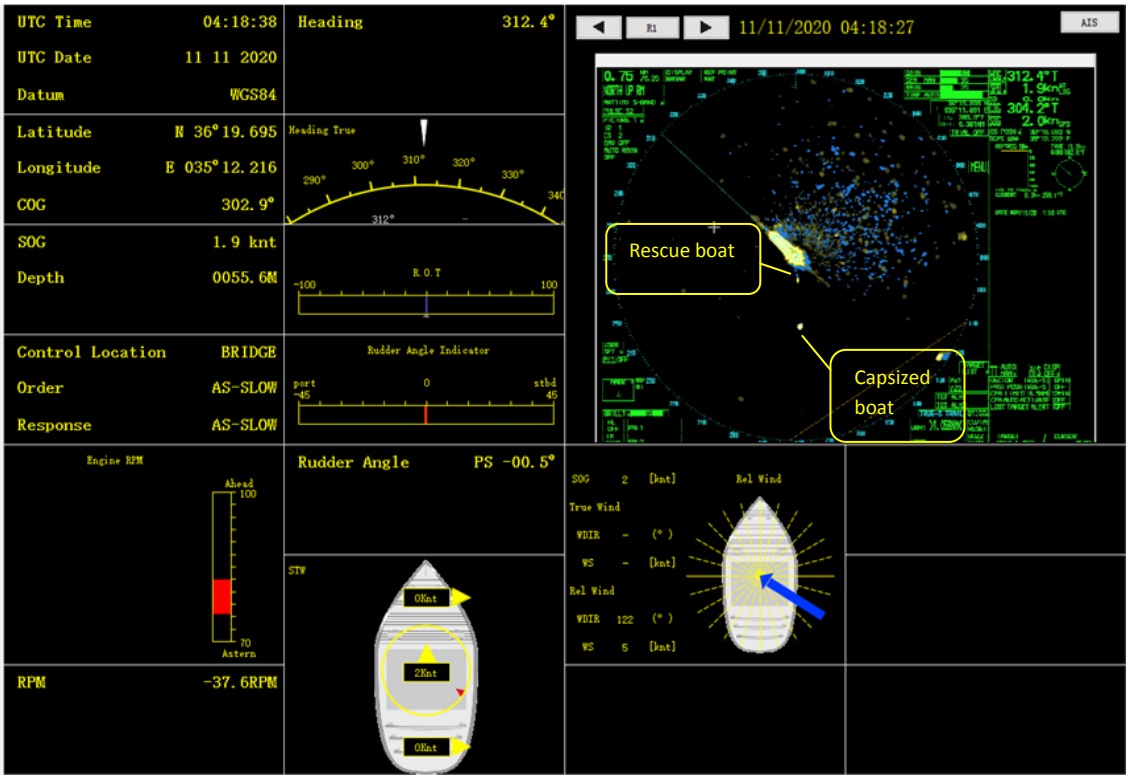


Figure 7 . VDR Coning recording at approximately 07:18 when EPHESOS reported to AKDENIZ VTS that the rescue boat is heading to the capsized boat. ARPA range to 0.75 nm. Target on starboard quarter is the capsized boat. Rescue boat is close to EPHESOS stern.

At 07:19:44 MAHMUTCAN 1 called AKDENIZ VTS. At 07:21:05 rescue boat reported to EPHESOS that another boat is approaching the area. At 07:24:50 the rescue boat arrived on scene and reported to EPHESOS that no survivors could be spotted. At 07:25:10 rescue boat reported to EPHESOS that some persons from the small boat that had approached were on the bottom of the capsized POLAT BEY 1 and searched for survivors (see Figure 2). At 07:25:26 EPHESOS called AKDENIZ VTS and reported that the rescue boat and the other boat on scene have not spotted any survivors. VTS replied affirmatively.

At 08:06 Turkish Coast Guard Vessels arrived on site and at 08:25 they ordered EPHESOS to collect the rescue boat. The rescue boat was retrieved on deck and secured at 08:43. At 08:48 EPHESOS reported the collision to Piraeus Operations Center of the Hellenic Coast Guard in Greece.

3. Narrative

Note1: The following sequence of events and facts are based on crew interviews of M/T EPHESOS and electronic data derived mostly from EPHESOS VDR and ECDIS as due to described circumstances no source of electronic information and evidence could be obtained from POLAT BEY 1 or nearby fishing vessels. Requested data concerning POLAT BEY 1 course and speed, including navigational data of the other fishing vessels at the casualty area, records and screenshots have been used, as recorded by Vessel Traffic Station that covered the sea area where the marine casualty occurred.

Note 2: EPHESOS VDR was interfacing only the S-Band ARPA; X Band radar was not interfacing VDR. The S-Band radar was operating, in north-up mode and VRM was set at

1.168nm. The OOW was utilizing the X-Band Radar during his watch and targets were acquired on X-Band. POLAT BEY 1 course and speed information were obtained by ECDIS stored data from approximately 05:30 until the collision time at 05:46:16.

3.1 M/T EPHESOS

EPHESOS under Greek Flag is a crude oil carrier engaged in international trade. At 01:18 on 11 November 2020 the unmooring operation was complete and EPHESOS sailed from Botas/Ceyhan terminal port, loaded with 139,196.4 mt of crude oil and 21 crew members, en route to Gibraltar. The Master had the con while visibility was reported good, with a moderate breeze and wind blowing from NE direction, with force 3 to 4 bf.

At 01:30 the tug boats casted off and at 01:36 the pilot disembarked while the vessel informed VTS Iskenderun, via VHF channel 12, in order to commence her voyage.
The Master stayed at the bridge until 04:00 when about the vessel cleared Ceyhan Traffic Separation Scheme and enter VTS Karatas. It was reported that there was no significant traffic, so the Master handed over the con to the 04:00-08:00 watch, consisted of the 2nd Officer and an OS as a lookout, and went to his cabin to rest. At 04:47 EPHESOS exited VTS Karatas and at 05:01 she exited from Iskenderun sector and reported her position on VHF channel 12.

During the watch both radars were switched on (X-band & S-band) and set at 6 nm range. The vessel sailed on autopilot with a planned course of 236^0 and a speed of 13 knots, keeping a south west course as shown in Figure 8 below, recorded by SEG Ecosystem[2].

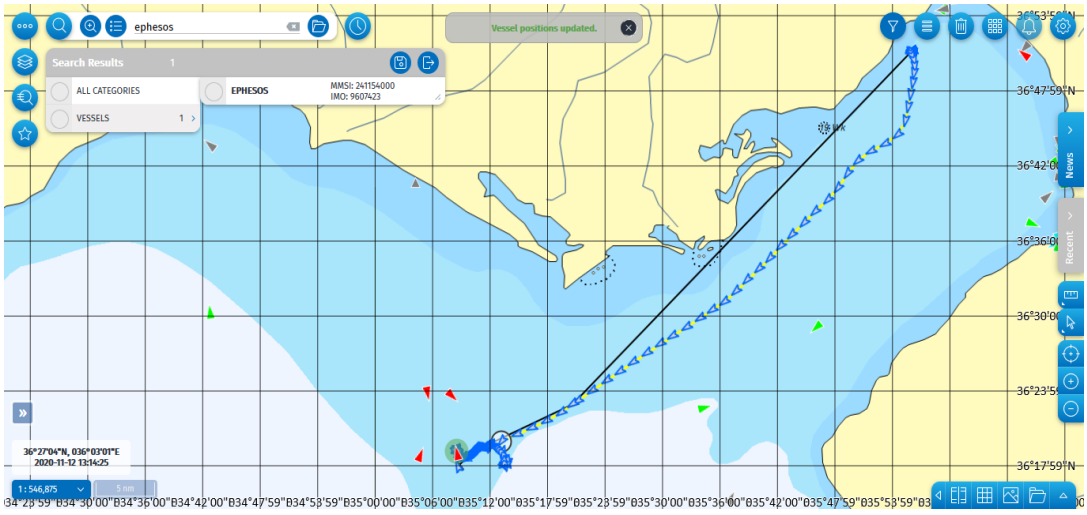


Figure 8. *EPHESOS Passage as recorded by SEG Ecosystem of European Maritime Safety Agency (EMSA).*

[2] SafeSeaNet Ecosystem GUI (SEG) is a new interface for the European Union Maritime Information and Exchange System, which may be defined as the technical framework encompassing the following maritime applications: SafeSeaNet, Integrated Maritime Data Environment (IMDatE), Earth Observation Data Centre (EODC) and LRIT Cooperative Data Centre (LRIT CDC). To improve situational awareness in the maritime domain and to provide tailor made solutions to authorities, such as vessels positions the VTMIS Directive (2002/59/EC) was amended by Commission Directive 2014/100/EU. This allowed information gathered and exchanged through SSN to be integrated with data from the EU's other monitoring and tracking systems, such as CleanSeaNet, EU LRIT CDC, THETIS, and from external systems such as satellite AIS.

3.2 F/V POLAT BEY 1

Seeking for electronic evidence in the course of the investigation process, HBMCI searched also for POLAT BEY 1 positioning data, from SEG and open source platforms like Marine Traffic. However it was found that AIS positions were recorded in Marine Traffic from the time the fishing vessel sailed from Mersin port at 13:18 on the 09 November 2020 until 16:45 on the same day (see **Figures 9&10**). Also from the track report that was send from TSIC, the last position recorded was before the day of the accident on 10th of November 2020 at 18:48:51. Therefore it was considered that POLAT BEY 1 could be at sea for almost 40 1/2 hours before the marine casualty occurred.

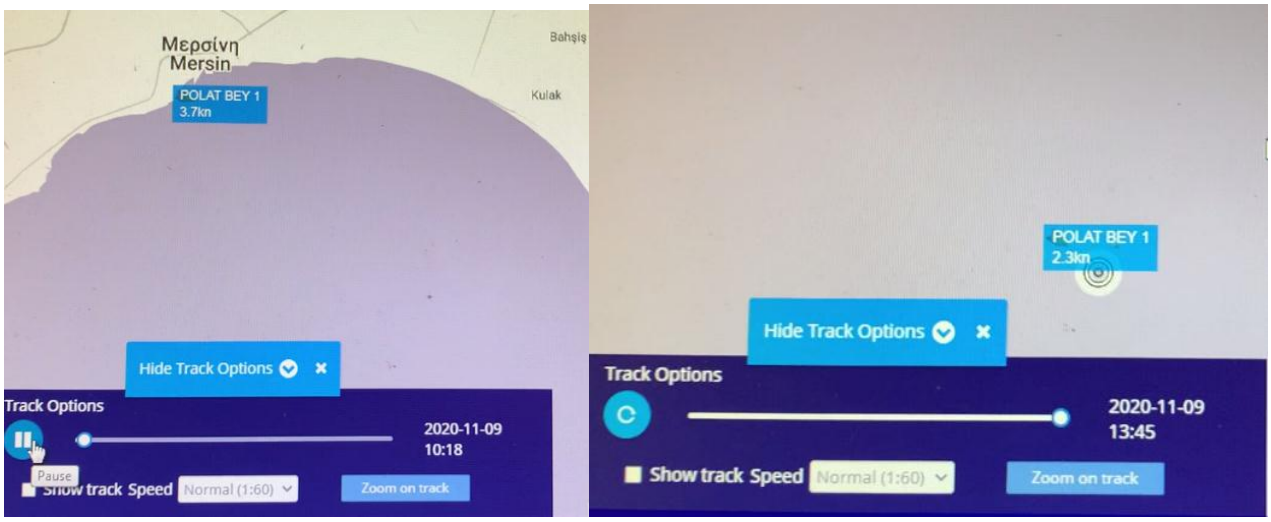


Figure 9 & 10. *Departure and last position of POLAT BEY 1 as was recorded in Marine Traffic two days before the collision. The time shown in above figures is UTC.*

Due to the above, and as mentioned earlier, navigational data concerning speed and course of POLAT BEY 1 at the day of the accident, were requested, obtained and examined from other sources like EPHESOS ECDIS, VDR and relevant data provided by VTS.

3.3 2nd Officer's actions on Watch

Having taken the command of the watch at 04:00 from the Master, the 2nd Officer proceeded to standard duties with Bridge Log recordings and observations on navigated sea area. It was reported that there was no particular traffic and the watch commenced normally until at approximately 05:25 when he had seen five to six targets on the ARPA at a distance of about 6 to 7 nm and decided to alter EPHESOS course in order to have a clear pass.

However, based on EPHESOS VDR data, it was evident that at 05:15 six targets were displayed on EPHESOS ARPA (as shown in **Figures 11 & 12**). At that time she was navigating with heading 237,2° (COG 236,9°) at 13.6 knots as per her voyage plan.

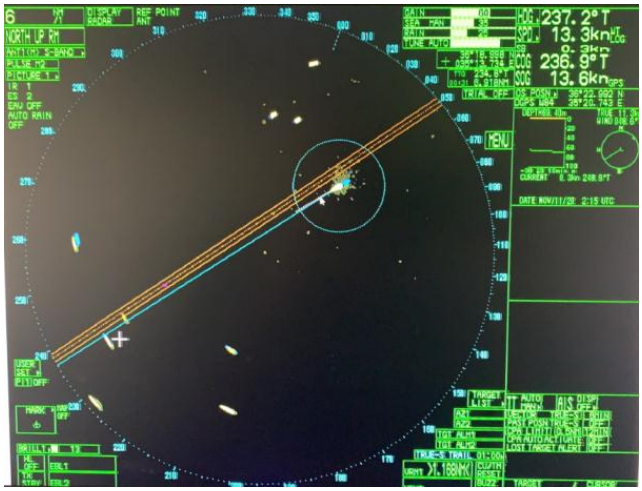


Figure 11: Course and speed at 05:15. Six targets are displayed on ARPA.

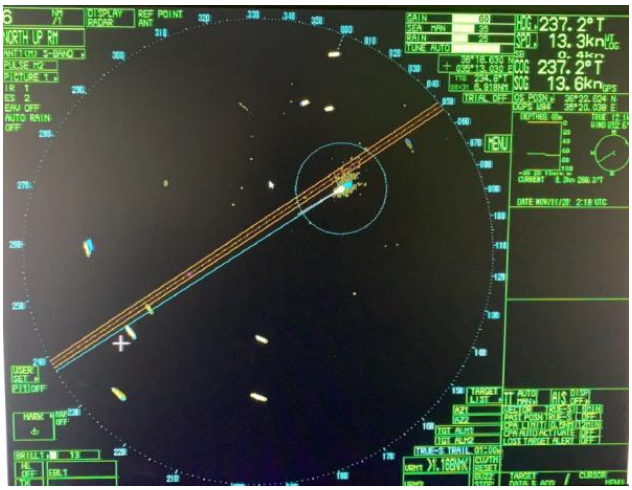


Figure 12: Course and speed at 05:18**.**

At 05:19, the marine traffic as recorded in EPHESOS VDR, is described in Figure 13. Targets course and speed are shown by simulated vectors based on VTS data at 05:25:30 (see **Figure 14**).

a) one target (**no. 1**) was about 20° on EPHESOS starboard bow at approximately 5 n.m. As per VTS recording, the target´s vector indicates that it was navigating with parallel course and speed close to 10 knots. The target is considered to be a power driven vessel either fishing vessel or cargo.

b) one target (**no. 2**) was about 5° on EPHESOS port bow, at approximately 6 n.m. As per VTS recording and based on the target´s vector indication, it was navigating at 6.0 to 6.5 and heading to around 060°, meaning that it was keeping reciprocal course in relation to EPHESOS. The target was identified as the F/V POLAT BEY 1, of trawler type. Her speed denotes that POLAT BEY was not engaged in fishing and was navigating as a power driven vessel.

c) one target (**no. 3**) was about 1-2° on EPHESOS port bow at approximately 5 nm. As per VTS recording and based on the target´s vector indication, it was probably drifting or sailing at low speed and heading to about 110°. The target was identified as F/V (trawler) MAHMUTCAN 1. Taking into account the trawler´s navigational status it is highly possible that she had finished the fishing operation and had retrieved her nets.

d) one target (**no. 4**) was about 10° on EPHESOS port side at approximately 6 nm. As per VTS recording, and based on the target´s vector indication, it was probably drifting or sailing at low speed; and heading to about 250°.

e) Two targets (**no. 5 & no. 6**) were both 40 - 50° on EPHESOS port bow at 3 nm and 4 nm respectively. Based on the targets´ vector indications their speed is estimated to approximately 3 knots. Due to their speed and steady course it is presumed that they were Trawlers engaged in fishing operations.

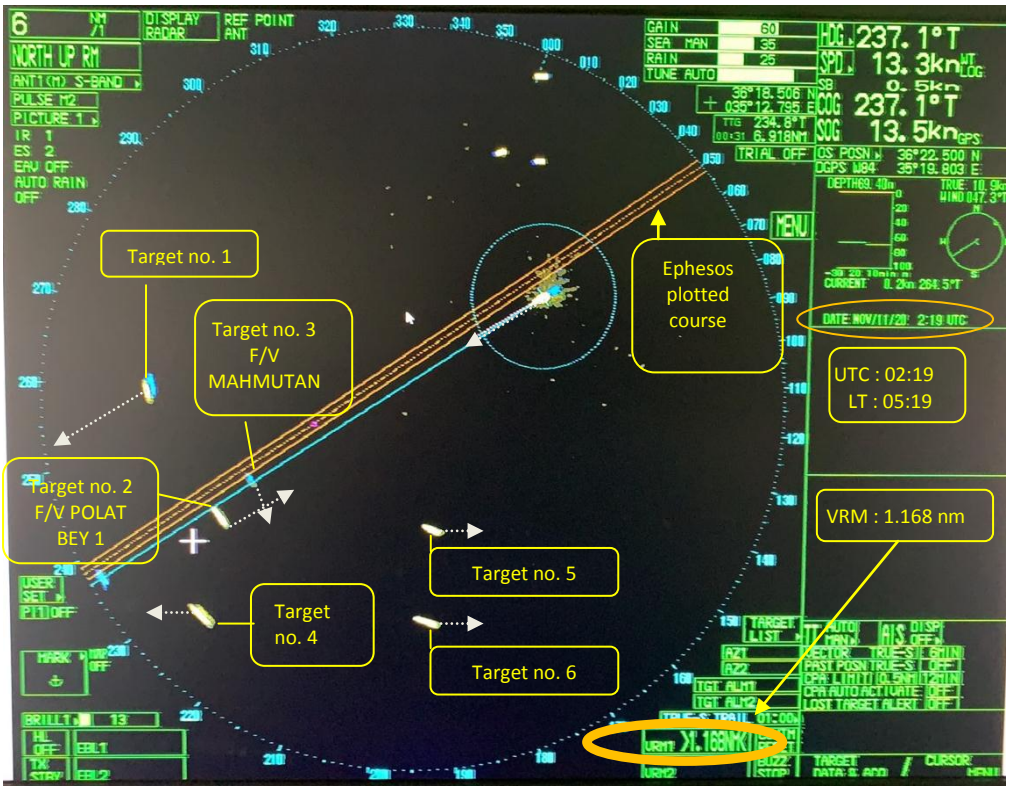


Figure 13: At 05:19 the marine traffic displayed on EPHESOS ARPA. Six targets are detected and displayed. VRM is set to 1.168. Targets' vectors are simulated.

Figure 14: VTS sector marine traffic depiction

At approximately 05:20**,** as resulted from the data extracted from EPHESOS VDR (**Figure 15**), the OOW having evaluated the unfolding marine traffic on his port bow and more specifically the six targets displayed on ARPA decided to alter EPHESOS course to starboard in order to have a clear pass. He started altering her course gradually to starboard by adjusting the autopilot´s course setting control.

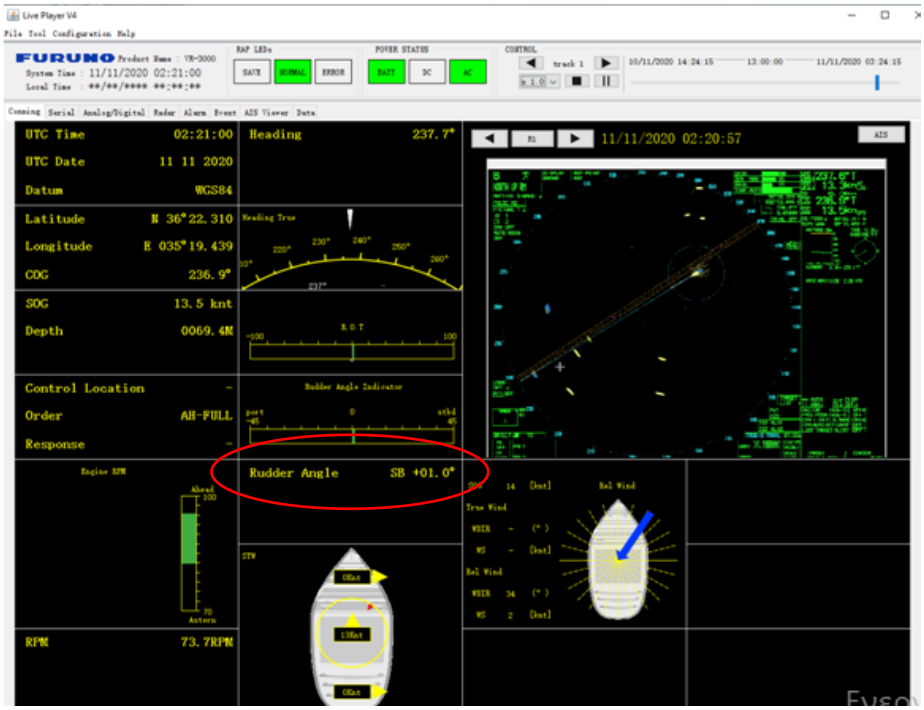


Figure 15: At approximately 05:20 EPHESOS OOW started altering her course to starboard. Rudder is set 1° to starboard by the course setting control.

The following **Figures 16 & 17** show the navigational situation until 05:25:30 where EPHESOS COG reached 241,5^{0} at a speed of 13,5 knots.

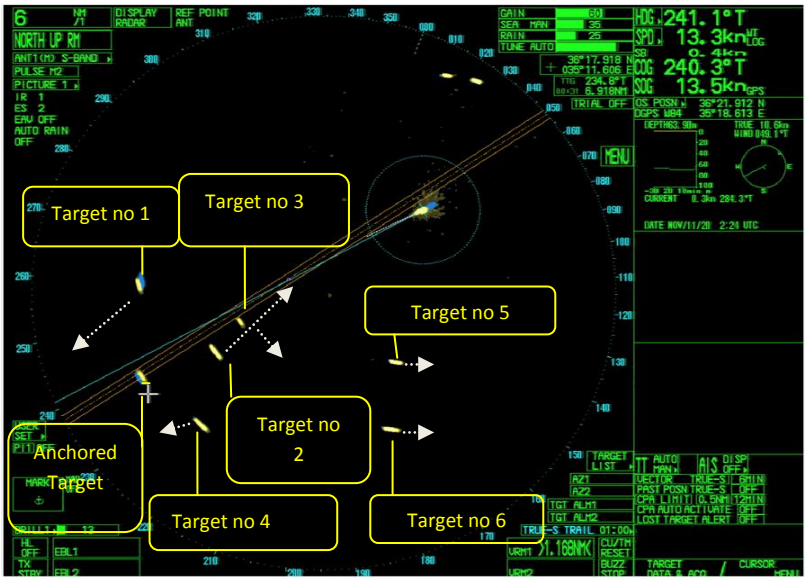


Figure 16. At 05:24 the marine traffic displayed on EPHESOS ARPA. Targets' vectors are simulated.

