



STATE COMMISSION ON MARITIME ACCIDENT INVESTIGATION

FINAL REPORT 30/14

Serious marine casualty

M/V LANGBALLIG

Contact of the stern with underwater part of the central breakwater embankment
on the fairway in Świnoujście on 9 August 2014

June 2015

The examination of a serious marine casualty of Langballig was conducted under the State Commission on Maritime Accident Investigation Act of 31 August 2012 (The Journal of Law item 1068) as well as norms, standards and recommended procedures agreed within the International Maritime Organisation (IMO) and binding the Republic of Poland.

The objective of the investigation of a marine accident or incident under the above-mentioned Act is to ascertain its causes and circumstances to prevent future accidents and incidents and improve the state of marine safety.

The State Commission on Maritime Accident Investigation does not determine liability nor apportion blame to persons involved in the marine accident or incident.

This report shall be inadmissible in any judicial or other proceedings whose purpose is to attribute blame or liability for the accident referred to in the report (Art. 40.2 of the State Commission on Maritime Accident Investigation Act).

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1. Facts

On 9 August 2014 at 17:40 “Langballig” unmoored from the Quay no 1 in the Marine Repair Yard in Świnoujście. With the pilot aboard, the vessel turned to the port exit. At the level of the downtown ferry terminal at the speed of 9.4 knots the vessel lost her propulsion caused by the immobilization of the main engine.

The pilot informed Świnoujście VTS duty operator about the failure. The steering of the vessel was done with the main rudder and the bow thruster.

At the command of the VTS operator via the pilot station dispatcher, the captain of the vessel asked for the tug boats. The dispatcher of the towing company informed the captain that the tugboats would not be sent until he received an order for the towing service from the ship's agent. The captain contacted the agent who ordered the tug boats at ca. 18:10.

The chief engineer attempted to restore propulsion, but without success. The vessel was slowly losing speed. As a result of the north-west wind and the outgoing current, the vessel drifted away to the fairway at ca. 18:24 and leaned against the central breakwater embankment with the stern and the rudder blade.

After arriving at the site of the accident at 18:31 the tug boat “Uran” started pulling the ship away from the breakwater. At 18:40 the tug boat “Atlant” reached the vessel and together with “Uran” both tug boats towed away “Langballig” to the Marine Repair Yard for repairs and the inspection of the underwater part of the hull. The crew inspected the tanks adjoining the area of contact with the breakwater embankment. No dents or water leaks were detected.

2. General Information

2.1. Ship's Particulars

Ship's name:	Langballig
Flag:	Cypriot
Shipowner:	MS Langballig Schiffahrtsgesellschaft GmbH & Co. KG
Operator:	Brise Bereederungs GmbH & Co. KG
Classification society:	DNV-GL
Vessel's type:	General cargo
Call signal:	P3AY9
IMO number:	9226762
Gross tonnage (GT):	3925

Year of built:	2001
Power:	2880 kW (MAK 6 M 32)
Width:	16,16 m
Length overall:	99,95 m
Hull material:	steel
Minimum crew:	9 men
Type of the SVDR recorder:	Headway HMT-S100



Photograph 1: A general cargo vessel “Langballig”

2.2. Voyage Particulars

Ports en route:	Świnoujście
Port of destination:	Baltiysk (Russian Federation)
Type of navigation:	international
Manning:	9 Poles, 1 Estonian

2.3. Accident Information

Kind:	Serious marine casualty
Date and time of accident (UTC):	09.08.2014 at 18:24 LT (16:24 UTC)
Geographical position of the accident:	$\varphi=53^{\circ}55,269' N$; $\lambda=014^{\circ}17,061' E$
Geographical area of the accident:	The Bay of Pomerania – the Świna Strait

Nature of the water region:	Internal waters, fairway
Weather during the accident:	Very good visibility, wind NW up to 18.5 m/s
The operational status of the vessel during the accident:	Ballasted vessel
Accident site aboard:	Underwater part, stern, starboard, rudder-blade
Consequences of the accident of the vessel:	scratches of paint on the hull and the rudder-blade in the underwater part at the length of 0.5 m
Consequences of the accident to the port infrastructure:	none

2.4. Shore Services and Rescue Action Information

No rescue operations were conducted. The casualty resulted in the need to tow the vessel away using two tug boats “Uran” and “Atlant” to the Marine Repair Yard in Świnoujście to remove the damage to the main propulsion and to inspect the underwater part of the stern in the area where the stern and the rudder blade touched the escarpment of the central breakwater.

