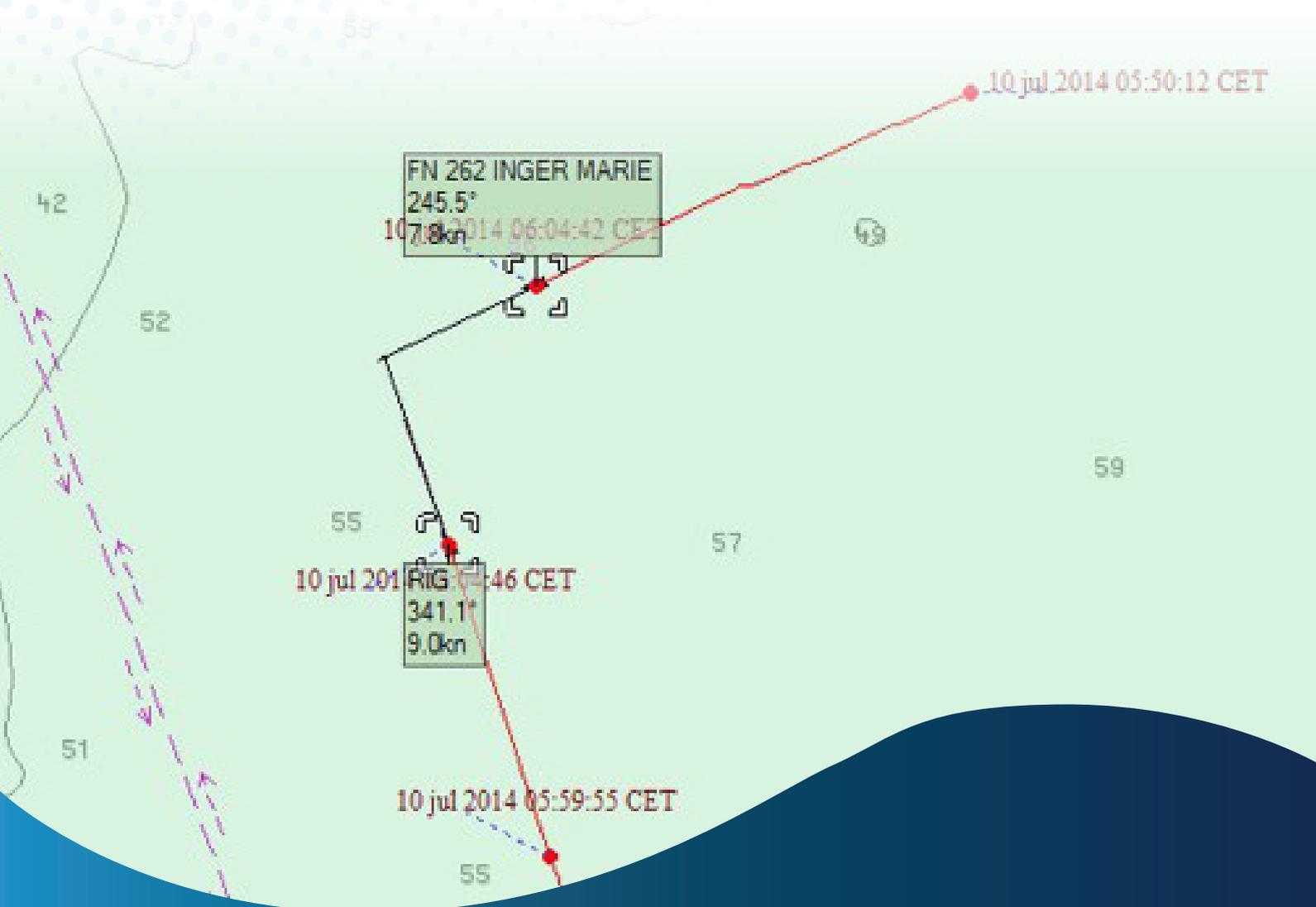




MARINE ACCIDENT REPORT

March 2015



RIG and INGER MARIE
Collision on 10 July 2014

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Front page: AIS from RIG and INGER MARIE. Source: The Danish Maritime Authority.

This marine accident report is available from the webpage of the Danish Maritime Accident Investigation Board www.dmaib.com.

The Danish Maritime Accident Investigation Board

The Danish Maritime Accident Investigation Board is an independent unit under the Ministry of Business and Growth that carries out investigations as an impartial unit which is, organizationally and legally, independent of other parties. The board investigates maritime accidents and accidents to seafarers on Danish and Greenland merchant and fishing ships as well as accidents on foreign merchant ships in Danish and Greenland waters.

The Danish Maritime Accident Investigation Board investigates about 140 accidents annually. In case of very serious accidents, such as deaths and losses, or in case of other special circumstances, either a marine accident report or a summary report is published depending on the extent and complexity of the events.

The investigations

The investigations are carried out separate from the criminal investigation without having used legal evidence procedures and with no other basic aim than learning about accidents with the purpose of preventing future accidents. Consequently, any use of this report for other purposes may lead to erroneous or misleading interpretations.

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1. SUMMARY

On 10 July 2014, the Danish fishing vessel INGER MARIE and the Maltese general cargo ship RIG collided approximately 11 nautical miles north-east of the Island of Læsø, Denmark. INGER MARIE foundered shortly after the collision and the skipper, who was the only crew member on board, perished.

The collision happened in good weather conditions and with little traffic in the area. Circumstances suggest that neither the skipper on INGER MARIE nor the watchkeeping officer on RIG were aware of the other ship's presence and the risk of collision until moments before the collision. The watchkeeping officer on RIG tried to avoid the collision by turning to starboard, but the manoeuvre was too late. It is uncertain whether the skipper on INGER MARIE realized the risk of collision before the impact.

After the collision, the crew on RIG launched the rescue boat, but were not able to locate the skipper. Within an hour after the collision, the skipper was recovered by a Swedish rescue helicopter, but had already perished. He was brought to a hospital in Gothenburg, Sweden.