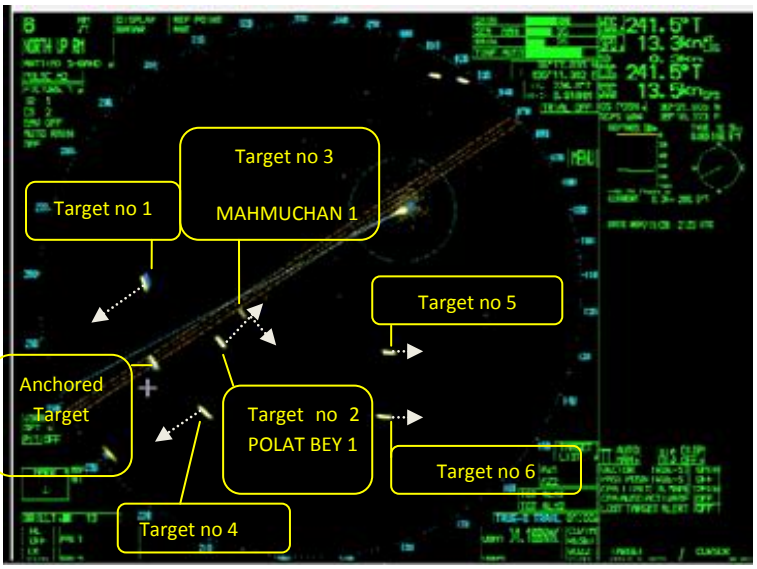


Figure 17: At 05:25 the marine traffic displayed on EPHESOS ARPA. Targets' vectors are simulated.

At 05:29:04 VTS captured EPHESOS navigating at 243.3° making 13.7 knots. The F/V MAHMUTCAN 1 (blue circle) was sailing at 030.1° and 6.2 knots. The F/V POLAT BEY 1 (red circle) was sailing at an estimated course of approximately 035° and speed of 6 knots. Additionally the target referred as no. 4 was apparently drifting away off EPHESOS navigating area. The two trawlers (targets no. 5 & 6) were recorded to sail more than 2.5 nm abeam off EPHESOS port side, running at approximately 3 knots. The trawlers speed indicated that they were engaged in fishing operations (see below **Figure 18**).

Figure 18: At 05:29:04 the situation recorded by VTS. POLAT BEY 1 (red circle), MAHMUTCAN 1 (blue circle)

At the time VTS recorded the marine traffic, EPHESOS ARPA as extracted from VDR (see below **Figure 19**), displayed her heading at 244.8° and speed to 13.2 knots. MAHMUTCAN 1 was approximately 3 nm (estimated as 3 times the VRM range) off her

bow and 10° to port. POLAT BEY 1 was about 4 nm (estimated as 4 times the VRM range) off EPHESOS bow and 5° to port. Both F/Vs vectors 'indicators were of the same length. MAHMUTCAN 1 speed was recorded at 6.2 knots. The estimated distance between the two F/Vs was approximately 1.2 nm.

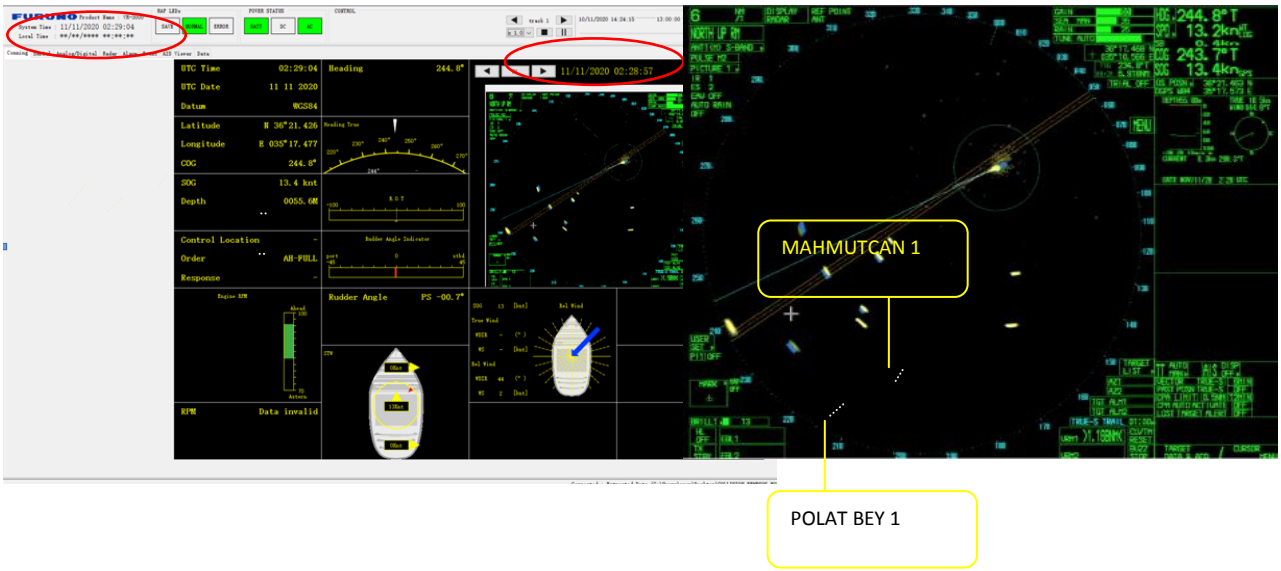


Figure 19: EPHESOS ARPA displayed the navigating situation at about the same time it was recorded by Akdeniz sector. System´s (VDR) time 02:29:04. ARPA time 02:28:57. A minor time difference of 7 seconds is observed between the time recoding indications of the two devices. Targets' vectors are simulated.

At 05:32:20, as per data extracted from EPHESOS ECDIS, while she was captured to navigate at 245.9° (COG 245°) and SOG 13.4 knots, MAHMUTCAN 1 was heading towards EPHESOS bow, steaming with an estimated course of 020° and speed close to 6 knots. At that time POLAT BEY 1 was not displayed (see below **Figure 20**).

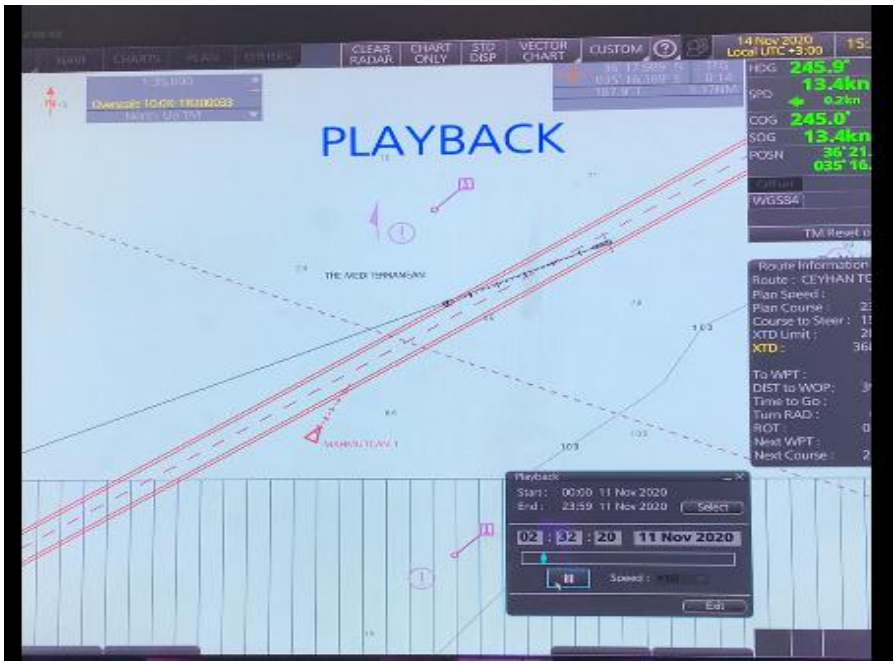


Figure 20: MAHMUTCAN 1 heading towards EPHESOS bow, course 020°; speed about 6 knots

Approximately one minute after, at 05:33:20, while EPHESOS was navigating with steady heading 247° (COG 247.7°) maintaining the speed of 13.3 knots, MAHMUTCAN 1 is captured to have altered her course to port, sailing at about 005°, that is about 15° to port, with the same speed of 6 knots (see below **Figure 21**).

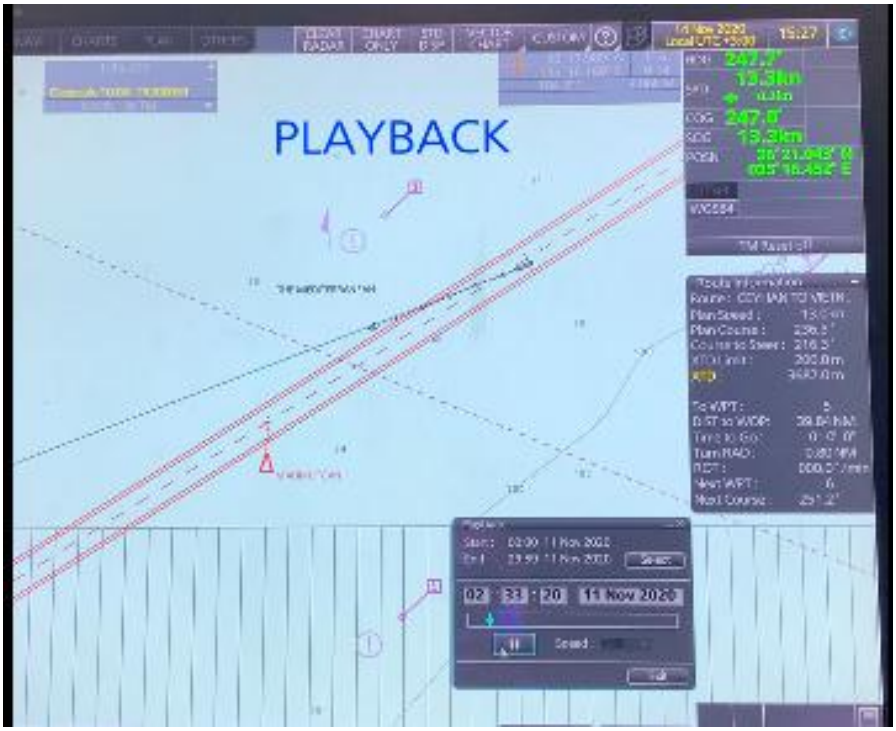


Figure 21: MAHMUTCAN 1 heading altered by 15° to port; course 005°; speed about 6 knots

At that time the navigational situation, as recorded and displayed on EPHESOS ARPA is presented on the following ARPA **Figure 22**. MAHMUTCAN 1 is about 2 nm off EPHESOS port bow and 10° to port.

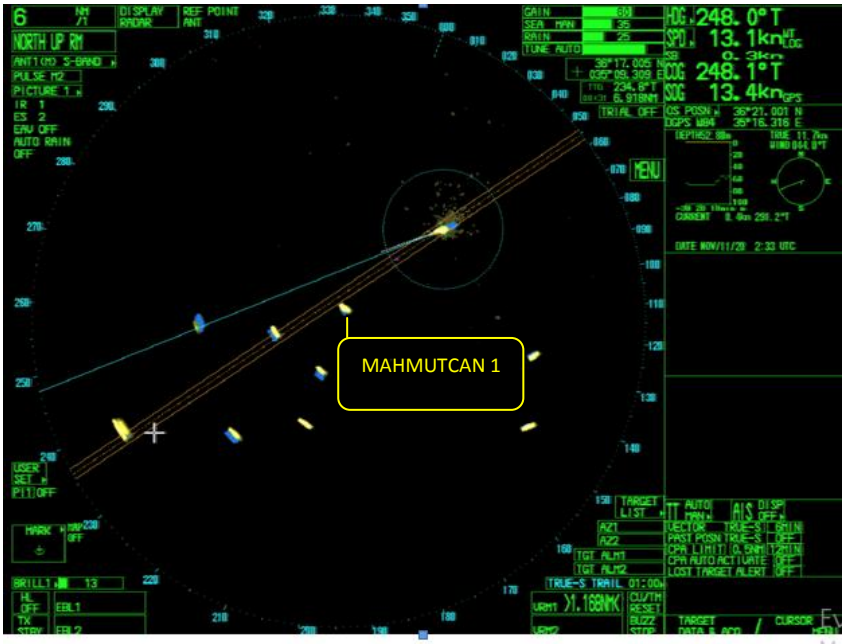


Figure 22 : EPHESOS ARPA recording at 05:33

At 05:33:28, as per VDR voice recordings, the OOW, due to the fact that MAHMUTCAN 1 was not keeping a steady course, navigating towards EPHESOS heading and a “crossing situation” or “close-quarters situation” could be projected, called her on VHF, in order to communicate with the Skipper and evaluate his intentions, despite the fact that the F/V was the “give away vessel”. However he did not receive any reply.

At 05:34:37, almost one minute after, the OOW called again MAHMUTCAN 1 three times on VHF, yet without any reply. At that time, as per ECDIS extracted data (**Figure 23**), MAHMUTCAN 1, was sailing at a distance of less than 2 nm off EPHESOS bow and at about 10° to her port bow. EPHESOS was navigating in autopilot maintaining the course of 247.9° (COG 248.4°) and speed of 13.4 knots. MAHMUTCAN 1, being the “give away vessel” took effective actions to avoid the risk of “close quarter situation” and was recorded to have started altering her course to starboard while her speed was reduced close to 3 knots (as per vector´s indication). Aforementioned situation can be seen through the following images obtained from ECDIS & ARPA (**Figure 23, 24**) in relation to the depiction of the marine traffic at 05:35:31 sourced from VTS (**Figure 25**).

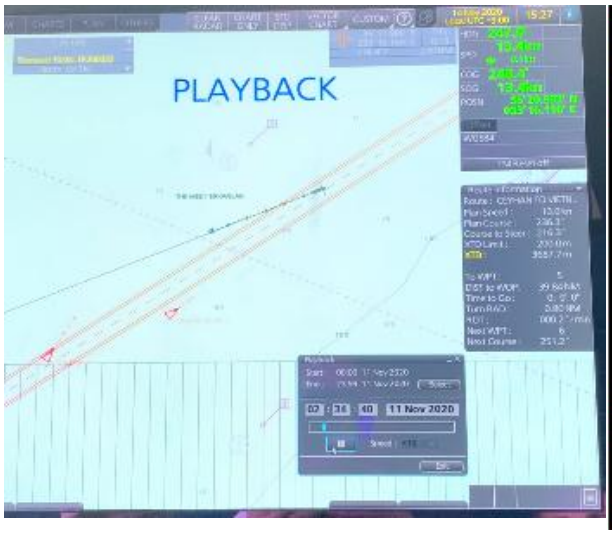


Figure 23: ECDIS at 05:34:40

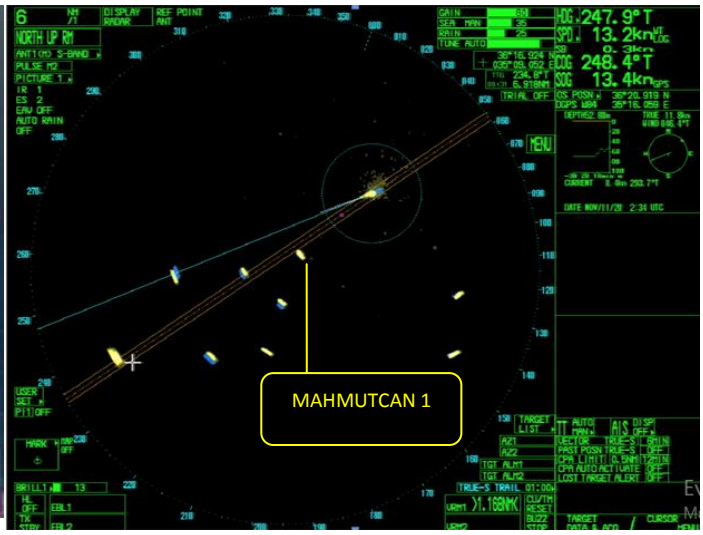


Figure 24: ARPA at 05:34

Figure 25: VTS recording at 05:35:31. POLAT BEY 1 (red circle), MAHMUTCAN 1 (blue circle)

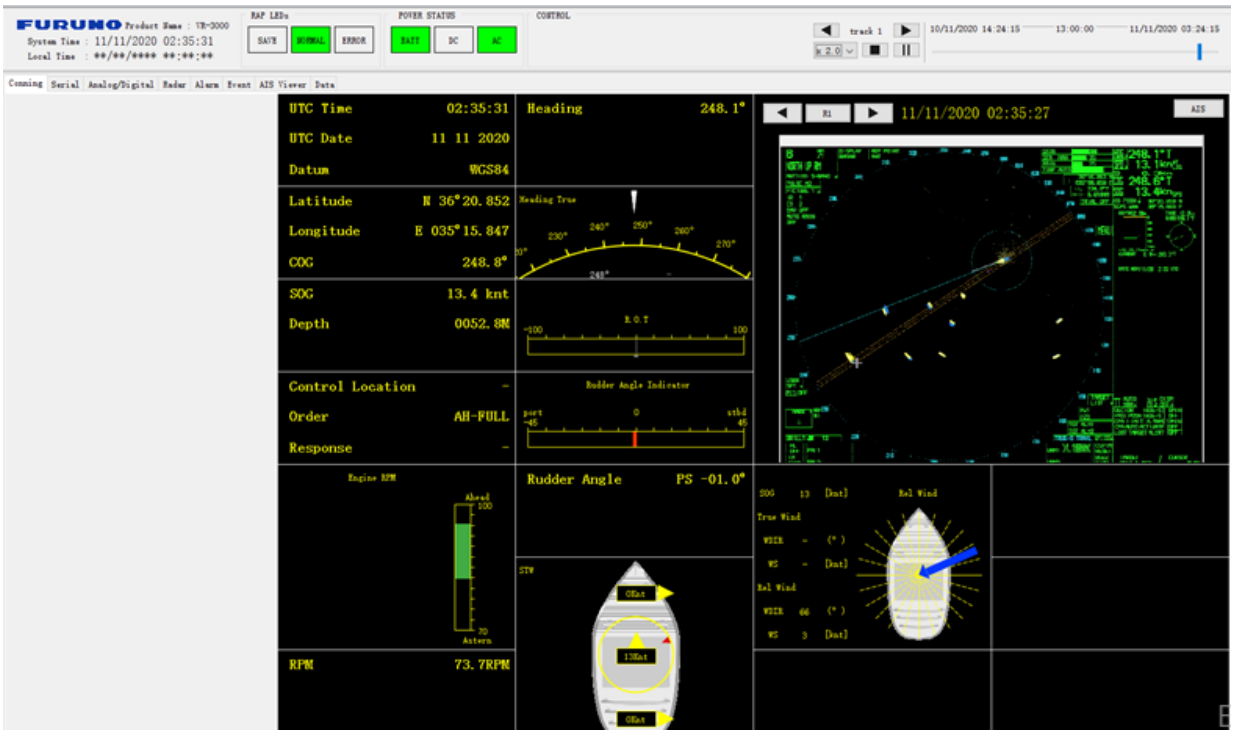


Figure 26: EPHESOS VDR conning screenshot 05:35:31

As MAHMUTCAN 1 was maneuvering to starboard making a large course alternation, POLAT BEY 1 was continuing to navigate towards EPHESOS course.

At 05:35:31 heading was recorded by Akdeniz Sector at 35.3° and speed at 6.2 knots. By that time she was 3.23 nm off EPHESOS bow, while her distance from MAHMUTCAN 1 was about 1 nm.

At 05:35:50, as per VDR recordings, EPHESOS OOW called POLAT BEY 1 on VHF, despite the fact that POLAT BEY was the “give away vessel” in the unfolding situation in order to communicate with the Skipper and be aware of his intentions, however no reply was received.

Following and within the next one minute, as per also VTS data, POLAT BEY was recorded to have altered her course to port by almost 20° while her speed was recorded between 6.2 and 6.7 knots.

More specifically her course as recorded in EPHESOS ECDIS was at 05:36:06, 050.5°; at 05:36:26, 042.2°; at 05:36:46, 023.6°; and at 05:37:16, 030.3°.

An indicative depiction of POLAT BEY 1 navigational status in relation to EPHESOS course for the aforementioned time period is shown in the following **Figures 27, 28, 29, 30**.

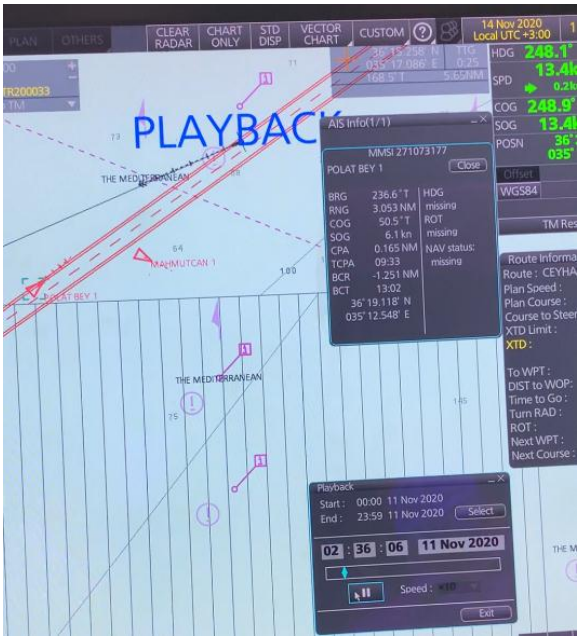


Figure 27: ECDIS at 05:36:06; POLAT BEY 1 course at 50.5°; CPA:0.165 nm - TCPA: 09:33 minutes; BCR: -1.251 nm

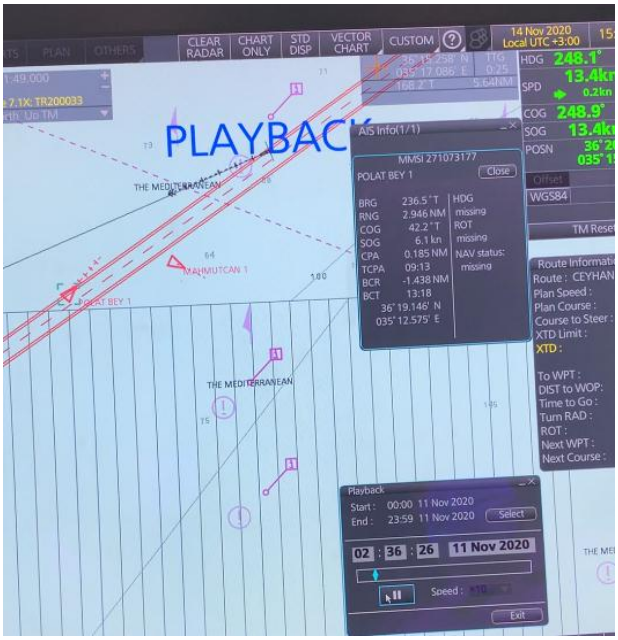


Figure 28: ECDIS at 05:36:26; POLAT BEY 1 course at 42.2° CPA:0.185 nm - TCPA: 09:13 minutes; BCR: -1.438 nm

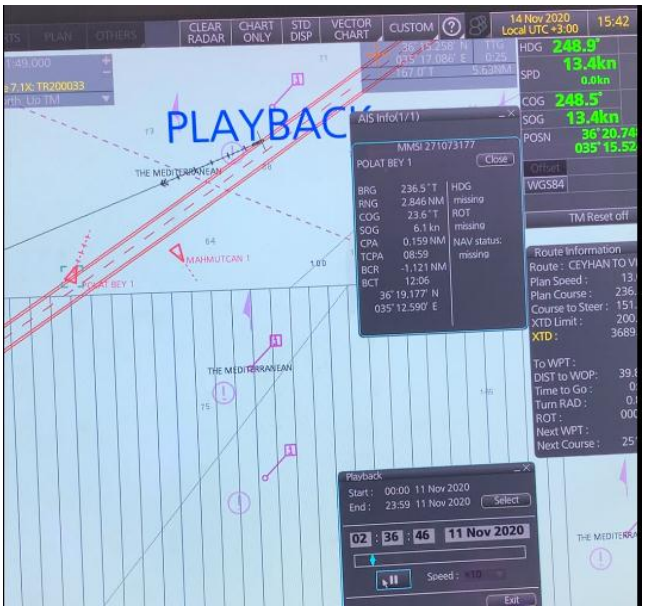


Figure 29: ECDIS at 05:36:46; POLAT BEY 1 course 023.6°; CPA: 0.159 nm - TCPA: 08:59 min; BCR:-1.121.nm. MAHMUTCAN 1 under maneuvering to starboard with reduced speed. Distance between the Fishing vessels about 1 nm.