3. Circumstances of the Accident

On 9 August 2014 at 17:40 the vessel “Langballig” left the wharf of the Marine Repair Yard in Świnoujście and started moving to the exit from the port. At the level of the downtown ferry service at 18:00:08 when the vessel was sailing at the speed of 9.4 knots the main propulsion came to a sudden halt causing the immobilization of the adjustable blade propeller. The vessel started losing her speed. In order to stay on the fairway the position of the vessel was controlled by means of the main rudder and the bow thruster.

At 18:01:51 via VHF on channel 12 the pilot reported to the Świnoujście VTS operator the breakdown of the vessel and the lack of propulsion.

After 4 minutes, according to the request of the VTS operator, the captain communicated with the pilot station dispatcher and transmitted information to the towing company that the vessel had no propulsion and asked for the assistance of a tug boat.

After another 2 minutes, the captain received a message from the pilot station dispatcher that unless the ship's agent confirmed the order of the towing service no tug boats would be sent.

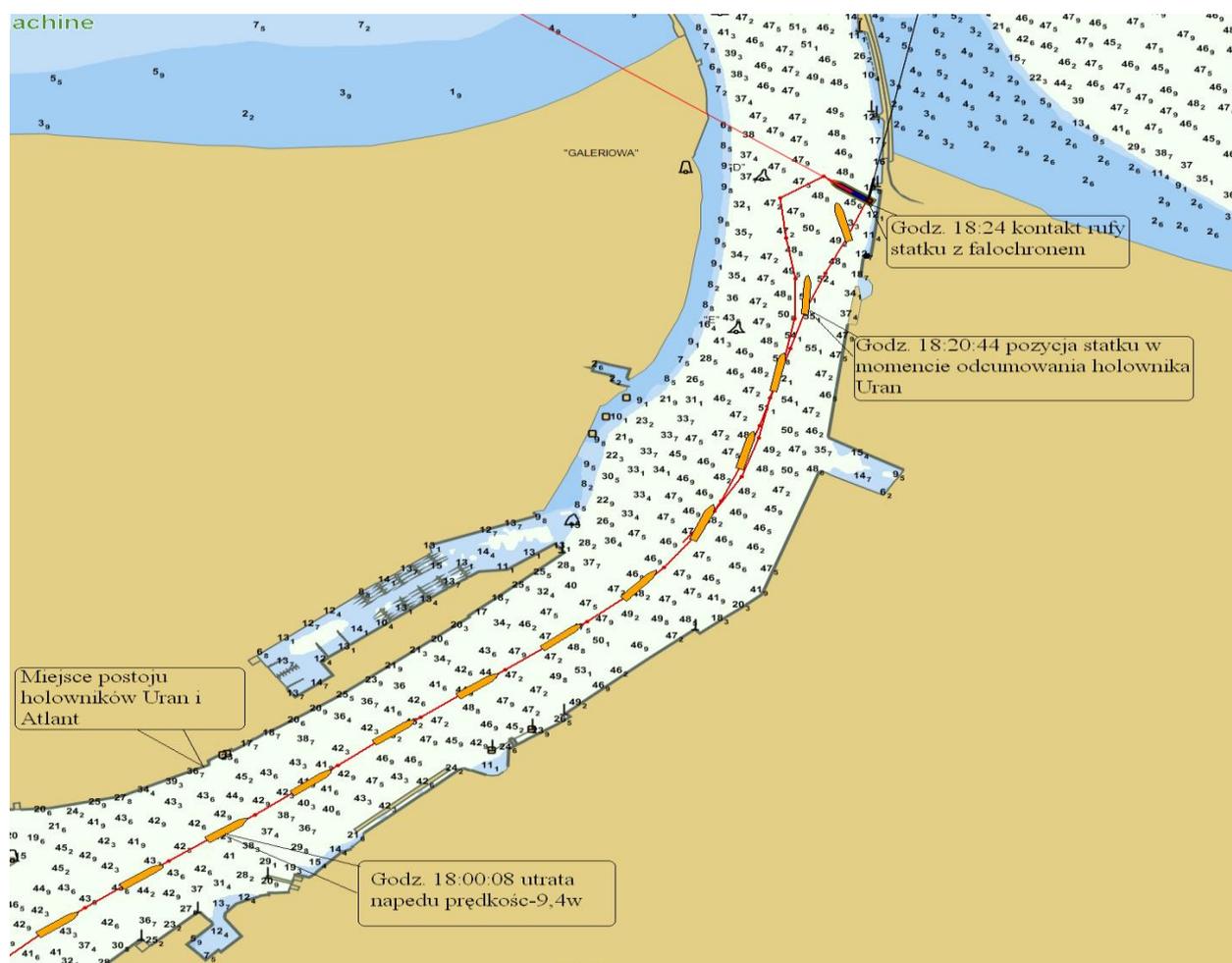
The captain of the vessel called the ship's agent at 18:08:35 informing him about the lack of propulsion and an urgent need to order a tugboat for assistance. At 18:09:50 the VTS operator ordered the dispatcher of the towing company to send immediately a tug boat to “Langballig”

