



Bundesstelle für Seeunfalluntersuchung
Federal Bureau of Maritime Casualty Investigation
Federal Higher Authority subordinated to the Ministry of Transport
Building and Urban Affairs

Investigation Report 101/06

Very serious marine casualty

Fatal accident on board the
MFV JAN MARIA
on 13 March 2006
approx. 150 nm west of Ireland

1 September 2008

The investigation was carried out in conformity with the law to improve safety of shipping by investigating marine casualties and other incidents (Maritime Safety Investigation Law - SUG) of 16 June 2002.

According to this law, the sole objective of the investigation is to prevent future accidents and malfunctions. The investigation does not serve to ascertain fault, liability, or claims.

The present report should not be used in court proceedings or proceedings of the Maritime Board. Reference is made to Art. 19 Para. 4 SUG.

The German text shall prevail in the interpretation of the Investigation Report.

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1 Summary of the Marine Casualty

The motor fishing vessel JAN MARIA, sailing under German flag, reached its setting position in the fishing area west of Ireland on 13 March 2006 at approximately 22:40¹. On a routine basis, four crew members would be employed on the aft deck² of the stern trawler carrying out the work processes required in preparation for putting out the trawl. The Master navigated the vessel. At the same time, he operated the various winches from the control position located in the aft part of the bridge. This position provided him with the best possible overview of the aft deck.

While handling the trawl gear as required for setting the trawl, suddenly, and contrary to the regular procedure, an extremely high line tension came about at the aft midships guide roller. A deckhand, who for an unexplained reason was in the danger area not visible from the bridge between the vertical guide roller and the tightening lines, was caught by the lines and pressed with a great force against the guide roller. During the process he suffered severe injuries in the chest area, which resulted in his death shortly in spite of immediately implemented first aid measures and direct contact with the radio medical advisory service. A rescue helicopter already dispatched to the JAN MARIA was thereupon recalled from the control centre.

The JAN MARIA discontinued the setting procedure immediately after the accident and headed for the Irish fishing port of Killybegs, which it reached at approximately 14:00 on 14 March 2006.

¹ All times in the report are shipboard times = UTC + 1 h (= MEZ).

² In the remainder of the text, the terms fishing deck and working deck will be used synonymously.

2 Scene of the accident

Type of event: Very serious marine casualty, fatal personal accident
Date : 13 March 2006
Time: approx. 22:50 h
Location: approx. 150 nm west of Ireland
Latitude/Longitude: ϕ 54°34'N λ 013°30'W

Section from the Great Circle Chart North Atlantic Ocean 2700,
Federal Maritime and Hydrographic Agency



Figure 1: Position of the vessel at time of accident

3 Vessel Particulars

3.1 Photo



Figure 2: MFV JAN MARIA

3.2 Particulars

| | |
|----------------------------|--------------------------------------|
| Name of the vessel: | BX 783 JAN MARIA |
| Type of vessel: | Fishing vessel / Stern trawler |
| Nationality/Flag: | Germany |
| Port of registry: | Bremerhaven |
| IMO Number: | 8707446 |
| Call sign: | DFDJ |
| Vessel operator: | Doggerbank Seefischerei GmbH |
| Year built: | 1988 |
| Shipyard: | Schichau Seebeckwerft AG Bremerhaven |
| Yard number: | -1066 |
| Classification society: | Germanischer Lloyd |
| Length overall: | 125.53 m |
| Breadth overall: | 18.00 m |
| Draught: | 6.51 m |
| Gross tonnage: | 7,646 |
| Deadweight: | 4,135 t |
| Engine rating: | 6,150 kW |
| Main engine: | Krupp Mak Maschinenbau GmbH 8 M 35 |
| Speed at time of accident: | 4 kn |
| Number of crew: | 42 |

4 Course of the accident

4.1 Preliminary remarks

4.1.1 Deployment, construction and manning of the MFV JAN MARIA

The JAN MARIA was built in 1988 at the Schichau Seebeckwerft in Bremerhaven and specially designed as stern trawler for catching herring and mackerel in the Atlantic and the North Sea. The ship is equipped with processing and cooling plant enabling it completely to process the catch within four hours and to store it at $-28\text{ }^{\circ}\text{C}$. In order to protect pressure sensitive fish types from excessive mechanical stress when drawing in the net, the JAN MARIA, as opposed to conventional stern trawlers, does not have a stern ramp slanted towards the surface of the water. Instead, depending on its sensitivity, the catch is hauled onto the working deck in divided net units called “purses ” or aspirated by means of a fish pump and then conveyed into the processing room (Figs. 3 and 4).



Figure 3: Atypical trawler stern of the JAN MARIA

In 2000, the JAN MARIA, which is operated by the German wholly owned subsidiary of a large Dutch fishing company under German flag, was extended by the insertion

of a 25.6 m section in the central area of the ship, thus becoming the largest and most modern fishing vessel sailing under German flag. This increased the catch capacity per trip to 5,500 tons. The on-board fish processing capacity is 350 tonnes.



Figure 4: View onto the fishing deck³

For operation in compliance with regulations, according to the Minimum Safe Manning Document issued by the See-Berufsgenossenschaft (Marine Insurance and Safety Association), See-BG, the JAN MARIA requires 22 crew members. To this should be added some 18 to 20 crew members primarily employed in fishing, net repair and fish processing activities. However, a fully definite and exclusive assignment of individual crew members to vessel operation, fish catching and fish processing areas only partly exist. Some crew members work exclusively in fish processing, while others are deployed in the processing domain as needed in addition to their nautical and/or technical duties. There are two teams of four crew members each on board for setting and drawing in the net; these teams work around the clock on the aft deck on a two-shift system. The foreman of each team is referred to as the “Mate”. The Mate communicates acoustically and by hand signals with the winch operator on the bridge.

According to the document submitted to the Federal Bureau as a “corrected crew list” 42 persons were on board on the accident voyage. The Master and 11 of the crew

³ Photographed from the open bridge window at the winch operation station.

members were Dutch citizens. Of the remaining persons on board the vessel, 23 were from Germany, four from Lithuania and three from Poland.⁴

4.1.2 Relevant locations on board

For a better understanding of the events, we will first describe the special design features of the fishing deck (= scene of the accident) and of the bridge as well as of the winch operation control position located there.

4.1.2.1 Fishing deck

The fishing deck is the central workplace for the four crew member team that is responsible for setting and drawing in the fishing gear. On the aft part of the fishing deck there is a centrally located crane column integrated into a two-level platform spanning the entire breadth of the ship and over which the lines required for net handling are led by means of blocks and deflectors (Fig. 5). The crane is used to help set the net and in particular for drawing in the purse nets full of fish on board.⁵

Access to the crane platform is by a companionway arranged centrally midships of the working deck and oriented from the crane column towards the after edge of the superstructure (Abb. 6⁶).

⁴ N.B.: Further details concerning peculiarities found in connection with the crew of the JAN MARIA follow in Chapter 5.3.5

⁵ N.B.: In connection with the fishing technology, cf. the explanations in Chapter 5.3.2.

⁶ N.B.: Hereafter referred to as “platform ladder” for the sake of brevity.



Figure 5: View onto the fishing deck during the net setting process⁷

⁷ N.B.: Individuals wearing white hard hats are members of the ship's crew (deck duty).



Figure 6: View from the forward edge of the fishing deck aft⁸

Midships and directly before the vessel's after edge, is the vertical guide roller involved in the accident; its diameter is 0.6 m (Figs. 7 and 8). The distance between the aft bulwark and the guide roller is also 0.6 m. Figures 5, 6 and 10 make clear the fact that the dimensions of the crane column create a relatively large blind spot, so that the area immediately around the guide roller cannot be seen from either the winch operating control position on the bridge or from the platform companionway.

⁸ N.B.: The accident relevant guide roller is in the blind spot behind the crane column.



Figure 7: View onto the guide roller



Figure 8: Guide roller (close-up)

The fishing deck is limited in the direction of the superstructure by a shelf-like steel structure on which all winches and net roller necessary for the catching process are installed (Fig. 9).



Figure 9: View from the fishing deck towards the after edge of the bridge⁹

The regular crew working area on the fishing deck for net and line handling is limited to starboard and port by an approx. 1 m high coaming leading from the “winch shelf” to the aft bulwark (Fig. 9 and 10). The width of the working area is 6.70 m aft, 7.80 m at the platform companionway and approx. 8.20 m in the area of the companionway leading to the superstructure.

⁹ N.B.: The platform companionway is in the foreground left, and part of the coaming that limits the working area is visible in the foreground on the right. The windows of the winch operating station on the bridge are marked in red.



Figure 10: Working area on the fishing deck

The space between the coaming and the lateral bulwark is used for storing spares and net accessories. In particular, this area houses the slides on which the fish are conveyed from the fish pump to the processing room.

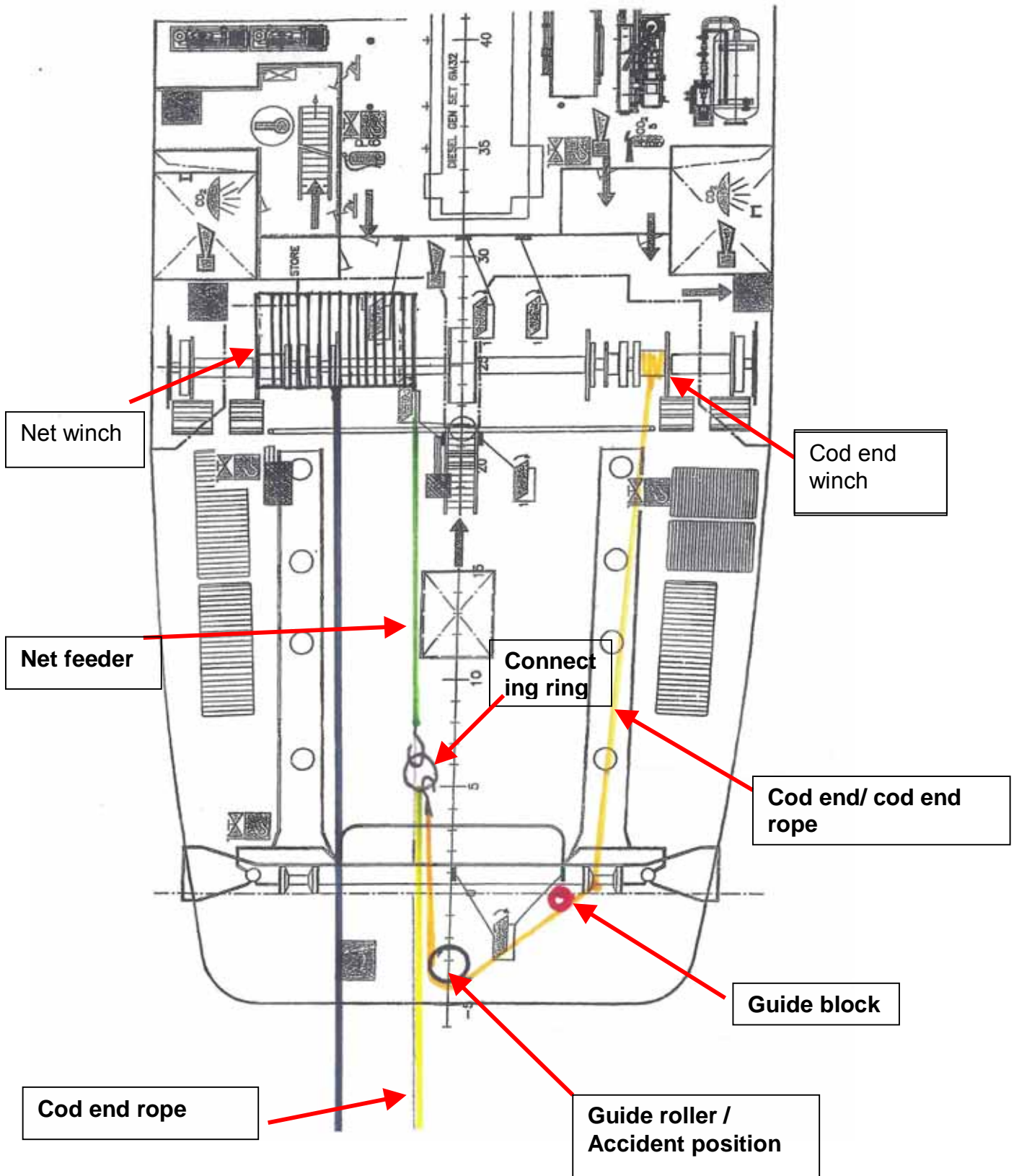


Figure 11: Schematic of the relevant lines in the working area

4.1.2.2 Bridge with control position

The bridge of the JAN MARIA is housed in a bridge house in the aft area of the superstructure.