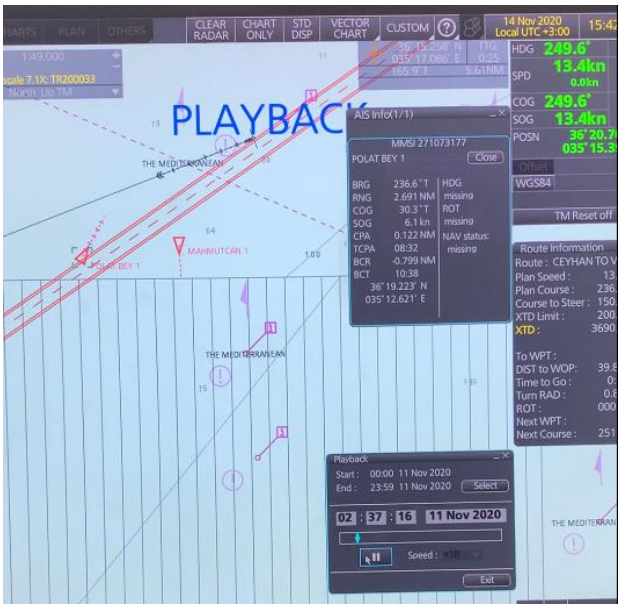


Figure 30: ECDIS at 05:37:16; POLAT BEY 1 course 030.3°; CPA:0.122 nm - TCPA: 08:32 minutes; BCR:-0.799 nm. MAHMUTCAN 1 under maneuvering to starboard with reduced speed.

Based on the navigational data (course and speed) of POLAT BEY 1 as plotted on ECDIS, the OOW presumed that vessel's course would not result to a dangerous "crossing situation" on the grounds that the Bow Crossing Range (BCR) indication was recorded at -1.251 nm; -1.438 nm; -1.121.nm; and -0.799 nm respectively. It is noted that the symbol (-) denotes that the acquired target´s bow will cross the course track (pass clearly from the aft) of the vessel and will not cross her heading.

At 05:37:30 POLAT BEY 1 is recorded by VTS to have changed her course to starboard and more specifically to 035.3° maintaining the same speed of 6 knots. Her distance from EPHESOS was reduced to 2.67 nm; relative bearing close to 13° to port. (see following **Figure** 31).

Figure 31: VTS screenshot at 05:37:30. POLAT BEY 1 (red circle), MAHMUTCAN 1 (blue circle).

At 05:37:56, EPHESOS had altered course further to starboard; Heading was 249.8° (COG 250.6°), that is 13° in total to starboard from the initial course of 237°, followed at 05:18. MAHMUTCAN 1, which was still maneuvering to starboard, was ranged about 1 nm from POLAT BEY 1 and approximately 1.4 nm from EPHESOS port bow (ARPA VRM set to 1.168 nm). By that time, as per ECDIS and ARPA data (see below **Figures 32 & 33**):

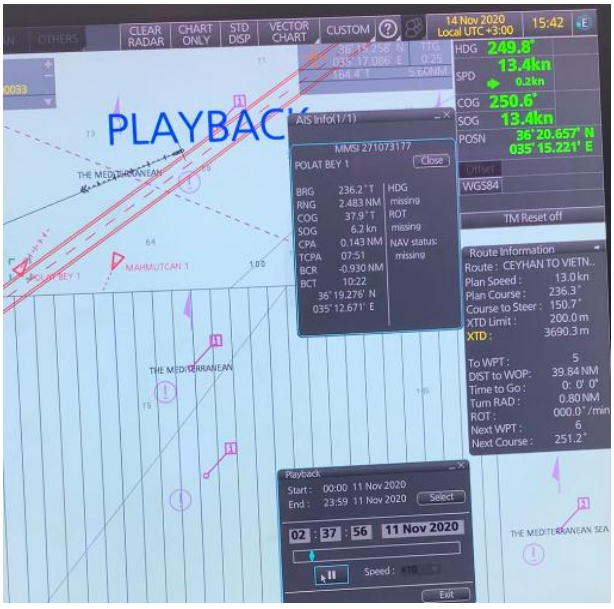


Figure 32: ECDIS data at 05:37:56

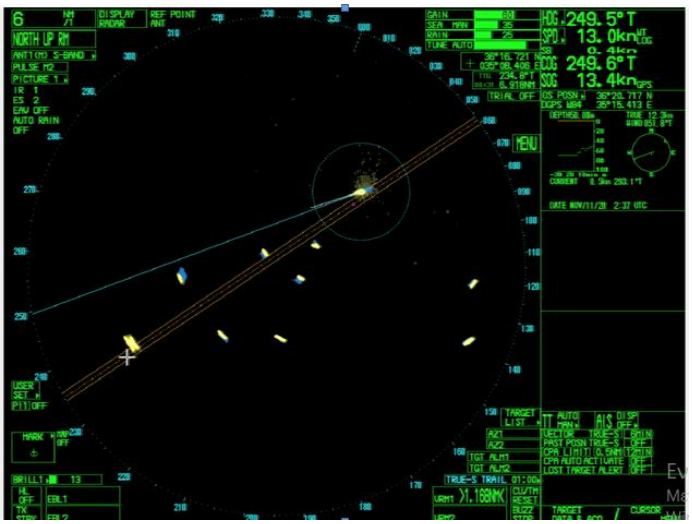


Figure 33: ARPA recording at 05:37

a) EPHESOS was heading at 249.8° with the speed of 13.4 knots.

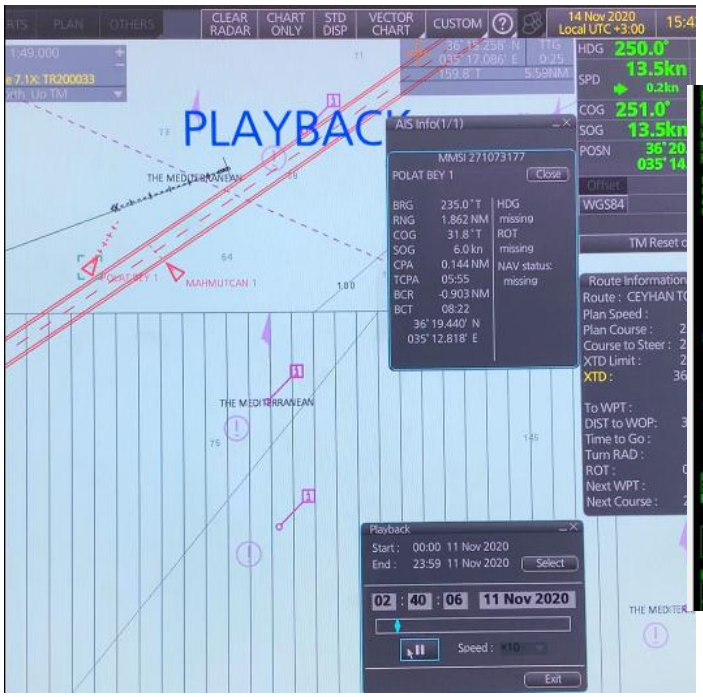
b) MAHMUTCAN 1 was about 1.4 nm off EPHESOS bow under course alternation to starboard. Her speed was close to 4 knots (as per her vector indication). Her distance from POLAT BEY 1 is estimated to approximately 1 nm.

c) POLAT BEY 1 was recorded to head at 37.9° and speed of 6.2 knots; the distance from EPHESOS bow was 2.483 nm and relative bearing close to 13° to port. CPA was recorded to 0.143 nm and TCPA at 07:51 minutes. As per Bow Crossing Range indication that was recorded to BCR: -0.930 nm, a cross heading situation was not assessed and anticipated.

At 05:38:16, as per EPHESOS VDR recordings, the OOW called again POLAT BEY 1 two times on VHF in order to communicate and draw Skipper´s attention, as effectively did with MAHMUTCAN 1. Nevertheless he did not receive any reply or respond.

At 05:40:06 bridge microphones captured the sound of signaling with the ALDIS lamp. The OOW had signaled in order to attract the attention of POLAT BEY 1 Skipper or crew. By that time POLAT BEY was navigating 1.862 nm off EPHESOS port bow.

The navigational situation is depicted in the following **Figures 34 & 55**, as extracted from ECDIS and ARPA:



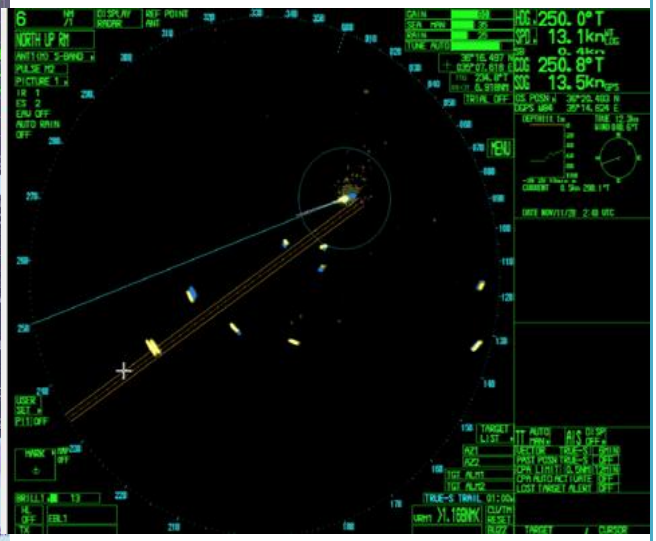


Figure 34: ECDIS data recorded at 05:40:06. ALDIS lamp signalling.CPA: 0.144 nm - TCPA:05:55 - BCR:-0.903 nm

Figure 35: APRA recording at 05:40

a) EPHESOS was heading at 250° (COG 251°)and her speed was 13.5 knots.

b) MAHMUTCAN 1 was about 1.3 nm off EPHESOS bow under course alternation to starboard. Her speed was close to 4 knots (as per her vector indication) and her distance from POLAT BEY was slightly less than 1 nm.

c) At that time (05:40:06), POLAT BEY 1 was recorded to sail with course 031.8°, at the speed of 6.0 knots. She was 1.862 nm off EPHESOS port bow and relative bearing from EPHESOS port bow was approximately 15°. As per ECDIS plotted data, CPA was recorded at 0.144 nm with TCPA 05:55 minutes while the BCR indicated -0.903 nm, denoting that a cross heading situation was not anticipated.

3.4 The Collision

At 05:40:16 (see below **Figure 36**) POLAT BEY 1 was recorded to have altered her course to port, heading at 027.5°. The new course was almost 10° to port from the course at 05:37:56. She was 1.755 nm off EPHESOS port bow at about 13° to port.

a) As per ECDIS plotted data, CPA was remained the same at 0.144 nm. TCPA was 05:36 minutes while BCR was -0.910 nm.

b) MAHMUTCAN 1 was about 1.1 nm off EPHESOS port bow under course alternation to starboard. Her speed was close to 4 knots (as per her vector indication) and the distance between her and POLAT BEY was about 0.8 nm.

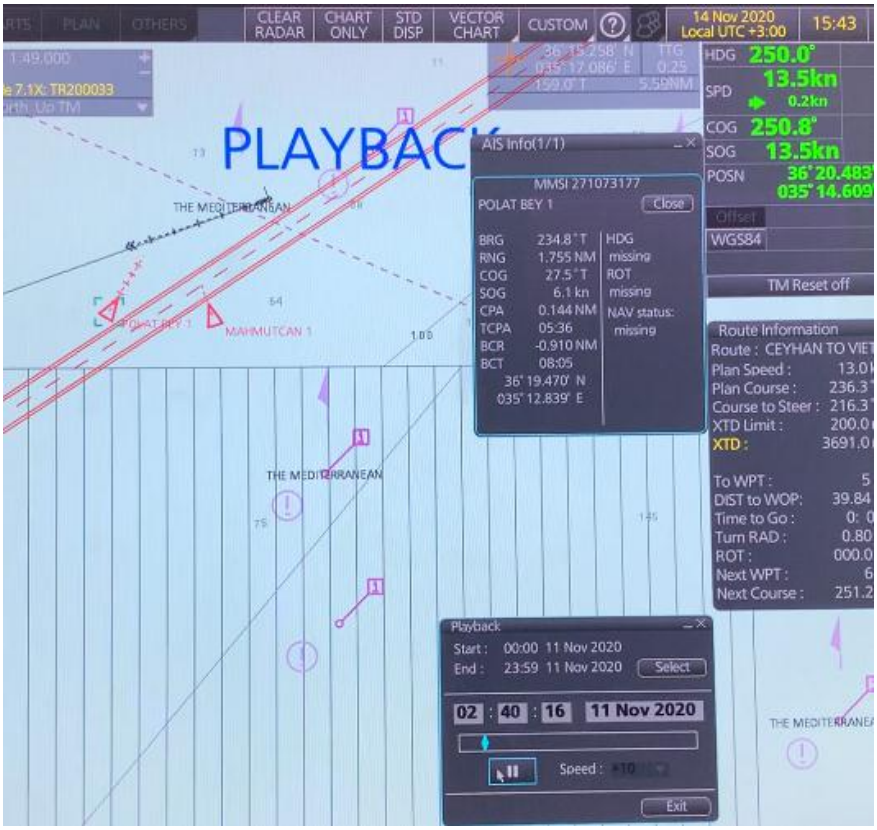


Figure 36: ECDIS data at 05:40:16. CPA: 0.144 nm; TCPA: 05:36; BCR: -0.910 nm.

At 05:41:01, as per VDR recordings, the OOW called again POLAT BEY 1, however there was no reply. According to EPHESOS ECDIS data (see **Figure 37**), at that time:

a) EPHESOS was navigating with heading 249.9° (COG 250.7°) and SOG of 13.5 knots.

b) MAHMUTCAN 1 was about 1.1 nm off EPHESOS bow under course alternation to starboard. She was about to complete a 360° maneuver with speed close to 4 knots (as per her vector indication). The 360° maneuver was resulting in position almost 50° abeam of EPHESOS port side.

c) POLAT BEY 1 was recorded to sail with course 028.1° and speed of 6.1 knots. She was 1.553 nm off EPHESOS port bow at about 15° to port; CPA was 0.141 nm and TCPA 04:47 minutes. BCR was recorded to 0.906 nm.

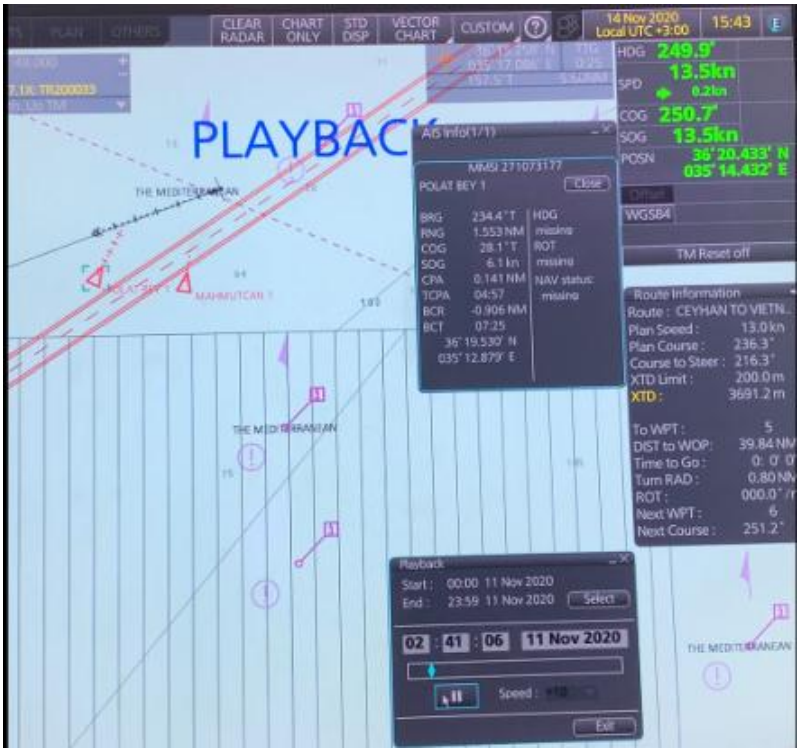


Figure 37: ECDIS data at 05:41:06. CPA: 0.141 nm; TCPA:04:57; BCR: -0.906 nm

At 05:42:36, as per VDR recordings, the OOW, taking into account that POLAT BEY 1 was not responding to VHF calls and ALDIS signals while her course was not steady due to ample alternations, ordered the OS on the watch to switch to manual steering.

At 05:42:42 the OOW ordered “port 5°” and the helmsman confirmed the set of the rudder “5° to port”.

At that time, as per EPHESOS ECDIS and ARPA extracted data (see following **Figures 38 & 39**):

a) EPHESOS was navigating at 249.5° (COG 250.8°) and SOG of 13.6 knots.

b) MAHMUTCAN 1 had completed the 360° maneuver to starboard (bold alternation) and was recorded to head at approximately 080°. She was about 01 nm abeam of EPHESOS port side. Her bearing from EPHESOS was 75° to 80° to port, as estimated from her vector indication. She had increased her speed close to 6 knots (as per her vector´s indication). The distance from POLAT BEY 1 was estimated to about 0.7 nm.

c) POLAT BEY 1 heading was recorded at 016.2°. Her course had altered within 30 seconds by almost 10° to port in relation to her previous course 027.5°. She was

running at 6.2 knots and her distance from EPHESOS bow was 1.051 nm. Bearing was about 15° to port, CPA 0.074 nm and TCPA 03:34 min. BCR was recorded at -0.484 nm.

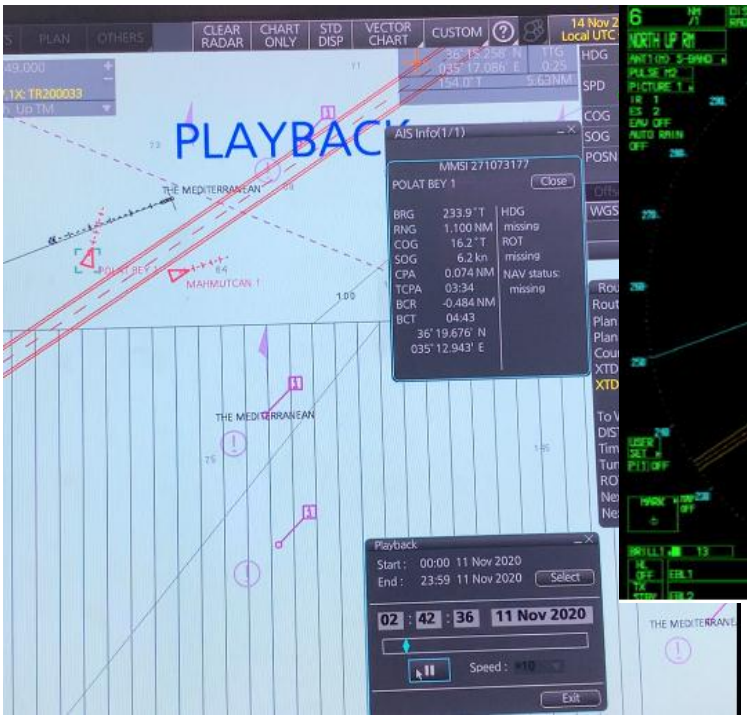


Figure 38: ECDIS data at 05:42:36 CPA:0.071 nm; TCPA:03:25 min; BCR: -0.484 nm

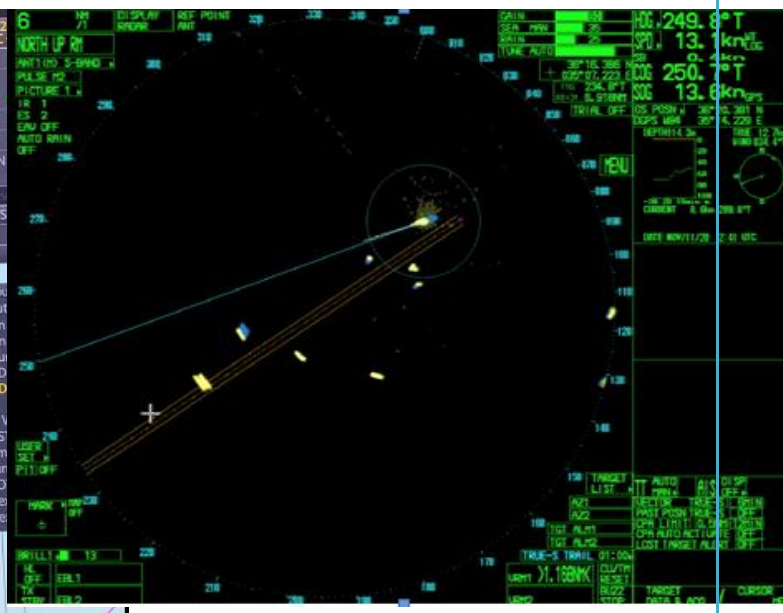


Figure 39: APRA recording at 05:42

EPHESOS rudder was set “5° to port”, following the OOW order (see below **Figure 40**).

