



**REPUBLIC OF CROATIA  
MINISTRY OF THE SEA, TRANSPORT AND  
INFRASTRUCTURE**

Class: 342-01/11-01/66  
File no. : 530-03-11-2  
Zagreb, 27<sup>th</sup> December 2011.

By the Decision of the Minister of the sea, transport and infrastructure Class: UP/I- 342-01/11-01/66 File no.: 530-03-11-1 of 2 November 2011, Commission for the conduct of marine safety investigation was established concerning the accident of the fishing vessel "Golub" which occurred on 1<sup>st</sup> November 2011. about 01:28 hrs at the position approximately 5 M southwest of Pula.

The following persons were appointed Commission members:

1. Joško Vlašić, B.Sc., Chairman of the Commission
2. Cpt. Loris Diminić, member
3. Đani Mohović, Ph.D., member
4. Vlado Frančić, M.Sc. member
5. Ivica Grgurić, B.Sc. member

Pursuant to the Ordinance on Investigation of Marine Accidents (Official Gazette, nos. 09/07, 118/2011) the Commission conducted a marine safety investigation and is presenting the Minister with the following report:

## **MARINE ACCIDENT REPORT**

### **COLLISION OF THE MOTOR VESSEL "JOERG N" AND THE FISHING VESSEL "GOLUB"**

#### **FOREWORD**

Goal of a marine safety investigation is to establish possible causes and deciding factors which contributed to the marine accident and which have to be put right for the purpose of improving and developing safety of navigation and preventing future accidents, as well as to put forward safety recommendations based on analyses and conclusions following safety investigations, which can concern amendment of regulations, improvement of working practices aboard, methods for conducting inspections, ship operation, occupational health and safety, maintenance and repair methods, crew drilling, procedures for assistance from the shore and emergency preparedness and so on.

Safety recommendations are intended for those directly involved and having the possibility to apply recommendations, primarily to ship owners, ship management companies, recognised organisations, maritime authorities, VTS service, exceptional circumstances or first aid units, the International Maritime Organisation (IMO) and/or the European Commission, all with the purpose of preventing marine accidents in the future.

This marine safety investigation report has been composed in conformity with Appendix I of the Ordinance on Investigation of Marine Accidents (hereinafter the Ordinance).

Pursuant to provisions of Article 8 paragraph 1 of the Ordinance, a marine safety investigation has to be independent of criminal or other investigations conducted for the purpose of establishing responsibility or apportioning blame. Therefore, no assumptions of possible blame are stated in this report, and the report may not be used for the purpose of establishing any legal responsibility.

As provided in Article 12 of the Ordinance, in the safety investigation the Commission followed the methodology for investigation of maritime accidents and incidents in accordance with the Code for the Investigation of Marine Casualties and Incidents annexed to Resolution A.849(20) of the IMO Assembly of 27 November 1997, in its up-to-date version.

As provided in Article 13 paragraph 2 of the Ordinance, records of the Commission including witnesses' statements and other statements, opinions and notes which the Commission drew up or received during an investigation of a marine accident, reports disclosing the identities of persons who provided evidence in the course of investigation of a marine accident, as well as medical or private information concerning persons who participated in an accident, are used only for the purposes of the marine safety investigation, except when judicial authorities establish that the benefit of their disclosure surpasses the negative domestic and international effect which such a disclosure could have on the investigation or on future investigations.

In accordance with the provisions of Article 20 paragraph 1 of the Ordinance, the Ministry of the Sea, Transport and Infrastructure will ensure that safety recommendations provided by the Commission are duly taken into consideration by those who they are intended for and where appropriate, and that they are acted upon in accordance with the law of the Republic of Croatia and international regulations.

The safety investigation into the concerned accident is based on the provision that such an investigation should be conducted in all cases after a serious or very serious accident involving a vessel sailing under Croatian flag and, considering that one vessel was totally lost in it, this accident can be categorised as very serious.

In the conduct of the safety investigation the investigators used available data and information from vessels, interviews with crew members, relevant documents and certificates, as well as records from all services that participated in activities following the accident, and especially the records obtained from the VTS centre. Data and information from the Voyage Data Recorder of the "Joerg N" were not available to the investigation commission.

## **1 SUMMARY OF FACTS OF THE MARINE ACCIDENT**

On 1<sup>st</sup> November 2011, at 01:28 hrs, the M/V "Joerg N", under Maltese flag, collided with the F/V "Golub", under Croatian flag, at the position approximately 5 M southwest of Pula ( $\varphi = 44^{\circ} 47.3' N$ ,  $\lambda = 013^{\circ} 44.8' E$ ). After the collision, due to severe damage of the hull, the F/V "Golub" soon sank, and the M/V "Joerg N" continued its voyage without changing its course or speed, since the officer on the watch-keeping duty failed to notice the impact with the fishing vessel.

The F/V "Golub" crew members abandoned the ship by boarding the ship's working boats and sailed unharmed to the Bunarina marina (Pula).

After having received a call on the VHF radio station from the National Maritime Rescue Coordination Centre in Rijeka and in conformity with the received instruction, the M/V "Joerg N" proceeded towards its destination port Rijeka where it arrived about 07:00 hrs on the same day.

## **2 FACTS**

Records and documents used in the description of facts were collected from the harbourmaster's offices Rijeka and Pula, the Croatian Register of Shipping, the Meteorological and Hydrological Service - Weather and Climate Observation Service - Ship Log and Sea Temperature Data Processing Section - Split, the Maritime Rescue Coordination Centre in Rijeka, the Rijeka VTS, and the Istarska County 112 Centre.

## 2.1 "Golub" fishing vessel information

Ship's name	"Golub"
Flag	Croatia
Port of registry	Zadar
Navigation category	National navigation (Category 5)
Call sign	9A9344
IMO number	N.A.
Year and place of build	1949. Pula
Vessel type	Fishing motor vessel (cutter)
Owner	Rade Palaškov, Labin, Presika 161
Manager	Redžep Raimović, Pula, Baližerka 144
Hull material	Wood
Minimum number of crew members	3 - master, helmsman and engineer
Length between perpendiculars (Lpp)	18.18 m
Length overall (Loa)	20.50 m
Breadth	5.89 m
Depth	3.46 m
Draft	2.74 m
Freeboard	0.76 m
Gross tonnage - GT	74
Net tonnage - NT	22
Displacement	127 t
Speed	7 kn
Propulsion type	Internal combustion engine
Types and number of propulsion machinery	DIES, ST1 (1 main engine)
Machine manufacturer and power	Schwermaschinenbau K.Liebknecht 220 kW at 750 rpm
Number and type of propeller	1 with fixed blades
Licence and type	SKL 6 NVD 26A



Figure 1. "Komarča" fishing vessel ("Golub" fishing vessel's "sister ship")

The F/V "Golub" is equipped in conformity with the technical rules of the Croatian Register of Shipping. Its navigation equipment included the following: magnetic compass, VHF radio station<sup>1</sup> and propeller revolution indicator. In addition to the above, there was non-mandatory equipment installed and operational aboard - such as the GPS device, the "Simrad" sonar, the "Fish 12" data plotter. Fishing vessels with registered length less than 24 m are not obliged to have a radar device, and the "Goldstar" radar, which, according to the master's statement, had been previously installed, was not onboard at the time of the accident and was not operational since it was being serviced. The ship is intended for purse seine catching of pelagic fish all year round in the territorial sea and the exclusive economic zone of the Republic of Croatia. The ship consists of one continuous deck with a superstructure, one chimney, and one mast with a net-lifting device. Summer load draft amounts to 2.74 m, and the freeboard is 0.76 m. Speed of the empty ship is 8 knots (kn), and when it is loaded 7 kn. One (1) right-handed propeller with four (4) fixed blades is installed. According to the above, this ship falls under classic fishing vessels (purse seiners) of this category. There are no special or prominent characteristics of the above equipment which would influence the manoeuvrability of the ship or navigation safety.