It is uncertain why the skipper on INGER MARIE did not realize the risk of collision, but it is likely that he was pre-occupied with work on the deck area aft of the wheelhouse and therefore did not see RIG approaching. On RIG, the watchkeeping officer was not actively using the radar and did not plot the vessels in the area. The watchkeeping officer did not visually observe INGER MARIE approaching, because he did not move around on the bridge and/or was preoccupied and, therefore, did not see INGER MARIE approaching in a blind sector.

The Danish Maritime Accident Investigation Board has received preventive measures taken from The Danish Maritime Authority.

2. FACTUAL INFORMATION

2.1 Photos of the ships



Figure 1: INGER MARIE, XP 3057
Source: G. Vejen, www.fiskerforum.dk



Figure 2: RIG, www.shipspotting.com
Source: Claus Schaefer

2.2 Ship particulars RIG

Name of vessel:	RIG
Type of vessel:	General cargo
Nationality/flag:	Malta
Port of registry:	Valletta
IMO number:	8801137
Call sign:	9HBU8
DOC company:	Aquarius Ship Management
IMO company no. (DOC):	5428270
Year built:	1989
Shipyard/yard number:	Viano Do Castello/152
Classification society:	Bureau Veritas
Length overall:	87.0 m
Breadth overall:	13.0 m
Gross tonnage:	2351
Deadweight:	3398.79 t
Draught max.:	5.075 m
Engine rating:	1,080 kW
Service speed:	11.5 kts
Hull material:	Steel
Hull design:	Single hull

2.3 Voyage particulars

Port of departure:	Riga, Latvia
Port of call:	Keadby, UK
Type of voyage:	International
Cargo information:	Timber on pallets
Manning:	10
Pilot on board:	No
Number of passengers:	0

2.4 RIG's crew

Master	Holder of certificate of competency STCW II/2 as master. 52-year-old Russian/Latvian. He had been at sea for 35 years. He was on his first contract with the company, whereof 2 months were served on RIG.
Chief Officer	Holder of certificate of competency STCW II/2 as master. 62-year-old Russian. Had been at sea for 37 years and he had worked for the shipping company for 4 years, whereof 15 months were served on RIG.
1 st Officer	Holder of certificate of competency STCW II/1 as officer of the navigational watch. 26-year-old Russian. Had been at sea for 8 years and had worked for the shipping company for 7 months, whereof 2 months were served on RIG.

2.5 Ship particulars INGER MARIE

Name of vessel:	INGE MARIE
Type of vessel:	Fishing vessel – stern trawler
Nationality/flag:	Denmark
Port of registry:	Østerby Harbour
IMO number:	NA
Call sign:	XP 3057
DOC company:	NA
IMO company no. (DOC):	NA
Year built:	1973
Shipyard/yard number:	P. Rønn Christensen ApS/2-1973
Classification society:	NA
Length overall:	12.13 m
Breadth overall:	4.11 m
Gross tonnage:	9.1
Deadweight:	Unknown
Draught max.:	0.98 m
Engine rating:	169 kW
Service speed:	8.0 kts
Hull material:	Steel
Hull design:	Single hull

2.6 Voyage particulars

Port of departure:	Østerby, Denmark
Port of call:	Østerby, Denmark
Type of voyage:	National – coastal
Cargo information:	Langoustine
Manning:	1
Pilot on board:	No
Number of passengers:	0

2.7 INGER MARIE's crew

Skipper 66 years old. Had been at sea as a fisherman for most of his life. Had his own ship from 1983 until 2006 when he semi-retired.

2.8 Marine casualty or incident information RIG and INGER MARIE

Type of marine casualty/incident: Collision
IMO classification: Very serious
Date, time: 10 July 2014 at 0607 CET
Location: Kattegat, Sweden
Position: 57°26,81' N – 011°27,17'
Ship's operation, voyage segment: RIG: International
INGER MARIE: Coastal
Place on board: Ship side
Human factor data: Yes
Consequences: INGER MARIE foundered immediately after the collision and the skipper perished. RIG suffered minor damage to port side anchor.

2.9 Weather data

Wind – direction and speed: East 4 m/s
Wave height: Slight sea
Visibility: Good
Light/dark: Light
Current: North 0.5 knots

2.10 Shore authority involvement and emergency response

Involved parties: Lyngby Radio, Denmark
Admiral Danish Fleet
Swedish Coast Guard
Resources used: HAUKUR, OZ2119 (merchant ship)
MORTEN STAGE (Østerby Redningsstation)
LRB (19) (Østerby Redningsstation)
Rescue helicopter Lifeguard 901 (Swedish Coast Guard)
HANS LAURIN (Swedish Coast Guard)
MARIANNE BRAT (Swedish Coast Guard)
MÅRTA COLLIN (Swedish Coast Guard)
Speed of response: RIG launched a rescue boat few minutes after collision.
Swedish rescue helicopter arrived at accident site 0700 LT.
Actions taken: Skipper picked up by helicopter and brought to a hospital in Gothenburg, Sweden.
Results achieved: The Swedish rescue helicopter brought the skipper of INGER MARIE to a hospital in Gothenburg, Sweden. He perished as a result of the accident.