Figure 12: Bridge house of the JAN MARIA



Figure 13: Bridge console

The control position for the operation of all winches required for setting and drawing in the net gear is located amidships in the aft part of the bridge house (Figs. 9, 13, 14 and 15).



Figure 14: Bridge windows for the winch operation control position



Figure 15: Winch operation control position with bridge windows

4.2 Course of events

4.2.1 Course of the voyage until the time of the accident

The JAN MARIA had left the Dutch port of IJmuiden on 7 March 2006 at 20:00. On 11 March 2006, at approximately 14:00, according to entries in the ship's logbook, the fishing operations that would continue until the time of the accident were begun in the Atlantic Ocean approx. 120 nm west of Ireland. The ship's logbook did not contain any written information concerning the number and time sequence of the individual catching procedures carried out, nor was this information communicated to the Federal Bureau in any other manner. However, the ship's logbook reveals the vessel's position at 19:00 on 13 March 2006 (the day of the accident) as being ϕ 54°34'N, λ 013°36'W. At 22:40 the fishing position at ϕ 54°34'N, λ 013°30'W approx. 150 nm west of Ireland was said to have been reached.

4.2.2 Course of the accident

The following description of the course of the accident is based on the written and oral information provided by the Master, his Fish Master on the bridge¹⁰ and the crew members working on deck at the time of the accident. At this point in the report only the witnesses' subjective perceptions will be described. Details concerning the (theoretical) fishing technology and the pertinent actual processes taking place on

¹⁰ N.B.: In the Master's own words, he was assisted on the bridge by a "ship and net operations observer".

the day of the accident were determined in the course of the investigation and they constitute the subject of Chapter 5 (Investigation). However, technical details will already be addressed in the next section in the form of remarks printed in italics to the extent that they may be essential for comprehension of the course of the accident.

At 22:40 the Master reportedly called the four member deck crew necessary for setting out the trawl onto the fishing deck by means of a sound signal and ordered them to set the trawl. Reportedly, weather conditions were acceptable and visibility, good. Winds were said to have been south-westerly at 5 to 6 Bft.

The deck team consisted of a Polish Mate, two Boys, one Lithuanian and one Pole, and the German Seaman who later became the casualty.¹¹ Two team members were assigned to the work processes on the port and two on the starboard side of the fishing deck. The Mate reportedly worked with the Lithuanian crew member on the starboard side, while the German Seaman and the Polish Boy were primarily supposed to be responsible for the work on the port side.

Between 22:45 and 22:50 they had reportedly begun to lay the net wound on the upper port side net winch and at the same time slack off the so called cod-end-rope which is at the end of the net, the so called cod end, permanently connected with this by 2 divider strops from the starboard side cod end winch and the approx. 665 m long blue top line, also connected with the net.

N.B.:

The only connection to the net during fishing is only effected by the trawl warps. All other lines that are necessary for handling the net and recovering the catch remain on the net and are secured there. While the trawl is being set out and drawn in, these lines are operated by an additional winch (the cod end winch). The additional lines are the cod end rope and the top line.

The cod end rope consists of two sections firmly coupled to each other and has a total length of 82.6 m. While one end of the cod end rope is firmly connected with the cod end, a steel ring is attached at the loose second end. The connection between the cod end rope and the cod end winch that is necessary to heave and lower the cod end rope is created by clipping a 34 m long line, called the tail end feeder, into this steel ring.¹²

Due to the reduced length of the cod end rope plus the tail end feeder as compared to the entire net gear to be set out, it is necessary to release the connection between the cod end rope and the cod end winch while setting the net.

Drawing in the full cod end after the catch, the connection between the cod end rope and the tail end feeder must be restored. In order to enable "access" to the loose end of the cod end rope, i.e. to the steel ring, which is necessary for the hauling in procedure, the loose end of an approx. 14.5 m long green connecting line (called the net feeder), which is permanently connected to the net and fitted with a steel hook, is hooked into the steel ring "beforehand", i.e. already when setting the net. This bridle is run onto the net roller together with the net. In this way the cod end rope, both of

¹¹ The functional titles, except for that of the Mate, are as per crew list. The Mate is listed there as a Boy; cf. the details in Chapter 5.4.3.

¹² N.B.: One end of the top line feeder is permanently connected to the cod end winch; a steel hook is fitted to the other (bitter) end of the feeder.

whose ends are now connected with the net, namely by means of the permanent linkage at the cod end on the one hand and by the temporary connection with the bridle on the other, is then let into the water together with the net itself. When drawing in the net, the connection between the cod end rope and the bridle at the steel ring is released, and replaced with the connection between the cod end rope and the tail end feeder.

Removing the connection between the cod end rope / tail end feeder at the steel ring of the cod end rope when setting the net requires that the line connection to be loosened is not subjected to tensile forces from the cod end, which is at this point already in the water. For this reason it is necessary, after previously having established the connection – initially not under tension - between the cod end rope and the net feeder, to deflect the traction in the direction of the cod end to this (new) connection. For this reason, after establishing the connection between the cod end rope and the net feeder, the net must be briefly heaved on, and, at the same time, to prevent otherwise a compelling line tension in the direction of the cod end winch, the top line feeder must be lowered away. In this way, the steel ring of the cod end rope is pulled around the aft midships guide roller, and in the process the traction between cod end, cod end rope and top line feeder is removed, and deflected on the line connection between the cod end, the cod end rope and the net feeder. At the same time this makes the line connection to be much easier to reach for the fishermen. On the port side, nearby the platform companionway, the connection between the top line feeder and the cod end rope, which is now no longer under tension, is released at the steel ring. This workstation is also stipulated, because it can best be observed by the winch operator.

Shortly before the accident and in preparation of the exchange of the connection between the cod end rope / top line feeder and the connection cod end rope / bridle the net was lowered away approx. 65 m and the winches had been stopped following a hand signal from the Mate. Then, the loose end of the bridle initially wound onto the net winch roller together with the net was reportedly led around the aft guide roller from the port side by the future casualty and clipped with the hook into the steel ring of the cod end rope on the starboard side at the level of the hangar block.

There were contradictory statements as to whether the German seaman had been assisted in this reportedly by the Polish boy. The Mate and the Lithuanian Boy in any event at this point in time had reportedly been engaged in connecting the sling of the top line, which runs around the net, with the net itself on the port side of the working deck. Reportedly the Polish Boy (potentially having joined them only slightly later) had helped them with this task.

N.B.:

The approx. 665 m long top line is designed to aid in drawing in the net by also heaving, thus helping bring the cod end closer to the stern of the ship. The top line sling is permanently connected with the net. In order to ensure that during the subsequent catch process the top line will not unintended draw together which would make catching fish impossible, three eyes spliced into the top line sling are connected by means of a 6 mm thick lanyard to three of the altogether 70 available rings permanently affixed to the net.

In the further course of the net setting procedure, at a later stage and in a procedure analogous to the “disconnection” of the cod end rope described above, the top line is

*also temporarily affixed to the end of the net with the help of a winch feeder and a net feeder, separated from the top line winch and then fully led into the water together with the net.*¹³

The connection between the top line sling and the net was reportedly established by two team members lifting the top line and a third crew member connecting the eye splice with the net rings. Thereafter, these three crew members had exited the danger area and moved towards the starboard side of the fishing deck. The Mate then reportedly gave the Master the hand signal to start hoisting the net. He reportedly had not given any thought to the actual position of the German seaman at the relevant time and had not perceived him visually. The other two witnesses on the fishing deck as well as the Master and his Assistant on the bridge also stated that the seaman had not been in their field of view.

In order to release the top line feeder – cod end rope the Master heaved the net and slackened the cod end winch. Suddenly, and reportedly before the steel ring of the cod end rope had reached the usual position for unhooking on port next to the platform companionway, a loud cry was heard on the bridge and on deck. The Master reportedly immediately slacked off the net in order to take the tension out of the running gear. The witnesses on deck reportedly hurried aft and saw the German seaman lying on the ground next to the midships guide roller. The Fish Master, too, reportedly ran down from the bridge to the place of the accident. In view of the evidently severe injuries of the barely conscious Seaman it reportedly became clear that he must have got between the vertical aft guide roller and the bridle and/or the top line feeder.

After the Master, too, had joined the scene of the accident a short time later, first aid measures were started directly. The Dutch Coast Guard Centre in Den Helder was contacted by radio; the Centre then established a communication with the radio medical advice service and ordered a helicopter to rescue the seriously injured Seaman.

The cod end of the net was taken back on board in order to be able to sail as fast as possible to meet the helicopter.

In the meantime the resuscitation measures had reportedly been continued uninterrupted by the First and Second Officers under the direction of the Master and with the assistance of other crew members. However, the casualty had reportedly not given further signs of life. At 00:15 on 14 March 2006 the Master reportedly once more contacted the radio medical advice service and described the situation to the advising doctor. The doctor thereupon reportedly recommended to discontinue the resuscitation measures. The helicopter that had been ordered was reportedly also ordered back to base.

¹³ N.B.:

As the technique to be applied here most substantially corresponds to that used in exchanging the cod end rope and on the day of the accident the corresponding work steps involving the top line did not actually take place, there will be no detailed description of this portion of the setting procedure.

The JAN MARIA then reportedly headed for the Irish port of Killybegs, which it reached the same day at approximately 14:00. There the deceased crew member was taken on shore and the official investigation of the accident was initiated. The JAN MARIA was allowed to continue its voyage one day later.