## 2.2 "Joerg N" information

Ship's name	"Joerg N"
Flag	Malta
Port of registry	Valetta
Navigation category	Unlimited
Call sign	9HA2288
IMO number	9508603
Keel laying date	28.11.2008
Year and place of build	2008, VVeihai City, PR China
Vessel type	Multi-purpose cargo ship (reinforced for the transport of heavy cargo)
Owner	Erste MLB Bulktransport GmbH & Co, Nussbaumvwg 7, 49808 Lingen, Germany (No. 4148174)
Manager	Team Ship Management GmbH & Co. KG, Barkhausenstr. 2 t.i.m.e port II, 27568, Bremerhaven, Germany
Hull material	Steel
Minimum number of crew members	10
Length between perpendiculars (Lpp)	84.95 m
Length overall (Loa)	89.97 m
Breadth	15.41 m
Depth	33.90 m
Draft	5.80 m
Gross tonnage - GT	3556
Net tonnage - NT	1535
Displacement	6359 t
Total load bearing capacity	4456 t
Capacity	2076 m <sup>3</sup>
Speed	10 kn
Types and number of propulsion machinery	1 main engine, 1 bow thruster
Main engine and power	ZJMD-MAN B&W SL28/32A-F -1.960 kW
Number and type of propeller	1 with fixed blades

<sup>1</sup> According to the master's statement, at the time of the accident the VHF radio station was switched off, and then he switched it on to send a distress signal, but he did not have enough time.



Figure 2. The "Joerg N" vessel

## 2.3 Information about the voyage

### a) The F/V "Golub"

Port of departure/arrival	Pula, departure 31 <sup>st</sup> October 2011 about 19:00 hrs
Cargo information	Fishing net on the stern part of the ship
Crew	8 crew members (master and 7 fishermen/seamen - did not embark in the capacity of crew members, and the majority of them is without a seaman's book, or any certificate of competence or proficiency). In addition, the crew had no seafaring or fishing experience.

Of the above mentioned crew members, only two men had valid certificates:

1. Master:
  - Advanced fire-fighting (STCW VI/3)
  - Master on a ship of up to 50 GT in national voyage (HR II/1)
  - Basic safety (STCW VI/1)
  - Chief engineer on a ship powered by main propulsion machinery of up to 500 kW in national voyage (HR III/4)
  - Chief engineer on a fishing vessel powered by main propulsion machinery of up to 500 kW (R-HR VI/5)
  - Master of a fishing vessel in national voyage and in the EFPZ (R-HR VI/1)
2. 1 ordinary seaman (fisherman):
  - Basic safety (STCW VI/1)

### b) The M/V "Joerg N"

Port of departure/arrival	Monfalcone/Rijeka 31.10.2011 at 16.55 hrs
Cargo information	Ship in ballast
Crew	10 crew members (master, first officer, second officer, chief engineer, helmsman, 2 ordinary seamen, ordinary seaman/cook, oilman, electrician) - all with valid seaman's books and valid certificates of competence or certificates of proficiency)

## 2.4 Information on the marine accident

Type of marine accident	Collision
Date and time	1 <sup>st</sup> November 2011. at 01.28 hrs
Location of the marine accident	Approximately 5 m southwest of Pula, $\varphi = 44^{\circ} 47.3' N$ , $\lambda = 013^{\circ} 44.8' E$
Meteorological conditions	Mostly clear, without wind (quiet), calm sea, visibility 8 - 9 km, air temperature 10°C (meteorological report on 1 November 2011. for HMO Pula)
Activities onboard "Joerg N"	The accident happened during the voyage of the ship "Joerg N" from the port Monfalcone towards the Port of Rijeka
Information on persons' activities on "Joerg N"	Second officer on the bridge on navigational watch, - crew member on watch-keeping duty (helmsman - according to the crew list) was occupied by washing ship's hallways in the superstructure
Activities onboard "Golub"	Ship at anchor; lighting for the purpose of catching fish.
Information on persons' activities on "Golub"	1 crew member on navigational watch: keeping watch on the deck, and from time to time watching the TV in the drawing room. The rest of the crew was sleeping.
Consequences (for persons, property, environment)	The sinking of the fishing vessel (total loss of ship) without the injured and without sea pollution (besides the wreckage of equipment from the fishing vessel). Total amount of fuel on the fishing vessel at the time of collision is estimated at 400 l.

## 2.5 Assistance from the shore and emergency preparedness

Who participated	112 Centre, Rijeka Maritime Rescue Coordination Centre, Pula and Rijeka harbourmaster's offices, maritime police, duty inspector of the Directorate for Seafaring Safety and Sea Protection
Quickness of response	<p>At 01:40 hrs, the crew of the fishing vessel establishes a mobile phone connection by calling 112. The 112 service informs the Rijeka MRCC.</p> <p>At 01.50 hrs, the Rijeka MRCC informs the Pula HMO, the Rijeka maritime police, the department for transport at the Rijeka HMO, the duty inspector of the Directorate for Seafaring Safety and Sea Protection</p> <p>At 02.05 hrs, the Rijeka MRCC contacts "Joerg N" through the Rijekaradio CRS</p> <p>At 03:45 hrs - the Pula HMO sent, through the Rijekaradio CRS, the call "SECURITE" (possible oil leakage and possible floating remains of the fishing vessel)</p>
Measures taken onboard "Joerg N"	At 02:05 hrs, a call by MRCC was received with the instruction to continue the planned voyage towards the destination port in Rijeka.



## 2.6 Characteristics of the navigation area and the surrounding vessel traffic

The navigation area in which the collision occurred includes the area between the extreme south-western part of the Istrian peninsula and the traffic separation scheme which had been set up more to the west. The place of collision is located approximately 6 m south of the island V. Brijun, 4.2 m southwest of the nearest land (the Istrian peninsula), 6.4 m from the Porer cliff, 7.5 m from the position south of the Albanež shoal where ships which navigate toward ports in the Kvarner Bay change course, and approximately 6.8 m from the border of the traffic separation scheme where ships which use the scheme sail northwest.

Ships navigating in the collision area sail from the area of north-Adriatic ports towards the ports in the Kvarner Bay and the other way round, and call to ports in the Pula Bay. Fishing vessels navigate in this area all year round, and during the summer there are, in addition to cargo and fishing vessels, also yachts and pleasure crafts navigating towards nautical ports in the immediate or wider area.

Depths in this area range from approximately 38 to 42 m, and dangers for navigation in the immediate environment are well marked by navigation marks.

To the port of "Joerg N" (closer to mainland), the ship called "Bremen" navigated with the approximate course of 150°. At 00:58 hrs "Bremen" was located approximately abeam "Joerg N" at a distance of 3.5 M and navigated at a speed of 9.6 kn (approximately the same speed as "Joerg N"). Distance between these two ships was being constantly reduced, and at the time of the collision between "Joerg N" and "Golub" it amounted to approximately 1.5 M.

At the time of collision there were also other fishing vessels anchored in this area (approximately 1 m further south from the place of collision).