2.11 Scene of the accident

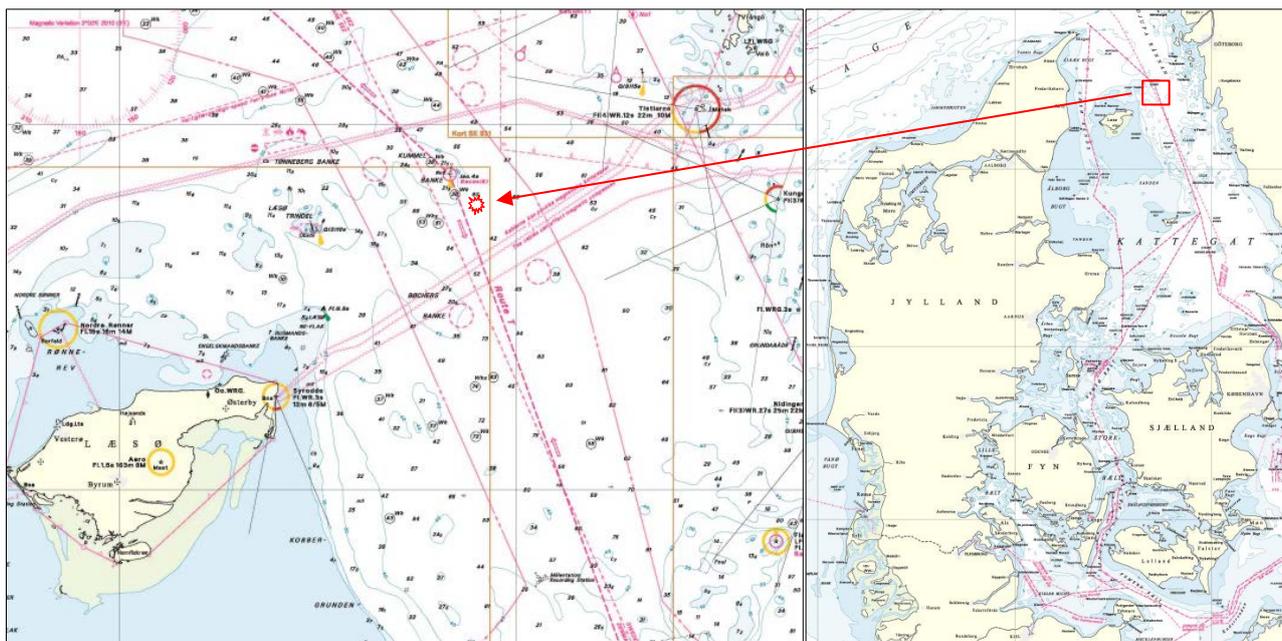


Figure 3: Approximate position of collision

Source: Chart no. 101. Danish Geodata Agency and DMAIB

3. NARRATIVE

3.1 Background

3.1.1 RIG

RIG was in a Northern-European tramp trade with timber from Baltic Sea ports to Northern European ports, primarily in the UK and Germany. The crew of nine consisted of three nationalities: Russian, Latvian and Estonian. The working language on board was Russian.

The bridge watch schedule was divided between three navigational officers. At sea the officers were 4 hours on watch and 8 hours off. During day time, the watchkeeping officer was alone on the bridge. The watch rotation did not change in port during cargo operations.

Ship's time at the time of the accident was UTC+3.

3.1.2 INGER MARIE

INGER MARIE was a stern trawler that was used for fishing langoustine in the Kattégat primarily in an area approximately 15 nautical miles east of the island of Læsø, Denmark. Fishing was usually done during day time in the winter and at night time in the summer. On a typical night INGER MARIE would catch approximately 70-100 kg of langoustine that would be brought to Østerby, Denmark, for sale at the local auction.

Time in this report is local time in Denmark (UTC+2) unless otherwise specified.

3.2 Sequence of events

The following is the sequence of events, based on a narrative from the viewpoint of the crewmembers on RIG. The skipper on INGER MARIE was alone and a narrative about the events on INGER MARIE is, therefore, not available because the skipper perished in the accident. A hypothesis about the events on INGER MARIE will be presented in section 3.5 about navigation on INGER MARIE and in the analysis of the accident.

RIG departed from Riga, Latvia, on 7 July 2014 at 1130 UTC (+3) with a full cargo of timber heading for Keadby, UK, for discharging. The voyage through the Baltic Sea and the strait of Øresund, Denmark, went as planned and the ship passed the island of Anholt, Denmark, northbound.

On the morning of 10 July 2014 at approximately 0300, the chief officer came on watch, while the ship was proceeding on a northerly course following Route T (figure 4). The weather did not cause any concern as the visibility was good, force 3 winds and a slight sea.

The officer of the watch was sitting in a fixed chair on the starboard side of the bridge by the radar, which was set on 3 nm range, 0.5 nm distance rings, trails, north up and relative motion. The image on the radar was clear and gave a good overview of the traffic in the vicinity.

The watchkeeping officer had navigated these waters before and was, therefore, familiar with the traffic pattern in the area and the presence of fishing vessels. Usually he would look out for fishing vessels as they, in his experience, gave way by changing course suddenly at close quarters. The radar was set on 3 nm range and on this particular day, he did not use the ARPA¹ functions of the radar, i.e. plotted the vessels in the area.

Navigation was done by paper charts that were located on a chart table on the port side, opposite of what was considered the normal conning station.

Approximately 10 minutes before the planned course change at buoy no. 3 by Kummel Banke (figure 4), the officer of the watch suddenly saw a small fishing vessel approaching on a crossing course at close quarters on the starboard side. He then quickly went to the centre of the bridge, disengaged the auto steering and put the rudder to full starboard. As the ship was in the starboard turn, RIG's port side collided with INGER MARIE's port side at 0607 LT.