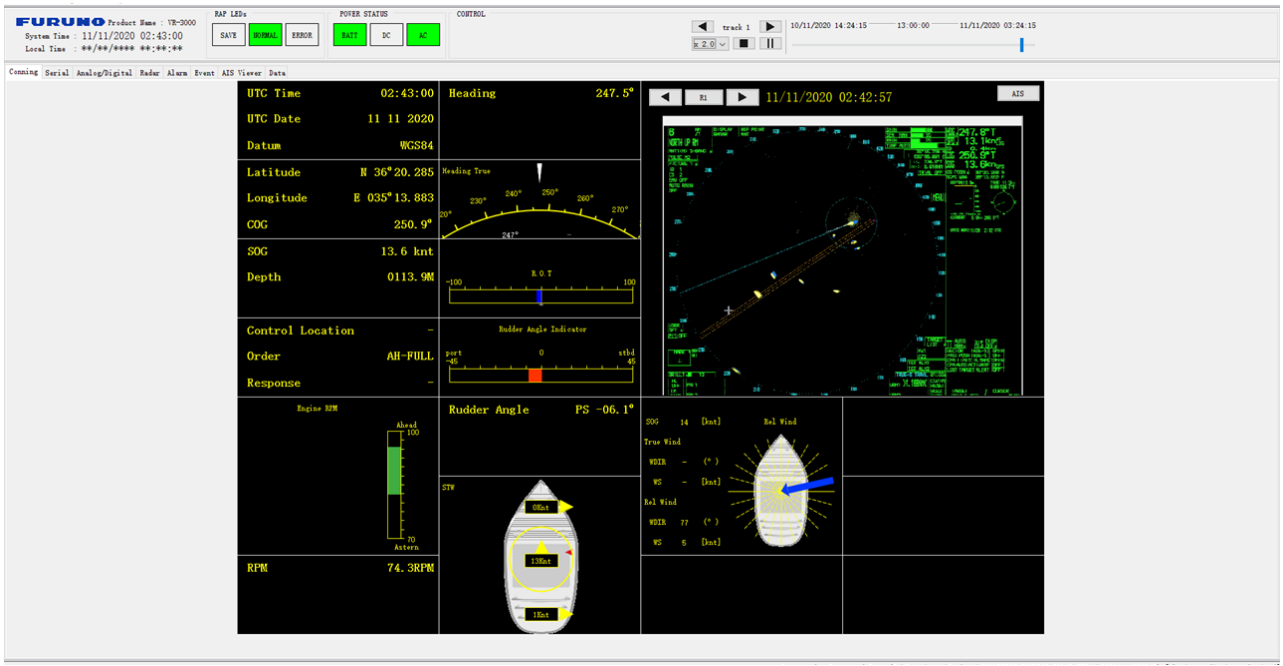


Figure 40: VDR Conning recording at 05:42:42

At 05:43:16, the OOW signaled again with the ALDIS lamp in order to draw the attention of POLAT BEY Skipper. At 05:43:45, the OOW ordered “port 10°” and the helmsman confirmed the order “10° to port”.

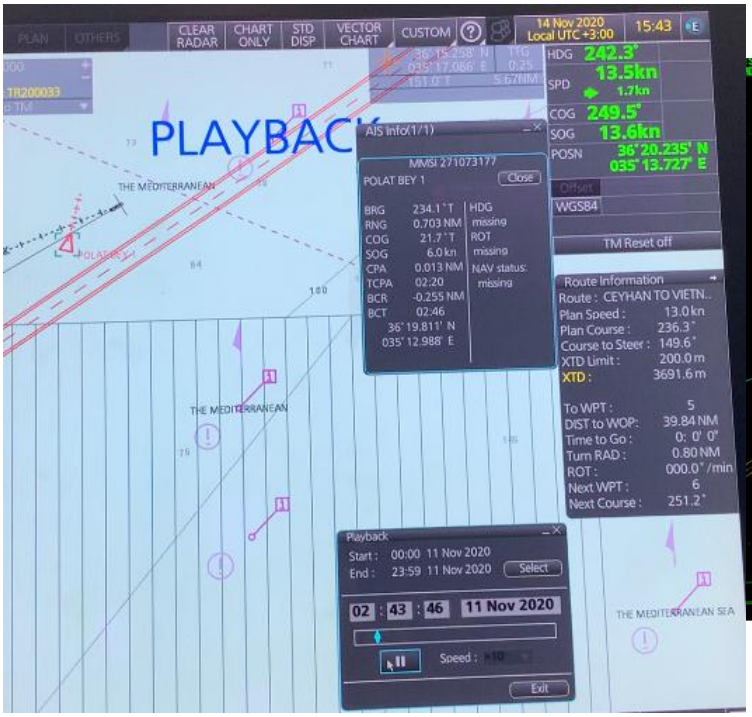
By that time, based on EPHESOS ECDIS and ARPA extracted data the navigational situation was as following (see below **Figures 41 & 42**):

a) EPHESOS course was altering to port, recorded at COG 242.3°. SOG to 13.5 knots.

b) MAHMUTCAN 1 was recorded turning to starboard and navigating to approximately 170° maintaining a speed of approximately 6 knots, as per her vector indication length that is almost equal in length with POLAT BEY vector´s indication.

c) POLAT BEY was sailing at 021.7°, about 5° to starboard from previous course. Speed was at 6 knots. Her distance from EPHESOS was reduced to 0.703nm and bearing was close to 5° to port. CPA was 0.013 nm and TCPA 02:20. The Bow Crossing Range indicator recorded to - 0.255nm.

At that time, POLAT BEY 1 was approximately 1 nm off MAHMUTCAN 1 starboard quarter, which was heading SSE.



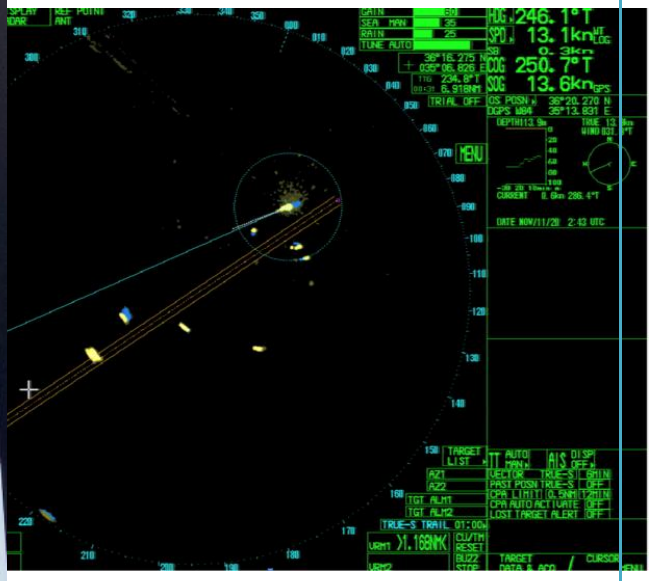


Figure 41: ECDIS recording at 05:43:46 **Figure 42:** APRA data at 05:43

At 05:44:06, the OOW called again POLAT BEY 1 on VHF. However he did not receive any reply. At 05:44:16, the OOW ordered “port 15°” and seconds after the helmsman confirmed “15° to port”. As per ECDIS stored data, by that time (see below **Figure 43**):

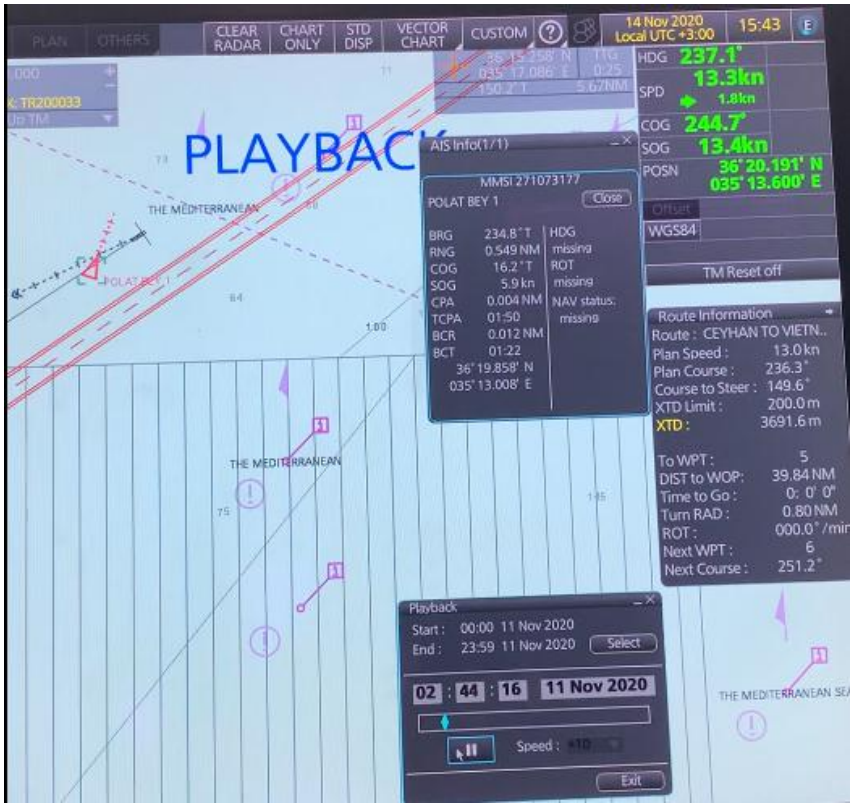


Figure 43: ECDIS data at 05:44:16

a) EPHESOS was altering her course by 15° to port. Her heading was recorded at 237.1° (COG 244.7°) and speed at 13.3 knots. POLAT BEY 1 was navigating 0.549 nm off her bow with course at 016.2° and speed at 5.9 knots.

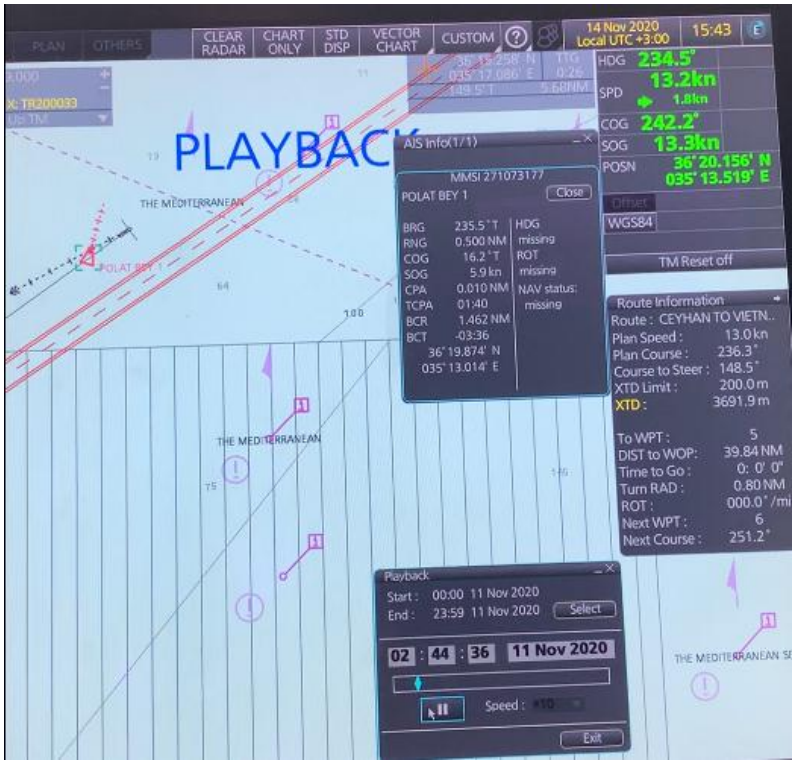
b) POLAT BEY 1 was heading at 016.2°. Her course had been altered to port by approximately 5° in relation to the course recorded at 05:43:46 (see **Figure 44**). CPA was reduced to 0.004 nm and TCPA to 01:50. BCR was recorded to 0.012 nm and Bow Crossing time (BCT) was captioned at 01:22 minutes, as POLAT BEY was about to cross the heading of EPHESOS.

At 05:44:32, the OOW ordered “port 20°” and seconds after the helmsman confirmed “20° to port”. At that time the navigational situation as per EPHESOS ECDIS and ARPA extracted data, is described below (see **Figure 44**):

a) EPHESOS course was altering to port, captured at 234.5° (COG 242.2°) and SOG of 13.2.

b) POLAT BEY 1 was navigating at 16.2° with speed 5.9 knots. She was 0.500 nm (926m) off EPHESOS stem post. CPA was recorded at 0.010, BCR at 1.462 nm and BCT -03:36 min.

c) Due to the fact that EPHESOS was turning to port by setting the rudder “20° to port” and POLAT BEY 1 had crossed her heading and had passed to her starboard side heading NNE, it was deduced that the “crossing situation” had been cleared (BCT is negative) and the imminent danger of collision had been avoided.



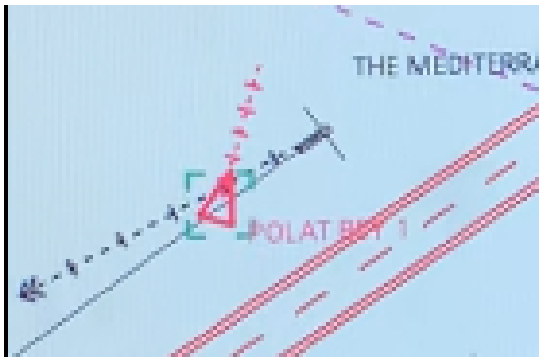


Figure 44: ECDIS data at 05:44:36

The aforementioned situation is evident from screenshots as extracted from EPHESOS ARPA (**Figures 45 & 46**).

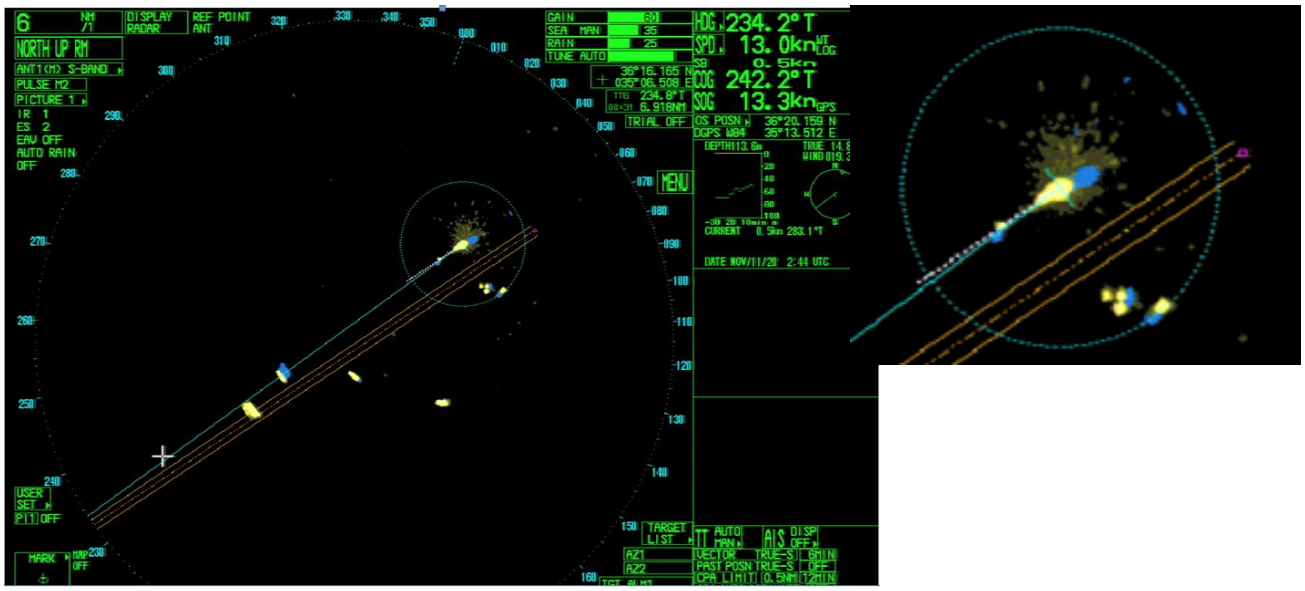


Figure 45: APRA recordings at 05:44

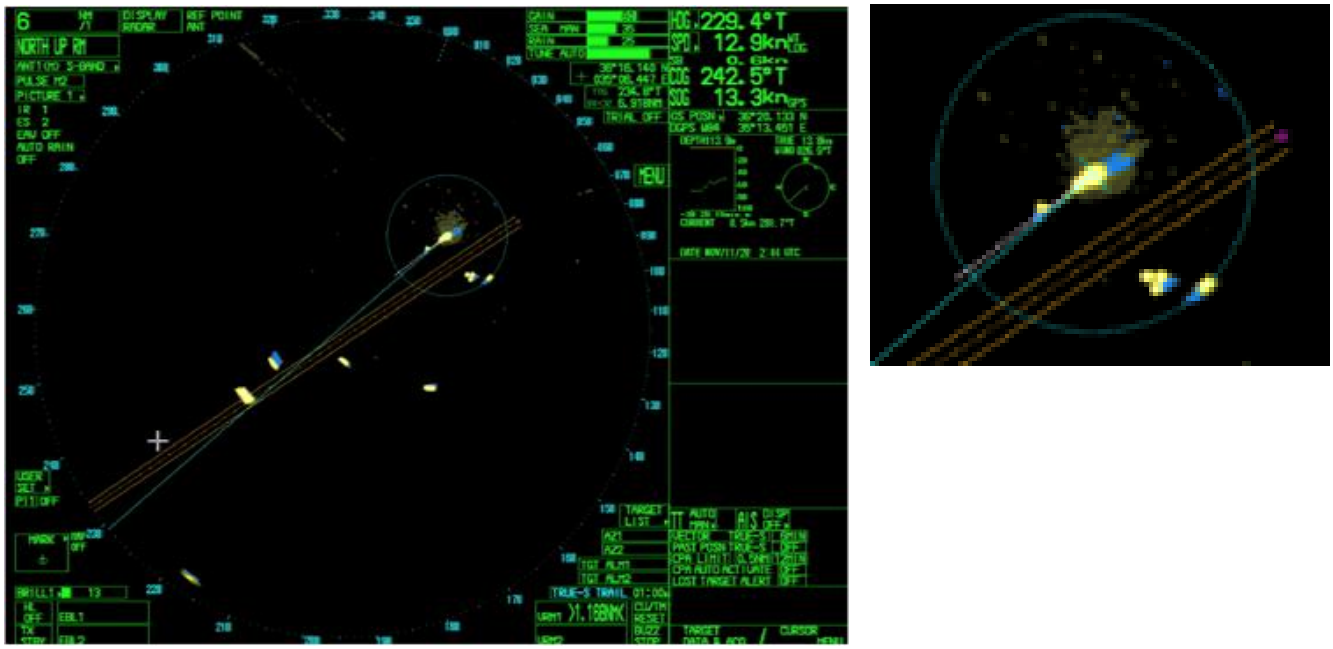


Figure 46: APRA recording at 05:44:46

At 05:44:46 that is 1 min and 30 seconds before the collision, the OOW, called POLAT BEY: *"POLAT BEY, POLAT BEY not change course all the time"*. However no response was recorded on VDR. The navigational situation at that time as captioned on EPHESOS ECDIS and ARPA, is described below (see following **Figures 47 & 48**):

a) EPHESOS rudder was set "20° to port" and she was on a continuous maneuver to port. Her heading was recorded at 231.7° (COG 242.3°) and speed 13.3 knots. Bow Crossing Range was recorded to -0.542 nm. The BCR indication denoted that the heading would not be crossed.

b) POLAT BEY 1 was recorded to navigate at 16.2° under the speed of 5.9 knots. She had already passed EPHESOS stem post and was navigating clear on EPHESOS starboard bow quarter heading NNE.

c) Due to the fact that EPHESOS was continuously altering her heading to port, as rudder was steel set 20° to port her projected course had been cleared off POLAT BEY 1 course.

d) POLAT BEY 1 relative bearing from EPHESOS was close to 5.3° to starboard.

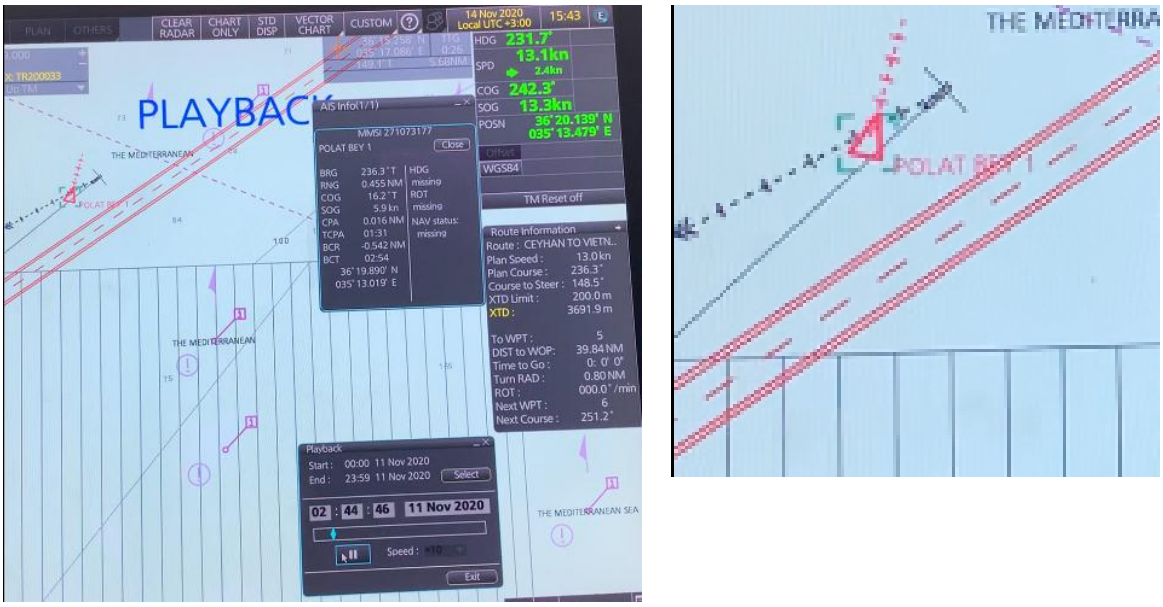


Figure 47: ECDIS data at 05:44:46.

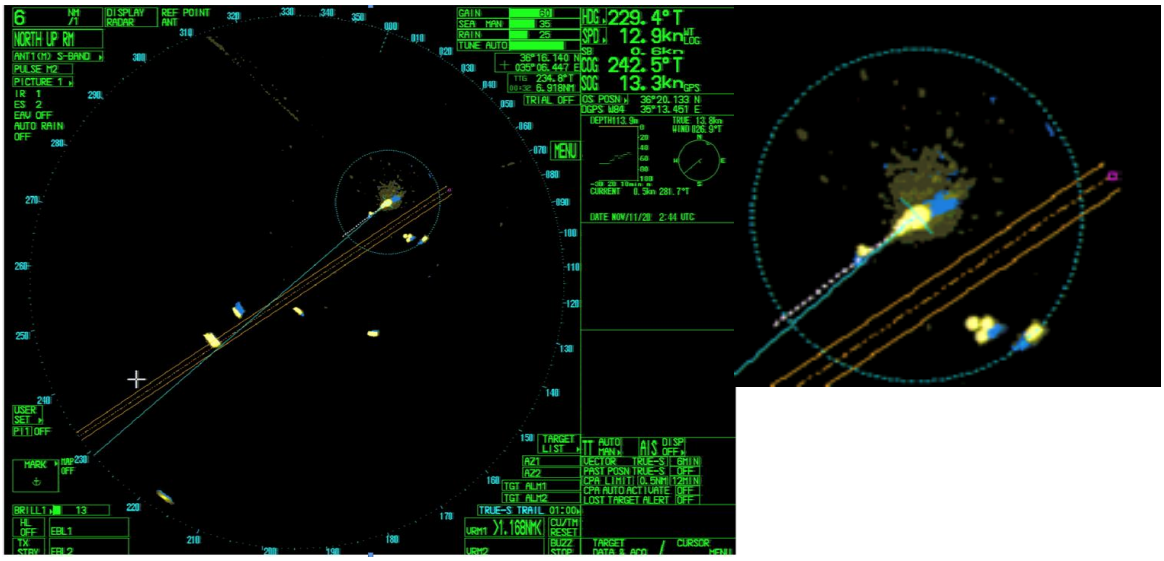


Figure 48: APRA recording at 05:44.