5 Investigation

5.1 Accident report to the BSU

The Federal Bureau of Maritime Casualty Investigation (BSU) was first informed of the accident on 14 March 2006 at 07:45 by telephone by the Maritime Reporting Centre in Cuxhaven (MLZ)¹⁴. The MLZ, for its part, had been informed of the event at 06:34 by fax by the Dutch Coast Guard. This fax notification was forwarded by the MLZ to the BSU at 07:56.

5.2 Course of the investigation

Immediately after receipt of the fax, and due to the severity of the accident, the investigation was taken over by the Federal Bureau. A first call to the shipping company's management in Bremerhaven confirmed that a fatal accident had taken place on board the JAN MARIA. At this point in time, no details concerning the course of the accident were known to management. A later phone call provided the information that the JAN MARIA had at that time arrived at the Irish port of Killybegs.

Due to the fact that on the one hand immediate initiation of the investigation on site was required, but that on the other hand the BSU investigation team was unable to reach the port of Killybegs in a timely manner, telephone and email contact was established with the Irish Marine Casualty Investigation Board. The BSU's colleagues of the Marine Casualty Investigation Board (MCIB) stated their preparedness to conduct the investigation on board the JAN MARIA on behalf of the BSU. Accordingly, on 15 March 2006, between 08:00 and 14:00 an Irish inspector ascertained the local conditions on the vessel and documented them by means of photographs. In addition, the investigator obtained an explanation of the work procedures and interrogated the relevant witnesses of the accident.

The comprehensive documentation of the shipboard inspection was made available to the BSU after completion on 27 April 2006 and served as a valuable foundation of the further investigation.

In the meantime, the BSU's investigation team had been in repeated written and telephone contact with the management of the JAN MARIA's shipping company. Various items of information concerning the vessel and its crew were requested, and received in writing on 10 May 2006.

In parallel to the BSU's investigation, the German Federal Police had also started to investigate the accident immediately after its occurrence and following instructions from the German Office of the Public Prosecutor. The results of their investigations, in particular witness statements and photographic documentation, were made available to the Federal Bureau as permitted by law.

On 22 May 2006 the investigation team inspected the JAN MARIA in the port of IJmuiden and received an explanation of the fishing technology from the crew

¹⁴ German Federal and Federal State's organisation that was rebaptised "*Gemeinsames Lagezentrum See* [Joint Maritime Reporting Centre] - *GLZ-See*" with the operational effectiveness of the supra-agency umbrella Marine Safety Centre on 1/1/2007. The GLZ-See constitutes the operative core of a network of Federal State's and Federal gencies fulfilling their different administrative tasks on a day-to-day basis, using a common reporting status and acting in coordination when a special situation arises.

members on site. In addition, the local conditions on the working deck and on the bridge as well as the visibility conditions in daylight and at night were also assessed. Finally a BSU investigator had the opportunity on 26 August 2006 to take part in a helicopter flight to the JAN MARIA, organised and operated by the German Federal Police. At that point in time, the JAN MARIA was offshore of Dutch territorial waters. The visit served for a practical demonstration of the fishing technology at sea.

5.3 Content of the investigation

The subject of the investigation were the environmental conditions, the processes in connection with the setting of the trawling gear, the condition of the technical plant and equipment on board, issues concerning crewing, work organisation and the related watch assignments, the atmosphere on board as well as keeping the shipboard documents, in particular of the ship's logbook and the time sheets..

5.3.1 Environmental conditions

The Federal Bureau of Maritime Casualty Investigation commissioned the German Meteorological Service – Marine Meteorological Services to draw up an official expertise on the weather and sea conditions for the area of the accident between 18:00 and 23:00 UTC on the day of the accident. This report reveals that in the relevant period of time a chain of low pressure systems ranged from Newfoundland over the North Atlantic to the north-east and into the Arctic Sea. In the course of 13 March 2006 the cold front of a depression whose centre was located south of Iceland at 00:00 UTC crossed the relevant sea area moving eastward. Owing to the weather conditions described above, brisk winds blew during the day at an average force 7 Bft, gusting 9 Bft. In the evening the wind dropped and turned west, so that in the area where the accident took place the average wind strength was 5 Bft gusting up to 7 Bft between 18:00 and 23:00 UTC.

The first half of the night was cloudy to heavily overcast. There were constant showers. Horizontal visibility was of approx. 2.7 nautical miles. The air temperature was 10 °C, the water temperature was 11 °C.

The significant wave heights were 3.5 to 4.5 metres.

5.3.2 Fishing technology

At the time of the accident no written documentation concerning the fishing technology to be applied existed either on board or on shore within the shipping company. Within the scope of the investigation the shipping company was requested to provide a written analysis of the operating process in order to better comprehend the work processes of setting the fishing gear described by the witnesses.

The evaluation of this document proved to be difficult, as the setting process of the pelagic¹⁵ fishing gear is only described in a highly summary fashion and the sense and purpose of the work steps to be carried out are only inadequately explained. Attachments 1 to 8, enclosed with the written analysis, graphically represent the line and/or net handling steps corresponding to the individual steps.

¹⁵ Pelagic: Technical fisheries term, used here in its meaning of “floating in the sea”

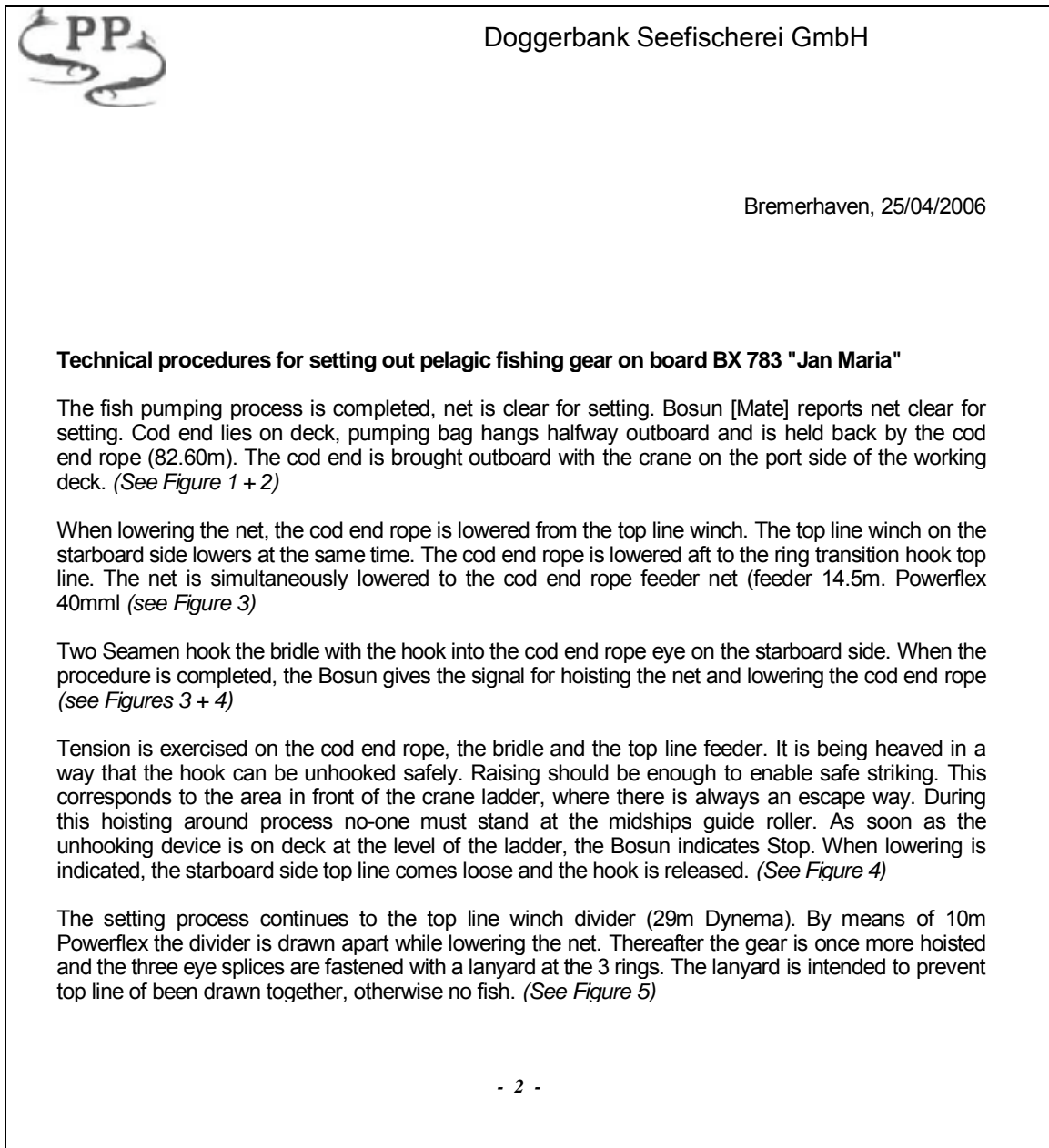


Figure 16: Technology Procedures Document 1 of 2



The hook of the 10m Powerflex is released and the net is lowered to the net sounder area and held there. The chain continues to be lowered into the water. While this is happening, all persons involved must stand in an easily visible area so that they can be seen from the bridge. As soon as the purse net of the net sounder is on the aft deck, it is fastened there by the Bosun. If the seine is clear, it is hoisted following a signal from the Bosun. If the net sounder is hanging free the gear continues to be lowered. (See Figure 6)

When lowering the net, the top line (665m) is lowered at the same time. The net is lowered to the net points on deck. At the top net point on starboard is a bridle with its hook for clipping the top line in. Two men loosen this hook from the upper net point on starboard. The length of the feeder and hook is 14.20 m. At the same time, a seaman loosens the second feeder (12m with eye splice) before the top line winch. This feeder is led around the midships deflector aft on the starboard side and clipped into the feeder on the starboard point. Once this procedure is completed and all crew are out of the danger area the net is hoisted and the top line is lowered, so that the top line winch feeder can be unhooked (See Figure 7)

Setting is continued as indicated by hand signals from the Bosun. Two people are on port and two people on starboard. In the upper and lower net points the 42 ft. pennants are hooked in and the net is lowered further. Once the net points are released, the jibs (210 m) are lowered to the fork and the pennants are lowered from the top line rollers. (See Figure 8)

Once the squeezing elements have gone through the hanging rolls, the latter are connected with the G hook of the trawl boards. These tasks are carried out by two men on either side. Once the trawl boards are hooked in, both sides give a hand signal that the boards are clear for hoisting. Once the boards are hoisted, the catch chain is unclipped, and the Bosun gives the "all clear" signal for lowering the trawl boards.