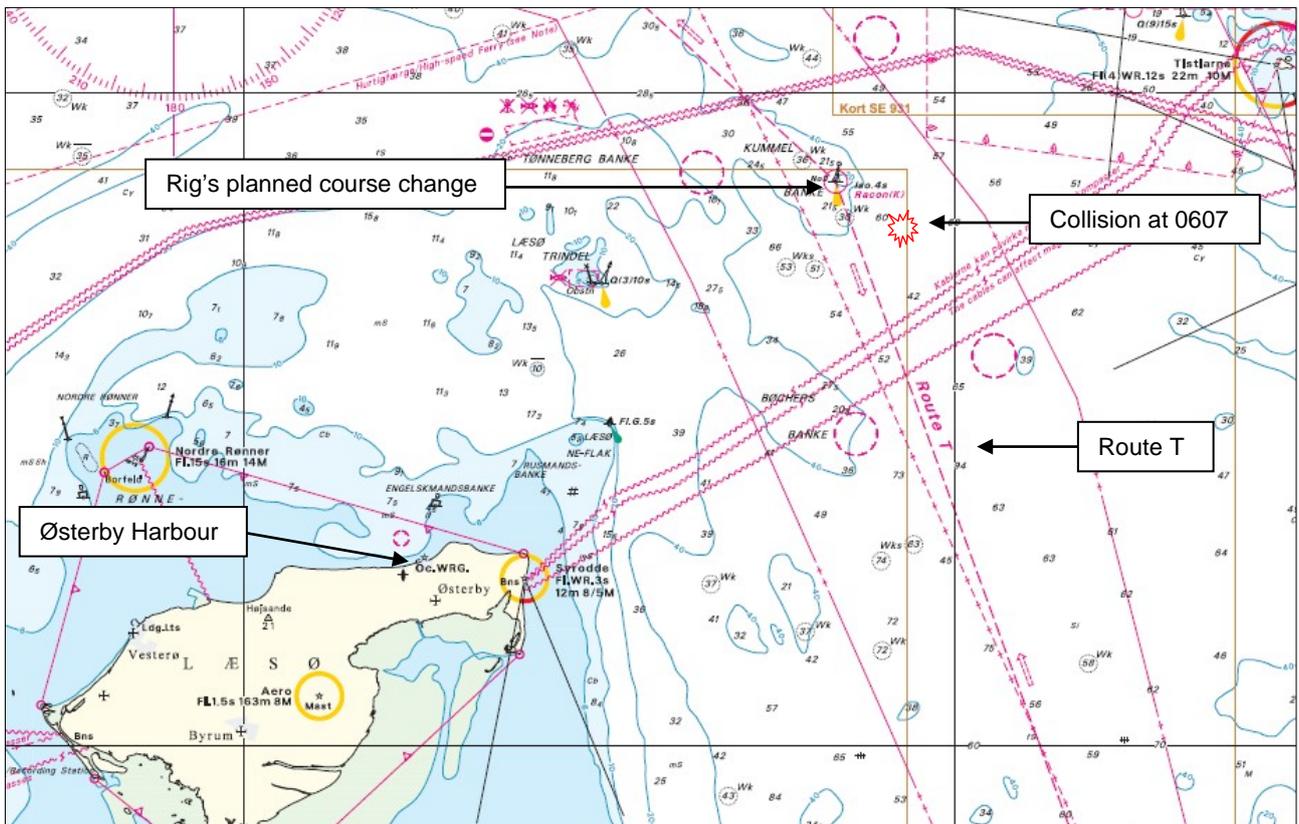


Figure 4: Overview of area of the collision
Source: Chart no. 101. Danish Geodata Agency and DMAIB

¹ Automatic Radar Plotting Aid

After the collision INGER MARIE moved down the side of RIG's port side while sinking rapidly with a port list. The officer of the watch on RIG saw one person wearing orange clothing on board INGER MARIE outside of the wheelhouse as the ship was about to founder.

In the galley the ship's cook was about to prepare breakfast. Suddenly, the cook heard the sound of the collision and saw shortly after, through the porthole, INGER MARIE's rotating propeller as it was about to founder.

At the time of the collision, the master was asleep in his cabin. He was awoken by the ship's cook who was standing in the doorway shouting that a collision had occurred and that the master had to go to the bridge immediately. As he arrived on the bridge, he saw a red silhouette on the port side and shortly after an inflated liferaft.

Within a few minutes, INGER MARIE had foundered and was no longer visible. The master sounded the man-over-board alarm and the crew assembled on the bridge and was updated on the situation. They proceeded to the muster station on the boat deck aft of the bridge at 0615 and donned lifejackets.

The master turned the ship around by the port side and returned to the approximate position of the collision.

Shortly after, the rescue boat was launched with the 2nd officer, bosun and motorman on board. As they were searching for survivors on the port side of RIG, they were notified by the lookouts on RIG that a person was in the water, but when they arrived at the reported position they realized that it was a lifebuoy and that no person could be found.

At 0625, the master sent a verbal distress message about the collision over VHF channel 16 that was received by Lyngby Radio (Danish coast radio station).

Lyngby Radio broadcasted a mayday relay message at 0629. The Danish Admiral Fleet was immediately notified by Lyngby Radio and started operations at 0633, when Østerø Coast Rescue Station on Læsø was alerted. The rescue boats MORTEN STAGE and LRB 19 were dispatched at 0650 and arrived on the site of the collision at 0710.

The collision occurred 1.98 nautical miles from Swedish territorial waters and within the exclusive economic zone of Sweden. Therefore, the Swedish JRCC² in Gothenburg took the lead on the rescue efforts. At 0633, a Swedish rescue helicopter was notified and was shortly after dispatched from Gothenburg, Sweden, to the accident site where it arrived at 0655. Three rescue boats from Sweden (HANS LAURIN, MARIANNE BRATT, MÄRTA COLLIN) were dispatched and they arrived at the accident site at approximately 0740.

At 0700, the skipper from INGER MARIE was located, recovered from the water by the rescue helicopter on the starboard side of RIG, and brought to a hospital in Gothenburg.

Initially, Lyngby Radio believed that there were two persons on board INGER MARIE, but at 0644 it was confirmed, by an employee at the Østerby Coast Rescue Station who knew the skipper on INGER MARIE, that only one person was on the fishing vessel.

The Swedish Coast Guard arrived on board on 10 July 2014 at approximately 0930. The navigational officers were tested negative for alcohol.

² Joint Rescue Coordination Centre.