## 2.7 Weather conditions

According to the report of the Meteorological and Hydrological Service - Weather and Climate Observation Service - Ship Log and Sea Temperature Data Processing Section - Split, of 4<sup>th</sup> November 2011, the general weather situation on 1<sup>st</sup> November 2011. southwest of Pula was such that the weather was under the influence of an anticyclonic ridge which lingered over the Adriatic.

In such meteorological circumstances, on 1<sup>st</sup> November 2011. from 00:00 till 04:00 hrs it was mostly clear in the concerned area. The wind was slight and changing. Sea was calm (sea 0 - 1 - waves up to 0.1 m). Visibility was reduced because of mist and amounted to 8 - 9 km.

## 3 RECONSTRUCTION OF THE MARITIME ACCIDENT

On 1<sup>st</sup> November 2011, at approximately 01:28 hrs, the M/V "Joerg N" hit the "Golub" fishing vessel at the approximate position  $\varphi = 44^{\circ} 47.3' N$ ,  $\lambda = 013^{\circ} 44.8' E$ . "Joerg N" navigated at the speed of approximately 10 knots, whereas the F/V "Golub" was anchored and was lighting for the purpose of catching fish. Since the officer on the watch-keeping duty, as well as other crew members, failed to notice the collision with the fishing vessel, the "Joerg N" motor vessel continued its voyage without changing its course or speed. As a result of the damage it suffered, the fishing vessel sank on the spot within the period of approximately 2 - 3 minutes. The fishing vessel's crew abandoned the vessel in working boats before it sank, and arrived ashore in these boats at the Bunarina marina. At 02:05 hrs "Joerg N" was informed about the collision by the Maritime Rescue Coordination Centre in Rijeka, which received the information on the collision at 01:40 hrs from the 112 service. The 112 service had been called over a mobile phone by a member of the fishing vessel's crew after they transferred to working boats. Since all the persons from the fishing vessel were safe in working boats and did not request rescuing (medical aid), there was no search or rescuing operation, and "Joerg N" was ordered to continue its voyage towards its destination - the Port of Rijeka.

"Joerg N" left port the previous day, 31<sup>st</sup> October 2011, at 16:55 hrs from the Italian port of Monfalcone towards the Port of Rijeka in ballast with the intention of loading artificial fertiliser in Rijeka, whereas the "Golub" fishing vessel left port the previous evening, 31<sup>st</sup> October 2011, at about 19:00 hrs from the Port of Pula for its usual fishing activities. "Joerg N" navigated on the course of 125° at the speed of approximately 10 knots. Ship positions were plotted onto the nautical chart at 1 hour intervals.

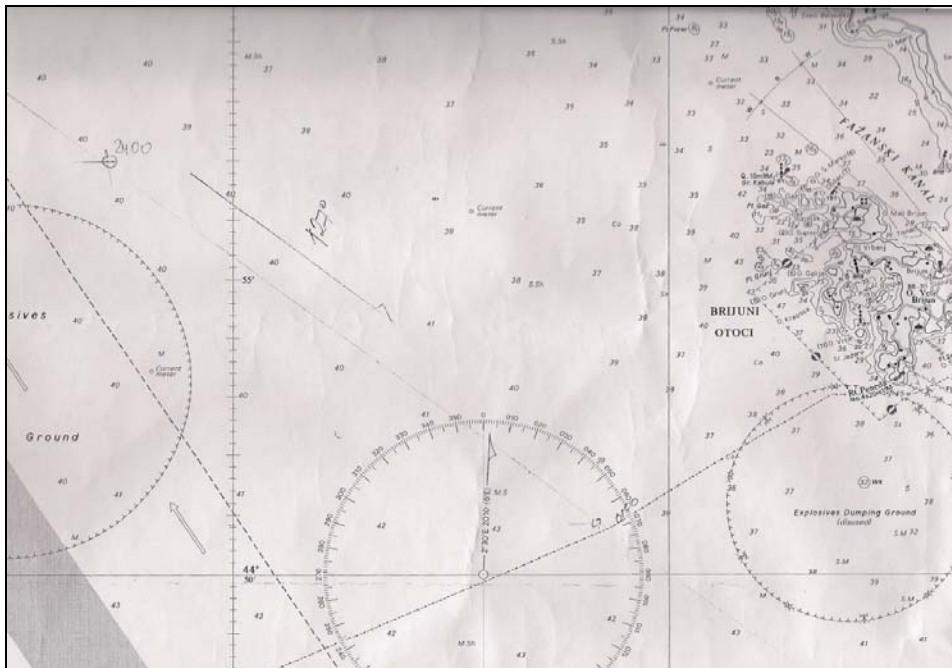


Figure 3. Copy of the nautical chart with the plotted "Joerg N" route

For the purpose of reconstructing the maritime accident through all its segments with a chronological course of events preceding the accident, as well as those occurring during the accident, segments of traffic images created at characteristic times by the VTS and showing the navigation of "Joerg N" and the position of "Golub" were used. Shown below are characteristic positions of the ships before and after the collision, as well as the moment of collision itself.



Figure 4. Voyage of "Joerg N" before entry into the North Adriatic traffic separation zone (31 Nov at 19:33)



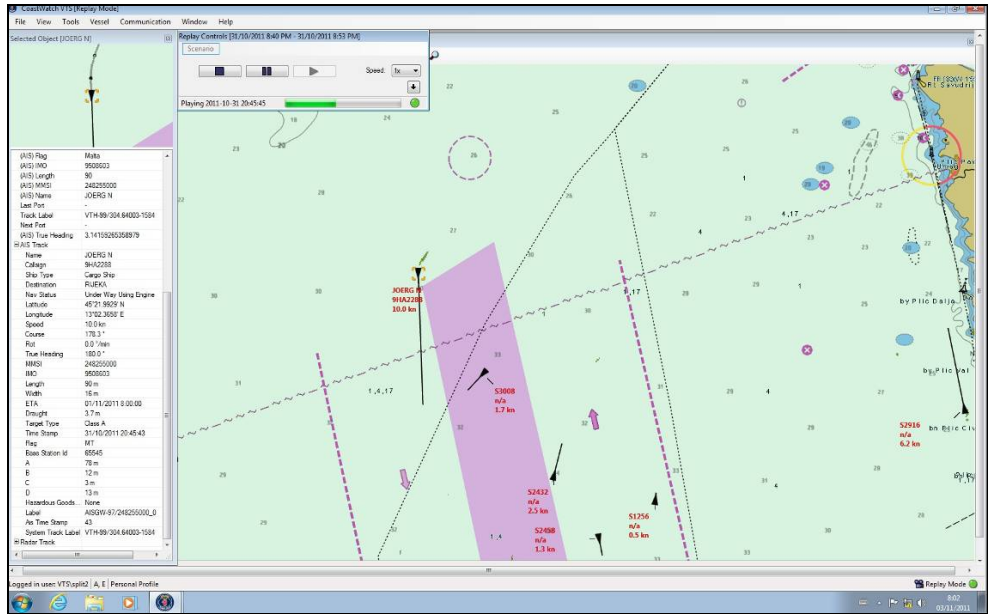


Figure 5. Voyage of "Joerg N" at entry into the North Adriatic traffic separation zone (31 Nov at 20:46)

