



SMAIC

STATE MARINE ACCIDENT
INVESTIGATION COMMISSION

FINAL REPORT

013/22

serious maritime accident

**SAILING YACHT
'YACHTING'**

**Fall overboard of a sailing yacht crew member on
the Baltic Sea on 23 February 2022**

November 2022



The investigation of the very serious marine accident of the sailing boat YACHTING was conducted under the State Marine Accident Investigation Commission Act of 31 August 2012 (Journal of Laws of 2019, item 1374) 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 Marine Accident Investigation Commission does not determine liability nor apportion blame to persons involved in the marine accident or incident.

The following 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 Marine Accident Investigation Commission Act).

State Marine Accident Investigation Commission
Pl. Stefana Batorego 4, 70-207 Szczecin
phone: +48 91 44 03 290, mobile: +48 664 987 987
e-mail: pkbwm@pkbwm.gov.pl
www.pkbwm.gov.pl

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1. Facts

On 19 February 2022, the 9-member crew took over the sailing yacht 'Yachting', which had been handed over from the owner to the charterer at the Imperial Marina in Gdańsk. The yacht's petty officer carried out handover as well as instructed the crew regarding the boat's equipment, as per handover checklist. On 20 February 2022 at 11:00¹ hrs, the 'Yachting' with 9 crew on board sailed from the Imperial Marina in Gdańsk to Karlskrona (Sweden). Due to deteriorating weather on the Southern Baltic, the 'Yachting' called on 20 February 2022 at 22:00 hrs the port of Władysławowo to stay berthed during the bad weather conditions. After weather improved on 22 February 2022 at 13:40 hrs the yacht resumed her voyage to Karlskrona (Sweden). On 23 February 2022 before 10:00 hrs there was a change of watch. The new watchkeeper agreed with the yacht's Master that, due to the bad hydrometeorological conditions, strong gusts of wind, rough sea and heavy roll, the voyage will be continued using the boat's engine. The sailor, who had finished his watch on deck, while moving from the cockpit to the mainsail retrieval area, due to the rough sea and heavy roll lost his balance when on the superstructure, collapsed and then fell onto the half-deck and, bouncing off it, around 10:10 hrs fell overboard.

The Master at approx. 10:18 hrs transmitted a message on VHF CH 16 reporting a man overboard (MOB²). A rescue operation to get the crew member out of the water by the yacht's crew proved unsuccessful.

As a result of the manoeuvres carried out, a rope was winded up on the propeller and the engine, which was the yacht's auxiliary propulsion system, became immobilised. The Swedish and Polish SAR services, aircraft and helicopters set out for rescue. The Master and crew decided to sail back to Władysławowo. They navigated for some time using the reefed jib. However, due to a damaged and torn genoa sail, the yacht's auxiliary propulsion system being immobilised due to a rope winded up on the propeller and the crew being exhausted by seasickness, as well as their poor mental state, on 24 February 2022 at approximately 03:32 hrs the yacht's crew reported via VHF a problem with the safe return to Władysławowo and called for assistance to tow the boat back to the port.

¹ All times in the report, unless otherwise indicated, are in CET (CET= UTC + 1 hr).

² MOB – Man Overboard.



The rescue vessel 'Sztorm' was sent for the rescue operations, which, after reaching the yacht, gave a tow and towed the boat up to the Władysławowo roads, and then handed over the tow to the rescue vessel 'Bryza', which brought the yacht inside the port.

After berthing a diver inspected the underwater part of the hull to remove a rope wound up on the propeller. The yacht was retrofitted with lifebuoys to replace those used by the crew during the MOB alarm. In addition, the yacht was fitted with a liferaft, the absence of which was noticed by the crew prior to a crew member falling overboard.