3.3 Investigation of the wreck of INGER MARIE

On 11 July 2014, the Swedish Coast Guard, by the use of an ROV³, located a wreck that was identified as INGER MARIE (figure 5). The vessel was found on a depth of 58 metres, upright with the bow in a southerly direction and with a port side list of approximately 45°.



Figure 5: Picture of the wreck of INGER MARIE
Source: Swedish Coast Guard

The extent of the damage is not known. That INGER MARIE foundered with a considerable port list within one minute after the collision suggests that the damage was substantial.

Only the starboard side hull and superstructure was visible. Neither the starboard bow nor the side showed any signs of damage above or below the waterline, which means that the substantial part of the damage must have been suffered on the port side.

The inflatable liferaft was retrieved fully inflated by the rescue boat MORTEN STAGE from Østerby Coast Rescue Station on the day of the accident. An investigation of the liferaft did not reveal any deficiencies in its functionality.

³ Remotely Operated Vehicle.

3.4 Investigation of RIG

On figure 6 below is a picture of RIG taken on the day of the collision.



*Figure 6: Picture of RIG's starboard side on the day of the accident
Source: Swedish Coast Guard*

RIG did not have a VDR⁴ or S-VDR and was not required to according to the ship's Record of Equipment attached to the Cargo Ship Safety Equipment Certificate.

RIG was carrying timber cargo, which in part was stowed on the cargo hold hatches. The cargo did not, however, obstruct the visibility over the bow or the starboard side, while the watchkeeping officer was standing or sitting by the radar on the starboard side. Visibility was to some degree hindered by the relatively small bridge windows and wide frames. The watchkeeping officer might not have been able to see an approaching ship in certain angles on the starboard side if he was not moving around on the bridge and the ship was approaching on a crossing course with no change in bearing.

According to the hours of rest records, the watchkeeping officer kept the mandatory rest hours. RIG had been at sea for three days with a bridge watch schedule of 4 hours on and 8 hours off and, therefore, nothing indicated that the hours of work influenced the watchkeeper's rest. The bridge navigational watch alarm system appeared in good order and was switched on according to the completed pre-departure checklist.

A few hours after the collision, the ship's radar was investigated and it appeared to function normally. The watchkeeping officer on duty on the day of the accident had the radar set on a 3 nm setting with own ship centred in the middle of the screen. That meant that there would be approximately 15 minutes from INGER MARIE appeared on the screen until the time of the collision. The watchkeeping officer was not monitoring the radar continuously, because there was no traffic in the area and the weather was clear with good visibility.

⁴ VDR: Voyage Data Recorder. S-VDR: Simplified Voyage Data Recorder.

Figures 7 and 8 show the starboard and port bow on RIG on the day of the accident.



Figure 7: Picture of RIG's bow port and starboard side on the day of the accident
Source: Swedish Coast Guard



Figure 8: Picture of RIG's bow starboard side taken a few days after the accident
Source: DMAIB

As seen in figure 6 and 7, RIG was almost fully loaded and therefore the anchors were close to the waterline. Traces of red paint were only found on RIG's port bow (figure 8). Whether the marks on the port anchor came from the impact is uncertain. The picture in figure 8 was taken four days after the collision when RIG arrived in port and by then most of the residue from the collision might have been washed away.

The traces of red paint indicate that the impact occurred on the port side of RIG, which is consistent with RIG colliding with INGER MARIE after having initiated a hard starboard turn, while in a forward motion. The port anchor on RIG is likely to have been inflicting substantial damage to INGER MARIE's port side hull resulting in the sudden foundering.

RIG had a starboard turning circle with a diameter of 1.2 cables within 3 minutes and 49 seconds with full rudder if fully loaded and at a speed of 9.9 knots. The rudder took 49 seconds to move from centre to full starboard with one power unit and 25 seconds with two power units. It is uncertain if RIG had more than one power unit running at the time of the accident.

There was, therefore, a delay from when the watchkeeping officer saw INGER MARIE and realized that the collision was imminent until the alteration of the course was initiated.

3.5 Navigation and equipment on INGER MARIE

On 9 July 2014 at 1800, the fishing vessel INGER MARIE departed from the island of Læsø, Denmark, to fish langoustine in an area 18 nautical miles east of Læsø, and within the EEZ of Sweden. Fishing for langoustine during the summer was done at night and, therefore, the skipper usually rested in the afternoon before departing in the late afternoon or early night time.

INGER MARIE was not owned by the Danish skipper, but he used the vessel only on-and-off on a temporary basis and had recently operated the vessel for approximately 2-3 months. He only used the vessel during the summer and always alone. Normally, he departed Østerby at approximately 1800-1900 and returned to port at approximately 0900 in the morning the following day. It was not unusual for the skipper to handle the catch, i.e. measuring the size of the langoustine and sorting them, during the voyage from the fishing grounds to the port. The work place for sorting the catch was situated just aft of the wheelhouse. The skipper was thereby able to have a look at the instruments inside the wheelhouse, while working on deck.

Below in figure 9 is a view of INGER MARIE from starboard side aft and front port side.



Figure 9: Pictures of INGER MARIE from port side
Source: G. Vejen. Retrieved from www.fiskerforum.dk

INGER MARIE was equipped with radar, electronic chart (ECS) and AIS that was integrated with the ECS. There were three or four VHF radios on board and a mobile phone. The equipment was to some degree visible from the doorway.

There was a lifejacket in the wheelhouse. Furthermore, there were two lifebuoys mounted on the port side of the wheelhouse. A liferaft was mounted on top of the wheelhouse.

As seen in figure 9, the skipper would have had a limited view ahead of the vessel's port side while situated aft by the doorway. If the skipper was preoccupied with sorting the catch and the bearing to the RIG was not changing and in a blind sector, then the risk of collision could go unnoticed for an extended period of time. INGER MARIE held a constant course of 245° and speed of 8 knots, which makes it likely that the vessel was underway to its home port of Østerby on the island of Læsø. Considering INGER MARIE's distance from the fishing ground at the time of the collision, the skipper was likely in the process of sorting the catch when the collision occurred.