which was in the emergency situation and moving along the fairway with immobilized main propulsion.

At ca. 18:10 the ship's agent ordered a tug boat. Since the breakdown the chief engineer was trying to restore the propulsion of the vessel. At 18:14 the chief engineer started the main engine, but he could not switch on the hydraulic clutch of the transmission gear. There was no control of the adjustable propeller, neither from the bridge, nor from the engine control station, or the emergency steering position.

At 18:20:44 the tug boat "Uran" unmoored from the waiting berth and proceeded towards "Langballig". At ca. 18:21 because of strong, north-western wind of 18.5 m/s and the outgoing current of 0.7 knots, "Langballig" started to drift with her stern towards the central breakwater of the port of Świnoujście.

At 18:21:16 the pilot asked a skipper of the pilot boat for assistance in pushing the vessel away from the breakwater to avoid contact. The pilot boat was too weak for that operation and at 18:24 "Langballig" touched the underwater part of the embankment of the central breakwater with the stern and the rudder, about 10 meters south from the sixth groyne.



Photograph 2: Trajectory of movement of "Langballig" from the S-VDR recorder

At 18:26 the tug boat “Uran” reached “Langballig” and gave her the towline and at ca 18:31 she started the operation of towing the vessel away from the breakwater. At 18:40 the vessel was approached by another tug boat “Atlant”. With the help of two tugboats “Langballig” was towed away to the Marine Repair Yard to remove the propulsion breakdown and to inspect the underwater part of the hull.

4. The Analysis and Comments about Factors Causing the Accident with Regard to Examination Results and Expert Opinions

“Langballig” is equipped in an integrated propulsion package (IPP) consisting of an adjustable propeller, a shaftline, a reduction gearing with a reduction gear with hydraulic gearbox and a hydraulic system - Fig. 1. Additionally, the integrated propulsion system is equipped with a control system.