At 05:44:56, as recorded in ECDIS, POLAT BEY 1, despite the fact that had passed clear off EPHESOS stem post and heading, navigating at approximately 16.2° (NNE), suddenly altered her course to starboard and started heading to 82.4° (see below **Figure 49**).

a) At that time, EPHESOS was still altering her course to port, as rudder was set to 20° to port. Her heading was recorded at 227.8° (COG 242.2°) and SOG at 13.3 knots.

b) POLAT BEY 1, having altered her course to starboard by 66.2°, was heading E with course at 82.4° and speed 5.5 knots. By that time ECDIS displayed that the distance from EPHESOS was 0.396 nm. Relative bearing was 5.6° to EPHESOS starboard bow, CPA of 0.006 nm, TCPA 01:19 minutes and BCR -0.060.

By that time, (approximately 05:44:56, as recorded in VDR), the OOW, called POLAT BEY on VHF: *"POLAT BEY, POLAT BEY not change course all the time"*. However no response was received.

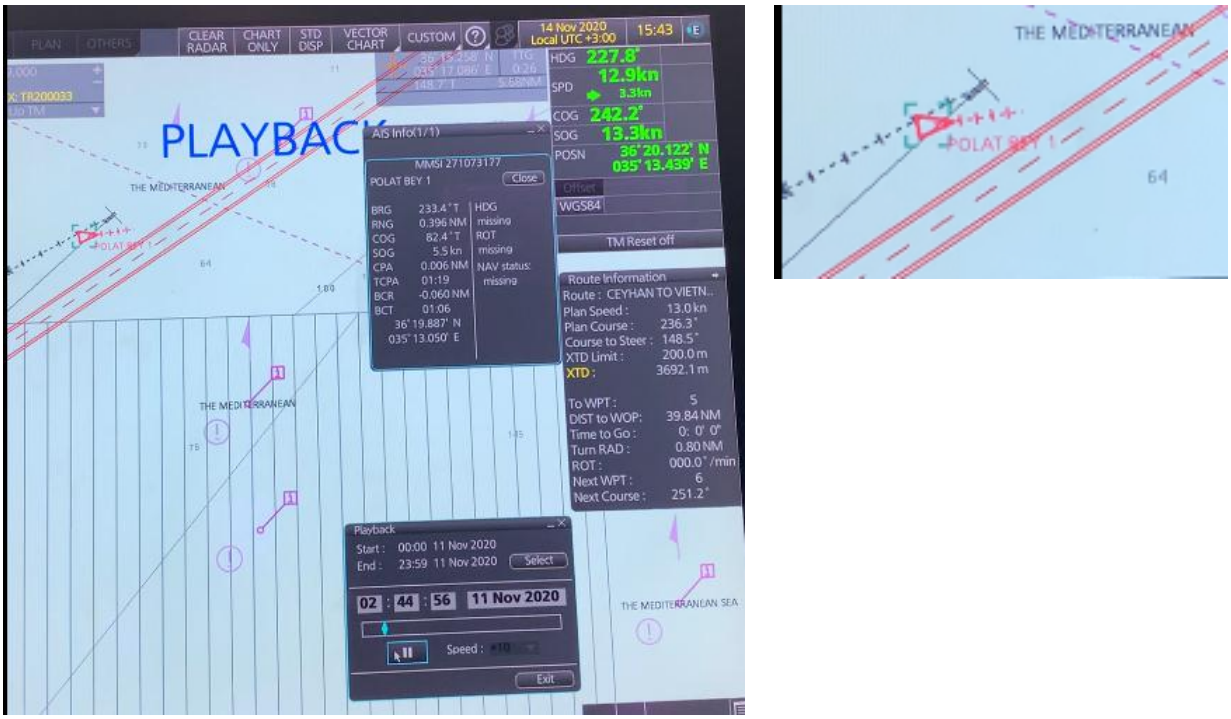


Figure 49: ECDIS data depicted at 05:44:56

At 05:45:05, the OOW took the ALDIS and signaled towards POLAT BEY 1. The distance from EPHESOS stem post was 0.297 nm (555m). At that time, as per EPHESOS ECDIS extracted data (see below **Figures 50 & 51**):

a) EPHESOS was under continuous maneuvering to port, as rudder was 20° to port. Her heading was recorded at 218.8° (COG 239.1 °) and SOG at 13.3 knots.

b) POLAT BEY 1, was keeping the course of 82.4° running at and speed 5.5 knots. She was captured to be 0.297 nm off EPHESOS bow on relative bearing 10.8° to EPHESOS starboard bow, CPA at 0.029 nm, TCPA 00:59 seconds and BCR -0.017.

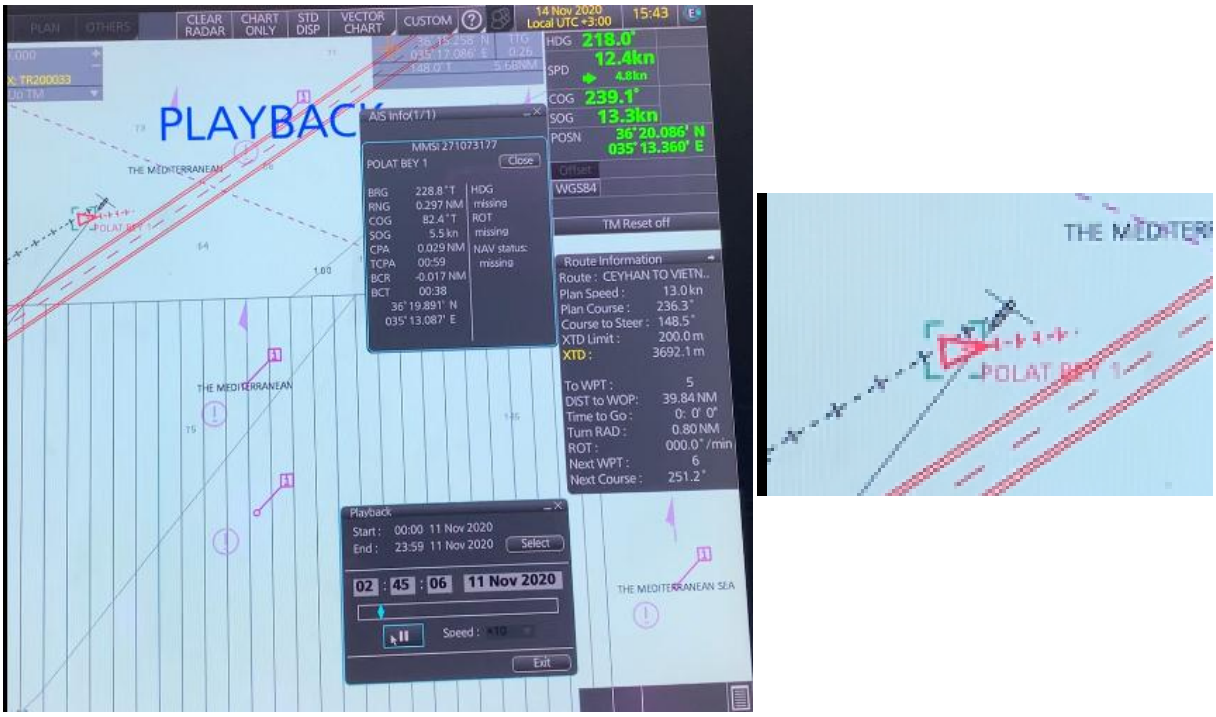


Figure 50: ECDIS data at 05:45:06.

c) MAHMUTCAN 1 was recorded approximately 0.8 nm off EPHESOS port bow (correlation to VRM set at 1.168 nm); and was probably heading SSE.

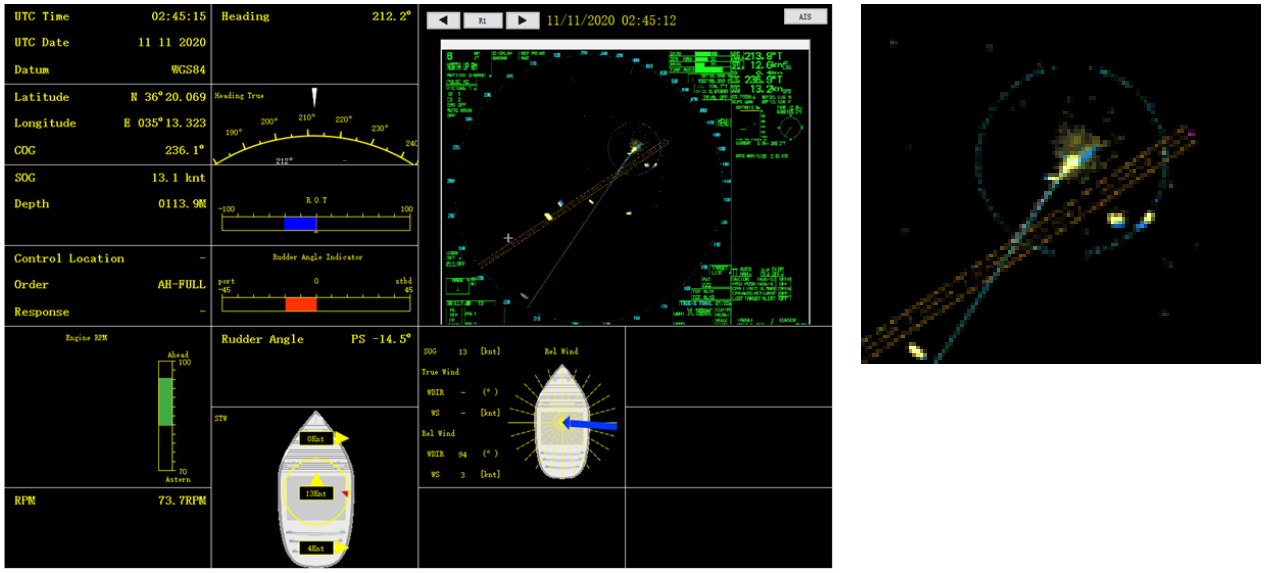


Figure 51: 05:45:15 VDR conning screenshot.

At 05:45:33, as per VDR recordings, the OOW called POLAT BEY 1 on VHF and shouted: *"POLAT BEY, change course"*. No reply was recorded by the bridge VDR microphones. The navigating situation was depicted on ECDIS, as following (see below **Figures 52 & 53**):

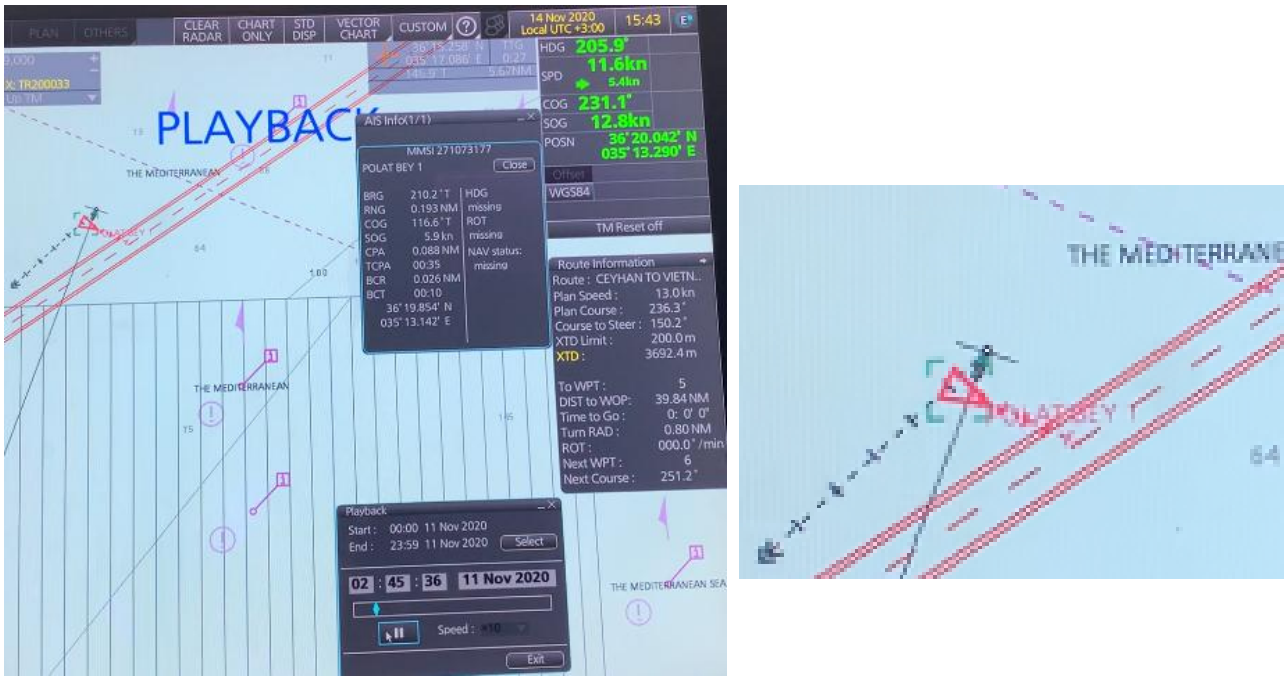


Figure 52: ECDIS depiction at 05:45:36

a) EPHESOS was under continuous maneuvering to port; rudder was set 20° to port; her heading was recorded at 205.9° (COG 231.1°) and SOG at 12.8 knots (reduced due to continuous maneuver).

b) POLAT BEY 1, had altered his course further to starboard, steering to 116.6° with the speed of 5.9 knots. She was 0.193 nm off EPHESOS bow. Relative bearing was 10.8° to starboard of EPHESOS with CPA of 0.88 nm, TCPA 00:35 sec, Bow Crossing Range (BCR) 0.026 nm and Bow Crossing Time (BCT) 00:10.

c) At that time, both BCR and BCT indications were apparently denoting collision.

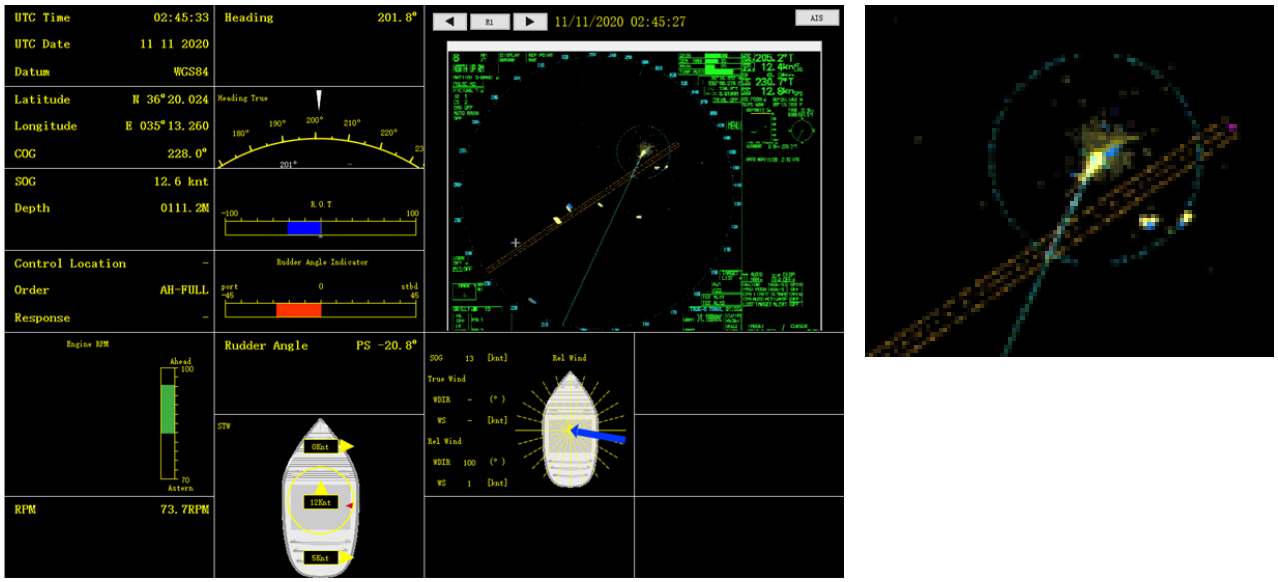


Figure 53: VDR conning recording at 05:45:33

At 05:45:42, the OOW ordered “port 30°” and the helmsman confirmed the steering order. At that time the situation displayed on ECDIS is described below (see below screenshots 54 & 55):

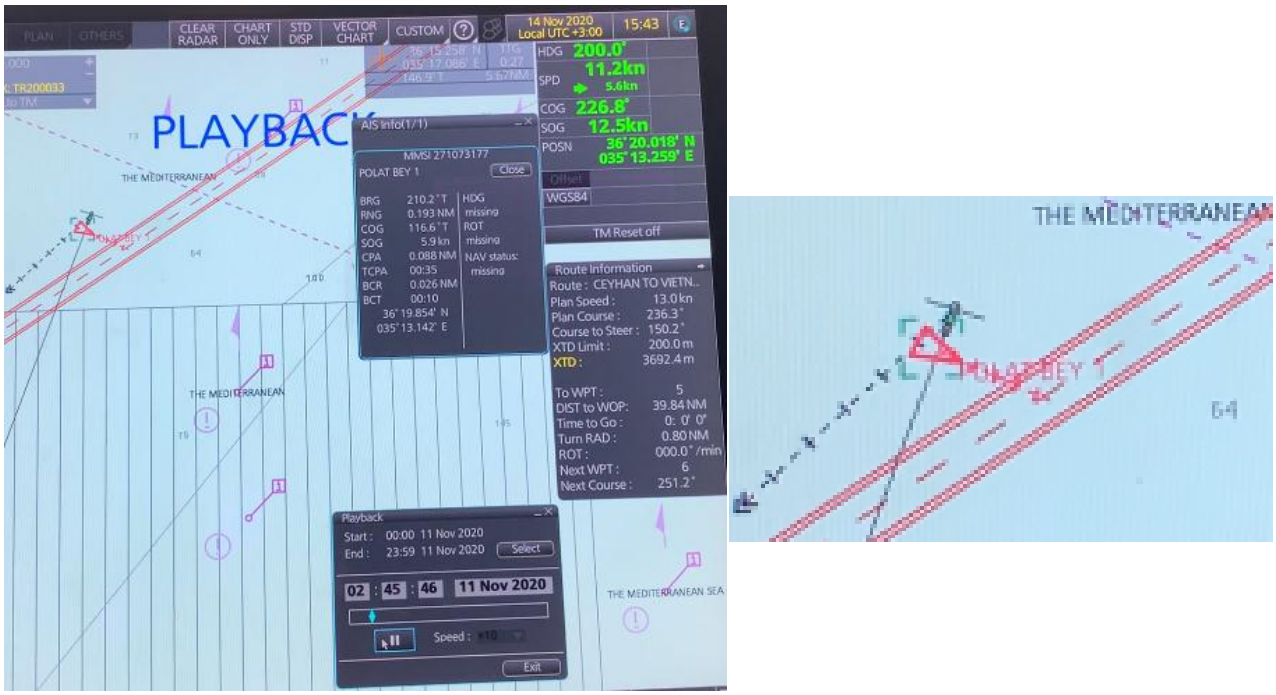
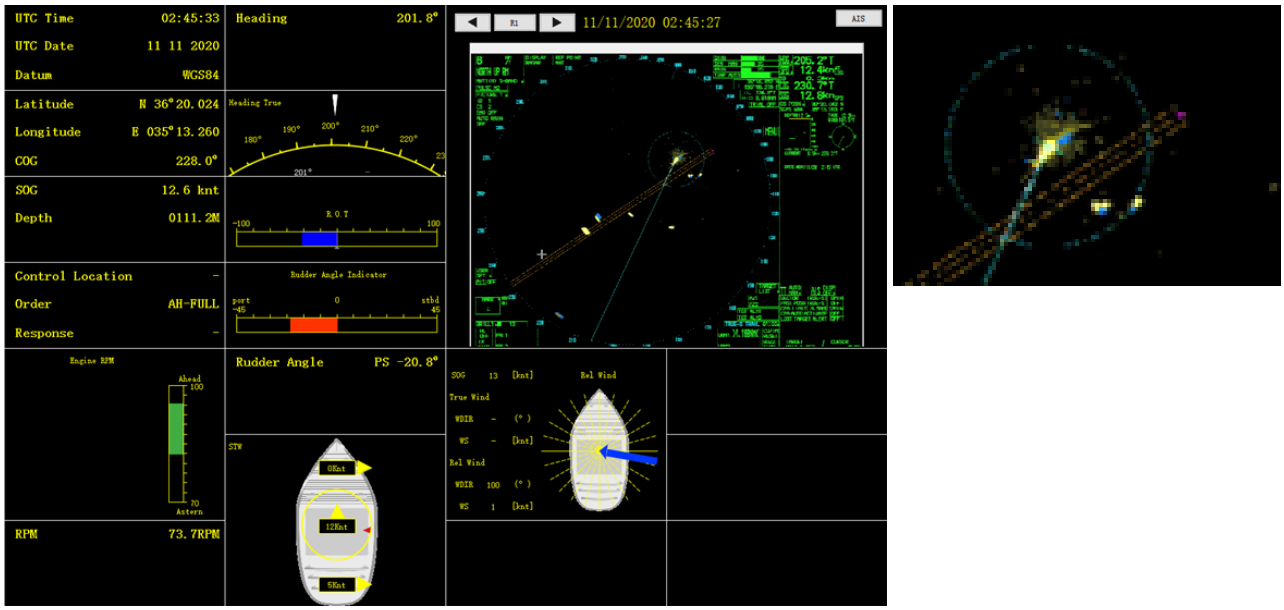


Figure 54: ECDIS data depiction at 05:45:46

a) EPHESOS was under continuous maneuvering to port. Her rudder was being set 30° to port (from 20° to port until that time). Her heading was recorded at 200.0° (COG 226.8°) and SOG at 12.5 knots (reduced due to the continuous maneuver).

b) POLAT BEY 1, was captioned steering with the same course of 116.6° under 5.9 knots. She was 0.193 nm off EPHESOS bow, relative bearing 10.8° to EPHESOS starboard. CPA was recorded the same 0.88 nm, as at **05:45:36** with same TCPA 00:35, same Bow Crossing Range (BCR) 0.026 nm and same Bow Crossing Time (BCT) 00:10.

c) At that time, as per VDR conning screenshot, MAHMUTCAN 1 was displayed on ARPA approximately abeam of EPHESOS at a distance of about 0.8 nm (EPHESOS VRM was set to 1.168 nm). Her heading, although not recorded on ECDIS should had been SSE.