2. General information

2.1. Sailing yacht particulars

Name of the sailing yacht:	Yachting
Flag:	Polish
Owner:	OK Events Kasper Orkisz - Warszawa
Technical supervision:	Polish Yachting Association
Yacht type:	Delphia 47, commercial sailing yacht with auxiliary power propulsion
Call sign:	SPG 4062
Year of build:	2014
Area and type of sails:	92.5 m ² of sails, Bermuda sloop
Power of auxiliary propulsion:	55 kW Volvo Penta diesel engine
LOA:	14.06 m
Width:	4.48 m
Hull material:	polyester-glass laminate
Minimum safe manning:	2 crew
Maximum available number of crew:	12 persons



Photo 1. Sailing yacht 'Yachting' in the port of Władysławowo

2.2. Voyage particulars

Ports of call during a voyage:	Gdańsk, Władysławowo
Destination:	Karlskrona (Sweden)
Type of voyage:	seagoing navigation limited to 200 Nm from the place of refuge in wind force up to 8° B and sea state unrestricted,
Crew details (number, nationality):	9 crew members (all Polish)



2.3. Marine accident information

Type:	serious marine accident
Date and time of the accident:	23 February 2022 at 10:10 hrs
Position at the time of the accident:	$\varphi = 55^{\circ} 55.4' N$ $\lambda = 017^{\circ} 35.0' E$
Area of the accident:	Baltic Sea, 130 Nm north of the port of Władysławowo
Nature of the water region:	international waters
Weather at the time of the accident:	wind 7°B, sea 4
Human factor contribution:	crew members of the sailing yacht
Consequences of the accident for people:	one of the crew members fell overboard, picked up from the water by a Swedish SAR unit in a state of profound hypothermia,
Consequences for the sailing yacht:	the yacht sustained no damage, there was a loss of auxiliary propulsion due to the rope winded up on the propeller while the yacht's crew was conducting the MOB rescue.

2.4. Shore Services and Rescue Action Information

Entities involved:

Maritime Rescue Co-ordination Centres (MRCCs) from Sweden, Poland, and Russia. A radio operator from the Polish oil platform 'Petro Giant' participated in the transmission of information.

Means used:

KBV 503 aircraft and Life Guard 004 helicopter from the Swedish MRCC, helicopter 906 from the Polish MRCC, and SAR vessels 'Sztorm' and 'Bryza' participated in the subsequent towing operation. Nearby commercial vessels 'Wilson Cadis', 'Vielikiy Novogrod', 'DC Orisant' were directed to the accident area.

Action taken:



Conducting a search for the man overboard, assisting the yacht's crew if needed.

Results achieved:

The unconscious survivor had been found by Swedish KBV 503 aircraft, picked up from the water by Swedish Life Guard 004 helicopter and transported to hospital in Karlskrona.

After completion of the search & rescue operation, the vessels involved were released. The yacht continued her voyage back to the port of Władysławowo until the crew's physical and mental strength was exhausted and help called. The SAR vessels 'Sztorm' and 'Bryza' participated in the action of towing the yacht and bringing her into the port of Władysławowo.

3. Circumstances of the accident

A group of 9 sailors hired a sailing yacht 'Yachting' (Delphia 47) to sail on a winter tourist cruise on the Baltic Sea from Gdańsk to Karlskrona. According to entries in the Yacht Logbook, the boat sailed from the Imperial Marina in Gdańsk on Sunday 20 February 2022 at 11:00 hrs. Due to a stormy weather Master decided to call the port of Władysławowo to await bad atmospheric conditions. In Władysławowo, the yacht moored at 20:00 hrs. The next day the yacht continued her stay in the port waiting for the weather to improve. After the Master had checked the weather forecast using the 'Windy' weather app, the yacht departed from Władysławowo on Tuesday 22 February at 14:00 hrs. In the Yacht Logbook sea state 5, wind force 5°B, visibility good, pressure 1012 hPa, and no signs of worsening weather conditions were recorded. According to the entries from the Yacht Logbook, by the morning of 23 February 2022 the weather conditions were variable: sea 3-4, wind 3-6°B. After 09:00 hrs the wind force started to increase. The entries in the Yacht Logbook indicate wind 7°B and the state of the sea very troublesome for the crew. Some of the yacht's crew experienced increased symptoms of seasickness to the extent that they were not able to work. After consulting with the watchkeeper, the Master decided to lower the sails and continue the voyage using an engine. Accordingly, she was preparing to go on deck to supervise the lowering of the sails. At the same time, there was a change of watch, and the crew noticed the absence of a liferaft located on the stern. Without informing the Master, one crew member came from the cockpit on deck and, moving across the deck seated and switching 2 safety lines attached to his inflatable lifejacket,