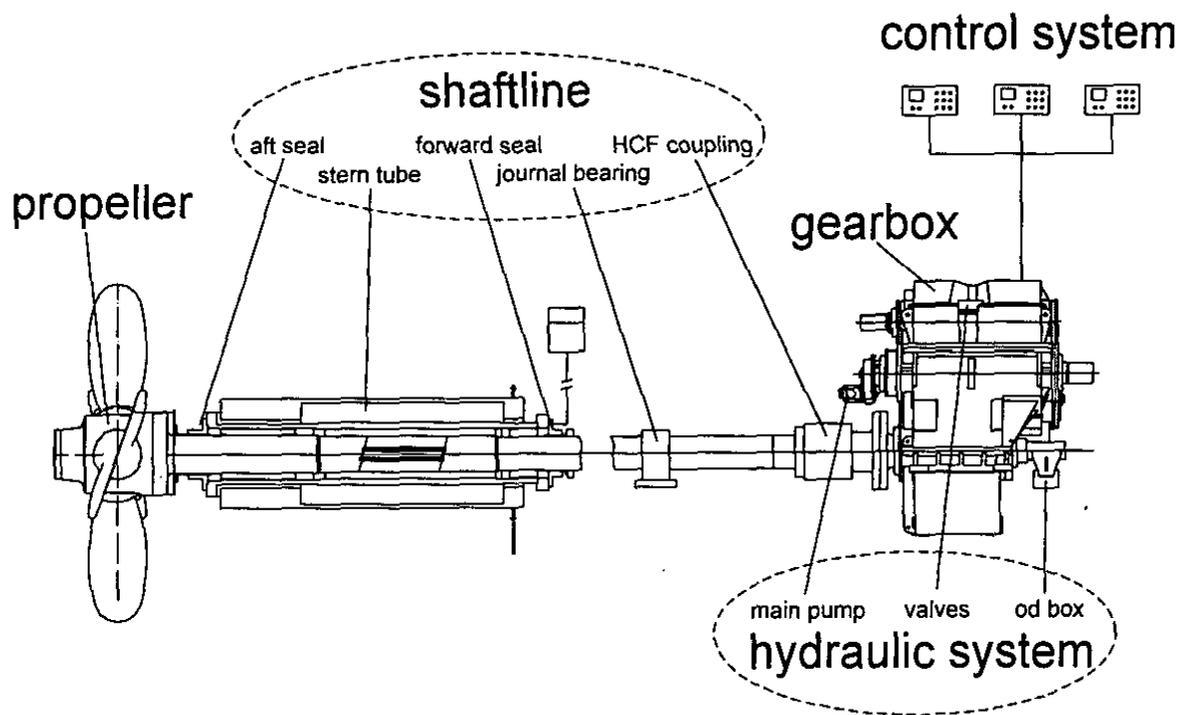
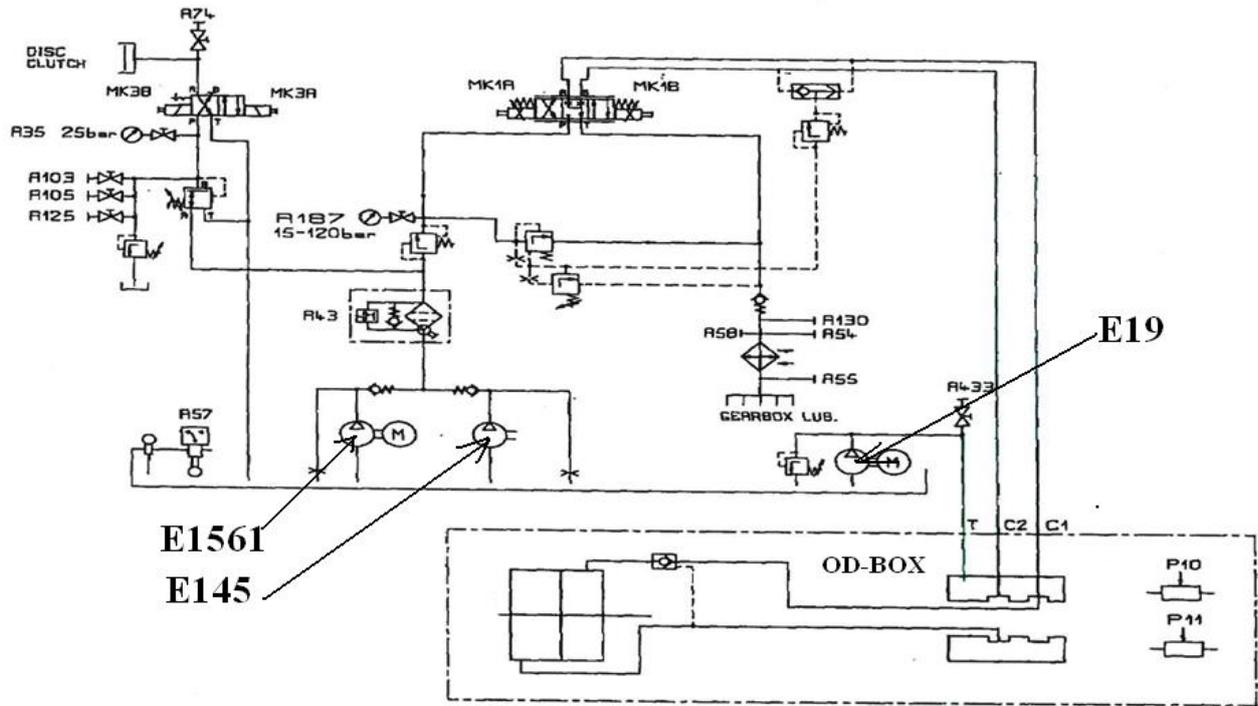


Figure 1: Integrated propulsion system of Langballig

During normal operation, adjustable propeller is controlled by an electronic control system, which transmits signals sent from the bridge or the steering and control room to the propulsion package.

The propulsion system presented in Fig. 2 in the propulsion system of the vessel generates pressure needed to alter the deflection of the adjustable propeller, to switch on and off the clutch

gear and to lubricate and cool the internal parts of the transmission gear. The pressure of the hydraulic oil is produced by the main oil pump (the so called suspended pump) - driven by the transmission, or an auxiliary pump – driven by the electric motor.