Screenshot 55: VDR conning screenshot at 05:45:30

At **<u>05:45:52</u>**, the OOW called POLAT BEY 1 on VHF: "POLAT BEY change course, change course" however no reply was received; seconds after the helmsman was recorded to say: "what he is doing?" At that time the situation displayed on ECDIS is described below (see below **Figure 56**):

a) EPHESOS was under continuous maneuvering to port, rudder was set 30° to port. Her heading was recorded at 193.0° (COG 222.5°) and SOG at 12.2 knots (reduced due to continuous maneuver).

b) POLAT BEY 1, was recorded to had altered her course to port by 13°.
She was caught heading at 129.8° (previous heading at 116.6°, about 10 seconds before). Her speed was recorded at 5.9 knots.
She was 0.174 nm off EPHESOS bow; relative bearing of 7.6° to starboard of EPHESOS. CPA was recorded the same 0.108 nm, TCPA 00:29, Bow Crossing Range (BCR) 0.030 nm and Bow Crossing Time (BCT) 00:06 showing that the collision was imminent.

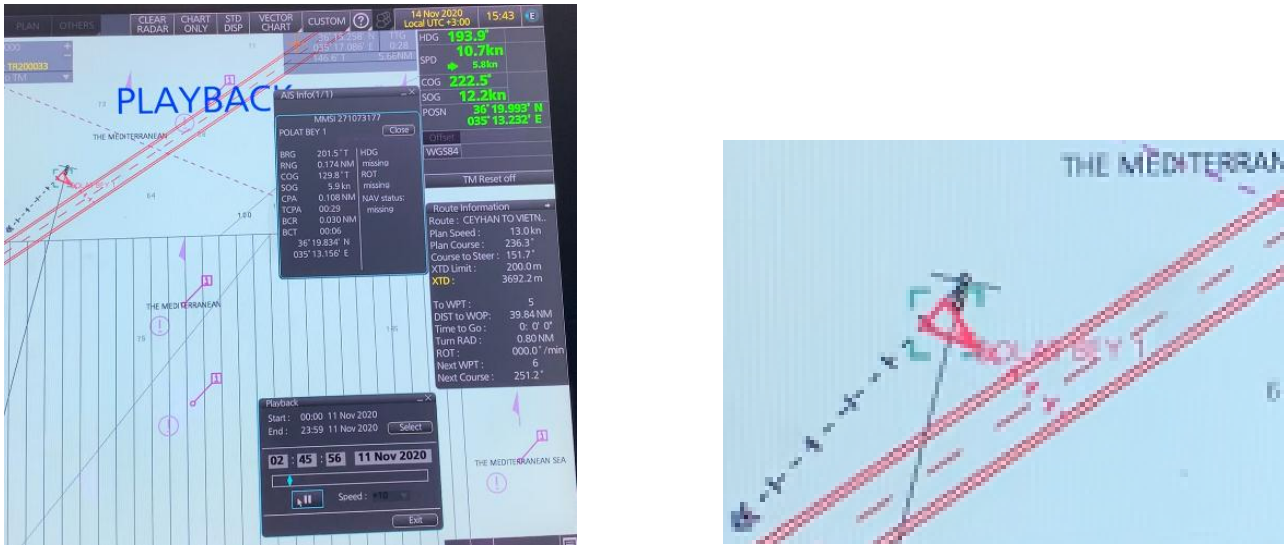


Figure 56: ECDIS deepiction at 05:46:56

At 05:46:06, POLAT BEY 1 and EPHESOS were crossing their courses. ECDIS screenshot depicts the following the collision situation (see **Figure 57**):

a) EPHESOS was under continuous maneuvering to port, rudder was set 30° to port. Her heading was recorded at 187.3° (COG 218.3°) and SOG at 12.0 knots (reduced due to continuous maneuver).

b) POLAT BEY 1, was recorded to had the same course of 129.8° (as 14 seconds before) and speed 5.9 knots;

Her distance from EPHESOS bow was recorded at 0.153 nm. Her relative bearing from EPHESOS is estimated close to 4° to starboard. CPA was recorded the same 0.113 nm. TCPA 00:22sec, Bow Crossing Range (BCR) 0.021 nm and Bow Crossing Time (BCT) 00:03 sec. The OOW reported that he noticed the red light of the fishing vessel in front of EPHESOS bow and then POLAT BEY 1 disappeared.

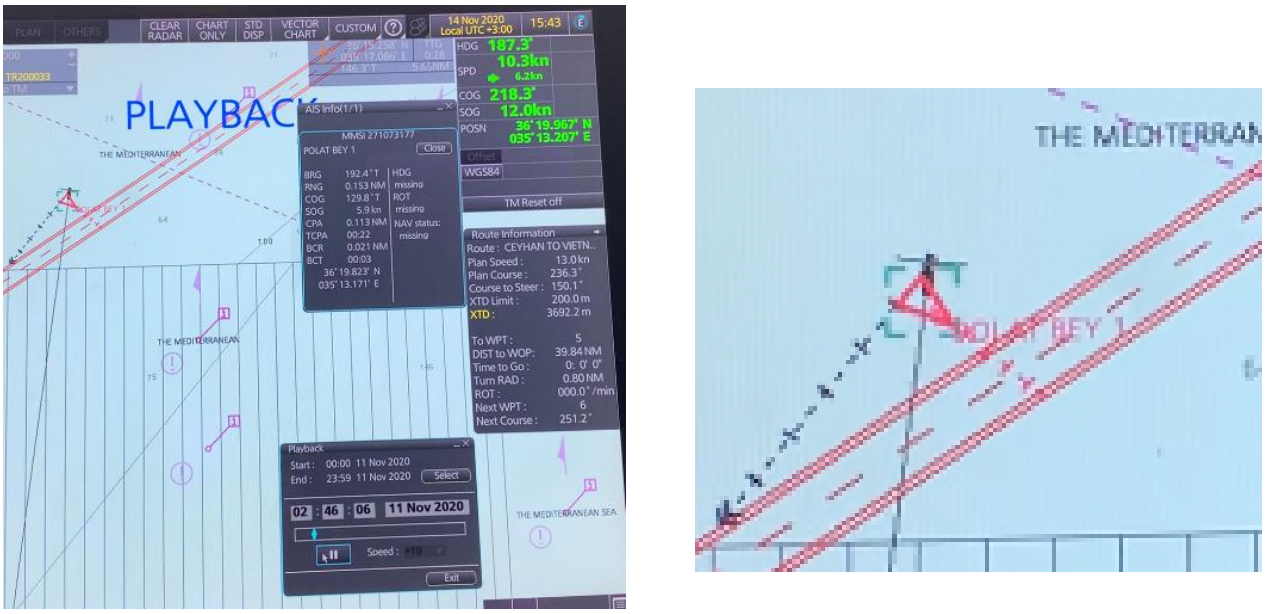


Figure 57: ECDIS 05:46:06.

At 05:46:16, as per ECDIS data POLAT BEY 1 and EPHESOS were captured in collision (see below **Figure 58**). By that time the helmsman reporter to the OOW the ruder setting to 30°: “steady 30”:

a) EPHESOS was still maneuvering to port, rudder was set 30° to port; her heading was recorded at 180.4° (COG 213.7°) and SOG at 11.7 knots (reduced due to continuous maneuver).

b) POLAT BEY 1, was recorded to have the same course of 129.8° and speed 5.2 knots. CPA was recorded the same 0.113 nm. TCPA 00:07. Bow Crossing Range (BCR) 0.000 nm and Bow Crossing Time (BCT) -00:04 (BCR and BCT figures leads to the conclusion that the collision had occurred).

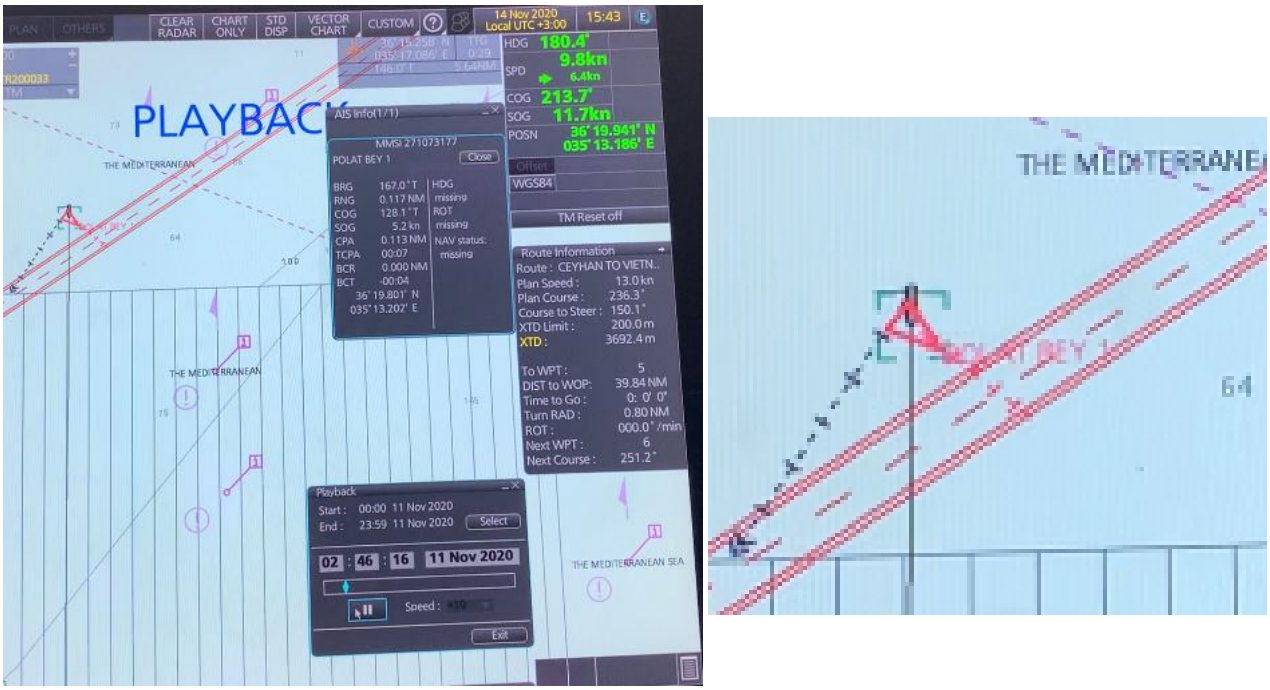


Figure 58: ECDIS recording at 05:46:16

At 05:46:26 the situation was about the same (see respective **Figure 59**). The OOW ordered “Midship” and the order was confirmed by the Helmsman: “Midship”

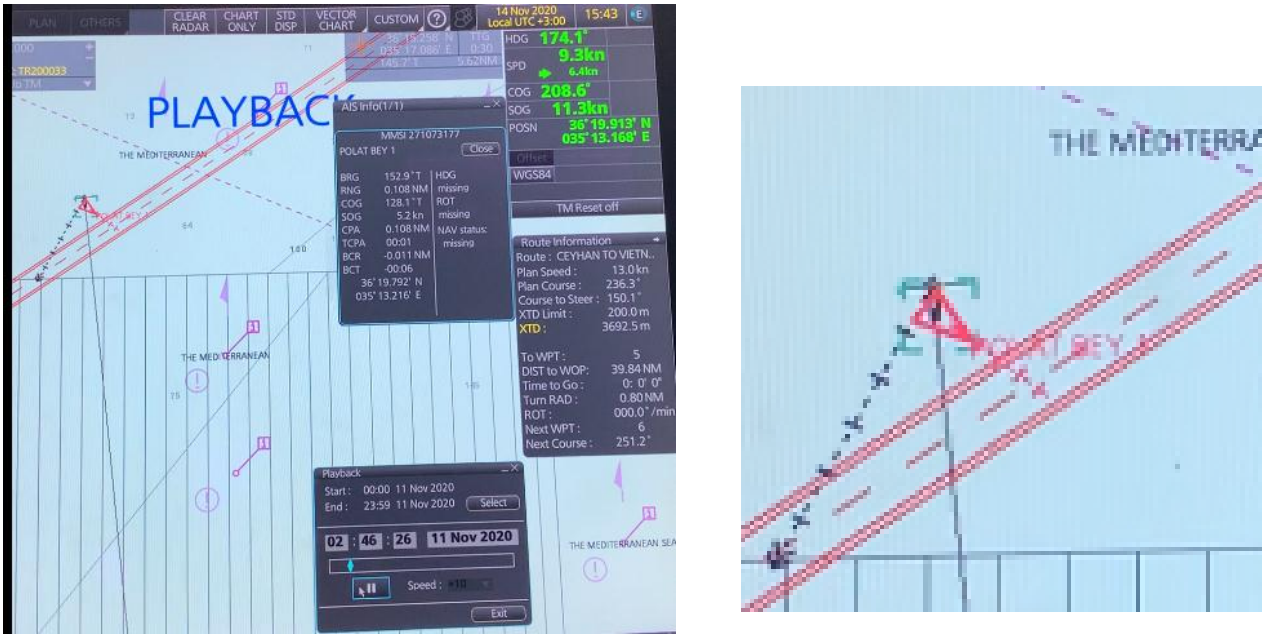


Figure 59: ECDIS depiction at 05:46:26

At 05:46:27 the Helmsman said: “Have fishing here Second”. It is presumed that he was referring to MAHMUTCAN 1. At 05:46:28 POLAT BEY 1 AIS and ARPA info disappeared from ECDIS display (see below **Figure 60**).

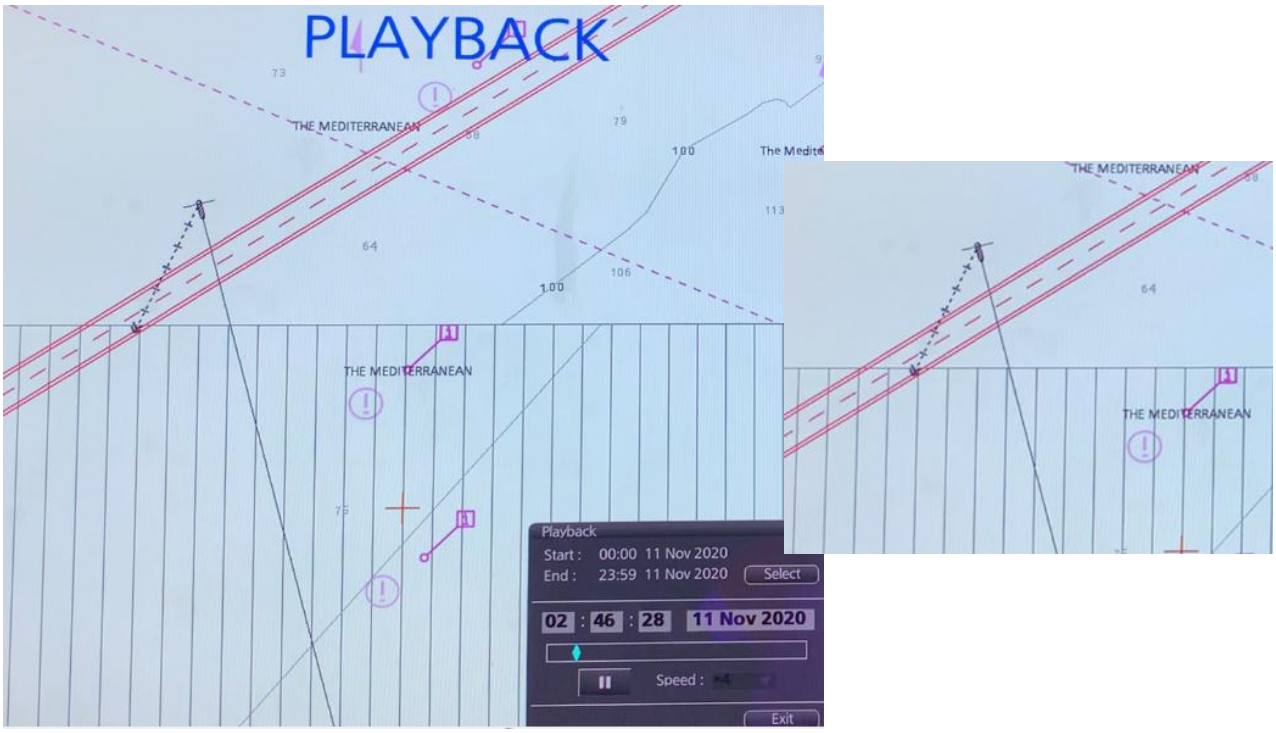


Figure 60: ECDIS at 05:46:28

3.5 Damages after the collision

During the accident investigation that was conducted on board the tanker EPHESOS, which was anchored at the international waters after the accident, her port bow was visually inspected (**Figure 61**).

The inspection identified scratches on her port bow, close to the waterline as well as at the edge of the anchor pocket. Due to the fact that EPHESOS had anchored with the port anchor, it was not possible to closely examine it. However the initial findings were further confirmed, after an internal inspection of the forward void space and fore peak tank was carried out by the class surveyor, who attended the vessel for that purpose at Gibraltar, after the safety investigation was concluded.

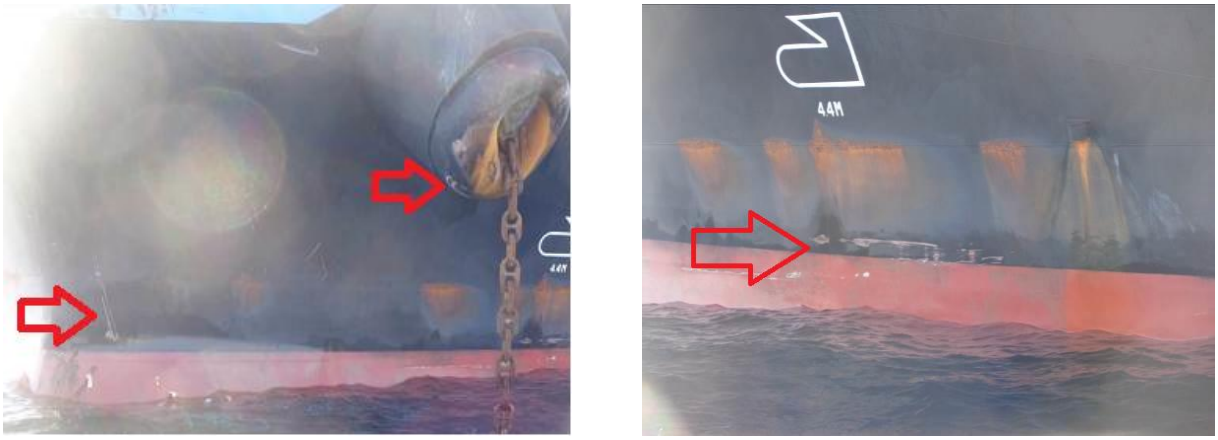


Figure 61: View of port bow. Paint and hull scratches are marked

During the inspection of POLAT BEY 1, it was found that POLAT BEY had sustained structural damages on her port superstructure. More specifically the port staircase of the

main deck leading to wheelhouse was damaged as well as the bridge superstructure (see **Figure 62**).

No penetration or damage on POLAT BEY 1 hull and main deck bulwark was detected.

Figure 62: Picture at the right:The damage sustained in the wheelhouse superstructure of POLAT BEY 1. Pictures at the left: Damaged area of POLAT BEY 1

Based on aforementioned findings it was concluded that M/T EPHESOS port anchor and anchor pocket struck on the port side of “POLAT BEY 1” at the point of bridge superstructure that forced her to list heavily to starboard, at a point that she lost her intact stability, allowing water ingress over the starboard bulwark or other deck openings that caused her total capsizing by 180°. POLATBEY 1 was severely damaged and became unusable as a result of the collision with the tanker.

3.6 HBMCI Safety Investigation –Cooperation with TSIC

On 11/11/2020 HBMCI notified all interested parties involved in the marine casualty as well as substantially interested Flag States, in line with the IMO Res. A. 1075 (28) and Casualty Investigation Code (Res. MSC 255(84)) as well as the European legislative framework applied by Dir. 2009/18/EC and Commission Regulation 1286/2011. HBMCI, as the Flag State of the vessel EPHESOS, has accordingly responded in order to collect information and evidence concerning subject marine casualty.

In view of Chapters 7, 10 and 18 of IMO Casualty Investigation Code, HBMCI called for an agreement with the esteemed department for Marine Casualty Investigation of the Transport Safety Investigation Center (TSIC) for the joint conduct of the safety investigation. However from the correspondence exchanged, an agreement for the Lead Investigative State was not deduced.

Therefore HBMCI launched 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, as the responsible authority of EPHESOS flag.

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.

4.1 EPHESOS

4.1.1 EPHESOS crew

EPHESOS was operating under a crew of two nationalities. The working language on board was English.

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 Master and Chief Engineer namely, 04 months on – 04 months off service while for all other Officers namely, 06 months on – 06 months off service. Rest of the crew was employed on a 7 months on -07 months off service.

4.1.2 Minimum Safe Manning (MSM)

According to EPHESOS Minimum Safe Manning Certificate issued by her Flag pursuant to Regulation V/14.2 SOLAS as amended, a minimum crew of 12 seafarers was required. EPHESOS was manned with 15 crew members in excess of Flag requirements. Crew certificates and endorsements were checked in relation with MSM and the Ship's article and found in order.

The redundant personnel was including capacities both of engine and deck department and specifically one (01) 2nd officer, one (01) 3rd Engineer, one (01) electrician, one (01) pumpman, two (02) OS, three (03) wipers, two (02) messman, one (01) engine cadet, one (01) deck cadet, one (01) cook and one (01) assistant cook.

4.1.3 Deck Department

Deck department consisted of five (05) Officers including the Master, four (04) Abs, two (02) OS and a Bosun. According to EPHESOS "Table of Shipboard working arrangement at sea" as listed below in table 1, only two (02) out of the four (04) ABs together with an OS were part of the bridge watch team during navigational watches and were posted as look out watch.

	Position/rank	Watchkeeping hours	Day working duties´ hours
1.	Master	-	08:00-17:00
2.	Chief Officer	-	06:00-18:00
3.	2nd Officer no.1	08:00-12:00 /20:00-24:00	13:00-17:00
4.	2nd Officer no.2	00:00-0400/12:00-16:00	08:00-12:00
5.	2nd Officer no.3	04:00-08:00/16:00-20:00	08:00-12:00
6.	AB 1	00:00-04:00/12:00-16:00	08:00-12:00 / 04:00-04:30 (accommodation safety round)
7.	AB 2	-	08:00-17:00 / 20:01-20:30 (accommodation safety round)
8.	AB 3	08:00-12:00/20:00-24:00	13:00-17:00 / 00:00-00:30(accommodation safety

			round)
9.	AB 4	-	08:00-17:00 /00:00-00:30 (accommodation safety round)
10.	OS 1	-	08:00-17:00/ 04:01-04:30(accommodation safety round)
11.	OS 2	04:00-08:00/16:00-20:00	08:00-12:00/20:01-20:30 (accommodation safety round)
12.	Bosun	-	06:00-18:00

Table 1. *EPHESOS deck shipboard working arrangement*

In the course of the interview process as well as from the electronic evidence being provided (e.g. VDR audio) it was emerged that the 2nd Officer no.3 together with OS 2 as a look out were carrying out their watch, monitoring the vessel's passage in compliance with required procedures applied on board and relevant COLREG regulations.

4.1.4 Examination of Crew rest and Work hours

The examination of the hours of work for the Second Officer and Ordinary Seaman, who were on watch when the collision occurred, did not identify any issues in relation to fatigue and resting hours. In addition, as per test carried out, neither Master nor the crew on the watch was found alcohol or drug intoxicated.