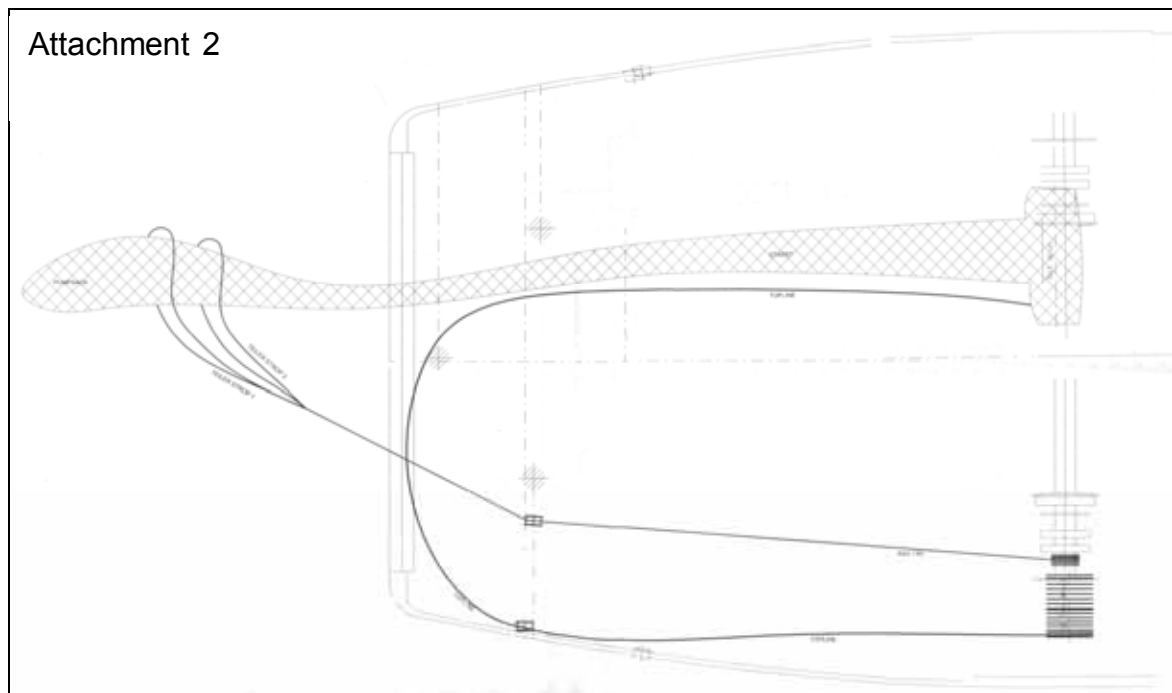
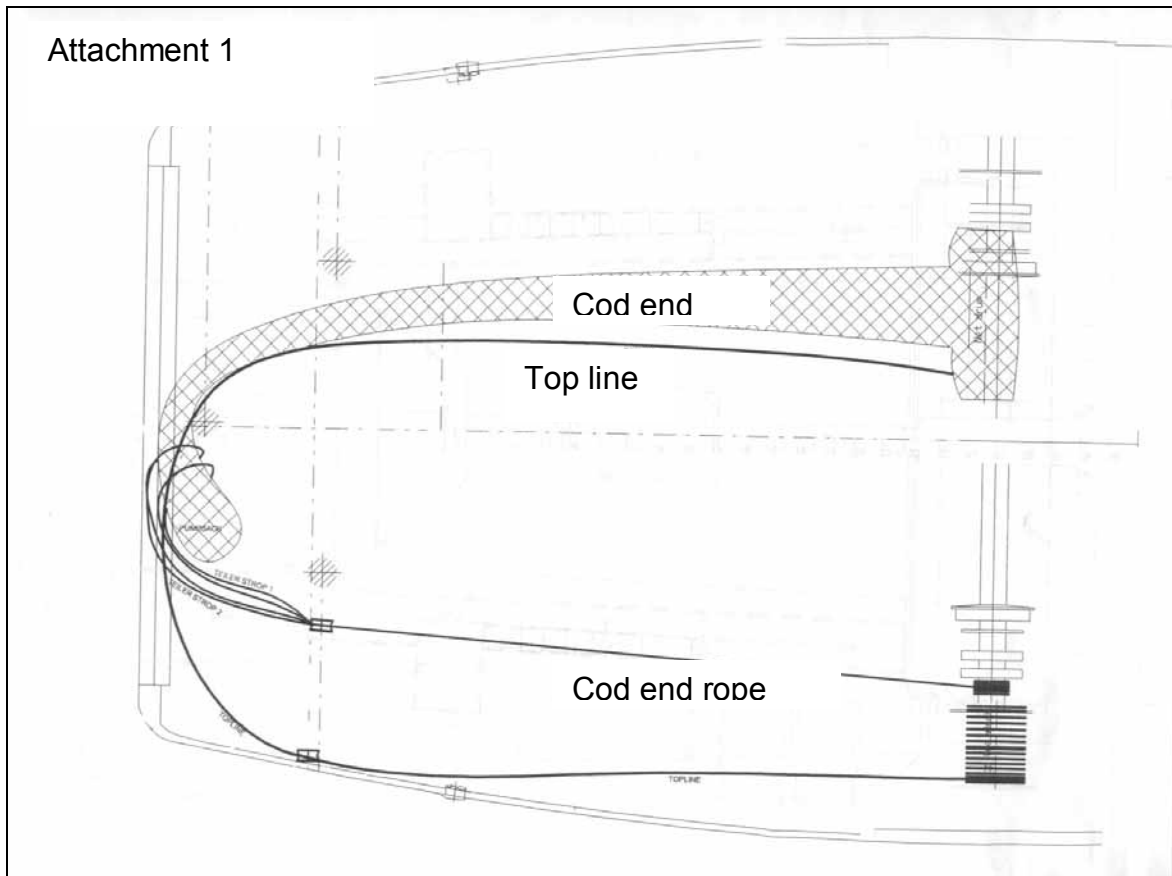
Line lengths indicated in the description are actual lengths corresponding to fishing gear measurements carried out on 07/04/2006.

Managing Director

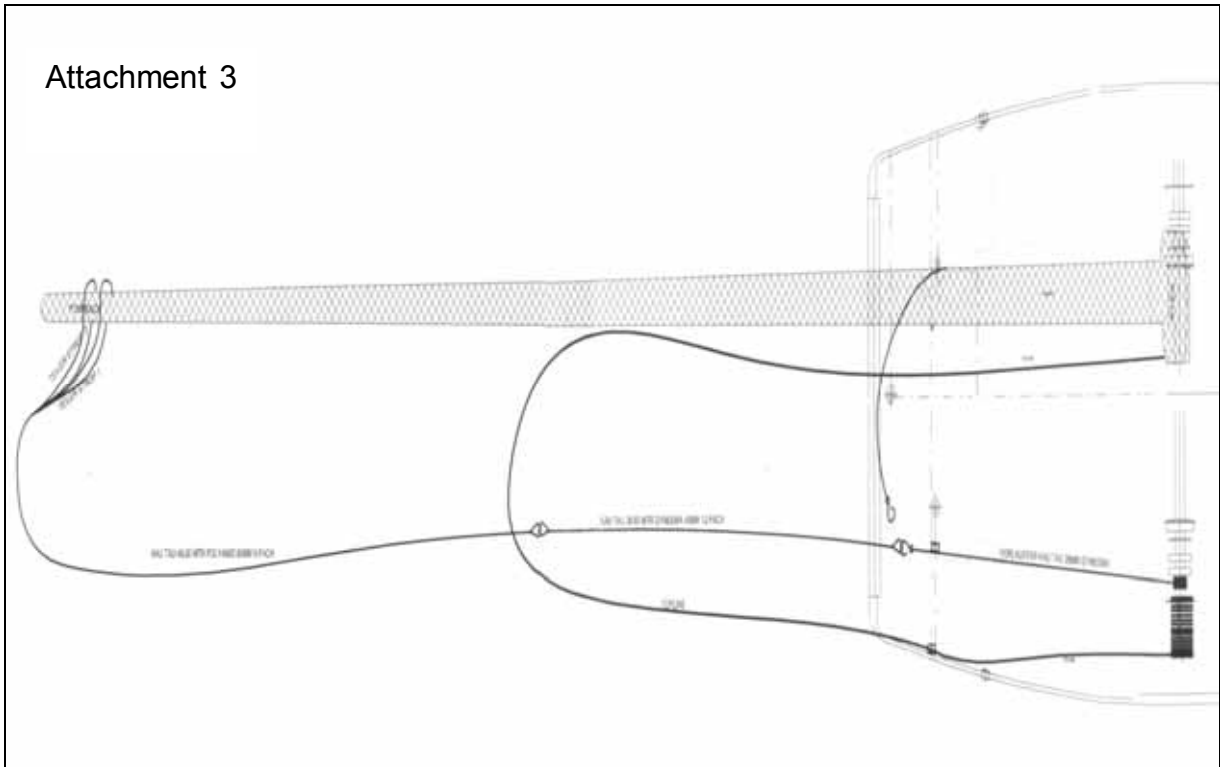
Figure 17: Technology Procedures Document 2 of 2¹⁶

¹⁶ N.B.: Figs. 16 and 17 are scanned original documents with names, addresses and other contact data (masthead) removed.

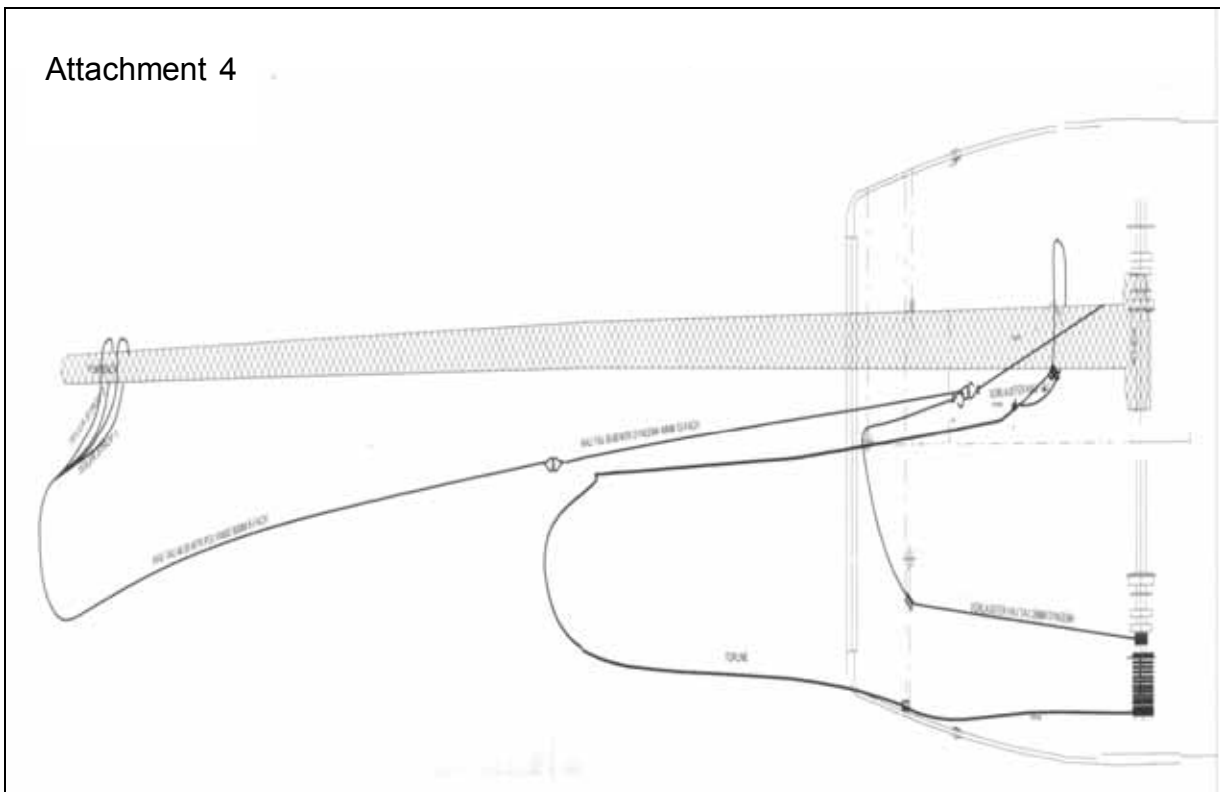
Figure 18: Attachments 1 to 8 to the Technological Process