This hypothesis is based on secondhand information about the skipper's normal work routine and the AIS data showing the speed and course that INGER MARIE had previously had on this particular voyage. It has not been possible, with the available data, to determine the factual circumstances of the working patterns of the skipper.

After the foundering of INGER MARIE, the skipper was found with injuries to his head and he had drowned without having donned life-saving equipment e.g. lifejacket, immersion suit or lifebuoy. The skipper was wearing orange work clothes, which might have led the crewmember on RIG to believe that he had donned an immersion suit and/or lifejacket.

3.6 The collision

Both INGER MARIE and RIG were equipped with AIS. The quality of the retrieved AIS data has been deemed to be valid because the AIS transmissions from both ships were found to be consistent over several hours. The data has been considered credible because it is concordant with other collected data.

The navigation of both ships in the period leading up to the collision could therefore be reconstructed from the true course and speed transmitted by the AIS. The difference between the steered and true course has been deemed minimal because at the time of the collision there was no significant current or wind.

Below in figure 10 are screenshots from the AIS signals from RIG and INGER MARIE on the day of the collision. The vectors on the ships are 3 minutes. INGER MARIE can be seen on a south-westerly course of 246 with a speed over the ground of 7.8 knots, which implies that the vessel was not engaged in fishing, but returning to port after having completed fishing. RIG can be seen on a north-westerly course of 341 with a speed over the ground of 9.0 knots.

Both ships had been on their respective courses for at least 60 minutes before the collision, i.e. for a distance of 8-9 nautical miles. The AIS signal transmitted small variations in the course that did not exceed 2-3 degrees.

The visibility was good and the ships were therefore within sight of each other before the collision with no significant change in bearing.

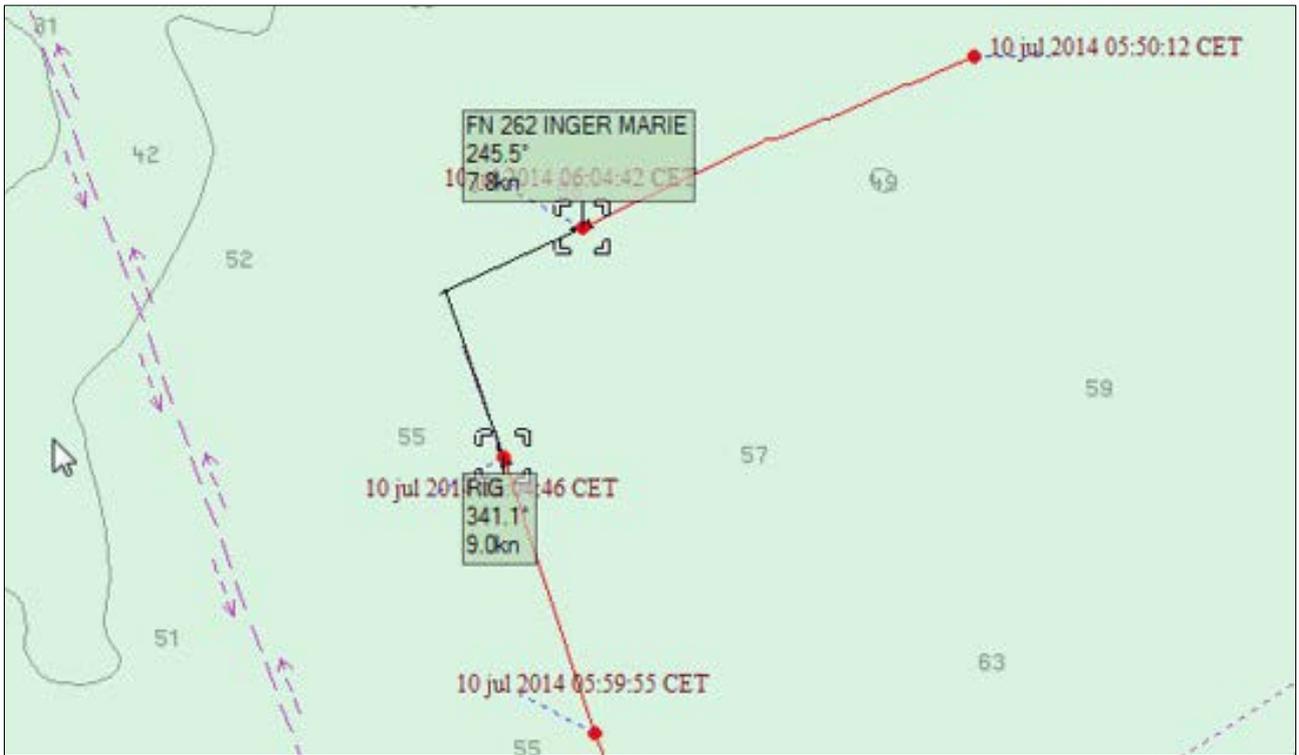


Figure 10: AIS track from RIG and INGER MARIE few minutes before the collision
Source: Danish Maritime Authority

It can be seen in figure 11 below that RIG was in a starboard turn moments before the collision and that INGER MARIE was apparently still on a steady course. Before the turn, the AIS on RIG was transmitting with an update frequency of approximately 10 seconds before the turn. During the turn, the update frequency increased. Therefore, the AIS data is considered a close approximation of the actual situation.