4.1.5 EPHESOS key personnel

.1 Master

Started his marine career with the Company of EPHESOS, as cadet, almost 30 years ago. He became a Master, with an in rank service of approximately 10 years. During his long standing career with the Company, he demonstrated high commitment and performance and he was never been involved in a marine accident. At the time of the incident he was not on the Bridge.

.2 2nd Officer no.3

He was 33 years old and had 1.6 years of seagoing experience and 20 months as a second Officer. It was his first contract with Ephesos Company. He had joined "EPHESOS" on 26 July 2020. His familiarization records were properly filled as per SMS manual provisions.

.3 OS

He was 31 years old and had 4 years of seagoing experience. He has been with the Company for 2.4 years with 1.6 years in the current rank. He joined "EPHESOS" on 21 August 2020. His familiarization records were properly being filled as per SMS manual provisions.

4.1.6 EPHESOS Main bridge equipment arrangement – conning position vision

.1 Main Bridge equipment

EPHESOS has a standard ergonomic bridge arrangement. The steering stand (the helm) was located at the back of Bridge center console (see **Figure 63**).

***Figure 63**. The helm*

The center console was fitted with the main bridge equipment, like AIS, auto pilot, and engine control lever.

EPHESOS bridge was also fitted with two radars. One S-Band radar (3GHz) fitted with an automatic radar plotting aid (ARPA) was mounted at the starboard of the center console and one X-Band (9 GHz) radar fitted also with ARPA was located at the port of the center console. (see **Figure 64**).

EPHESOS voyage planning and monitoring of its course were performed by two ECDIS systems. ECDIS No.1 was mounted next to S-Band radar and ECDIS No.2 next to X-Band radar. Two VHFs were also fitted at the starboard console.

A Bridge Navigational Watch Alarm System (BNWAS) system was installed on the starboard console.
Two GPS were installed at the port corner console, next to the chart console[3].

[3] The chart console is not used since EPHESOS according to its Safety Equipment certificate does not use paper charts.

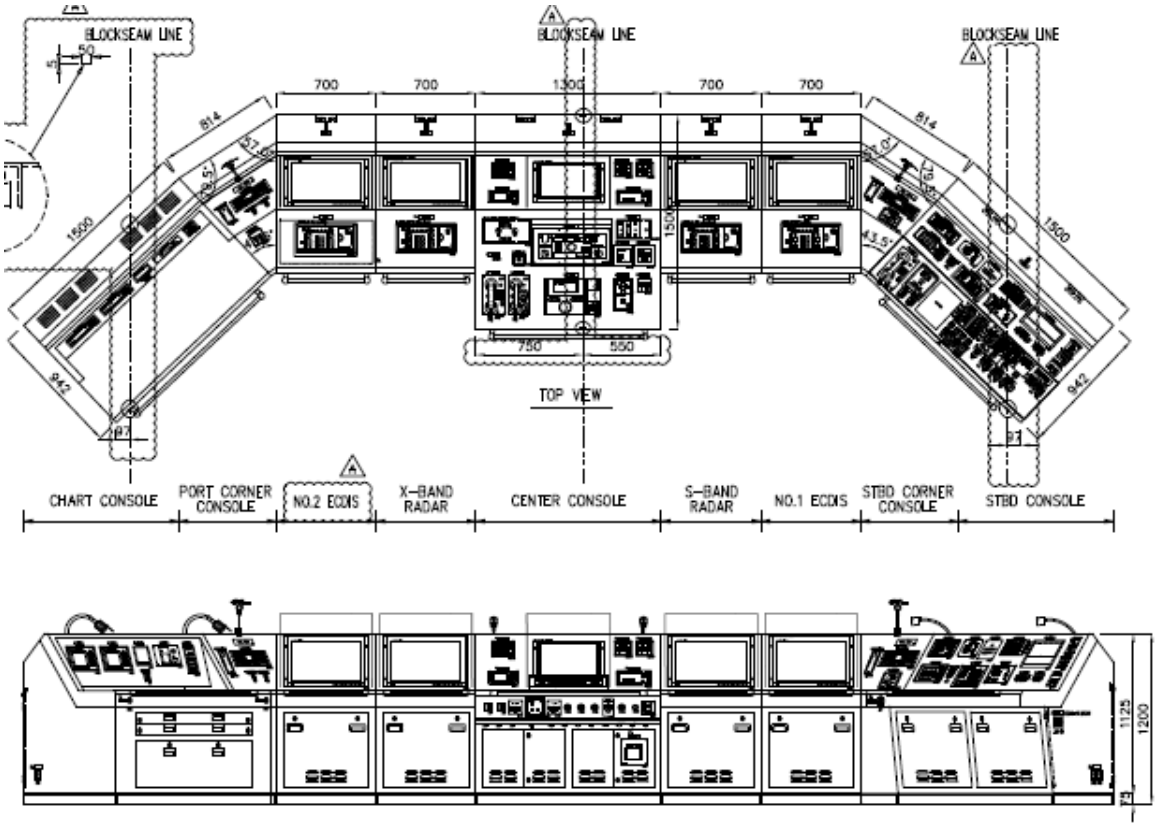


***Figure 64**. EPHESOS bridge arrangement.*

.2 Conning position's vision

EPHESOS wheelhouse structural arrangement offered a very good horizontal field of vision from the conning position to the navigated sea area ahead (see **Figure 65**).
The OOW could maintain a very good visual contact and monitoring of head on vessels with reciprocal or crossing courses on her port bow or abeam.

In the view of the above the OOW could observe and monitor MAHMUTCAN and POLAT BEY 1 crossing courses on EPHESOS port bow at all times before the collision.

***Figure 65**. EPHESOS´s bridge horizontal field of vision.*

4.2 POLAT BEY

4.2.1 POLAT BEY crew

POLAT BEY 1 was operating under a crew of one nationality and the working language on board was Turkish. At the time of casualty POLAT BEY 1 was manned with two seamen, the Skipper and an AB. Three more crew members were working as fishermen on board, but were not included in the minimum safe manning of the vessel which was found to be compliant with national legislation issued by the flag state administration. Crew certificates and endorsements were checked and found in order.

4.2.2 POLAT BEY key personnel

.1 Skipper

He had finished the primary school on 1974 and took his COC as AB on 18.07.2017. According to Turkish legislation, AB can work as skipper at fishing vessels. His total experience was namely 9 months 22 days as a deck boy, one year and 8 days as a seaman, and 4 years 4 months as an AB.

.2 AB

He had also finished the primary school and took his COC as AB on 14.06.2017. His total sea experience was 17 years, 15 years of which working as an AB.

No more information on the working experience for the rest three crew members of POLAT BEY 1 were provided.

4.2.3 Examination of crew rest and work hours

The examination of POLAT BEY's 1 work and rest hours was not feasible, since the vessel capsized and all crew members died as a result of the collision. However it should be stressed that the vessel was already at sea for almost 40 ½ hours before the collision occurred, as already stated in par.3.2, in the narrative section of this report.

Furthermore, as per provided test records, neither the skipper nor the crew was found alcohol or drug intoxicated.

4.3 Navigational procedures

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

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

Said procedures could be directly related to the set of the instructions stemming from the "Bridge Resource Management"[4] requirements correlated also with Master's standing and night orders.

Based on the above principal provisions the company had adopted a policy whereby all vessels under its management navigate in accordance with the procedures documented in the **Navigation & Anchoring Procedures Manual (NAP)**. These procedures stipulate the minimum required standards for the safe navigation of its vessels. The company had also adopted the concept of Bridge Team Management whose primary goal was the elimination of "one person error".

Concerning OOW responsibilities the manual described the following:

- Safe navigation of vessel.
- Safety of personnel.
- Pollution Prevention.

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

- Maintaining standards and requirements of good seamanship.
- Compliance with COLREGS and local regulations that are relevant to navigation.
- Considering Company requirements.
- Compliance with Master's Standing Orders and Bridge Order Book.
- Keeping of proper lookout.
- Familiarisation and understanding of various underway watch conditions and resulting responsibilities.

4.3.1 Safe Navigation of the vessel

EPHESOS NAP manual stated that the Master was responsible for the vessel's safe navigation. However, this responsibility also extended to officers and crew, who were required to always be on the alert to prevent incidents. It was the duty of each crew member observing any situation which they felt may endanger the safety of personnel, the vessel, the environment, or the cargo, to report their observations to the Officer of the Watch, or if circumstances dictate, to the Master[5].

Therefore the Master was tasked with assigning and adjusting navigational watches, based on conditions of navigation (e.g. ocean, coastal waters[6]), traffic density and state of visibility. To help the Master in his tasks the NAP manual described the number of crew required to form a navigation watch. For the examined marine casualty, the recommended watch condition (BWIII) and number of crew required are shown in **Figure 66**:

Bridge Watch Condition		Conditions		Master	OOW	Additional OOW	Look-Out	Helmsman	Additional Look-out	Engine	Helm
		Traffic	Visibility								
BW III	Coastal Waters	No or Moderate	Clear weather							U	A
			Restricted visibility	Option		Option		Option		M	Option
		Heavy	Clear weather	Option		Option		Option		U	Option
			Restricted visibility			Option			Option	M	H

Figure 66: EPHESOS bridge composition (BWIII), under the conditions existed before the marine casualty.

Additionally relevant sections of the NPM on maintaining a safe navigational watch were summarized and recorded by the Master as standing and night orders. These instructions were signed by all navigation officers as having been read and understood.

[5] This working practice is called "stop work authority" and its primary goal is to establish a culture when all employees are provided with the power to stop work in a situation when there is a belief that: a) people including colleagues, co-workers, other personnel are at risk or in danger. b) the safety of the operation is questioned and a possibility of a damage to the vessel or injury exists. c) There is a possibility of environmental damage.

[6] According to the Company's NAP manual, coastal waters were defined as navigating within 20 miles of the coast or inshore of the 50 meter depth contour.

4.3.2 Master's Standing Orders

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

- *The first and foremost duty of the OOW is keeping a GOOD LOOKOUT, using all means available, visual audible and electronic. The OOW should not be left alone at any time. (except while vessel is safe alongside at berth) it is self-explanatory.*
- *The international regulations for preventing collisions at Sea are to be strictly observed. Do not hesitate to use the whistle or engine or any other available equipment in obeying these Regulations. When altering course for another vessel do so boldly and in sufficient time to let any other vessel be in no doubt as to your intentions.*
- *SPEED: Do not hesitate to alter ship's speed in any case (i.e. in traffic congested areas, in confined waters, in TSS) you consider safe to do so, In any significant speed alteration, Engineer on duty should be informed. When speed limitations are imposed by the Local Authorities the vessel should strictly comply with.*
- *Watch keepers are to use all means and opportunities in order to establish the ship's position. The positions of all course alterations are to be logged. Officers are to familiarize themselves with the operations, scope and limitations of bridge navigational equipment, especially electronic. This means studying the manufacturer's operational manuals provided.*
- *Officers are to read the Company Regulations and carry out the duties prescribed therein.*
- *I expect you to call me on Bridge immediately in the following circumstances:*

  a. In the event of a restricted visibility less than …..NM

  b. When there is heavy traffic in the vicinity.

  c. If the CPA is less than 2.0 miles and TCPA less than 30 minutes. If you are in doubt as to another vessel's intentions, or if the bearing of any vessel at either side is steady.

  ……..

  j. In any other situation about which you are in doubt.

  k. In case of an emergency or near emergency.

4.3.3 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 specific navigational hazards, and so forth.

.2 EPHESOS night Orders were written down at the night of the marine casualty, signed by all navigation officers and stated among others the following:

- *Keep extra lookout for fishing vessels.*
- *Keep CPA of 2.0 nm from other vessels.*
- *Call me in case of emergency or near emergency.*
- *Maintain proper lookout by sight and hearing using all available means.*
- *Always be vigilant your watch especially at night time.*
- *Time spent to chart room is to be limited to essential navigational duties.*
- *Call me on failure to sight land or a navigational mark or to obtain soundings by the expected time or a land or a mark is sighted unexpectedly or a unexpected reduction of sounded depth contour.*
- *Call me if you are in any doubt.*

4.3.4 Calling the Master

At the night of the collision the abovementioned standing and night orders were in force as EPHESOS was sailing at coastal waters and weather conditions were very good. The OOW and OS acting as a look out were in the bridge complying with the required Bridge Watch condition (BWIII), and were monitoring the course of fishing vessels located at the port bow in order to notice any course alterations.

The navigational instructions were explicit and defined safe distances of CPA in various situations and dictated early actions with the fishing vessels involved in EPHESOS safe passage. Such situations could include head on with reciprocal courses, cross track, close quarter with minimum CPA and calling the master, when other vessel's CPA decreased less than 2 n.m or when OOW was in doubt for other vessel's intentions.

It is inferred that even though standing and night orders were signed by the OOW and were well understood, the Master was not called on the bridge when CPA from MAHMUTCAN and POLAT BEY 1 decreased well below 2.0 nm.

Indicatively at 05:33:28 and at 05:34:37 almost 12 minutes before the collision, when the OOW called repeatedly MAHMUTCAN 1 on VHF yet without any reply, MAHMUTCAN 1 was not keeping a steady course sailing at a distance of less than 2 nm off EPHESOS bow and at about 10° to her port bow. However, the Master was not called on the bridge as ultimately MAHMUTCAN 1 responded and moved away from EPHESOS course by altering her course to starboard, while her speed was reduced to 3 knots.

However, POLAT BEY 1 took no effective actions to avoid a "close quarter situation". At 05:36:06, almost ten minutes before the collision and within the next minute, POLAT BEY 1 course has been altered to port by almost 20^0 and her course was recorded according to ECDIS from 50.5° to 30.3^0, with a CPA ranging from 0.165 nm to 0.122nm. At 05:37:30

POLAT BEY changed again her course to starboard and more specifically to 035.3^0. At 05:38:16, the OOW called again POLAT BEY 1 two times on VHF, in order to communicate and draw skipper's attention; At 05:40:06 the OOW signaled with the ALDIS lamp. Nevertheless, despite the fact that he did not receive any reply or respond, and clearly POLAT BEY was not keeping a steady course due to ample alterations while she was anticipated to cross EPHESOS passage and her intentions were not known, the Master was not called again on the bridge.

In the view of the above mentioned it was evident that despite the fact that the bridge was adequately manned when OOW initially spotted the fishing vessels at approximately 05:20 at EPHESOS port bow, the situation 20 minutes later has changed posing an imminent danger to EPHESOS course. Consequently, not calling the master in contrast to the required standing and night orders had an impact on the vessel's safe navigation and stretched the human recourses available to the OOW.

Moreover, the bridge team management policy adopted by the company for the elimination of "one person error" was not effectively implemented. The OS acting as a lookout did not apply the stop work authority to call the Master, since EPHESOS was encountering a close quarter situation, and the bridge team was in doubt as to the intentions of POLAT BEY 1. The above are considered contributing factors to the examined marine casualty.

4.4 Actions to avoid Collision - COLREGs

4.4.1 EPHESOS

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 2.

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 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.
4.	**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.
5.	**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.
6.	**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.
7.	**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.

Table 2*. COLREGS that apply on examined case.*

Taking into account the electronic data obtained from ECDIS and VDR as well as VTS recordings, EPHESOS was under a continuous course alteration to starboard from 05:20 until the next 15 minutes, based on the marine traffic situation in the navigating sea area to clear off the fishing vessels at her port bow that were evident not to be engaged in fishing (see **Figure 13**) [7]. At 05:25 POLAT BEY 1 was heading at an estimated course of 67^0, that is almost a reciprocal course in relation to EPHESOS. During the development of the situation until POLAT BEY 1 crossed EPHESOS heading, at 05:44:36 (**see Figures 44, 45, 46**), she was following various courses from 067^0 to 16.2^0, with a speed almost to 6 knots.

[7] Examining the various courses and speed of POLAT BEY 1 and MAHMUTCAN that was sailing close to POLAT BEY 1, they appear not be engaged in fishing and thus are considered as "power driven vessels" according to Rule 3 of COLREG. Targets no.5 and 6 appeared to be engaged in fishing however their courses did not affected the casualty situation.

While the fishing vessel was steaming in a “crossing situation”, EPHESOS would see POLAT BEY 1 to her port bow signaling the green navigational light, and POLAT BEY 1 would see EPHESOS to her starboard bow signaling the red navigation light. In this situation COLREG rule 15 applies and therefore the fishing vessel was the “give away” vessel and her skipper should have taken action to avoid crossing ahead of EPHESOS and to keep clear off her passage. Despite the fact that EPHESOS was the “stand on vessel” when POLAT BEY 1 and MAHMUTCAN were seen 5 to 6 nm on her port bow, the OOW started altering the vessel’s course. This course alteration resulted to a new heading at about 249^0 to 250^0 that is 13^0 in total from the planned course of 237^0, which is considered an effective avoiding action to avoid any close quarter situation, provided that give away vessels follow COLREGs.

The situation became alarming when, despite the fact MAHMUTCAN had altered her course, POLAT BEY 1 continued to follow variable courses and was actually heading unreasonably towards EPHESOS heading. At 05:42:36, as per VDR recordings, the OOW taking into account that POLAT BEY 1 was not responding to VHF calls and ALDIS signals and her course was not steady due to ample alternations, ordered the OS on the watch to manual steering and maneuvered to port as a last action to avoid the collision.

As resulted through the evidence obtained from EPHESOS VDR, the decision taken by the OOW to alter course to port to avoid the collision, given the circumstances at that time, was considered the most appropriate one as Rule 17 (c) stipulates. As it was proven it was also the most effective one, since POLAT BEY had already crossed the course of EPHESOS at 05:44:46, that was under collision avoidance maneuvering to port by 20^0 rudder set (see **Figures 47, 48**). It was also derived that EPHESOS maneuvering to port, were large enough and in ample time according to Rule 8(e). EPHESOS maneuvering to port gave sea room and allowed POLAT BEY 1 to cross her heading despite the fact that she was the “stand on” vessel. EPHESOS course was captured at 231.7° (COG 242.3°) and speed 13.3 knots. Bow Crossing Range was recorded to -0.542 nm, and the situation was cleared since POLAT BEY 1 had already passed EPHESOS stem post and was navigating clear on EPHESOS starboard bow quarter heading NNE (see **Figure 49**).

Nevertheless it became alarming again at 05:44:56 that was about 70 seconds before the collision, as per ECDIS data, due to the fact that POLAT BEY 1, unexpectedly made a large course turning to starboard by 66.2^0 (see **Figure 49**). It was apparent that the maneuvering actions by POLAT BEY 1 were unforeseen by the OOW and not compliant with the applicable COLREGs. Even at that time OOW counteracted and apart from the fact that he called POLAT BEY 1 on VHF and signaled with the ALDIS, ordered 30^0 to port, as a last action to avoid collision in compliance with Rule 17(a) (ii) and 17 (b).

4.4.2 POLAT BEY 1

Taking under consideration the evolution of the events in the examined case, as presented in the narrative section of the report, and analyzed in the previous paragraph 4.4.1, it was emerged that despite the fact that “a close quarter situation” has been developed from approximately 05:40:16 until 05:44:46, due to EPHESOS maneuvering actions ultimately the f/v had passed at a close distance (3-4 cables) ahead of EPHESOS bow. As recorded above POLAT BEY 1 helmsman or Skipper had changed course at 05:44:56 by 66.2^0 to starboard and by that time the f/v was heading again towards

EPHESOS course that was under maneuvering to port. This action to unreasonably alter the course caused a new “close quarter situation” and actually put EPHESOS on a threatening new collision course. Moreover apart from this impetuous act, the helmsman continued altering POLAT BEY 1 course further to starboard reaching 116.60, as recorded in EPHESOS ECDIS (see **Figures 52, 54**) while she was ranged less than 0.2 nm off EPHESOS bow.

At that time EPHESOS OOW turned her rudder further to port at 30°. However this time the collision was unavoidable, considering that POLAT BEY 1 was navigating as if she was not in collision course with Tanker EPHESOS, did not take any avoiding actions, despite the fact that she could easily turn again hard to starboard making a bold course alternation, an action which is considered easy based on her length and maneuvering characteristics

Despite EPHESOS action to set the rudder 30° to port and due to POLAT’s BEY 1 helmsman sudden course alternation and his failing to apprehend the danger of collision, the situation became threatening and the collision imminent.

In terms of the above it is suggested that POLAT BEY 1 sudden alteration of course heading towards EPHESOS, disregarded the respective COLREG’s. Therefore it can be inferred that the failure of POLAT BEY 1 to act according to relevant COLREGs, is considered a contributing factor to the accident.

4.5 The Look-out

4.5.1 EPHESOS

As already analyzed in par. 4.3.1, company’s NAP manual described the recommended watch condition (BWIII) and number of crew required, under specific voyage conditions to perform the bridge watch. As stated in the manual the OOW and a look-out were required to carry out the bridge watch under clear weather conditions, navigating in coastal waters and when heavy traffic was expected, whereas there was an option for an additional OOW and a helmsman or even the Master to be called upon, if the OOW considered that further assistance was required.

Rule 5 of COLREGs stipulate that:

“Every vessel shall at all times maintain a proper look-out 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”

Moreover the principals of a look-out are referred also in Part 4-1 of Section VIII/2 of STCW convention as follows:

“ 14. A proper look-out shall be maintained at all times in compliance with rule 5 of the International Regulations for preventing Collisions at Sea, 1972……

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

16. the duties of the look-out and helmsan are separate…..”

EPHESOS course alteration to starboard started at 05:20 that is almost 26 minutes before the collision occurred, when the OOW spotted a group of fishing vessels at her port bow at a distance of 5-6 nm ahead. This indicates that the continuous manoeuvre was an action to avoid any "close quarter situation" and any risk of collision.
Considering the evolution of the events that lead to the collision, as presented in the narrative section of the report, it was evident that the OOW was continuously monitoring the course of the fishing vessels and more specifically the closest to EPHESOS passage targets MAHMUTCAN and POLAT BEY 1.

At 05:35, 11 minutes before the collision, 2nd officer called POLAT BEY 1 three times with no response. POLAT BEY 1 was acquired on ARPA and was observed to have a clear pass (see **Figures 27, 28, 29, 30**). At that time MAHMUTCAN 1 was maneuvering to starboard making a large course alternation moving away from EPHESOS passage. On the other hand, POLAT BEY 1 was continuing to navigate towards EPHESOS course.

Based on the navigational data (course and speed) of POLAT BEY 1 as plotted on ECDIS, the OOW presumed that vessel's course would not result to a dangerous "crossing situation" on the grounds that the Bow Crossing Range (BCR) indication was recorded at -1.251 nm; -1.438 nm; -1.121.nm; and -0.799 nm respectively. It is noted that the symbol (-) denotes that the acquired fishing target bow will cross the course track (pass clearly from the aft) of the vessel and will not cross her heading.

At 05:42:36, as per VDR recordings, the OOW, taking into account that POLAT BEY 1 was not responding to VHF calls; ALDIS signals; and her course was not steady due to ample alternations, ordered the OS on the watch to switch to manual steering.

EPHESOS OOW took actions and changed course firstly by setting the rudder 5^0 to port, then 10^0 to port, then 20^0 to port and 30^0 to port, to give a safe passage to the fishing vessel. It was also evident that the time before the collision, OOW was calling through VHF and also used ALDIS lamp to attract the fishing vessel's crew attention so as to alarm them, however with no results. In terms of the above it is concluded that look-out on board M/T EPHESOS was effective as per COLREG's.