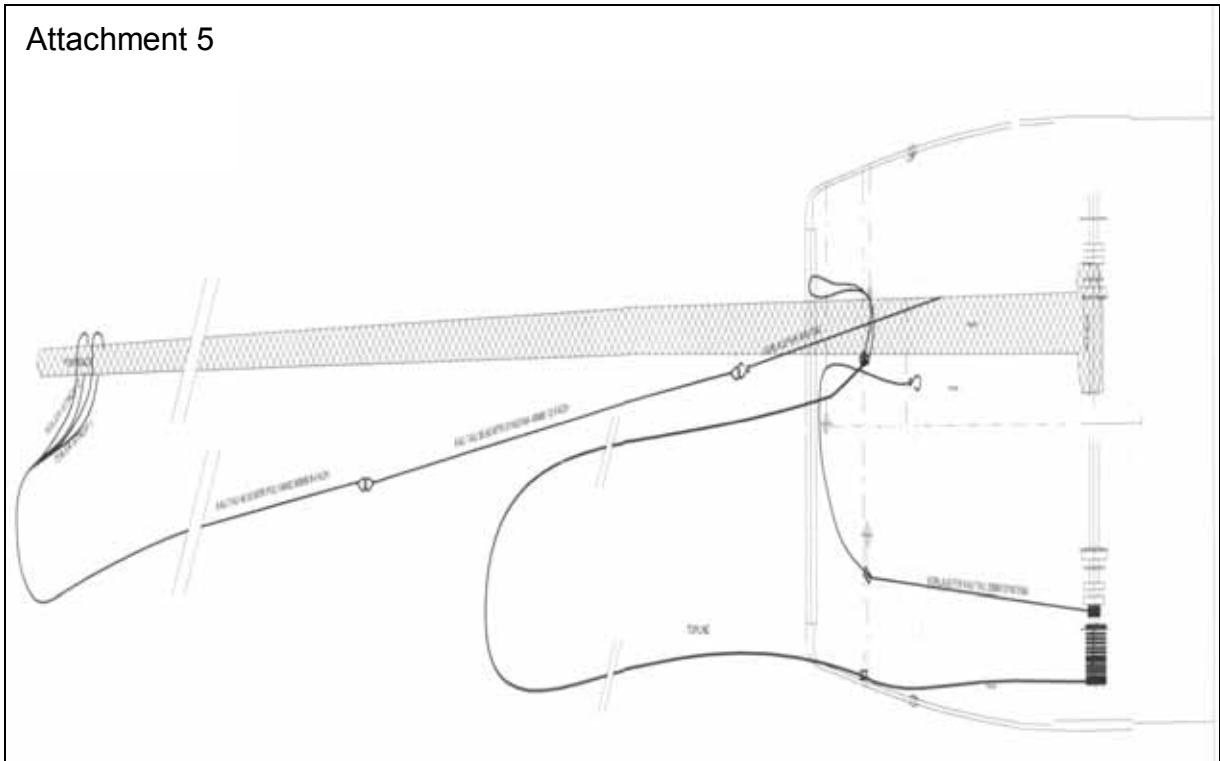
Attachment 3



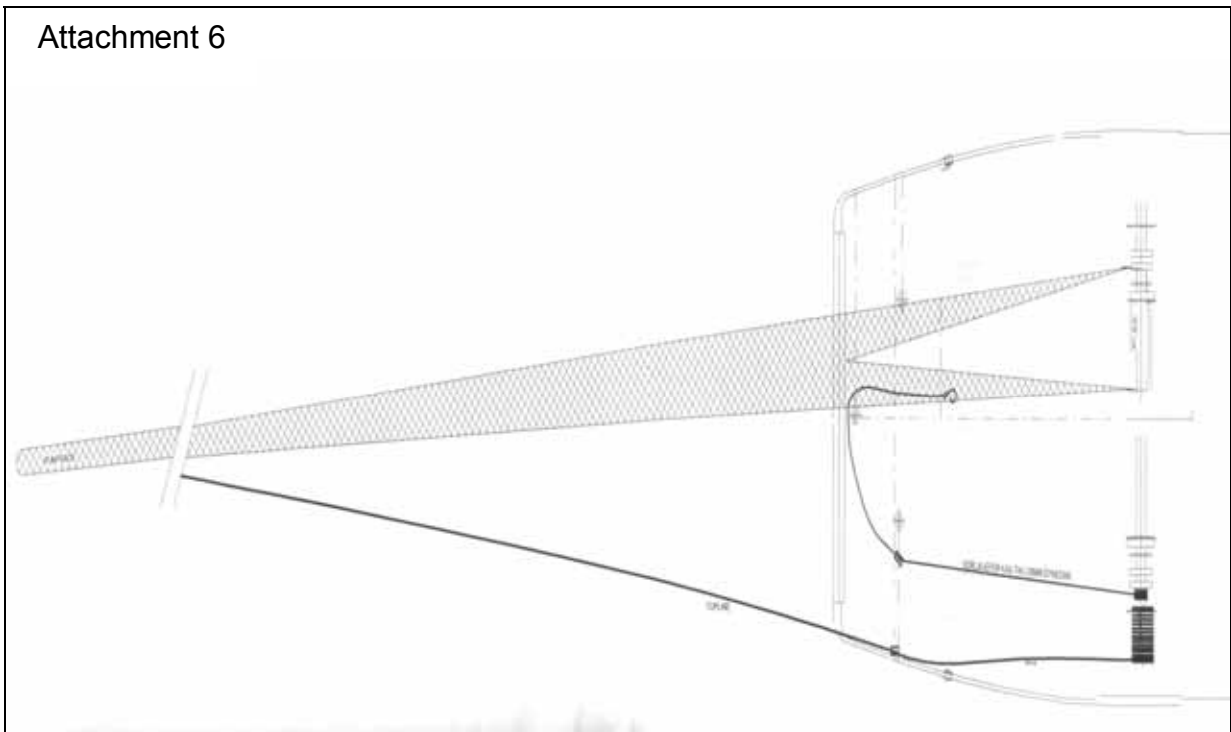
Attachment 4



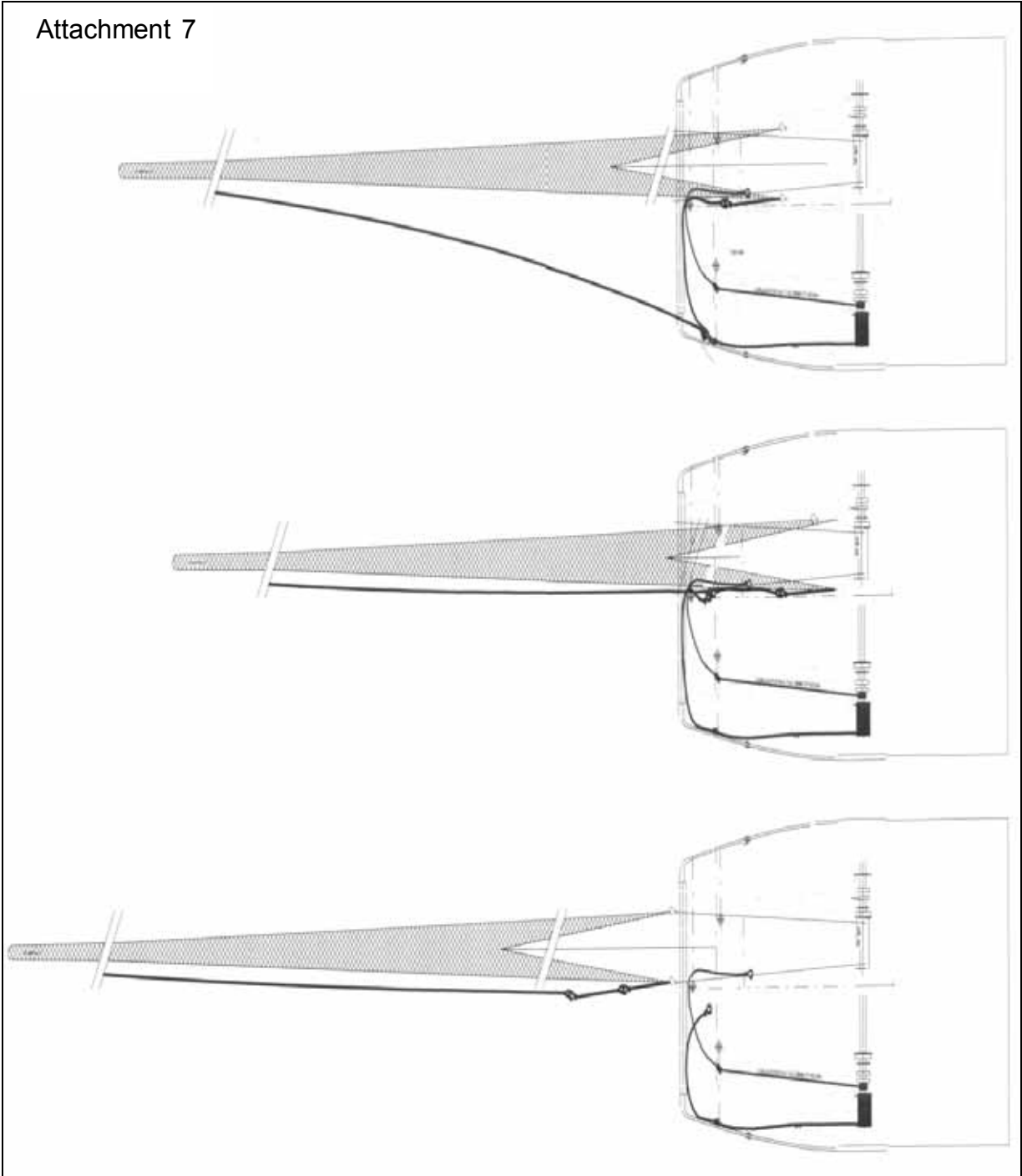
Attachment 5



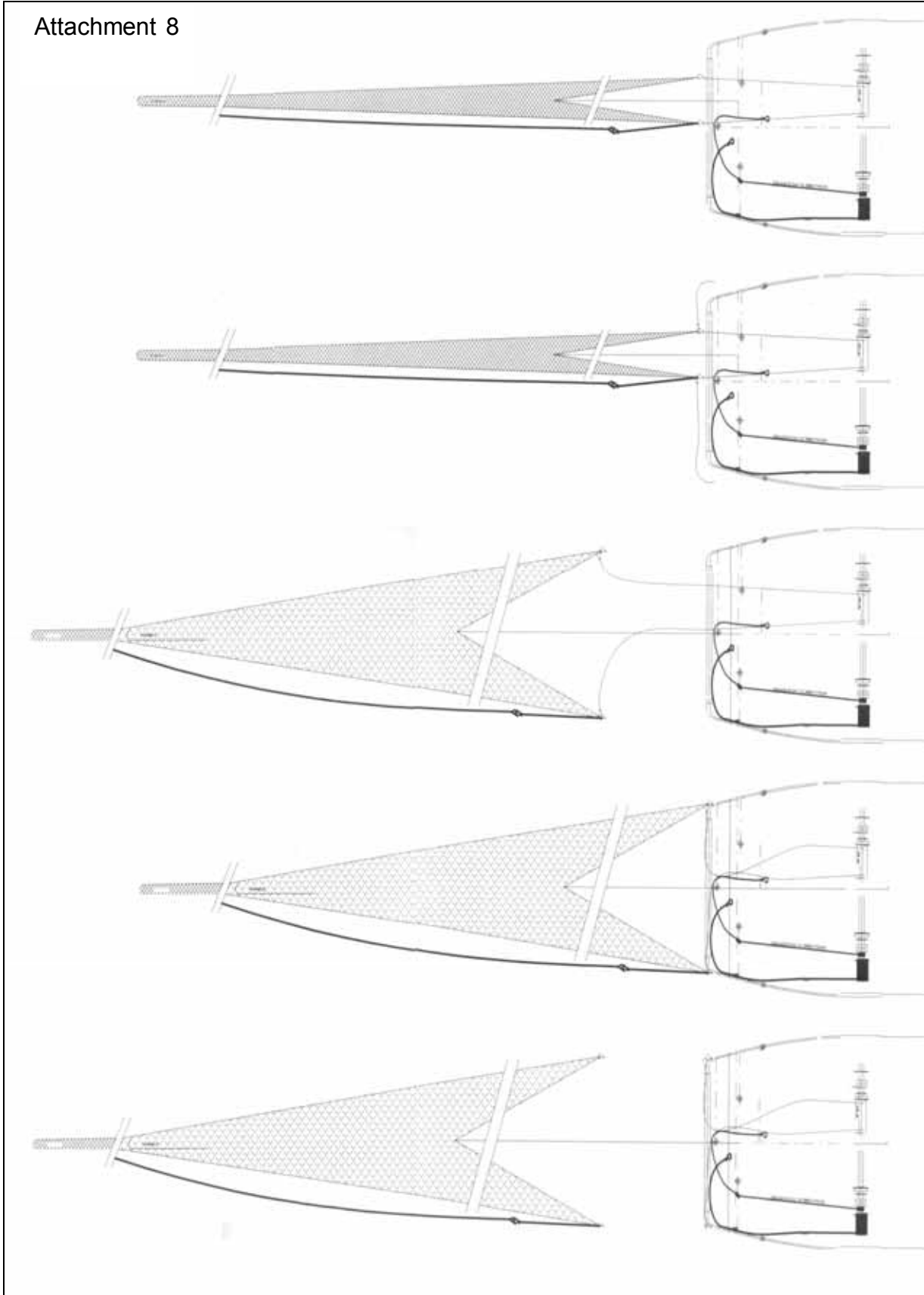
Attachment 6



Attachment 7



Attachment 8



5.3.3 Practical implementation

In order to be able better to comprehend the work procedures, on 26 August 2006, approx. 14 nautical miles off the Dutch coast, and with the participation of experts of the BSU, the See-BG and the German Federal Police, a demonstration of the net setting technology took place on board the JAN MARIA. The record of the net setting demonstration took place under realistic working conditions and served the reconstruction of the fatality. It was evaluated by the participating experts in Hamburg on 6 October 2006.

The reconstruction of the accident provided the following information:

Together with two of his fellow crew members and the Mate, the fisherman who would later become the casualty had been assigned to work on the fishing deck from 07:00 to 13:00 on 13 March 2006 and from 19:00 to 01:00 on 14 March 2006. At around 22:40, after the JAN MARIA had reached its fishing position approx. 150 nm west of Ireland (position according to the logbook at 19:00 54°34'N 013°36'W), the Master gave three sound signals to set out the net, which had been made clear on the fishing deck. First, on the aft starboard side of the fishing deck the bridle was attached by means of the hook into the eye between the cod end rope feeder and the cod end rope. At approx. 22:50 the Mate in charge gave the Master – as the winch operator - the hand signal to heave the net; however, the abovementioned line connection was not simultaneously lowered from the cod end winch. This suddenly resulted in an extremely high line tension at the aft midships guide roller. The fisherman, who was in the immediate vicinity, probably in order to remove the hydraulic hoses that run in the area, was pressed backwards against the guide roller by the very high pressure of the above mentioned line connection running across his chest.

He was jammed there and pulled aft around the guide roller in the hoisting direction of the net onto the port side. Once released from the pressure he fell down, having suffered significant injury in the thoracic area, stretched out at the guide roller with his head pointing to starboard. Despite the resuscitation efforts immediately initiated he died on site as a consequence of his injuries.

The accident was said not to have been observed by any of those present, as the view of the aft guide roller is blocked off by the crane column both for the Master and the Fish Master on the bridge and also as concerns the victim's three team members on the aft deck.

The demonstration of 26 August 2006 showed among other things that while the work is being performed communication with the winch operator on the bridge takes place by means of hand signals. In addition to the Mate in charge, other deckhands also give instructions by hand signals to the winch operator on the bridge when hoisting and lowering lines and the net, so that the latter can become disorientated by the many different hand signals. Radios are seldom used, as the noise level on deck significantly impairs acoustic communication and comprehension. Additional instructions from the bridge can be given via loudspeaker. No video cameras to monitor the work on deck had been installed at the time of the accident.

Supervision of the actions of the deckhands by the Mate in charge and paired teamwork with clear task assignment and separation while setting the net had not

been apparent on the fishing deck. Rather, it was ascertained that during the net setting procedure the Mate in charge actively worked on both sides on standing and running line as well as on the net, and that as a result he did not have an overview of the working methods of the other deckhands.

When lowering the net and simultaneously lowering the cod end rope from the cod end winch to fasten the bridle with its hook into the eye on the cod end rope, starboard side aft, at least two deckhands worked simultaneously and partially with the help of the Mate in an area not visible from the bridge. The working method used at the time, hoisting the net and lowering the cod end including cod end feeder with the fastened bridle with its hook significantly differs from the stipulated technical procedure for setting this type of net. As a result of insufficient lowering of the cod end rope including the cod end rope feeder from the cod end winch, when the net was hoisted, a sudden high line tension occurred at the aft midships guide roller with an almost right-angle line being described between the connection feeder-cod end rope and the net feeder. In order to prevent this high line pressure from occurring at the aft midships guide roller, the technical working procedures stipulate that the cod end rope and its feeder should be lowered in a manner such that safe striking (unhooking) of the cod end rope feeder can be performed on the fishing deck in the area of the companionway to the crane platform. Both the Mate in charge and also the winch operator, who did not lower enough of the cod end rope including its feeder from the cod end winch before starting to hoist the net, accepted the generation of the sudden high line tension and thus also the modification of the technological net setting procedure.