tried to reach the mast to retrieve the mainsail, which had no downhaul³. Because of the strong wind, the sail slides were moving terribly slow down the mast delaying the sail from being fully settled on the boom. As the yacht did not have a lifeline⁴ stretched along the deck, it was necessary to connect lifejacket's safety lines directly to the storm rail⁵ as well as to the fixed parts of the yacht that were in range.

At the same time, both jib sheets came completely slacked and slipped out from the sheet blocks, due to the lack of protection. Slacked jib made subsequent manoeuvring difficult. When the yacht's engine was started and before the yacht was positioned against the wind to allow the sails to be lowered, heavy roll and pitch caused difficulty to move on deck. A crew member who had reached the mast but, as he claimed, secured by safety lines was unable to reach the sail, was approached by another crew member with the intention to secure the sail on the boom, who, despite wearing a lifejacket with safety lines attached (like the rest of the crew) did not connect the lines to the deck⁶.

³ **Downhaul** is a rope used to lower moving rigging components. It is a rope with an opposite action to the halyard.

⁴ **Lifeline** (safety rope) - steel or other strong fiber ropes stretched between the bow and the cockpit preferably on both sides. They are used to connect the snap hooks of the life jackets' safety lines, thus securing the movement (seated movement) of the sailors on the deck without the need for clipping to other fixed parts of the yacht. The lifeline is not part of the equipment required by the regulations on the yacht. Many sailors have reservations about using the lifeline in practice.

⁵ **Storm rail** - a rail running around the yacht. Most often it is a steel rope running through metal posts with holes.

⁶ There are a few places around the mast that the crew member could have been connected without restricting access to work on the mast and boom.



Photo 2. Location of the sailor before falling overboard

As a result of the wave hitting the yacht's hull and conquering it, he lost his balance, fell onto the superstructure deck, then fell onto the half-deck hitting it, and further hit the storm reel, which became slacked under the pressure of his body. As a result, at 10:10 hrs the crew member fell overboard. The watchkeeper who saw the moment the crew member fell overboard sounded the 'Man overboard' alarm. Surprised by the situation, with some delay he threw a lifebuoy with a flag pole towards the man overboard, but too far from the person, so the man overboard was unable to reach it. The crew member who fell overboard was wearing a buoyancy suit and an inflatable lifejacket, which provided buoyancy. The lifejacket filled with air when the sailor fell into the water. As he remained afloat, the helmsman designated a person to observe him. The crew prepared another lifebuoy with two ropes attached and the helmsman began to manoeuvre the yacht around the man overboard in the hope that he will reach the rope and get into the lifebuoy. At the same time, at 10:18 hrs, the Master decided to send MOB signal with information that a man is overboard. The call was received by the radio operator of the Polish oil platform 'Petro Giant' located approximately 38 Nm south of the yacht as well as by the Swedish MRCC. The forwarded call from the operator of the oil rig 'Petro Giant' also reached