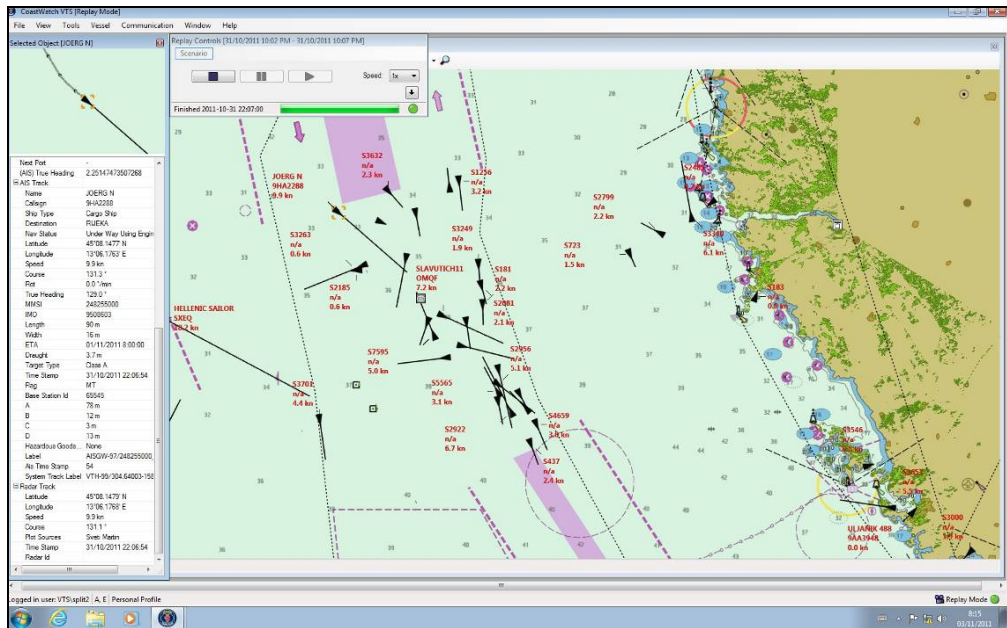


Figure 6. Change of course by "Joerg N" to approximately 130° (31 Oct at 22:07)



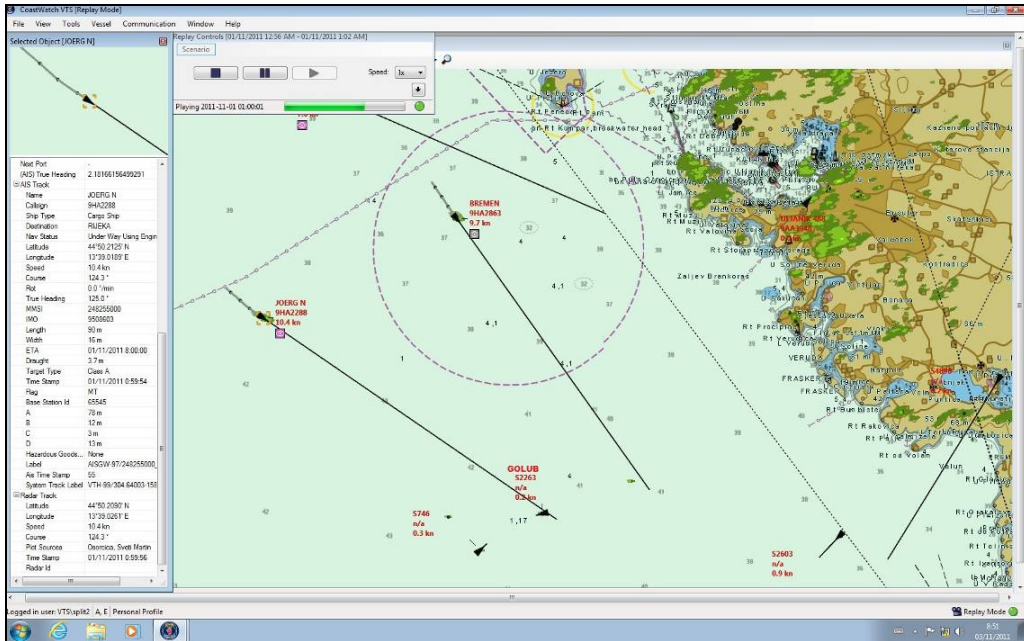


Figure 9. Change of course of the "Joerg N" motor vessel to approximately 125° - the "Golub" fishing vessel is situated dead ahead of "Joerg N" (1 Nov at 01:00)

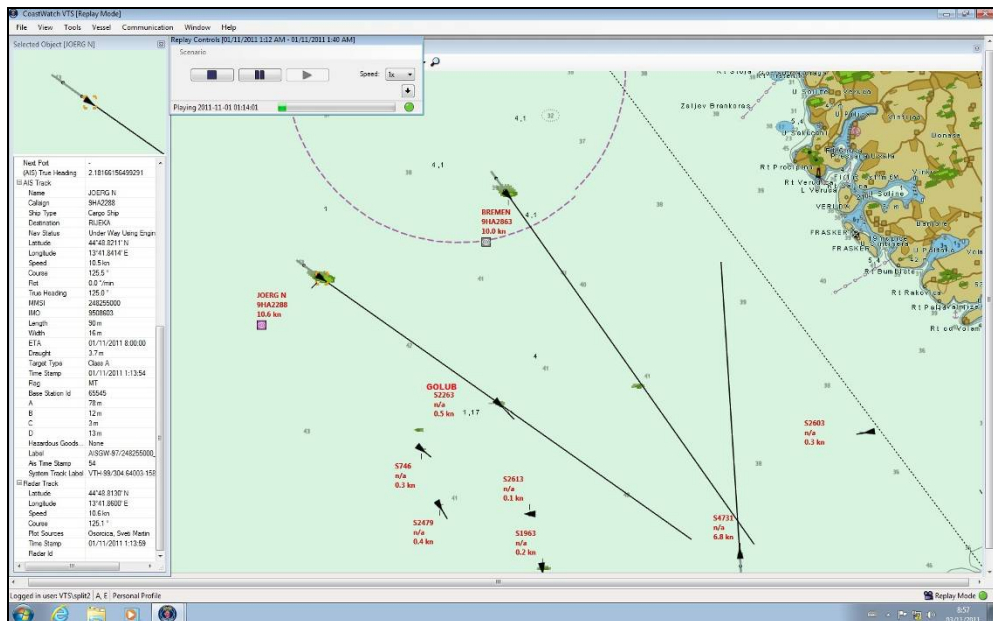


Figure 10. Continued voyage of "Joerg N" on the course of 125° (1 Nov at 01:14)

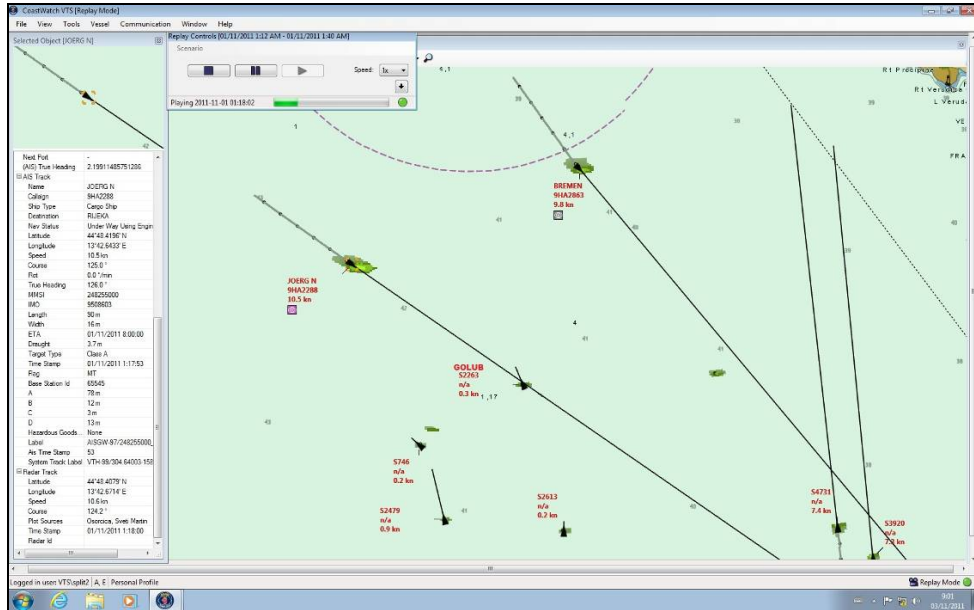


Figure 11. Continued voyage of "Joerg N" on the course of 125° (1 Nov at 01:18)