Contrary to the technical net setting work procedure, while the net was being hoisted and the net feeder with its hook clipped into the eye of the connection between the cod end rope and its cod end was being pulled around, deckhands were in the immediate vicinity of the aft midships guide roller, where at least one deckhand pulled the hanging hydraulic hoses of the fish pump away from the guide roller. The Mate in charge gave the hand signal for hoisting the net and lowering the cod end rope including its feeder contrary to the parameters of the technological net setting work procedure while he and other deckhands were in the immediate proximity of the aft midships guide roller and carried out other tasks. The winch operator, who cannot see the blind spot around the aft midships guide roller, operated the winches despite the presence of the deckhands in this area following hand signals from the Mate and therefore also deviated from the stipulated technological net setting procedure. Only once the hoisting of the net to pull around the net feeder, connected to the cod end rope feeder and the cod end rope itself, was completed, were the deckhands – as specified in the technical work procedure - present in the visible area for striking (unhooking) the cod end rope feeder at the level of the ladder on the fishing deck.

5.3.4 Technical plant and equipment / Circumstances

The JAN MARIA has a long forecastle, while the aft part, where the dangerous work (handling net gear) is unexceptionally carried out, is very short. This means high risks for the deck crew. Precisely with the very dangerous work in connection with the setting and drawing in the nets a larger work area with significantly larger escape areas and larger safety distances when handling running rigging would be very valuable. In particular the inner coaming impedes rapid evasive movements of the deckhands.

At the time of the accident there were video cameras installed that displayed the winch rollers on monitors on the bridge control position. There was no video monitoring for the area not visible to the winch operator from the bridge.

The condition of the working deck made a good impression. The deck was fitted with a non-skid coating.

A total of five emergency stop switches could be ascertained in the area of the fishing deck, although they are very difficult to access: one each at port and starboard aft, one on the crane platform, one under the companionway to the superstructure and one on the starboard side in the area of the lower winches on the after edge of the superstructure (in this connection, cf. Fig. 19).

There was also an emergency stop switch on the bridge in the area of the control position for the winch operator.

At the time of the interrogation, the Master and the Mate were unaware of the existence of the emergency stop equipment for interruption of winch operation on the fishing deck.

The following illustration of the emergency stop switches shows how difficult it is to find them.

Figure 19 : Illustration of emergency stop switches on the fishing deck



5.3.5 Vessel's crew

According to the crew list the crew comprised four different nationalities: German, Dutch, Polish and Lithuanian. The official duty language was said to have been English. However, large differences were noticed in the faculty of the English language of the different crew members.

According to the See-BG Vessel's Minimum Safe Manning Document the ship must be under the command of a German Master. According to the crew list, at the time of the accident a Dutch Master was on the bridge. He holds the Dutch certificate of competence of a "Master of High Seas Fishing Vessels". The "Equivalence Attestation of Certificates of Competence of EU Member States" of the Waterways and Shipping Directory North was produced upon request. The Master has 20 years' experience in Middle and Distant Waters High Sea Fishing, including four years as Master and helmsman at the current shipping company.

For the deck crew, which is responsible for setting out and hoisting the fishing gear as well as for maintenance work pertaining thereto, a team of four crew members is assembled at the beginning of the voyage for each watch. These teams are supposed to be formed according to technical qualifications as well as a basic knowledge of German, English and Dutch language. In principle, set deck crews are used. Absences due to holidays and illness are covered by permanent personnel from other vessels of the same shipping company. The Safety Warden Deck or the Master must perform an instruction and work position induction according to UVV-See. According to shipping company rules, such training instructions must be documented in writing.

The ship's command was unable to provide any evidence of such training for the crew members that were on board at the time of the accident.

The Mate must have basic technical knowledge of the fishing gear to be used as well as of its technical handling on board. He must be able to organise the entire process of setting and hoisting in consultation with the Master (here in the role of the winch operator). For this position the shipping company also demands proof of linguistic communication with all participating crew members. Proven experience of similar jobs in the same position on vessels outside the shipping company or recommendations from Masters of the same shipping company are prerequisites for obtaining a position as Mate.