the operators of the GMDSS Polish Rescue Radio⁷, and further the Polish MRCC, as well as the MRCC in Kaliningrad. While the yacht's Master was checking the boat's position and relaying information about the situation, the crew tried to pick up a friend from the sea. On the next lap, the man in the water grabbed the rope at the end of which was a lifebuoy, but the speed of the yacht made it impossible for him to hold on to it. Further manoeuvring brought the man overboard close to the yacht stern. At this moment, one of the crew members, secured by a safety line to the yacht came on the ladder at the stern and reached with his hand a MOB's lifejacket. But the sailor who was in the water lost consciousness and the loose lifejacket without a crotch strap slipped out from him. A colleague trying to reach him was unable to grab his buoyancy suit because, weakened by seasickness and soaked by the impact of the waves, he himself needed help to get aboard. As a result of the manoeuvres and attempts to slow down the yacht by running the engine in reverse, the rope to which the lifebuoy was attached wound up on the propeller and the yacht was deprived of its auxiliary propulsion.

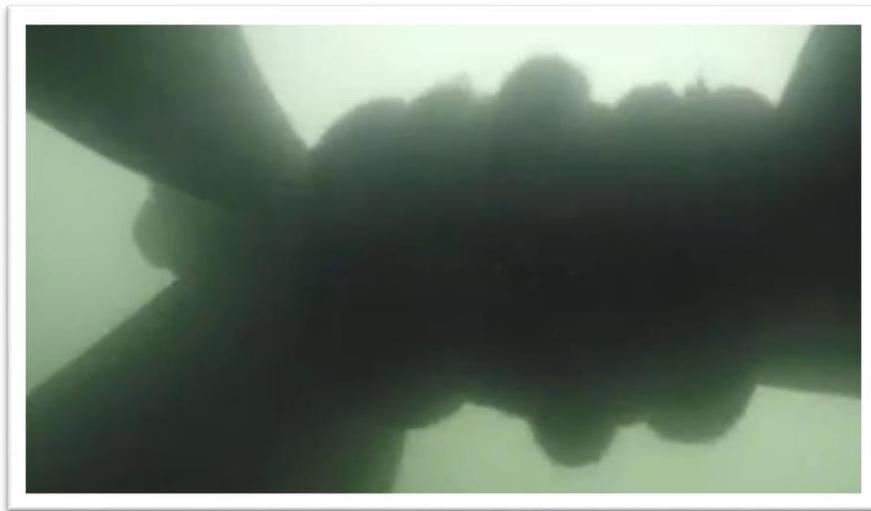


Photo 3. Mooring rope winded up on the propeller shaft.

Crew exhaustion, sea state and wind force did not allow the yacht to manoeuvre on the sails. The distance between the man in the water and the drifting yacht was increasing and after some time a visual contact with the sailor overboard was lost.

⁷ Polish Rescue Radio - a shore station that from 1 January 2020 took over the functions and responsibilities of the former shore station 'Witowo Radio'. The station carries out 24-hour watch within the framework of the Global Maritime Distress and Safety System (GMDSS) in the Polish area of responsibility for search & rescue operations.



During the rescue operation, the yacht's Master kept the operator from the Petro Giant drilling rig and the GMDSS operator of the Polish Rescue Radio informed about the situation on the yacht. This information was relayed to the Swedish MRCC.

After information about the yacht's geographical position had been received, it was determined that the yacht is in the Swedish Search and Rescue Region (SRR)⁸ area of responsibility, but close to the Russian and Polish ones.



Figure 1 - Location of search and rescue regions (SRR) on the Baltic Sea. The red dot indicates the approximate position of the sailing yacht 'Yachting' at the time the crew member was reported to fall overboard.

The Swedish MRCC at 10:26 hrs gave the order for a helicopter from the base in Kristianstad to fly into action. At the same time, it notified the Maritime Rescue Co-ordination Centre in Kaliningrad about the accident. In response, Swedish MRCC received information that the Maritime Rescue Co-ordination Centre in Kaliningrad did not receive any distress or emergency call and that they have no units to send immediately to the accident area. At 10:28 hrs the Polish Maritime Rescue Co-ordination Centre (MRCC) notified the Swedish MRCC that a helicopter will be sent from Poland for search and rescue operation.