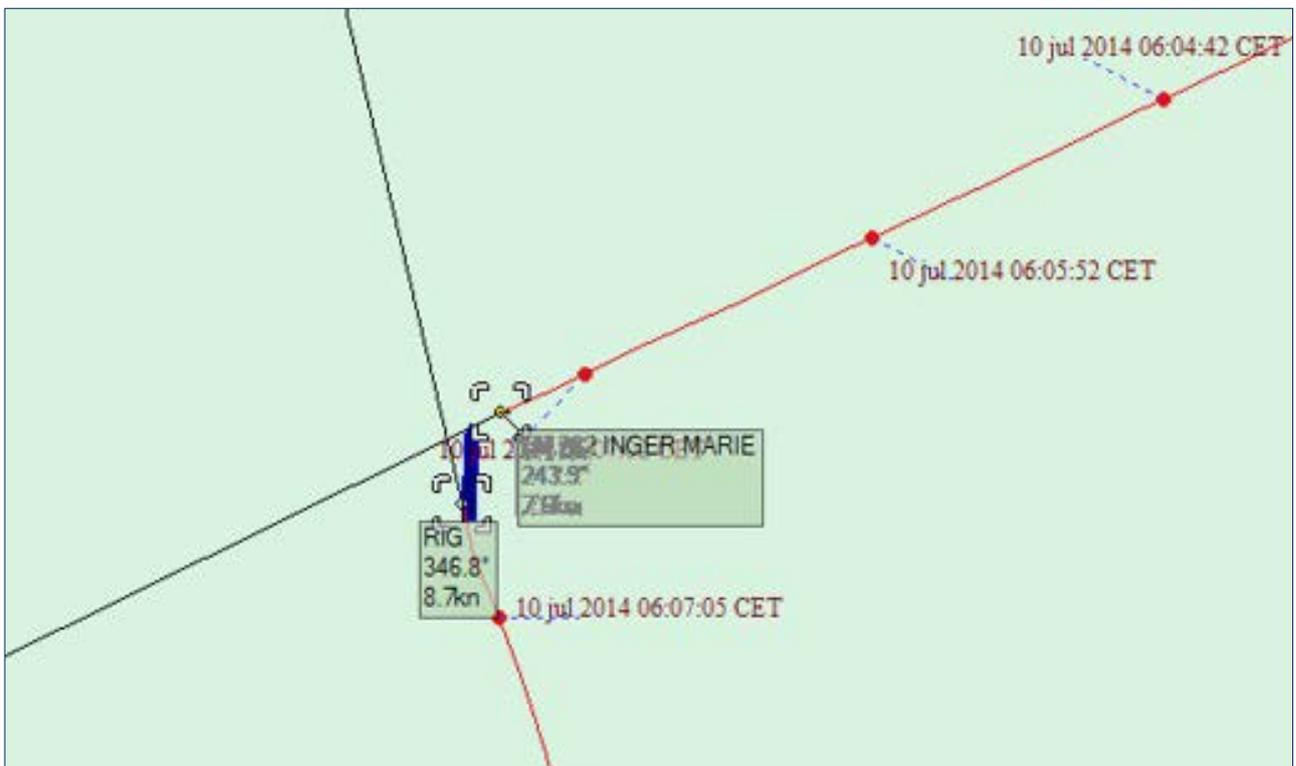


Figure 11: AIS track from RIG and INGER MARIE moments before the collision
Source: Danish Maritime Authority

At approximately 0535, on a position approximately 5 nautical miles south of the collision, RIG was in a similar situation with the Danish fishing vessel JANE OLSEN, XP9245. RIG was approaching JANE OLSEN on a crossing course with the fishing vessel on RIG's starboard side. The situation resulted in a close quarter's situation without RIG taking initiative to alter course.

3.7 COLREG⁵

In COLREG terminology RIG and INGER MARIE were two power-driven vessels in sight of each other in a crossing situation. RIG had INGER MARIE on her starboard side and was therefore the give-way vessel and INGER MARIE was the stand-on vessel.

According to Rule 15 in COLREG, RIG was required to keep out of the way of INGER MARIE and avoid crossing ahead of INGER MARIE. According to Rule 17 (b), INGER MARIE was required to take action to best avoid a collision.

The skipper on INGER MARIE was presumably not aware of the risk of collision as he would otherwise have taken action to avoid collision. The watchkeeping officer on RIG became aware of the risk of collision so late that a collision became unavoidable. In that context neither the skipper on INGER MARIE nor the watchkeeping officer on RIG adhered to Rule 5 about keeping proper look-out.

Therefore, neither ship complied with the collision avoidance provisions of COLREG.

3.8 Recent collisions involving fishing and cargo ships in Danish waters

3.8.1 Collision in 2011 – cargo ship FRANK W and fishing vessel LILLY⁶

In the morning of 26 June 2011, the Danish fishing vessel LILLY with two fishermen on board was on a WSW course close by light buoy "No 1A" east of Skagen. The fishing vessel was bound for Skagen, Denmark, after having finished fishing in the northern part of the Kattegat. At the same time, an Antigua & Barbuda flagged general cargo ship FRANK W was approaching light buoy "No 1A" on a SE course bound for Halmstad in Sweden.

The two vessels only observed each other shortly before the collision, but actions to avoid a collision were not taken in ample time to have any effect. The collision caused a severe leak in the fishing vessel, and approximately 30 minutes after the collision the fishing vessel sank. The two fishermen were taken directly on board a pilot vessel that had come to their assistance. The cargo vessel had minor dents aft and was allowed to continue its voyage to the destination.

The accident occurred as the watchkeeping officer on FRANK W did not visually observe the fishing vessel because of reflections from the sun and because the echo on the radar was mistaken for a buoy. On the LILLY the fishermen were occupied with sorting fish on the deck and therefore did not realize the risk of collision.

3.8.2 Collision in 2011 – cargo ship VINGA and fishing vessel N. A. HANSEN⁷

On 18 January 2011 at 2330, the Swedish general cargo ship VINGA collided with the Danish trawler N. A. HANSEN 11 nautical miles SSE of Grenå, Denmark.

The two vessels were on almost head-on courses and did not observe each other before the collision and no actions to avoid the collision were taken. The collision caused breach of hull and indentations on the bow of VINGA, and N.A. HANSEN foundered within a few minutes. Both fishermen on board N. A. Hansen perished.