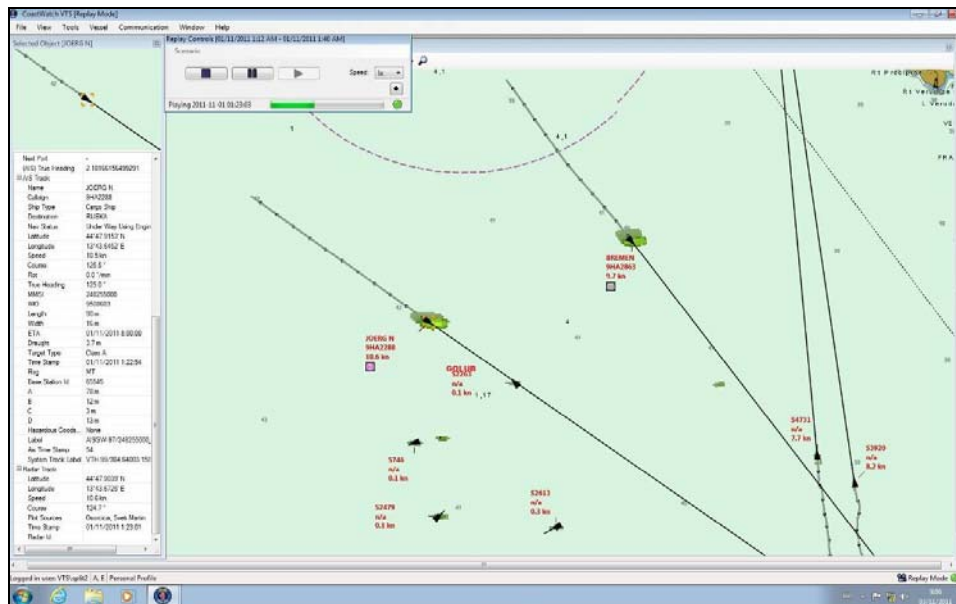


Figure 12. Continued voyage of "Joerg N" on the course of 125° (1 Nov at 01:23)

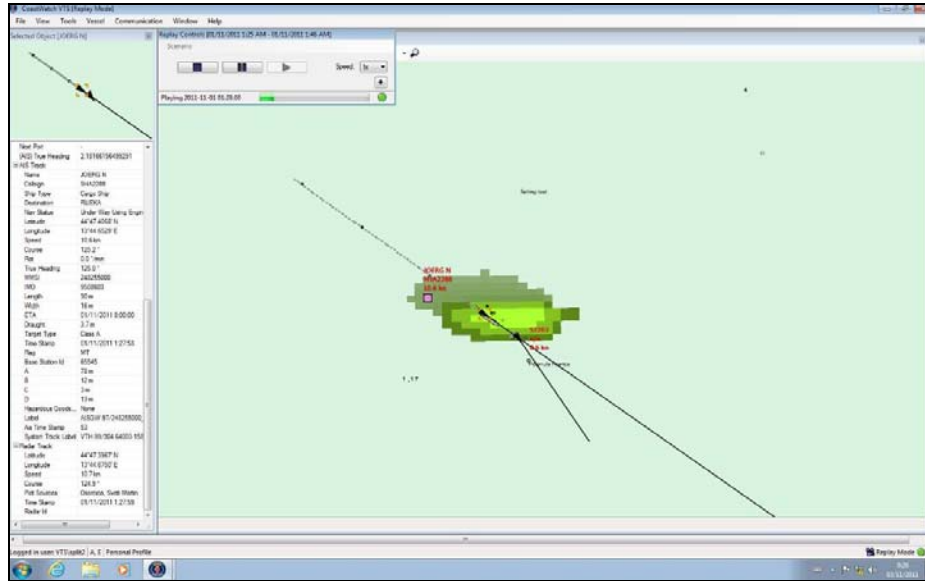


Figure 13. The moment immediately before the collision (1 Nov at 01:28)

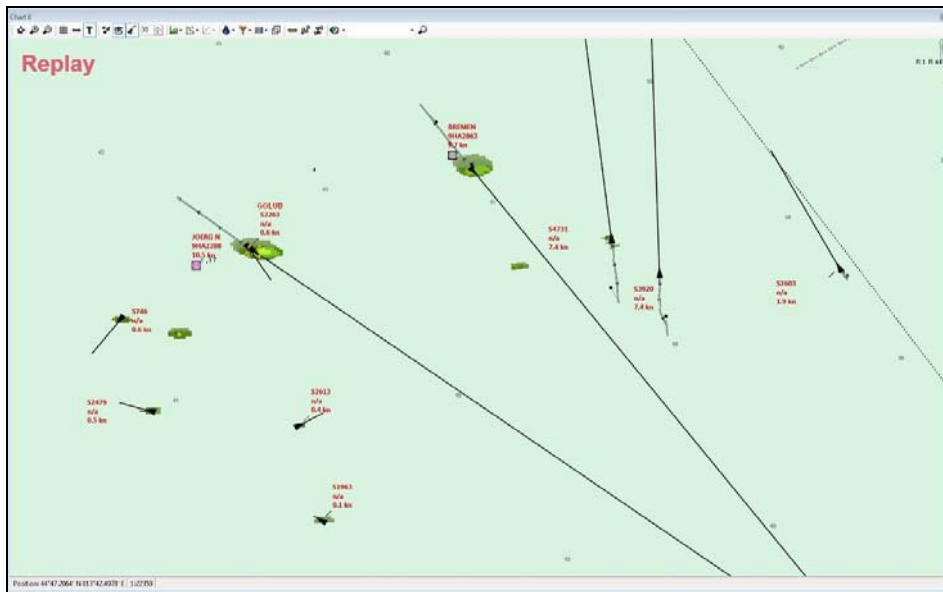


Figure 14. The moment of collision (1 Nov at 01:28)