At 10:31 hrs, the Swedish MRCC reported that their helicopter should reach the area of the accident in approximately 1 hour.

⁸ According to the Swedish Maritime Rescue Co-ordination Centre's initial findings, the yacht was assumed to be in the Russian SRR area of responsibility.



At 10:34 hrs, the Polish Maritime Search and Rescue Service (MSRS) reported that a helicopter from Poland is on the way, but due to difficult weather conditions, it is unclear how long it will be able to spend in the area of the accident.

At 10:38 hrs MRCC reported that there is a high (3 m) sea state in the area of the accident. At the same time a Swedish rescue aircraft was directed into action.

At 10:43 hrs, the Master gave her latest position and confirmed that the crew no longer have visual contact with the person in the water. This information was passed by the MRCC to the Maritime Search and Rescue Service in Kaliningrad, but no confirmation of receipt had been received.

At 10:50 hrs, the MSRS Gdynia requested the vessels 'Wilson Cadis', 'Vielikiy Novgorod' and 'DC Orisant', which were in the vicinity of the accident scene, to proceed to the position where the yacht's crew member fell overboard. The vessel 'Wilson Cadis', which was the closest one to the yacht, offered to pick up the yacht's crew on board. However, the yacht's crew reported that at the moment they do not need assistance and are able to sail alone. Swedish lifeguards doubted whether the yacht's crew would be able to continue their voyage in these weather conditions without assistance. Weather situation reported at 10:50 hrs by the 'Petro Giant' oil platform and transmitted via VHF channel 16 stated: wind direction 287°, wind force 45 knots (9°B), wave heights from 2.5 m up to 4.5 m.

At 11:10 hrs, when asked about the situation on the yacht, the Master confirmed that the crew are in control, will not evacuate and will proceed to the port of refuge where repairs can be made to the boat's propulsion system.

At 11:32 hrs, the crew from the Swedish rescue plane reported that a lifejacket had been found, and a minute later that a man had been found, and gave the exact position.

At 11:40 hrs, a rescuer from a Swedish rescue helicopter picked up from the water a crew member of the sailing yacht 'Yachting' who was in a state of profound hypothermia⁹.

⁹ Hypothermia. A person in the water loses heat about 25 times faster than in the air of the same temperature. The amount of time a person can survive in cold water depends on such factors as (among others): health, weight, age, clothing, mental state. However, the main factor is the temperature of the water. The lower it is, the shorter is time the man can survive.

On Figure 2, on the track record determined by the received AIS¹⁰ signals (from the VesselFinder¹¹ system) the following positions are plotted:

1. - Position of the yacht (Mayday position) at the time the man overboard was reported: $\varphi = 55^{\circ}55.348$ N, $\lambda = 017^{\circ}35.000$ E.
2. – Position of the man overboard at the time he was found: $\varphi = 55^{\circ}54.508$ N, $\lambda = 017^{\circ}36.046$ E.
3. – Position of the yacht at the time the man overboard was found: $\varphi = 55^{\circ}52.670$ N, $\lambda = 017^{\circ}33.380$ E.