After the original Mate (of German nationality) had left his position because he had not wanted to assume responsibility for the procedures modified by the Master, a Polish fisherman was appointed Mate. He had graduated from a three-year fishing course in Poland and had more than 24 years' experience in the fishing trade. He had already been on board the JAN MARIA for five months (although engaged as a Boy).

In addition to the later casualty (engaged as a Seaman), his team also included a Netmaker and another Seaman (both engaged as Netmakers). All three had many years' experience in the fishing trade.

The casualty was known as a level-headed and experienced seaman with good knowledge of net related work. According to the witness who shared his room, the casualty was referred to as a “German Dutchman” because of his knowledge of these languages and was popular with the rest of the crew.

5.3.6 Work organisation

5.3.6.1 Watch organisation

A differentiation is made between Mates and Fishermen as concerns the deck crew’s working hours. The two Mates are always alternately on deck from 01:00 to 13:00 (13:00 to 01:00) and the Fishermen, from 07:00 to 13:00 (19:00 to 01:00). This results in 12 working hours per day for each crew member. Contrary to the statements of the shipping company to the extent that fixed teams are set up (cf. 5.3.4) in fact especially the Team Leaders change regularly during each shift.

5.3.6.2 Signal equipment for activating the crew

On board the JAN MARIA it was customary to inform the crew by means of various ringing tones of the alarm system as to whether the net was supposed to be set out or hauled in again. The actual emergency signals on the other hand were hardly known any longer.

5.3.7 Keeping of documents

In the course of the investigation the BSU received, among other things, differing crew lists. Already on the list for the voyage 7/2005 it was conspicuous that only one Mate was listed, although there should have been one Mate on board for each of the two shifts.

It was also considered to be unusual that there were always “passengers” on each voyage, who on other voyages were however listed as Seaman or Boy.

In the case of one particular crew member, his date of birth changed from one list to the next, and his nationality also changed from German to Dutch and back.

It was noticed that during the accident voyage the Mate continued to be listed as a “Boy”.

The requested time sheets were filled in a rather exemplary manner, however, on one of the Master’s documents the year was shown as “2005”.

On the casualty’s work time documentation the “Embarkation Date” is reflected as 10 March 2006. The “Duration of the Voyage” is indicated on this document as being: “07 March 06 – 03 April 06”. The “Place of embarkation:” is IJmuiden, but according to the logbook the ship left IJmuiden on 7 March.

On the casualty’s work time documents, the “Rank:” is indicated as “Boy”, but on the crew list he is shown as a Seaman. His time sheet for the previous voyage is very accurately filled out, and only the indication of “2005” as the year is confusing.

Such errors are found on almost all documents available to the BSU.

5.3.8 Ship's Logbook

The existing copies of the ship's logbook prove that it was kept in a very superficial manner. Most requirements were not met. Nonetheless it can be concluded that on 10 March 2006 the vessel had drifted relatively close to the Irish Coast (without indicating reasons).

There are two supplementary pages to the ship's logbook, which show the signing on and off of different crew members. According to this evidence there had been an exchange of some crew members while the JAN MARIA drifted close by the coast of Cork on 10 and 11 March 2006.

Among other information, these crew pages show that the previous Master had already been paid off on 6 March 2006 while still in Ijmuiden, but that the next Master had only signed on on 10 March 2006.

Overall, this document, too, creates the impression of only having been created after the accident.

6 Analysis

6.1 Preliminary remarks

This casualty investigation was difficult. This was due not only to the at first hesitant co-operation of the shipping company but also to the fact that documents that could originally not be produced were then available in different versions, and e.g. a description of the fishing technology was only produced once it had been requested for this investigation. Understandably, fishing is the first priority for this shipping company. This must however not lead to work organisation and protection of labour and safety being neglected, either on shore or on board!

The investigation uncovered a certain degree of performance pressure on board the JAN MARIA, which did not allow for discussing and agreeing work procedures and for responsibly paying attention to the safety of all workers.

6.2 Legal framework/Protection of Labour/Safety at Work

The See-Berufsgenossenschaft is the German Federal safety authority¹⁷. The UVV See represents the *summa summarum* of all professional experiences at sea. The stipulations of the UVV See are mandatorily oriented towards preventive targets and they highlight typical risk possibilities. These specifications require that ship owners and insured seamen under German flag eliminate or and/or minimise such risks by means of appropriate safety measures embodied in the UVV See.

Because of the glaring violations, we shall cite the paragraphs of relevance for this casualty at sea:

„... UVV-See § 257 Winches and other equipment in the fishing trade

(1) Operator stations of fishing winches and net drums must be arranged in a manner such that the operator has an unobstructed view of all areas in which winches and net drums are used in the course of the work, and that he should be able to monitor the operation of the guindineau, the winch line and the net itself.

(4) Emergency stop switches must be provided for the net and auxiliary winches in the areas of the trawl gallows, net winches, the bridge and the operator station.

(11) Protective systems must be provided to limit the potential for contact with lines, trawl warps / sweep lines and movable equipment parts to a minimum.

D to (1)

When an unobstructed view of local conditions is hampered, the See-Berufsgenossenschaft can, upon request, authorise the installation of e.g. cameras with monitors.

In regard to operating components and operator stations and consoles cf. also §§ 68, 69.

¹⁷ Cf. § 6 of the Act on Federal Duties concerning the field of maritime operations (*Seeaufgabengesetz* [Maritime Duties Act] - SeeAufgG)

§ 68 Control positions

(3) Control positions must be arranged in a manner such that the operator has a good overview of dangerous motion processes. If this is not possible, then it must be ensured by means of appropriate layout of the control positions or by means of additional systems that the operator has visual contact with the observation post that can overlook the dangerous motion processes. If visual contact between the operator and the observation post is not assured for the entire motion process, or if the distance between the operator and the observation post is more than 40 m, observation stations must be arranged in a manner such that from both such observation stations and from the control positions there is – jointly – good visibility of the dangerous motion processes. It must be possible immediately to interrupt the motion process from the observation stations at any stage.

(4) Winch control positions must be arranged in a manner such that the operator can observe the winch drum or the cable wheel and, insofar as possible, also the line leads or the chain run.

...“

As reconstructed in the net setting demonstration on 26 August 2006, the winch operator on the bridge, by applying time-saving “tight” line guidance, and the Mate in charge, by inadequate observation and organisation of the work on the fishing deck, contributed to the Fisherman’s fatal accident.

In principle, the Master and the Mate were responsible for organising the work processes on deck.

At the time of the accident the Master was in charge and working on the bridge. At the same time commanding the vessel he observed, with his back to the vessel’s heading, he work processes on the fishing deck, operated the winches ambidextrously at the winch control position following the Mate’s hand signals, monitored the control monitor screens for the winches and observed the radar. Near the winch control position stood the Fish Master, looking down on the fishing deck, and assisting the Master as a nautical observer and in the fishing process. In doing so he usually looked through the open bridge window onto the fishing deck, partially covering the radar image with his body. In the demonstration on 26 August 2006 the Master demonstrated his usual working procedures as a winch operator during the net setting process. He did not appear to take any recognisable action to eliminate acute dangers to life and limb for the deckhands, who while hoisting and lowering the net and connecting the lines were in his blind spot, immediately at the aft midships guide roller. Questioning led to the conclusion that the Master only had superficial knowledge of accident prevention and health and safety at work procedures on board fishing vessels sailing under German flag. He was not aware of emergency stop devices for interruption of winch operations on the fishing deck and of the proper keeping the shipboard documentation and formal documentary evidence of accident prevention instruction.

The Mate, who had 24 years’ experience on fishing vessels, had been sailing on the JAN MARIA since September 2005 as a Bosun (Mate). At the time of the accident he was listed on the vessel’s crew list as a Boy and according to the valid muster roll call he was not mustered on board for the sea voyage from 7 March to 3 April 2006.

Enquiries conducted at the Harbour Office of the Hanseatic City of Bremen revealed that at that point he did not hold a German Seaman's Registration Book. In the demonstration of the net setting technology on 26 August 2006 he demonstrated how he performed that function. From the BSU's perspective, his work methodology was uncertain. What remains unclear is whether the cause was a lack of danger consciousness, lack of knowledge or dereliction of his duty of supervision. Thus he remained in dangerous areas while lines were running, sometimes he worked outside the range of view of the winch operator, and did not take any action to exclude dangerous situations for himself and other deckhands or to prevent suddenly occurring dangers during winch operation. During the previous voyage from 2 to 21 December 2005 this uncertain behaviour had obviously already led to an accident on the job, as a result of which he was unfit for work for several days. This accident on the job is not recorded in the logbook of the JAN MARIA and was also not reported to the See-BG as required in the Accident Prevention Regulations for Shipping Enterprises [UVV See]. The vessel's medical record book reveals that in his capacity as a "passenger" he had sustained bruises on the right side of the chest. His technical knowledge concerning safe working procedures for net setting are insufficient, and his knowledge concerning emergency stop arrangements on the fishing deck, non-existent.

In ignorance of the legal fundamentals¹⁸ concerning accident prevention and worker health and safety on board vessels sailing under German flag, the Master and the Mate did, through their course of action when indicating winch operation and the winch operation itself, cause sudden line tension of the net feeder with its hook and the cod end rope feeder at the aft midships guide roller, without ensuring that nobody would be present in the danger area. These two people's operating methods practised and demonstrated on 26 August 2006, significantly contributed to an increased level of risk for life and limb for the deckhands working at setting out the net.

In particular the Master contributed to the risk by the fact that he as the winch operator and in spite of the recognisable line tension at the aft midships guide roller and the well-known blind spot in that area he consciously operated the winches against the tenets of the work technology without being aware of the personnel's whereabouts. Based on his constant observation of the fishing deck he was aware of the fact that with the multiple work processes to be carried out and the reduced availability of personnel on deck there were always crew members in the blind spot and the adjacent danger area. An indication of the fact that the Master's dangerous conduct was not universally tolerated is the fact that the previous Mate had resigned his position to work as an ordinary Seaman, taking a cut in income.

By giving the signal for winch operation, the Mate in charge at the time of the accident enabled deckhands to be situated in an area not within the winch operator's visual range. By giving the signal for winch operation he causally contributed to a sudden line tension developing at the aft midships guide roller and to a deckhand

¹⁸ e.g. the Council Directive 93/103/EC of 23 November 1993 concerning the minimum safety and health requirements for work on board fishing vessels (thirteenth individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC), in this case in particular Annex II and in particular Point 12, Workplace equipment (see Annex)

remaining in the blind spot, not visible from the bridge, by the guide roller e.g. while pulling away hydraulic hoses for the fish pump and becoming exposed to a very high risk.

A deviation from the course of events demonstrated on 26 August 2006 must be contemplated on the basis of the injury pattern determined and the position in which the casualty was found in relation to the working techniques established by the shipping company.

It must therefore be assumed that the accident victim had at the time of the accident very probably been at the aft midships guide roller in order to pull away hydraulic hoses and, by the sudden tensioning of the lines, was pulled in, right chest side first, between the cod end rope feeder and the net feeder, to be crushed with his back to the guide roller. Because of the extremely high line tension his probable attempts to push the line away with his right hand and upper arm were unsuccessful, so that as a result he was crushed against the guide roller at chest height and pulled around by the continued hoisting of the net to the position in which he was found.