- E1561 - hydraulic oil pump of the IPP driven by the electric motor
- E145 – suspended main hydraulic oil pump of the IPP driven by the transmission gear
- E19 - oil pressure pump of the adjustable propeller hub driven by means of an electric motor
- DISC CLUTCH - clutch gearbox
- OD-BOX - distributor of hydraulic oil adjustable propeller
- GEARBOX LUB – lubricating of the transmission gear

Figure 2: Hydraulic diagram of the integrated propulsion system of “Langballig”

Hydraulic oil auxiliary pump switches on automatically when the oil pressure in the system drops below the value of 18 bar. The drive system is additionally equipped with the propeller hub oil pressure pump. The pump is driven by an electric motor with a power of 130 W, powered by the electrical current of 24V DC from the same source as the electronic system of propulsion control. The auxiliary pump generates pressure of ca. 2 bar and its task is to pressurize hydraulic oil in the propulsion hub higher than the pressure of water surrounding the propeller. This prevents the ingress of seawater into the hydraulic oil system in the event of any leaks. The pump switches on automatically when the vessel is at the port when the propulsion system is switched off and the pressure of oil in the system drops below 1 bar.



Photograph 2: Auxiliary pump of the hydraulic oil driven by an electric motor



Photograph 3: Oil pressure pump of the adjustable propeller hub driven by means of an electric motor

The Commission found out that the failure which caused the main engine to stop was due to a very poor state of insulation of the damaged electric motor that drives the propulsion hub oil pressure pump. Poor insulation condition caused interference in the working of the electronic control system, which caused instability and fluctuations in the hydraulic oil pressure in the gearbox lubrication system. The hydraulic oil pressure drop below the 16 bars activated the security system against lack of lubrication of the gear that stopped the main engine.

The chief engineer, in order to restore the proper hydraulic pressure, took over the control of the propulsion to the steering and control room and then to emergency position. He set the switch mode of the auxiliary hydraulic oil pump from automatic to manual and turned on the hydraulic oil pump manually. While switching on the pump the contactor was damaged (the contacts were burned), which resulted in the lack of electric power of the pump motor and the inability to obtain the pressure of the hydraulic oil needed to restore the propulsion of the vessel.

4.1. Mechanical Factors

Among the mechanical factors that contributed to the accident the Commission included contactors in the on/off system of the electric motor of the auxiliary hydraulic pump which were partly burned by electric arc and a very poor state of insulation of the damaged DC electric motor of the propeller hub oil pressure pump. These defects and malfunctions were found after the accident of the vessel during her stay in the repair yard.

4.2. Human Factors (fault and neglect)

When conducting the repair in the yard, the technical condition of the electric motor of the propeller hub oil pump had not been checked and when replacing a defective contactor in the control

system of the electric motor of the auxiliary hydraulic oil pump there was used a new contactor which had too small maximum nominal current range in relation to the power of the electric motor. This led to the damage of the working contacts.

4.3. Organizational Factors

Among the organizational factors that influenced the occurrence of the accident the Commission included:

- 1) a failure to include the propeller hub oil pressure pump with the electric motor in the schedule of inspections and repairs of “Langballig” which caused that these devices were not covered by technical inspections required by the manufacturer;
- 2) the need to make a formal request for a towing service by the ship's agent, and not by the master; that practice caused a delay in sending a tug boat to assist the vessel which was in the emergency situation.

4.4. Influence of the External Factors including Factors Related to the Marine Environment on the Occurrence of the Accident