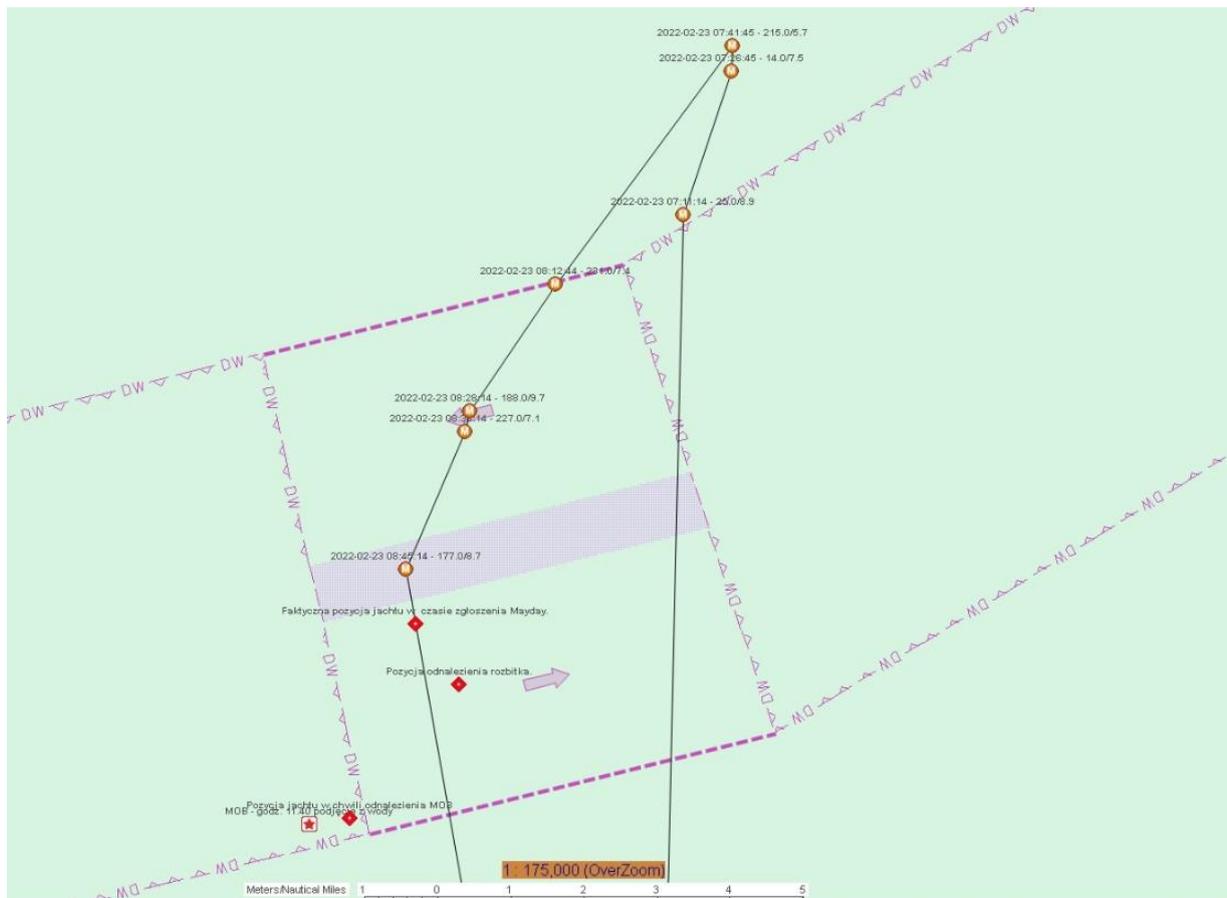


Figure 2 - Record of yacht movement during rescue operation.

At 11:50 hrs the rescue operations were terminated.

At 12:20 hrs the unconscious yacht crew member was handed over to the hospital in Karlskrona.

¹⁰ AIS - Automatic Identification System.

¹¹ The application developed and operated by Astra Paging Ltd. (Bulgaria). Vessel tracking covers the entire world.



The yacht's crew continued sailing towards Władysławowo using the reefed jib only. The lack of a jib sheets blocking against slipping out from the sheet blocks during tack changes made it necessary for the watchkeeper to go to the bow of the yacht several times, in stormy weather, to get the jib correctly positioned and set again. This was especially difficult and risky during the night.

At around 03:30 hrs on 24 February 2022, during another loss of control of the jib sheets, the watchkeeper notified the Master that he considered it too dangerous to continue to go out to the bow of the yacht to catch and re-rig the jib sheets, given the engine failure, the lack of life-saving equipment and the extreme exhaustion of the crew members.