The conduct of the Master and the Mate led to the fact that the procedures practised by them resulted in the fisherman's death during net setting on 13 March 2006 on board the JAN MARIA.

At the time of the accident there were video cameras installed that represented the winch rollers on monitors on the bridge control position. Contrary to the stipulations of the Accident Prevention Regulations for Shipping Enterprises [UVV See], there was no video monitoring for the area not visible to the winch operator from the bridge.

7 Action taken

7.1 Organisational measures

On the occasion of the accident the shipping company took the occasion in a letter of 6. April 2006 once again to point out strict compliance with accident prevention regulations. In detail, the recommendations comprise:

- wearing protective work clothing on deck,
- definition of a uniform communication system between the bridge and the deck, and instruction of all personnel concerning that system,
- the Mate's special responsibility when signalling winch motion,
- the fact that only people directly assigned to work on the aft working deck should be at that location at any given time,
- that the winch operator must be familiar with the people working on deck,
- that, if it were necessary for technical reasons to have additional people on deck, this must previously be agreed upon with the Master, the winch driver and the Mate,
- regular operating checks of the emergency stops on the fishing deck and the bridge, including the documentation of such verifications in the ship's logbook,
- ensuring full visibility of the fishing deck by the winch operator, eliminating any blind spots.

The shipping company expects immediate reports concerning identification of the appointed Safety Wardens for the engine, deck and production areas. The Safety Wardens must immediately perform an accident evaluation and instruction according to Accident Prevention Regulations for Shipping Enterprises. Evidence of this and all subsequent regular instruction sessions is to be communicated to the shipping company and filed on board for verification at any time.

Seamen signing on for the first time and non-mustered supernumeraries must receive safety instructions as soon as they start their service on board. The Master must generally record instructions and inspections carried out in the ship's logbook.

The ship's safety equipment must be comprehensively inspected. Any faults or defects must be immediately reported. Required repairs and/or orders must be reported in a timely manner at the next port of call.

The current version of the Accident Prevention Regulations for Shipping Enterprises and the last annual report of the See-BG are to be provided to every vessel at their next port of call.

7.2 Technical measures

After the accident, the See-BG carried out an on-board inspection on 4 April 2006. This inspection resulted among other things in the requirement that areas of the fishing deck that are not visible to the winch operator must be equipped with monitoring cameras.

When a BSU team carried out an on-site inspection in the port of IJmuiden on 22 May 2006 it could be determined that this requirement had already been implemented. According to the See-BG requirement, one camera had been installed on each of the girders of the crane platform on port and starboard, respectively. Both cameras appeared to be active, as a red light diode could be seen. The cameras pointed to the area not visible from the bridge and located between the midships guide roller and the stern (=scene of the accident).

On the bridge were two monitors on shelves, positioned left and right above the winch operating station oriented towards the fishing deck. When pressing a button, the right hand monitor shows three different camera images, all of which are trained onto winches; the left hand monitor showed an unchanging camera image, namely that of the camera mounted on the aft port side.

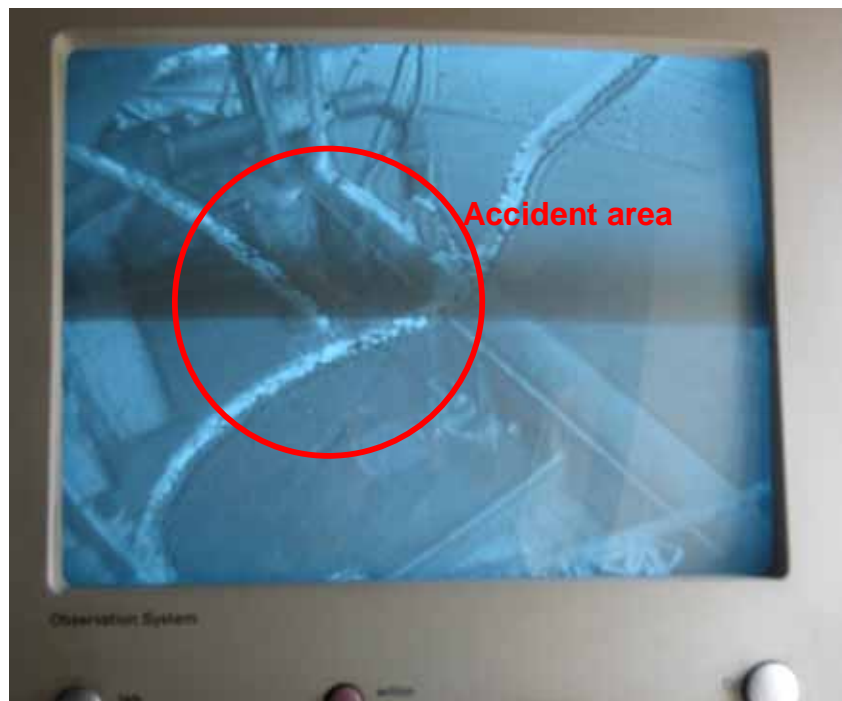


Figure 20 : Additional B/W monitor on the bridge
to show the blind spot on the fishing deck

This image was in black and white. Transmission was disrupted by interference at irregular but relatively frequent successive intervals (probably due to the natural vibrations of the camera). In all other respects it essentially appeared unclear and fuzzy. The transmission of the second installed camera could not be represented. Accurate and especially longer observation of the monitor is required in order to e.g. recognise a person in the monitored area, in particular at night visibility conditions. In contrast, the cameras directed on the winches worked perfectly and generated clear, interference-free pictures.

8 Safety recommendations

The measures set forth in Chapter 7 show that many effective consequences have already been drawn from the casualty on board the JAN MARIA. In the awareness of these safety measures already introduced and implemented, the BSU issues the following safety recommendations:

- 8.1 The **Federal Bureau of Maritime Casualty Investigation recommends that operators of** sea-going fishing vessels review their safety management system and if applicable supplement it with effective procedures for work in hazardous areas of the ship. In particular, the vessel specific fishing technology must be laid down in writing and implemented on board. The pertinent instruction sessions must be documented.
- 8.2 The Federal Bureau of Maritime Casualty Investigation recommends to the **See-Berufsgenossenschaft** that within the scope of the audit of safety management systems the Marine Insurance and Safety Association pay attention to the adequate implementation of procedures aimed at structuring work in dangerous areas of the ship. In particular, the efficacy of cameras to prevent blind spots should be checked. In all other respects, the vessel specific fishing technology should be laid down in writing by the shipping company and reviewed by the See-BG in regard to technical safety aspects. If possible, this should also be supported by a demonstration on board the relevant vessel.
- 8.3 The Federal Bureau of Maritime Casualty Investigation recommends that **operators of sea-going fishing vessels and ship commands** introduce or optimise existing shipboard systems for real time day to day written recording and acknowledgement of all work and other shipboard measures that may involve safety relevant aspects.
- 8.4 The Federal Bureau of Maritime Casualty Investigation recommends that **operators of seagoing fishing vessels** consistently implement the Accident Prevention Regulations for Shipping Enterprises: In particular, the following aspects should especially be taken into consideration:
 - 1) The operating positions of fishing winches and net rollers must be arranged in a manner such that the operator has an unobstructed view of all areas in which winches and net drums are used in the course of the work, and that he should be able to monitor the operation of the guindineau, the winch line and the net itself.
 - 2) If this is not possible, then it must be ensured by means of appropriate arrangement of the operating station or by means of effective additional systems that the operator has visual contact with the observation post that can overlook the dangerous motion processes.

- 3) The mandatory emergency stop switches must be easily accessible. Their position and function should be publicised on board by means of regular training sessions; if possible, indicator signs should be installed.
- 8.5 The Federal Bureau of Maritime Casualty Investigation recommends that **operators of seagoing fishing vessels and their management teams** to implement a uniform working language on board among their crews and to enforce a standardised sign language for all vessels operated by the shipping company. At the same time it must be ensured that emergency signal systems are not used for regular work communications.

The above safety recommendations do not constitute any presumption of fault or liability in terms of their type, number or sequential order.

9 Sources

- 1.) Council Directive 93/103/EC of 23 November 1993 concerning the minimum safety and health requirements for work on board fishing vessels (thirteenth individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC)

- Official Journal No. L 307 of 13/12/1993 pp. 0001 – 0017 -

ANNEX II

MINIMUM SAFETY AND HEALTH REQUIREMENTS FOR EXISTING FISHING VESSELS (Articles 5 and 7 (1) (a)) Preliminary note

In Germany, the stipulations of the EC Directive are reflected in the principles of the Accident Prevention Regulations for Shipping Enterprises, and also via the Working Conditions Framework Act and the Work Place Regulations.

12. Workplace equipment

12.1. Workplaces must be free of obstacles and insofar as possible protected from swamping seas as well as providing appropriate protection for workers against falling on or overboard.

Fish handling areas must be roomy enough both in height and in area.

12.2. If engines are monitored from the engine room, this must take place from a sound and heat insulated control station separate from the engine room and attainable without needing to transit the engine room.

The command bridge is defined as a room that meets the requirements of Subparagraph 1.

12.3. The control room for the operation of the fishing gear must be large enough in order to enable the operating personnel to work unhindered.

In addition, the fishing gear operation device must be equipped with appropriate safety devices including emergency stop devices.

12.4. When operating fishing gear operation controls, the operator must be able clearly to see the equipment and any workers involved in its operation.

When operating fishing gear operation controls from the bridge, the operator must also be able clearly to see the workers involved in its operation either directly or by means of appropriate arrangements.

12.5. A reliable communications system must be used between the bridge and the working deck.

12.6. The highest degree of watchfulness and attention is required at all times, and during fishing work or other activities on deck the crew must be warned of the imminent danger of heavy seas washing over the deck.

12.7. Lines, trawl warps / sweep lines and movable equipment parts must be fitted with protective systems in order to limit the potential for contact to a minimum.

12.8. Provide appropriate equipment for handling awkward loads, in particular on trawlers:

- Equipment for securing trawl doors,
 - Equipment to keep the swinging movements of the cod end under control.
- 2.) Regulations relating to Work Protection and Accident Prevention of the Working Conditions Framework Act and the Work Place Regulations (UVV See of the See-BG) § 68 and §257
 - 3.) Shipboard documentation from the JAN MARIA
 - Excerpts from the ship's logbook
 - Crew list
 - Watch schedule
 - Time Sheets
 - 4.) Information received from the shipping company
 - 5.) Investigation report concerning the on-board inspection of the JAN MARIA on 13 March 2006 by an official of the Marine Survey Office, Dublin, Ireland
 - 6.) Results of investigations carried out by the German Federal Police
 - Interrogation reports
 - Photographs, video recording
 - 7.) Witness interrogations by the BSU during local inspections of the JAN MARIA
 - 8.) German Meteorological Service (Marine Meteorological Service): Official expertise concerning weather and sea conditions on 13 March 2006 between 18:00 and 23:00 UTC in the North Atlantic west of Ireland close to position 054°34'N 013°30'W