⁵ Convention on the International Regulations for Preventing Collisions at Sea, 1972, as amended.

⁶ http://www.dmaib.dk/Ulykkesrapporter/N_A_HANSEN_VINGA_180120112_FISK.pdf

⁷ http://www.dmaib.com/Ulykkesrapporter/Frank_W_Lilly_Engelsk_fisk.pdf

The accident occurred as the watchkeeping officer on VINGA did not observe the fishing vessel. It was uncertain why the watchkeeping officer did not observe the approaching fishing vessel. N.A. HANSEN was in the process of fishing, but it was uncertain why the vessel did not observe and/or manoeuvred before the collision. The fishermen were presumably preoccupied with fishing.

4. ANALYSIS

4.1 The collision

RIG and INGER MARIE collided after having been on steady crossing courses for over an hour in daylight and good visibility. There was no significant traffic in the area and none of the ships were restricted by draught, manoeuvrability or fishing activities.

That neither ship adhered to COLREG's rule 5 about proper lookout is a factual circumstance that does not in itself provide an explanation of why the collision occurred. Understanding why there was a lack of knowledge about the other ship's presence and thereby a risk of collision is essential for the explanation of the collision. However, the investigation has not with certainty established why the risk of collision was acknowledged neither by the watchkeeping officer on RIG, nor by the skipper on INGER MARIE, who were both experienced seafarers.

INGER MARIE's course and speed indicate that the vessel was returning to the port of Østerby and therefore was not engaged in fishing, but navigating as a power-driven vessel. This is supported by the fact that the collision occurred after INGER MARIE had been at a steady course with full speed for approximately an hour after having had varying courses and speed indicating that the skipper was fishing at that time.

It is therefore likely that the skipper was engaged in work on deck and did, therefore, not maintain an effective lookout because the wheelhouse obstructed a clear view ahead of the vessel.

The watchkeeping officer on RIG did not make a visual observation of INGER MARIE until the collision was imminent. He was not able to turn the ship sufficiently to avoid the collision once he realized the risk of collision. RIG turned to starboard to avoid the collision. A port turn would, at this late stage, not have been effective to prevent the collision, but would rather have brought RIG ahead of INGER MARIE and, thereby, in violation of COLREG.

He was sitting at the conning station on the starboard side beside the radar. However, he did not identify INGER MARIE on the radar as he was not actively and continuously using it because there was little traffic and the weather was clear with good visibility. The radar was on a 3 nm range setting, which would give the watchkeeping officer a relatively short notice from the echo appeared on the radar until the collision. The instrumentation was therefore not utilized to the fullest extent due to the favourable weather conditions that presumably gave a good overview of the situation.

The close quarter's situation involving the fishing vessel JANE OLSEN, which occurred approximately half an hour before the collision, indicates that the watchkeeping officer was sleepy or was pre-occupied with something and therefore had a limited overview of the other ships in the area. If INGER MARIE was approaching RIG in a blind sector and the watchkeeping officer on RIG was sitting in the same place for a prolonged period of time, then he would not observe INGER MARIE approaching as the bearing was not changing.

It is common for rather small Danish fishing vessels to be operated by one or two persons. These fishing vessels are often preparing the vessel for fishing, while it is underway to the fishing grounds. While fishing there is seldom a person available to be designated for look-out. After having completed fishing, the crewmembers are working on deck, for example sorting the catch and

stowing it, while the vessel is underway to port. These practices will limit the skipper's ability to recognize the risk of collision. Previous collisions involving cargo ships and fishing vessels in Danish waters show how these practises can become a causal factor in collisions.

As INGER MARIE foundered, the skipper was not able to utilize the safety equipment on board. The injuries the skipper suffered as a result of the collision/foundering might have impaired his response or even made him unconscious. Even though the crew on RIG responded within 15 minutes, they were not able to locate the skipper because they were searching on the port side of RIG where they assumed INGER MARIE had foundered. The skipper was located on the starboard side of RIG by the rescue helicopter from the Swedish Coast Guard and recovered within an hour after the collision.

This accident and its consequences emphasize the importance of having life-saving appliances readily available on board fishing vessels. The timeframe from impact to foundering is narrow on small fishing vessels and gives little time for donning equipment that is stowed away.

5. CONCLUSIONS

The collision occurred after both ships had approached each other on crossing courses in good visibility, calm seas and clear weather, i.e. the situation was not complicated by the environment or the presence of other ships in the area. Both the skipper on the fishing vessel and the navigational officer on RIG were experienced navigators that were familiar with the waters.

The investigation has not established the causes of the accident with certainty, but has presented a likely explanation of why the collision happened, based on the circumstantial information available.

A conjunction of circumstances led to the collision that was overall caused by a lack of effective look-out on both ships. On INGER MARIE, the look-out was not effective probably due to work practices while the vessel was underway. On RIG, the lack of effective look-out was probably caused by the favourable weather conditions that gave a good overview of the situation and minimized the use of the radar. Once the presence of INGER MARIE was acknowledged on RIG, it was too late to avoid the collision.

Even though the rescue boat was expediently launched, the crew on RIG did not manage to find the skipper. It is uncertain whether the skipper was conscious after INGER MARIE foundered. The body of the perished skipper was recovered by a helicopter from the Swedish Coast Guard within an hour. He was not wearing any life-saving equipment when he was recovered.

6. PREVENTIVE MEASURES TAKEN

In connection with periodic surveys of fishing vessels, the Danish Maritime Authority will focus on the importance of the crewmembers' understanding of the accessibility of the life-saving equipment and, furthermore, on how to apply it swiftly in an emergency.

The Danish Fishermen's Occupational Health Service is, as an ongoing effort to promote the safety of fishermen, campaigning for implementing the use of inflatable lifejackets that can be worn while working on deck.