4.5.2 POLAT BEY 1

There was no tangible proof that the Skipper or the AB on board were on the bridge acting as a look-out, according to the manning certificate of the vessel, as all crew of the POLAT BEY 1, unfortunately passed away. However it was evident from the electronic evidence collected that the helmsman or Skipper did not conduct a proper look-out and could not perceive POLAT's BEY 1 navigation and projected courses as the "give away vessel" in relation to EPHESOS headings and maneuvers, as the "stand on vessel" as well as her position and navigation shown by the masthead lights and sidelights and the corresponding aspect of EPHESOS. The fact that POLAT BEY 1 was navigating as she had not received any VHF calls and visual warnings by ALDIS from the tanker suggests that no proper look-out by sight and hearing was carried out on the fishing vessel.

Therefore it is suggested that POLAT BEY 1 could not evaluate the unfolding situation and consequently was not acting according to COLREGs and good seamanship. The inappropriate conduct of POLAT BEY 1 look-out is considered a contributing factor for the casualty.

4.6 Safe Speed.

4.6.1 EPHESOS

Avoiding collisions is a three-stage process which is contained in Rules 5 (look out), 7 (Risk of collision) and 8 (Action to avoid collision). Therefore reducing a vessel's speed or even stop her engine should be examined under the following framework:

1. *Detect and observe the approach of other vessel (Rule 5).*
2. *Appraise the situation and the risk of Collision (Rule 7).*
3. *Take timely and large enough avoiding action (Rule 8).*

At 05:35:50, 10 minutes before the collision, 2nd Officer called POLAT BEY 1 three times with no response. POLAT BEY was acquired on ARPA and was observed to have a clear pass (see **Figures 27, 28, 29, 30**). At 05:40 and 05:42 the fishing vessel altered her course to port two times by almost 10^0 each time, instead of starboard to avoid the collision according to COLREGs, and tried to cross ahead of the tanker's bow. At that time EPHESOS OOW took actions and changed course by firstly setting the rudder 5^0, then 10^0 to port, 20^0 to port and finally 30^0 to port to give a safe passage to POLAT BEY 1. It is also evident that the whole time before the collision, OOW was calling through VHF and also used ALDIS lamp to attract Skipper's and crew's attention.

At that time reducing speed could have been an option for the OOW, however due to the evolving situation and the distance between the vessels (0.396nm-as shown in Figure 49), steering maneuvering was seen as a best option to avoid collision, considering the emergency slowing down and stopping characteristics of EPHESOS. It is noted that according to EPHESOS emergency stopping characteristics with a speed of 13,6 knots in loaded condition, if the engines was set from full ahead to stop, the distance to stop would be 2nm. If the engine was set from full ahead to full astern, the stopping distance was estimated to 1.8nm.

Moreover, it is questionable whether the collision would have been avoided even if the OOW had slacken EPHESOS speed or even stopped the vessel's engine due to the sudden and erratic maneuvering by POLAT BEY 1, in contravention to COLREGs, since POLAT's BEY 1 helmsman could not comprehend the situation and act accordingly.

4.6.2 POLAT BEY 1

Based on the electronic evidence, as presented in the narrative section of the report, the speed of the fishing vessel remained constant close to 6 knots until the collision. Taking into account POLAT's BEY 1 ample variations of course, it was deduced that most probably vessel's navigation was focused on seeking fish rather than avoid the collision. It was clear that POLAT BEY 1 did not take any actions to reduce speed or even stop her engine that is considered an action that would result in immediate slacken of speed, taking into account her maneuvering characteristics as a boat of 21.5 meters of length.

It is noted that despite the fact that vessel's speed remained constant, at approximately 05:42 four minutes before the collision, the fishing vessel had ample room to manoeuvre to starboard instead of port to avoid the impact with EPHESOS. The only fishing vessel close to POLAT BEY 1 at that time was MAHMUTCAN 1, at approximately 1 nm distance as can be estimated through EPHESOS ARPA data (see **Figure 38**). This distance allowed the fishing vessel to maneuver hard to starboard at any time before she crossed EPHESOS course, or hard to port after crossing EPHESOS heading. Turning circle of

such types of boat with 21.5m of length is estimated to approximately 50m to 60m, considering that she was not engaged in fishing-trawling.

However at 05:44:56, as recorded in ECDIS, POLAT BEY 1, despite the fact that had passed clear off EPHESOS stem post and heading, navigating at approximately 16.2° (NNE), suddenly altered her course to starboard and started heading to 82.4° (see **Figure 49**). The alteration of course to starboard side by POLAT BEY 1 after crossing EPHESOS course, instead of the port side is considered to be one of the safety factors that caused the marine casualty.

4.7 Use of Warning Signals

4.7.1 EPHESOS

The Officer on Watch of the tanker EPHESOS noticed the fishing vessels, which he guessed to be five or six in number, on the port side of the tanker within about six-seven nautical miles at around 05:15. A few minutes later, at 05:20 he discovered that one fishing vessel was sailing towards the course of EPHESOS. Subsequently, he began to alter the course of the tanker slightly gradually towards the starboard side to clear off the fishing vessel and thereafter called the fishing vessel MAHMUTCAN, which was sailing towards the course of the tanker, and then the fishing vessel POLATBEY 1, with which she was collided, through VHF. However, the fishing vessel MAHMUTCAN 1, which he first called through VHF, did not respond to the calls of the tanker but moved out of the tanker's course. However POLAT BEY 1 continued to navigate towards EPHESOS course.

Taking into account the evidence presented in par.2.4 of the report (Emergency report actions), it was concluded that the fishing vessels at the area of the marine casualty following the collision, were not replying to AKDENIZ VTS Sector calls, most probably because they either had their VHF devices off or had turned the volume button down. Respectively it is highly possible POLAT BEY 1 to have followed the same practice before the collision, since most probably was seeking fish.

EPHESOS OOW took actions to attract attention and alert the Skipper and crew of POLAT BEY 1 by signaling with the ALDIS. However his actions had no results.

Therefore it is considered that the Officer on Watch of the tanker EPHESOS could alert the fishing vessels for the hazardous situation except using the light signals to attract attention, by operating the vessel's whistle, as Rule 34(a) or (d) or Rule 36 of COLREG specifically stipulates:

COLREG Rule 34 (a):

"When vessels are in sight of one another, a power-driven vessel underway, when manoeuvring as authorized or required by these Rules, shall indicate that manoeuvre by the following signals on her whistle:

- one short blast to mean 'I am altering my course to starboard ';

- two short blasts to mean 'I am altering my course to port ';

d). When vessels in sight of one another are approaching each other and from any cause either vessel fails to understand the intentions or actions of the other, or is in doubt whether sufficient action is being taken by the other to avoid collision, the vessel in doubt shall immediately indicate such doubt by giving at least five short

and rapid blasts on the whistle. Such signal may be supplemented by a light signal of at least five short and rapid flashes.

COLREG Rule 36:

"Signals to attract attention.

If necessary to attract the attention of another vessel any vessel may make light or sound signals that cannot be mistaken for any signal authorized elsewhere in these Rules, or may direct the beam of her searchlight in the direction of the danger, in such a way as not to embarrass any vessel. Any light to attract the attention of another vessel shall be such that it cannot be mistaken for any aid to navigation. For the purpose of this Rule the use of high intensity intermittent or revolving lights, such as strobe lights, shall be avoided."

In this way he could raise the situational awareness of the fishing vessels around, primarily including the fishing vessel POLATBEY 1. The fact that OOW of EPHESOS did not use sounds signals as specifically are regulated by COLREG is considered a contributing factor for the marine casualty.

4.8 The Use of VHF and the role of VTS

While there are standard rules to be followed in order to avoid a collision, as analysed in the previous paragraphs of this analysis section, there are no rules governing the use of VHF in the COLREG convention. This is due to the fact that, the advantage of being able to communicate with others vessels through VHF in order to clarify their intentions in a "close quarter" situation thus avoiding collisions, in practice can become a drawback. For example, is accustomed the OOW on the bridge not to be able to communicate efficiently in a common language (e.g. English), or the crews of the fishing vessels not to speak any language other than their own. Consequently many times communication through VHF is considered a loss of time and even more can lead to potentially dangerous situations.

As stated before, the OOW on board EPHESOS tried several times to establish a VHF communication with POLAT BEY 1, however with no result. The safety investigation conducted had shown that both vessels did not seek any navigational assistance from VTS, in order prompt action to be taken at an earlier stage, thus avoiding a close-quarter situation to be developed. This is considered a contributed factor for the marine casualty.

Moreover considering the above it is further suggested that VTS involvement has to be examined, analyzed and highlighted respectively.

The Directive on Vessel Traffic Services in Izmit, Izmir, Mersin, No. 36935900-010.07.02-E1367 dated 06.09.07, issued by the Turkish Ministry of Transport Maritime Affairs and Communication, Kocaeli Port Authority specifically states in Article 8 par.2 that:

"Vessels in this group (e.g. passive participant vessels which in this case are the fishing vessels) should get out of the route of active participant vessels (in our case M/T EPHESOS) and should not create risks for these vessels. They will act in compliance with provisions of COLREGS and other relevant legislation".

Taking into account that the primary goal of the VTS is to improve navigational safety, as well as the safety of people, property and the environment, by providing information, traffic data, and navigational assistance services with regard to actively participating ship traffic, within the context of national and international regulations, it is noted that VTS

could have been involved advising or instructing in time both vessels. Such instructions could have been to either avoid EPHESOS course, given that POLAT BEY was the "give away vessel" or any other advice or instruction deemed necessary.

Therefore it is suggested that the intervention from the relevant VTS service becomes even more important where possible language barriers may exist between national fishing or other type of vessels and international vessels that can hinder the direct communication through VHF. Under this respect the non involvement of the VTS is considered a contributing factor into the marine casualty.

4.9 EMSA's Safety analysis on Navigation Accidents

On October 2022, EMSA published a safety analysis based on navigation accidents which have been reported in EMCIP[8]. This technical report under a specific methodology developed by the Organisation, presents the findings of the safety investigations with the view to detect potential safety issues, the factors that contributed to the occurrences and the remedial actions suggested to prevent similar occurrences in the future[9].

Following an assessment of the data imported in EMCIP, nine safety issues which directly or indirectly had contributed to navigation accidents have been identified, with the most common among others being[10]:

- Work / Operation Methods (36.3%).
- Organisational Factors (18.9%) and
- Individual Factors (7.3%).

Concerning Work/Operation methods, the safety analysis highlighted similar contributing factors with the safety investigation carried out by HBMCI and specifically the following:

- Bridge Resource Management (BRM) Coordination.
- Work methods and supervision. (e.g. stop work authority)
- Communications (External) (e.g. with other vessels, VTS)
- Coordination with 3rd parties (e.g. VTS).
- Communications (Internal) (e.g. calling the Master).
- SMS implementation on board (e.g. keep CPA 2 nm, stop work authority).

Two organisational factors, which were also identified in this safety investigation report, included among others:

- Compliance with regulations and standards. (e.g. STCW)
- Resource Availability (e.g. absence of Master in an emergency situation)

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[8] The European Marine Casualty Information Platform (EMCIP) provides the means to store data and information related to marine casualties and incidents involving all types of ships, including occupational accidents related to ship operations. It also enables the production of statistics and analysis of the technical, human, environmental and organisational factors involved in accidents at sea.

[9] The full safety analysis can be found on EMSA's website:https://www.emsa.europa.eu/newsroom/latest-news/item/4830-safety-analysis-of-emcip-data-analysis-of-navigation-accidents.html

[10] The other safety issues are linked to: Risk Assessment (10.4%), Environment (8.5%), Tools & Hardware (7.1%), Competence & Skills (4.2%), Emergency response (3.7%) Operation planning (3.5%).

Moreover several individual factors, like the physical and psychological conditions that may well influence the human behaviour and contribute to navigation accidents included the following:

- Fatigue.
- Misperception / Misinterpretation / Distraction.
- Situational awareness.
- Physical / Mental Unfitness.
- Cognitive Workload.
- Unawareness of actual dangers.
- Overconfidence,

some of which were also presented in the analysis section of this investigation report.

The following conclusions, safety issues 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. EPHESOS

1. The 2nd Officer together with the OS as a look out were carrying out their watch, monitoring the vessel's passage in compliance with required procedures applied on board and relevant COLREG regulations (§.4.1.3).

2. The work and rest hours for the second officer and ordinary seaman, did not identify any issues in relation to fatigue. In addition, as per tests carried out, neither Master nor the crew on the watch was found alcohol or drug intoxicated (§ 4.1.4).

3. The OOW could observe and monitor MAHMUTCAN and POLAT BEY 1 crossing courses on EPHESOS port bow at all times before the collision. (§ 4.1.6.2).

4. Even though standing and night orders were signed by the OOW and were well understood, the Master was not called on the bridge when CPA from MAHMUTCAN and POLAT BEY 1 decreased well below 2.0 nm. (§ 4.3.2, 4.3.3, 4.3.4).

5. Not calling the master in contrast to the required standing and night orders had an impact on the vessel's safe navigation and stretched the human recourses available to the OOW. (§ 4.3.2, 4.3.3, 4.3.4).

6. The bridge team management policy adopted by the company for the elimination of "one person error" was not effectively implemented (§4.3.4)

7. EPHESOS despite being the "stand on vessel" was under a continuous course alteration to starboard from 05:20 until the next 15 minutes, based on the marine traffic situation in the navigating sea area to clear off the fishing vessels at her port bow that were evident not to be engaged in fishing. This course alteration is considered an effective avoiding action to avoid any close quarter situation, provided that give away vessels follow COLREGs. (§ 4.4.1)

8. At 05:42:36, OOW taking into account that POLAT BEY 1 was not responding to VHF calls, ALDIS signals and her course was not steady due to ample alternations, ordered the OS on the watch to manual steering and maneuvered to port as a last action to avoid the collision. (§ 4.4.1)

9. The decision taken by the OOW to alter course to port to avoid the collision, given the circumstances at that time, was considered appropriate as Rule 17 (c) stipulates. It was also considered the most effective, as POLAT BEY 1 had already crossed the course of EPHESOS at 05:44:46 and the "close quarter" situation had been cleared. (§ 4.4.1)

10. EPHESOS maneuvering to port, was large enough and in ample time according to Rule 8(e). EPHESOS maneuvering to port gave sea room and allowed POLAT BEY 1 to cross her heading and pass EPHESOS stem post, as she was navigating clear on EPHESOS starboard bow quarter heading NNE. (§ 4.4.1)

11. Even at 05:44:56 when POLAT BEY 1 had changed course by 66.2^0 to starboard, the OOW counteracted and apart from the fact that he called POLAT BEY 1 on VHF and signaled with the ALDIS, ordered 30^0 to port, as a last action to avoid collision in compliance with Rule 17(a) (ii) and 17 (b). (§ 4.4.1)

12. The look-out watch on board M/T EPHESOS was effective and in compliance with relevant COLREGs. (§ 4.5.1)

13. It is questionable whether the collision would have been avoided even if the OOW had slacken EPHESOS speed or even stopped the vessel's engine, considering the emergency slowing down and stopping characteristics of EPHESOS and the sudden and erratic maneuvering by POLAT BEY 1, in contravention to COLREGs. (§ 4.6.1)

14. The OOW did not use sounds signals as specifically are regulated by COLREG, to attract the attention of the fishing vessels around, primarily including the fishing vessel POLATBEY 1. (§ 4.7.1)

5.2. POLAT BEY 1

1. Crew certificates and endorsements were checked and found in order according to the manning document issued by the flag administration according to national legislation. (§ 4.2.1).

2. Examination of work and rest hours was not feasible since all crew had died after the vessel capsized; however it was emerged that POLAT BEY 1 was most probably already at sea for almost 40 ½ hours before the collision occurred, therefore it is considered possible that the skipper as the only competent crew member for navigation was under a certain level of fatigue. (§ 4.2.3)

3. Even though the fishing vessel was the "give away" vessel and her skipper should have taken action to avoid crossing ahead of EPHESOS course and to keep clear off her passage, she was steaming in a "crossing situation" following various courses from 067^0 to 16.2^0, with a speed almost to 6 knots, until she crossed EPHESOS heading, at 05:44:36. (§ 4.4.1)

4. Despite the fact that “a close quarter situation” has been developed from approximately 05:40:16 until 05:44:46, due to EPHESOS maneuvering actions, ultimately the fishing vessel had passed at a close distance (3-4 cables) ahead of EPHESOS bow. (§ 4.4.2)

5. Nevertheless at 05:44:56, that was about 70 seconds before the collision, as per ECDIS data, POLAT BEY 1, unjustifiably and unexpectedly made a large course turning to starboard by 66.2^0, heading again to EPHESOS starboard bow. (§ 4.4.2)

6. The alteration of course by the fishing vessel, caused a new “close quarter situation”. Moreover the helmsman continued altering POLAT BEY 1 course further to starboard reaching 116.6^0, as recorded in EPHESOS ECDIS while she was ranged less than 0.2 nm off EPHESOS bow. (§ 4.4.2)

7. POLAT BEY 1 was navigating as if she was not in collision course with tanker EPHESOS, did not take any avoiding actions, despite the fact that she could easily turn again hard to starboard making a bold course alternation, an action which is considered easy based on her length and maneuvering characteristics. (§ 4.4.2)

8. POLAT BEY 1, had shown a total disregard to respective COLREGs for collision avoidance. (§ 4.4.2)

9. It was evident from the electronic evidence collected, that the helmsman or Skipper did not conduct a proper look-out by sight and hearing, as POLAT BEY 1 was navigating as she had not received any VHF calls and visual warnings by ALDIS from the tanker. (§ 4.5.2)

10. POLAT BEY 1 did not take any actions to reduce speed or even stop her engine that is considered an action that would result in immediate slacken of speed, taking into account her maneuvering characteristics as a boat of 21.5 meters of length. (§ 4.6.2)

5.3. Conclusions referred to both vessels

1. Both vessels did not seek any navigational assistance from VTS, in order prompt action to be taken at an earlier stage, thus avoiding a close-quarter situation to be developed. (§ 4.8)

2. VTS could have been involved advising or instructing in time both vessels, especially when possible language barriers may exist between national fishing or other type of vessels and international vessels, that can hinder the direct communication through VHF. (§ 4.8)

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, and TSIC. The company of EPHESOS informed HBMCI about the following corrective actions adopted following the investigation carried out by a third party on behalf of the owners and the investigation report prepared by the managing company after the marine casualty:

1. The Bridge Team on board to undergo refresher training on Bridge Resource Management, covering the following topics:
   - ✓ Emerging conditions
   - ✓ Call the Master
   - ✓ Application of COLREGS in varying close quarter situations even when vessel is not the “give away “vessel.
   - ✓ Ability to apply task and workload management
   - ✓ Knowledge and ability to apply decision- making techniques
   - ✓ SC Self awareness, personal and professional development
2. Regular unannounced VDR analysis across the Fleet on board vessels to be conducted to assess the navigational practices and BT resilience on board fleet vessels.
3. A fleet wide campaign on navigation covering following areas to be adopted:
   - ✓ Understanding and applicability of company procedures
   - ✓ Understanding and applicability of COLREGS
   - ✓ Effective use of all bridge equipment for safe navigation
4. The OOW involved to be placed under Performance Improvement Plan to revalidate his knowledge with COLREGS and company procedures.
5. A training video of the incident has been developed with exactly the same scenario in order to be used as a case study with step of actions seeking by the officers to confirm course of actions they would have taken in similar situation. This video to be shared with the contracted training institutes and during officers’ seminars as to ensure that deck officers ashore will undergo this training as pre- requisite prior rejoining a vessel.
6. Bridge Management Procedures have been enhanced to address the following:
   - ✓ emphasise the fact that fishing boats are likely to not to always apply COLREG rules even when not engaged in fishing and BT should act keeping in mind that Collision avoidance rests with the vessel’s actions.
   - ✓ Strengthen the STOP work authority procedure with the aim to encourage lookout to call the Master when OOW is engaged in collision avoidance and crisis assessment may affect his decision making.
   - ✓ Highlight in the Master standing orders the requirement to call the Master as well as to post a warning reminding Bridge team that 'Do not hesitate to call Master and take any actions required by altering course/speed in accordance with COLREG timely, to avoid collision –Safety First “
7. Marine Superintendent & Master navigation audit has been enhanced for incorporating additional reference to COLREGS, evaluating CPA, etc with the aim to address root causes & lessons learnt from this incident).
8. Newly promoted Junior Deck Officers as well as those serving first time with the Company, to serve on board on a probation period of 2 months. During that time the Master and the senior 2nd Officer to mentor them on safe navigation practices and BRM techniques as well as assess their skills and competencies with the purpose to

timely identify and address any training needs. Lessons learned of navigation related incidents to be used in this respect.

9. Lessons learnt disseminated to the fleet as well, to raise awareness. This investigation and the lessons learnt have been added to the safety committee meeting agenda of all vessels for discussion. Feedback including any proposed improvement actions will be reviewed by QSE department.

10. Within 3 months from the Incident, the vessel to be attended for a non routine real time audit and navigation refresher training to onboard Bridge Team, to verify effective implementation of and compliance with actions taken.

11. The full investigation, prepared by the company to be disseminated to all parties concerned, in line with Company's sharing policy.

12. Root causes and lessons learned from this investigation have been added to the dynamic list of briefing topics for all officers and petty officers prior to assignment. This has also been included in the next scheduled open forum agenda including office Safety Seminars attended by shore leave personnel.

13. Company Attendance Instructions to Marine and Technical Superintendents, have been enhanced to include the compliance with and verification of effectiveness of the lessons learned during future onboard attendances.

Additionally TSIC, in its safety investigation report, had issued the following safety recommendations to:

1. **The Managers of M/T EPHESOS:**

.1. Carry out additional training and internal audits for the bridge crew on the navigational watch to always comply with the COLREGs rules and the Master's standing orders.

.2. Establish the procedure to ask for navigational aid from VTS in cases where there is no contact with vessels that pose a risk of collision.

To both of the aforementioned safety recommendations the company replied that appropriate actions have been taken to comply with the safety recommendations been issued.

2. **The Directorate General of Maritime Affairs:**

.1. Deliver on site training on VTS to fishing vessels masters who are sailing in local traffic zones within the VTS region.

3. **The Directorate General of Coastal Safety**

.1. Monitor the areas especially where there is a risk of Collision between vessels operating in local traffic and those sailing internationally more carefully, and warn the vessels that do not comply with the COLREGs rules.

.2. Develop procedures for notifying the vessels that violate COLREG rules to the Maritime Administration for the purpose of reporting to the flag state of the relevant vessel.

4. The Chambers of Shipping:

.1. Circulate the safety investigation report and the VTS implementation instruction to your members in the fishing industry to minimize or prevent similar accidents.

7. Safety recommendations

Taking under consideration the analysis and the conclusions derived from the safety investigation conducted, and the corrective actions taken by the company of M/T EPHESOS after the collision, no safety recommendations were issued to the managers / operators of the vessel.

Moreover since TISC had issued the above mentioned Safety Recommendations addressed among others, to the responsible Authorities of the coastal state, no further safety recommendations were issued concerning the VTS operation of the Coastal State.

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