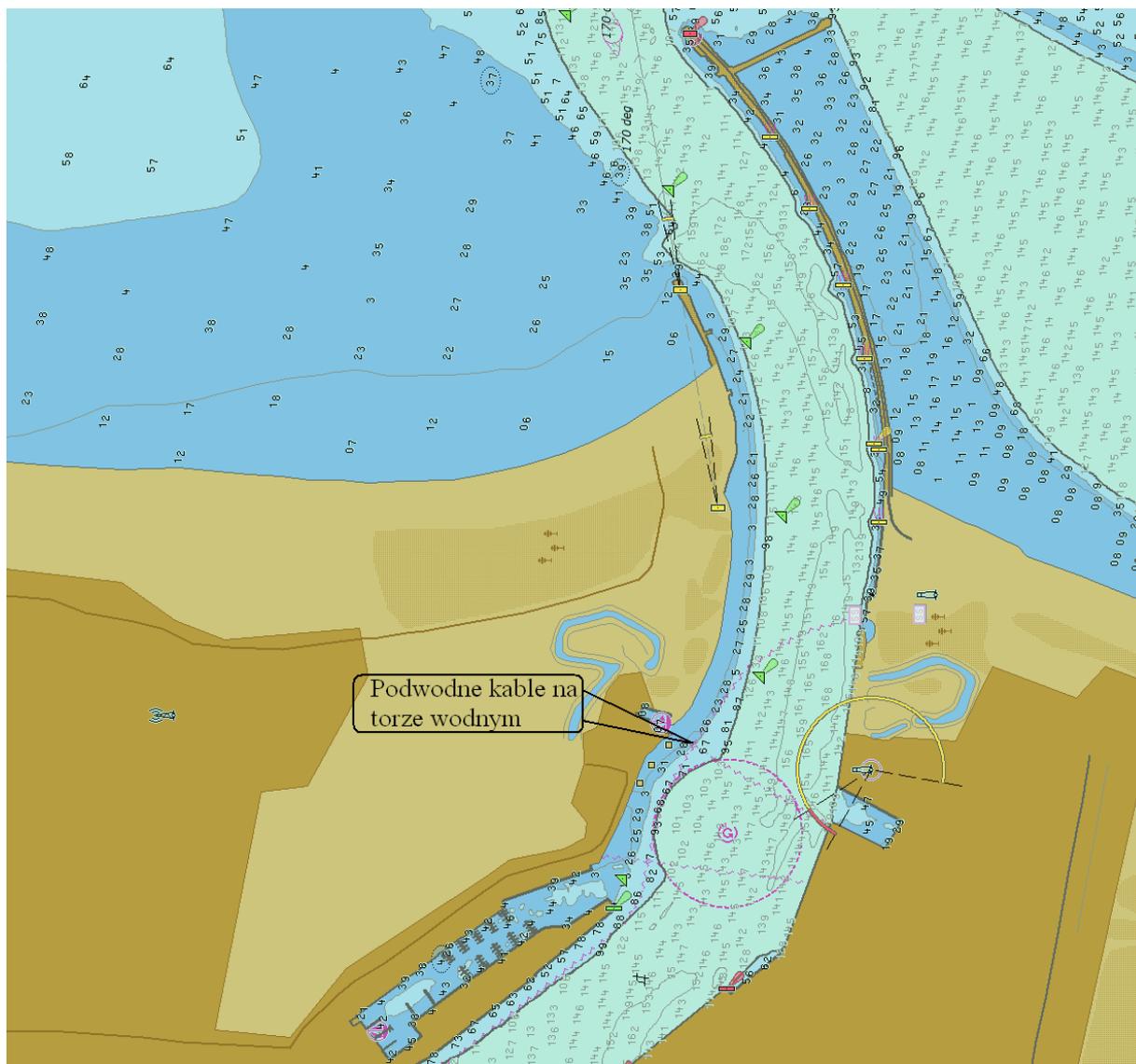
One of the external factors that influenced the accident were gusts of strong wind with the speed of up to 18.5 m/s blowing from the north-western direction while the vessel remained without power and was losing speed. The additional factor that caused that the stern of the ship was pushed onto the breakwater was an outgoing current of the speed of ca. 0.7 knots.

According to the entries in the Port Logbook kept by the duty officer of the harbour master’s office in Świnoujście on 9 August 2014, the following hydro-meteorological conditions prevailed at the site of the accident:

Time	Direction and wind power	Pressure	Visibility	Cloudiness and precipitation	Air temperature	State of water	Strength of Current	Direction of current	Sea state
17:00	2-3	1010	12	3	25	508	0.8	Towards the sea	1-2
18:00	W 2-3	1011	12	3	25	502	0.7	Towards the sea	1-2
19:00	NW 5-6	1011	12	3	21	517	0.2	Towards the sea	2-3

The duty officer noted in the Port Logbook: „Notice: 1815 gusts of wind up to 18.5 m/s NW”.

The Commission also found the presence of another type of external factor. The location of submarine cables on the way of the drifting vessel prevented the captain of the vessel to cast anchor safely and to stop the vessel at an appropriate distance from the breakwater.



Photograph 4: Distribution of underwater cables on the fairway in Świnoujście

5. Description of Examination Findings Including the Identification of Safety Issues and Conclusions

As a result of the investigation, the Commission found out that a direct reason for the contact of the stern of “Langballig” with the underwater part of the central breakwater embankment in Świnoujście was drifting of the vessel from the fairway due to a sudden strong gust of wind from the north-western direction while the vessel was remaining on the fairway without propulsion.