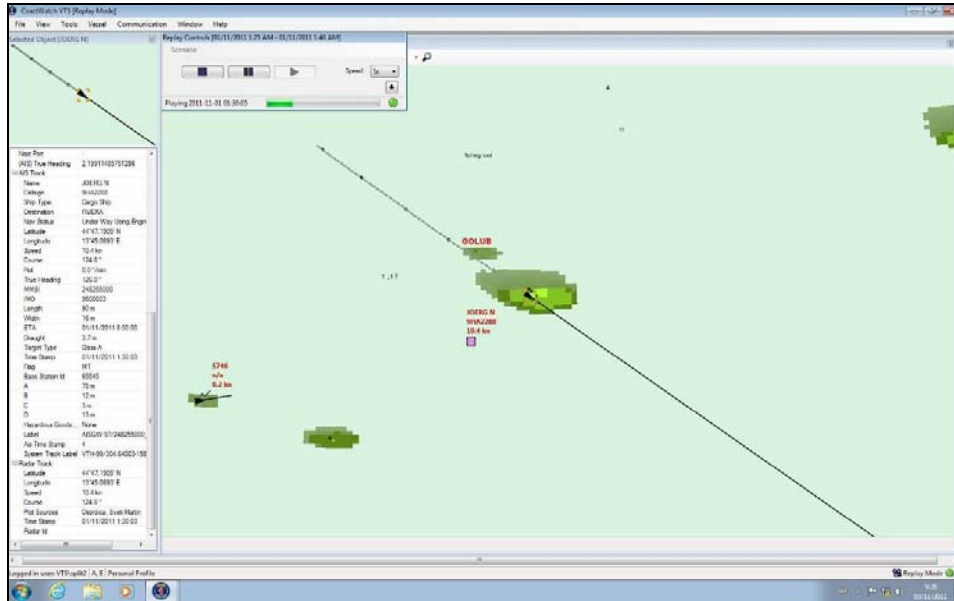


Figure 15. The moment immediately after the collision – fishing vessel radar signal is present (1 Nov at 01:30)

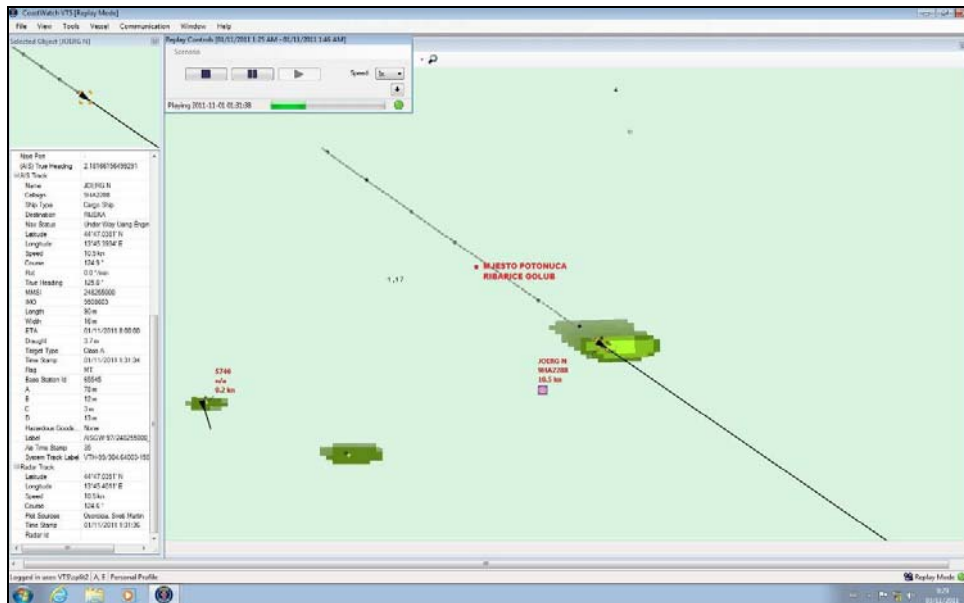


Figure 16. The moment immediately after the collision – fishing vessel radar signal is lost (1 Nov at 01:31)



The picture combines and shows the most important positions and movements of Joerg N" and "Golub" ships and other vessels before and after the collision.

1. Position of the "Joerg N" ship at 01:00 (speed 10 kn, course 125°), distance from the "Golub" ship approximately 5 M, 28 minutes before the collision
2. Position of the "Joerg N" ship at 01:40 (speed 10 kn, change of course to approximately 130°), the moment when the accident was reported to MRCC Rijeka
3. Position of the "Joerg N" ship at 01:46 (speed 10 kn, course 129°)
4. Position of the "Joerg N" ship at 02:04 (speed 10 kn; course 130°), moment of call made to the "Joerg N" ship by the MRCC Rijeka and informing the ship about the collision, the ship instructed to proceed to the Rijeka destination port.

The closest fishing vessel was approximately 1 M away from the point of collision. None of the shown fishing vessels were moving.

## 4 ANALYSIS

### Analysis of the actions of the F/V "Golub" crew

"Golub" fishing vessel left the Pula port on 31<sup>st</sup> October 2011 around 19:00 hrs. Besides the master, aboard a ship there were also seven fishermen who were not boarded as the ship crew. Sailing in the direction of southwest, they were searching for the fish using ultrasonic sonar, and around 21:15 hours they anchored the ship, having found the shoal of fish. Lights for attracting fish (reflectors), which are placed on the roof of the superstructure, were lighted and directed towards the sea surface. Also, two red lights visible from all sides and set up one above the other in a vertical line were turned on, marking the ship which is not under command. According to statements, visibility was very good, and the sea was calm. Weak tramontane was blowing. Two working boats were released astern, one of which was 20 meters away from the stern of the ship, and the other approximately 5 meters away from the first boat, in one row.

Around 24:00 all but the crew member on duty went to rest, as follows: master and one crew member to the cabins located behind the ship's bridge, and other members to the fore-end steerage with beds.

The crew member on watch-keeping duty<sup>2</sup> was in the salon where he was watching TV. Some time around 01:15 hours he came on deck and felt the impact against the ship. He started shouting, and the master came on deck, as well as the other crew members. This is inconsistent with the statement given by the master to the safety investigation officer, indicating that, awoken by the shouts of the crew member on watch, he took a hand-held flashlight and started waving in the direction of the approaching ship. After the collision, "Joerg N" motor vessel was dragging the fishing vessel for a while. The master stated that he went to the ship's bridge to turn on the VHF radio station in order to send the distress signal, but this signal was not sent because the ship started sinking. He ordered the crew to board working boats and abandon the fishing vessel. After several moments, the fishing vessel started sinking by the bows first, and then sank completely. All crew members noticed that the ship hitting them was orange and continued sailing southeastwards.

One of the crew members used the mobile phone he was carrying and dialled 112 County Alert Centre, informing them about the incident. Using auxiliary vessels, they headed for Pula - Bunarina port - where they arrived at 02:30 hours.

Based on the analysis of the said actions and the statements of the F/V "Golub" crew, it can be concluded that the fishing vessel left the Pula port without professional crew, which was not boarded pursuant to the Ordinance on the Minimum Number of Crew Members Ensuring Safe Navigation on Board Seagoing Ships, Floating Facilities and Fixed Offshore Structures (OG no. 63/2007, as amended in no. 73/2011), and the crew was not registered in the Crew List at the time of leaving port.

After anchoring, the "Golub" fishing vessel turned on two red lights at the top of the mast, visible from all sides, marking a vessel not under command, and the lights for collecting fish. A vessel with such lights cannot be considered a vessel engaged in fishing. Therefore, we can conclude that the Master of the "Golub" fishing vessel turned on the wrong lights (ship not under command), instead of which he needed to turn on the lights indicating a ship at anchor, according to its length.

Furthermore, upon anchoring of the fishing vessel, the master failed to comply with the Regulation on Watch-keeping Arrangements and Performance of Other Duties on Board Ships for Assurance of Safety of Navigation and Marine Pollution Protection (OG no. 125/2005, as amended in no. 126/2008, 34/2011) in terms of organising watch-keeping which would ensure safe stay of the ship at anchorage (Article 6). As the result, while the "Joerg N" motor vessel was approaching, and when it was possible to ascertain, beyond doubt, that there is a collision risk, nobody carried out any actions which would indicate the danger of collision with the M/V "Joerg N", and warn the approaching vessel to perform a collision avoidance action.