The failure of the propulsion indicates that the shipowner should pay special attention to the maintenance and repairs of individual elements of the propulsion to ensure the reliability of the IPP, having a particular impact on the safety of navigation.

The propulsion system of “Langballig” at the time of standstill in the repair yard in Świnoujście was characterized by 61 500 operating hours (in the period of 13 years of operation) and needed a thorough check of the technical condition of all its components. The shipowner’s system of planned overhaul and repair examined by the Commission did not include technical inspection of some elements of the propulsion of the vessel. It lacked certain indicated time periods for repairs and overhaul recommended by the manufacturer of the propulsion in their instructions. Entries made in the system of planned overhaul and repair were not detailed enough to recognize that the technical condition of the propulsion was maintained in accordance with manufacturer's requirements.

While the ship had been in the repair yard before the accident, the owner did not provide a full survey of the technical state of the propulsion transmission gear and had not reviewed the oil pump of the propeller hub, together with the electric motor (Fig. 3 - abbreviations, as shown in Fig. 2).

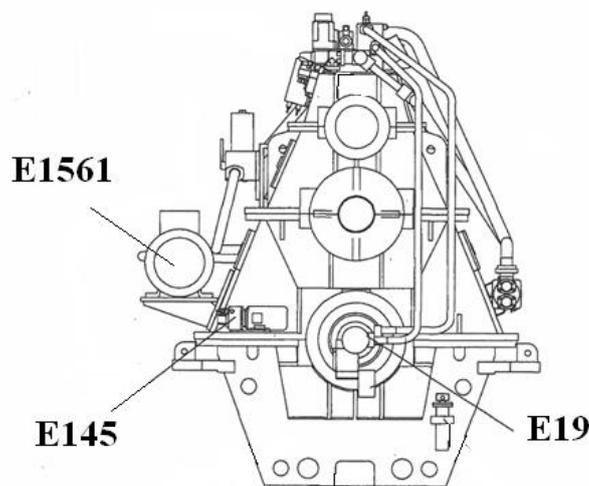


Figure 3: Transmission gear of the propulsion – view from the aft of the propulsion

The oil pump of the hub pressure with an electric motor is mounted on the body of the propulsion gear, near the bilges of the engine room, in a place which is obscure and hard-to-reach for an engineer. The electric motor of the pump is exposed to dust, moisture and vibrations coming from the transmission gear and this can cause premature wear and sudden failure.

The user manual prepared by the manufacturer of the integrated propulsion package (IPP) assumes that to maintain the system in perfect condition the inspections and checks should be

carried out in the following time sequence: daily, monthly, quarterly, semi-annually, annually, every 10 years or every 60 000 operating hours (propulsion gear) and each time when docking the vessel.

The repair of the propulsion system after the break-down required the replacement of the contactor of the electric motor in the electric power supply system of the auxiliary hydraulic oil pump and check of the value of pressure at which the pump is switched on when there is a pressure drop in the system. The electric motor of the propeller hub oil pressure pump was repaired and the work of the pump was tested. The test showed that the pump was not running in an automatic mode. Switching the pump on and off could be done only manually. That malfunction was specified in the inspection report made by the classifier.

The inspection of the underwater part of the stern and the rudder blade made by a diver, showed no damage, only some scratches of the paint at a length of about 0.5 meters.

After completion of repairs and inspections the operation of propulsion of the adjustable blade was checked. Propulsion tests were conducted at the testing station of the Marine Repair Yard at the Wharf No 1 while the main engine of the tethered vessel was running (load at 40% of capacity) in the presence of a representative of the classification society. The propulsion of the vessel was tested from three places of control of the adjustable propeller: from the bridge, from the engine control room, and from a local position. The operation of the rudder and the steering gear were checked. All tests went correctly. The appropriate classification documents were issued by the DNV-GL inspector and the vessel left the Marine Repair Yard in Świnoujście on 11 August 2014 going on a journey to the port of Baltiysk.

Apart from the technical aspects noticed by the Commission in the course of the investigation, the Commission also drew attention to the fact that the need to place an order for a towing service by the “Langballig”’s agent delayed the arrival of the tug boat to the vessel drifting towards the breakwater. If the order for towing services was taken directly from the captain of the vessel, omitting the agent, it would have reduced the delay in the arrival of the tug boat to the side of the vessel and it would have accelerated the initiation of the manoeuvre of holding the vessel and then pulling her away from the breakwater. Fast towing assistance could have prevented the hull of the vessel to get in contact with the breakwater.

6. Safety Recommendations

The State Commission on Maritime Accident Investigation deemed it appropriate to send the recommendations aimed at improving technical condition of propulsion that had a direct impact on the safety of navigation to the shipowner of “Langballig”, i.e. Brise Bereederung GmbH & Co. KG Kg.

The State Commission on Maritime Accident Investigation has recommended that the shipowner should include in the system of planned overhaul and repair of “Langballig” the oil pump of the adjustable propeller hub, together with the electric motor and keep these devices in good technical condition as well as he should observe the timing of overhaul and repair of all propulsion elements and components to operate that system according to the manufacturer's instructions.

Furthermore, the Commission deemed it appropriate to draw the attention of the towing company Fairplay Towage Poland Sp. z o. o Sp. k. that their practice of not accepting orders for towing services from ships' captains and waiting for information (service request) from ships' agents¹ was incompatible with good seamanship. The captain of the ship, just as the ship's agent is a representative of a shipowner². Calling for the assistance of tug boats by the captain, and particularly by the captain of a ship which is in an emergency situation, such as “Langballig”, should be treated just like an order of a duty officer of the harbour master's office or the VTS operator³. Calling tug

¹ The Commission accepted that in this case it was not an unjustified waiting for the opportunity to provide rescue services instead of towing services. Such action could prove to be, in certain circumstances, disadvantageous both for the port and for the operations at the port, where the towing company operates, as well as for the towing company itself. For example it is the case of blocking the fairway by a vessel which has not received the assistance of tug boats on time, as a result of a collision with another ship, causing serious pollution or damage to the port access infrastructure, thereby preventing the other vessels from entering or leaving the port or berthing, resulting in the lack of orders for services of the towing company itself.

² Under art. 54 of the Act of 18 September 2001 on Maritime Code (The Journal of Laws of 2013 item 758 as amended) the captain is by law a representative of the shipowner, i.e. a person who has the authorization to perform actions on behalf and with direct legal effect of the shipowner. That representation includes simple matters related to navigation and ordinary management of the vessel and cargo. Undoubtedly the ordinary management includes matters related to ordering of towing or pilot services. In the foreign law, including the common law, the issue of representation of the shipowner by the captain is treated in a similar way: the captain is subordinate to the owner of the ship and its representative in terms of the purposes for which he is employed, that is all the activities that are ordinary and necessary for the use and employment of the ship (*Halsbury's Laws of England, vol. 43 (1), art. 466, p. 273*). The power of attorney of the captain is based on the so-called *implied authority*, or in other words on powers which do not result from a separate agreement between the parties, but implicitly arise from the moment the captain is entrusted with commanding the ship by the shipowner. According to art. 201 and 202 of the Maritime Code, a shipping agent, as a representative of the shipowner is entitled to undertake on their behalf ordinary activities related to navigation. These ordinary activities related to navigation, like ordinary management of the vessel, include entering into towing and pilot contracts although the act does not specify them in the open catalogue of agent's authorities in art. 202 § 2.

³ Under § 11 p. 1 of the Order No 3 of the Director of Maritime Office in Szczecin of 26 July 2013: Port Regulations (Official Journal of the West Pomeranian Province item 2932): “Harbour master's officers have the right to give instructions aimed at preventing risks to human life and health, to the environment, dangers threatening the ships, port facilities and cargoes and, if necessary, to apply to appropriate authorities for help.” On the other hand, under paragraph 3 of that order “The commands issued by harbour master's officers in the field of maritime safety, security and port order as

boats and ordering to send them to the vessel were aimed at maintaining the safety of navigation on the fairway and preventing the occurrence of an emergency.

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9. Glossary and Abbreviations

UTC – Universal Coordinated Time

DC - direct current

NW - north west (direction of wind)

V – voltage

IPP - integrated propulsion package

10. Information Sources

Notification of the accident

Documents of the vessel

Materials from hearing of witnesses

Data from the S-VDR recorder

Register of the traffic flow by VTS Świnoujście

well as environmental protection are immediately enforceable, unless the deadline for their implementation has been clearly defined”.

11. Composition of the Accident Investigative Team

The team conducting the examination was composed of:

the team leader: Tadeusz Gontarek, a member of the State Commission on Maritime Accident Investigation,

the team member: Krzysztof Kuropieska, a member of the State Commission on Maritime Accident Investigation.