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<sup>2</sup> According to his own statement

### **Analyses of actions on board the M/V "Joerg N"**

Sailing along the west coast of Istria after leaving the North Adriatic traffic separation scheme at 01:00 hours (28 minutes before the collision), the M/V "Joerg N" changed the course to approximately 125°, directing the vessel towards the anchored fishing vessel. After that, the ship did not alter its course or speed. According to the nautical chart, the last ship's position was determined at 01:00, and ship's positions were plotted every hour.

According to collected VTS photographs, the "Joerg N" motor vessel changed the course to the 5° to the left, and it is assumed that the course was changed to avoid a group of fishing vessels on the starboard bow.

In his statement to the investigation commission, the second officer said he saw a fishing vessel for which he did not know that it was anchored, but concluded that the ship was moving at the speed of 2 kn. Also, according to his statement, he started tracking the fishing vessel when the distance was 4 M, at which time there was not a single loss of the tracked target, which is understandable considering the quality of the return echo from the fishing vessel and the weather conditions (calm sea without precipitations). The officer said that, according to the radar, the closest point of approach (CPA) to the fishing vessel was 0.2 M. While approaching the fishing vessel, the second officer actually did not perform any actions to avoid the collision. According to the ISM manual which the ship possesses (*Shipboard Operations, 7.2.7 Officers on Watch*), the closest point of approach while navigating the open seas must not be less than 2 M, and not less than 0.5 M while navigating the traffic separation schemes. With regard to the navigation area and other circumstances, the second officer had to anticipate the passage of the other ship at a distance not less than 0.5 M. Therefore, the officer was aware that the determined closest point of approach (CPA = 0.2 M) to the fishing vessel was less than the one required under the ISM manual, but did not do anything. Also, the second officer was not constantly observing the fishing vessel and failed to notice that the determined closest point of approach of 0.2 M was not correct, but that there was a risk of collision, which eventually happened. It can be concluded that the second officer failed to apply the rules on collision avoidance at sea and precautionary measures required by the ordinary practice of seaman in order to avoid collision with the fishing vessel.



## 5 CONCLUSIONS

In the process of performing investigatory actions within the safety investigation, the investigation commission concluded that the causes of the accident are as follows:

### Causes related to the "Joerg N" motor vessel:

The basic cause of accident related to the "Joerg N" motor vessel is the navigational error of the deck officer, that is, the breach of duty on the navigational watch. With regard to the failure to notice the collision by the officer on watch, as well as by any other crew member, the investigation commission holds that the breach of duty during navigational watch can be attributable to:

- the activities of the officer of the watch on the bridge which are not related to navigation,
- the absence of the officer of the watch from the bridge,
- the sleeping (drowsing) of the officer of the watch on the bridge due to fatigue.

A possible additional cause of the accident related to the motor vessel "Joerg N" can be attributed to the navigational error of the deck officer, which manifested itself in the following actions or omissions:

- a. Omission in the application of rules concerning bridge watch during navigation, when during the night the watch has to be composed of the officer responsible for deck watch (navigation) and another crew member who performs observation.

EXPLANATION: The second officer had sent the crew member who performs observation to clean the superstructure of the ship during the watch, and was thus left alone on the bridge during that time. According to the regulations on watch-keeping during navigation and according to procedures from the ISM manual which the ship possesses ("*Watch schedule*"), during the night the watch has to be composed of the officer responsible for deck watch (navigation) and another crew member who performs observation. The second officer thus directly endangered navigation safety, since the other crew member, whose basic role is to perform observation around the ship and to inform the officer of the watch accordingly, was not on the bridge.

- b. Omission in the application of rules on collision avoidance at sea and precautionary measures required by the ordinary practice of seaman.
- c. Unconscientious watch-keeping by observation and all available means (radar) in the interest of complete assessment of the situation and the risk of collision.
- d. Failure to act in order to avoid collision.

EXPLANATION: Considering the properties of the navigable area in the collision area (sufficient sea depth, good signage warning of navigation hazards close to the coastline), the movement of other ships in the collision area (one larger ship - "Bremen" - and several smaller anchored fishing vessels), very good detectability of other ships by radar and good visibility in the observed area, the second officer had to notice the anchored fishing vessel and establish whether there was any risk of collision.

### Causes related to the "Golub" fishing vessel:

Causes of the accident related to the "Golub" fishing vessel can primarily be considered additional factors, which indirectly contributed to the accident. They are reflected in the following actions or omissions of the master of the "Golub" fishing vessel:

- Omission in the application of rules determining the minimum number of crew members and their qualifications.

EXPLANATION: The ship master is obliged to ensure aboard a ship, before leaving the port, the minimum number of crew members qualified for the performance of duties assigned to them. The minimum number of crew members for the "Golub" fishing vessel is three - one master, one helmsman and one engineer. When leaving the port, the ship master failed to ensure that another two crew members, who could perform the duties of the helmsman and the engineer, are also aboard.

- Omission of not marking the fishing vessel in conformity with the regulations for the marking of vessels at anchor in periods of dark and low visibility.

EXPLANATION: After anchoring, the "Golub" fishing vessel switched on two red masthead lights visible from all sides which mark a ship not under command Convention on the International Regulations for Preventing Collisions at Sea, 1972., a fishing vessel at anchor. According to that anchor, when it supplies lighting for the purpose of collecting fish, cannot be considered a ship not under command, but has to be considered an anchored ship and, depending on its length, has to switch on the appropriate lights for anchored ships (in case of the "Golub" fishing vessel, one white masthead light visible from all sides). The investigation commission holds that the failure of the fishing vessel to show lights according to the International Regulations for Preventing Collisions at Sea, 1972 did not reduce the visibility of the fishing vessel to other ships because the vessel was also lighted with fishing lights, which are very bright and usually noticeable from a great distance. This was also confirmed by the second officer of the "Joerg N" motor vessel when he said that on his watch he had noticed on the starboard bow several ships with very bright, glaring lights. However, based on the lights shown from the F/V "Golub" (two red lights visible from all sides and set up one above the other in a vertical line), other ships could not conclude that the ship was anchored and that it practically was not moving through the water, and in this way other ships were partly prevented from accurately noting the status of the fishing vessel (anchored ship).

- Omission of nonorganising the watch to ensure a safe stay of the ship at anchorage.

EXPLANATION: On the F/V "Golub", navigational watch at anchor was not organised in conformity with the Regulation on Watch-keeping Arrangements and Performance of Other Duties on Board Ships for Assurance of Safety of Navigation and Marine Pollution Protection (OG 125/05, as amended in 126/08, 34/11). The person appointed by the master to perform watch at anchor had not been appropriately trained and it is therefore justified to believe that this person failed to perform the observation correctly and thus failed to establish that there was a risk of collision with the approaching ship ("Joerg N"). Correct observation from the fishing vessel was required to establish the existence of the risk of collision and actions had to be taken to attract the attention of the ship approaching in the collision course.

## 6 SAFETY RECOMMENDATIONS

Based on the findings of fact and the analysis, the investigation commission proposes the following safety recommendations:

### A. Safety recommendations for ships

- It is recommended to encourage ship managers to implement additional activities for the purpose of promoting procedures defined in SMS, primarily regarding the implementation of passage planning, through the additional training of crew members regarding the ISM Code provisions,
- It is recommended to increase the minimum number of crew members, particularly those who can perform observation, for the purpose of reducing their workload.

NOTE: An important safety recommendation for ships would be mandatory fitting of all ships with the Bridge Watch Navigational Alarm System, which would prevent failure to act by watch-keeping officers. Considering that the amendments to the SOLAS Convention, which entered into force on 1<sup>st</sup> January 2011, according to the resolution MSC.282.(86) of the Maritime Safety Committee of the International Maritime Organisation, introduced the provision on mandatory fitting of such device on all ships exceeding a gross tonnage of 150 as of 1<sup>st</sup> July 2014<sup>3</sup>, the investigation commission does not find it necessary to give additional recommendations regarding the earlier implementation of the said regulation.

### B. Safety recommendations for fishing vessels

- It is recommended to harmonise regulations on the minimum number of crew members aboard fishing vessels (up to 500 GT) with the needs of adequate performance of observation in such a way as to regulate additional training of at least another crew member of the fishing vessel in watch-keeping (Certification of ratings forming part of a navigational watch).
- It is recommended to introduce the obligation of recording the activities on the fishing vessel (navigation, fishing, maintenance, crew activity, etc.), as well as the obligation to define the procedures related to the mentioned activities. This can be carried out by introducing the obligation of carrying and keeping the adequate ship's log and/or introducing the so-called "mini ISM" procedures (similar to what is stipulated for passenger ships engaged in national voyages).
- It is recommended to introduce rules and regulations to establish the method (intensity, height and angle) of setting the lights for the collection of fish, so that they would not prevent the observation of lights set up according to the International Regulations for Preventing Collisions at Sea, 1972.

NOTE: An important safety recommendation for fishing vessels would be mandatory fitting of all ships with the Automatic Identification System (AIS), which would enable better noticeability of fishing vessels and their activities by other ships. Considering that the Ordinance on the Terms and Methods of Maintaining Order in Ports and Other Parts of Internal Waters and Territorial Sea of the Republic of Croatia (OG no. 90/05, as amended in nos. 10/08, 155/08, 127/10) introduced the provision on mandatory fitting of the mentioned device on all fishing vessels with a length of more than 15 meters as of 31<sup>st</sup> May 2014, the investigation commission does not find it necessary to give additional recommendations regarding the earlier implementation of the said regulation.

### C. Safety recommendations for services ashore

- It is recommended to increase supervision of the control of implementation of passage planning and practical work on nautical charts (nautical chart control, device control) by the PSC inspection.

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<sup>3</sup> Not later than the first annual ship inspection after 1 July 2014

- It is recommended to introduce the obligation of using the North Adriatic traffic separation scheme for ships at sea.
- It is recommended to organise the VTS system operation in a way so that it is possible to notice the risk of collision between ships navigating in the VTS control area. In order to avoid subjective collision risk assessment by the VTS operator, it is proposed to identify the procedures which would define conditions to be used by the VTS operator or the system in determining the potential risk of ship collisions and the need to warn ships.
- The flag state inspection is recommended to implement periodic focused campaigns of control of all fishing vessels for the purpose of controlling the ships' operational acceptance and controlling the status of the crew on board.
- The competent ministry is recommended to organise a discussion (round table) on the subject of the safety of fishing vessels, in order to identify measures which would increase the fishing vessel navigation safety, with relevant participants (representatives of fishermen, competent ministries, Croatian Shipping Register, educational institutions, and other relevant experts from the fisheries area).

7 ANNEXES

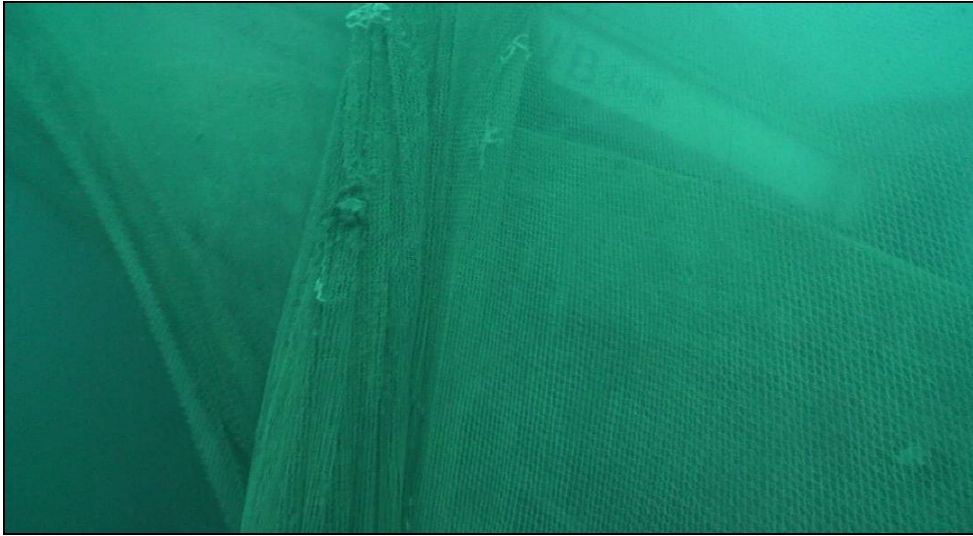


Figure 19. "Golub" fishing vessel at the point of sinking (ship's stern)

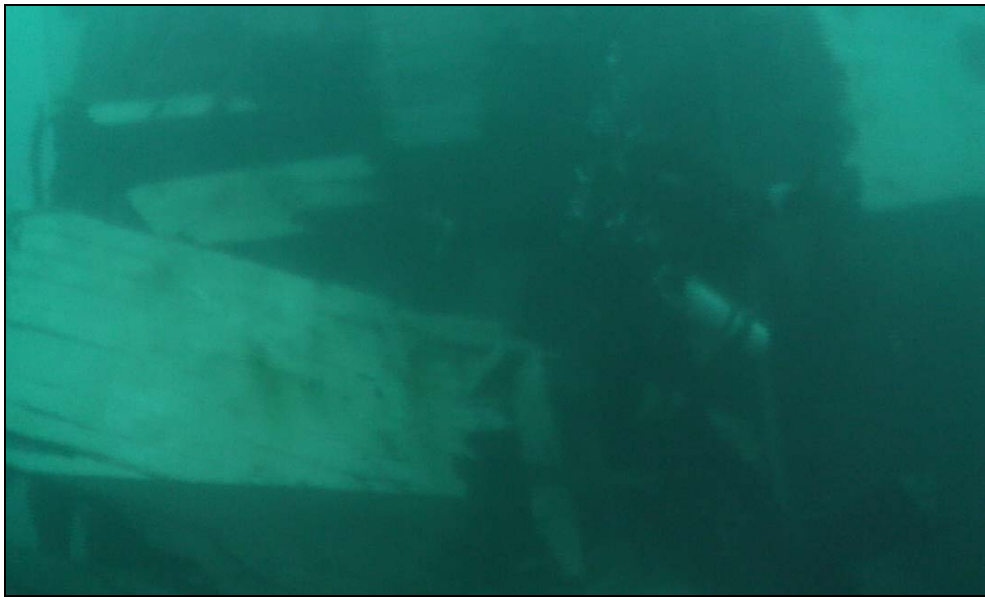


Figure 20. Damage of the "Golub" vessel on the left hull (towards the bow)





Figure 21. "Joerg N" vessel berth at the Rijeka port after the accident



Figure 22. Damage of the "Joerg N" vessel on the bow

Rijeka, 27<sup>th</sup> December 2011.

Commission members,

Joško Vlašić, president

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Loris Diminić, member

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Đani Mohović, member

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Vlado Frančić, member

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Ivica Grgurić, member

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