At 03:32 hrs, the radio operator of the oil platform 'Petro Giant', who was acting as an intermediary in communication with the yacht, transmitted information to the MSRS that the boat is drifting, and the crew are asking to be towed to the port of Władysławowo. He also relayed the yacht's current position and the weather conditions recorded on the platform: wind SW 16 m/s (7° B), pressure 1015 hPa , visibility 20 km, state of the sea 3-4 (wave heights min. 1.2 m, max. 2 m).

At 04:20 hrs, an operator from MSRS (MRCC) Kaliningrad contacted to ask can they help in any way. The Russian side was informed that no further assistance is currently required.

At 05:58 hrs, the SAR rescue vessel 'Bryza' was initially scheduled to tow the yacht, but due to safety reasons related to the weather conditions, it was decided to send the larger SAR vessel 'Sztorm'. A message was passed to the yacht that the rescue vessel will be on scene in 2 - 2.5 hours.

At 08:26 hrs the SAR vessel 'Sztorm' reached the drifting yacht. A tow was given and wrapped around the yacht.

At 08:57 hrs SAR vessel 'Sztorm' commenced to tow the yacht at a speed of approx. 2 kn¹² due to the bad weather conditions.

At 17:40 hrs, the yacht reached Władysławowo roads and SAR units 'Bryza' and 'R-14' were sent into action. From the 'R-14' boat, two rescuers went on board the yacht helping the crew to tidy up the tangled ropes and to transfer the tow to the SAR vessel 'Bryza'.

At 17:53 hrs, the 'Bryza' started towing the yacht inside the port. At 01:44 hrs, the yacht berthed at Władysławowo port starboard side alongside.

¹² kn - an abbreviation for knot, a speed unit equal to one nautical mile per hour (1 nautical mile = 1.852 km)



Photo 4. Mooring the yacht in the port of Władysławowo after the towing operation.

At 20:34 hrs, the MSRS Gdynia received information from the Karlskrona Hospital that the yacht's crew member, who had been rescued and picked up from the water, succeeded in restoring basic vital functions, but there is uncertainty about the proper functioning of his brain.

4. Analysis and comments about factors causing the marine accident with regard to results of investigation and expert opinions

In the Commission's opinion, a lack of adequate nautical training and limited knowledge about their own capabilities for sailing on the Baltic Sea during a strong winter storm led to a sequence of events initiated by a crew member falling overboard and ended on the rescue vessel's tow.

4.1. Mechanical factors

4.1.1. Technical condition of the yacht and its equipment at the time of taking over by the crew at the Imperial Marina in Gdańsk

- sailing yacht type DELPHIA 47 has design category A according to the requirements of the Directive 94/25/EC in force at the time of launching the boat (Category A means approval for sailing under unrestricted weather conditions),

- technical survey: the yacht had been subjected to a technical survey by an authorised surveyor from the Polish Yachting Association and, following a positive result, a certificate of seaworthiness was issued, based on which the Maritime Office in Gdynia issued a Sea Yacht Safety Certificate following a safety inspection;
- life-saving appliances: inflatable lifejackets¹³, safety lines¹⁴, lifebuoys, liferaft, EPIRB¹⁵, distress pyrotechnic kit, radar reflector.



Photo 5. How the safety line should be secured to the handle on an inflatable lifejacket

- sailing yacht was not equipped with a lifeline and the inflatable lifejackets did not have a crotch strap to prevent the person from slipping out from the lifejacket.

4.1.2. Equipment condition at the time of sailing

While sailing the crew when in the cockpit and on deck were wearing lifejackets with safety lines. One crew member had his own lifejacket fitted with a crotch strap. The crew member who fell overboard was additionally wearing a buoyancy suit which he owned.

The yacht was handed over by the charter company without the liferaft properly attached. The liferaft fitted on the stern was attached to a bed slightly bigger than the rigid container in which the inflatable liferaft was placed. As soon as there was a little slack on the securing straps, due to the impact of the wave, the slip-hook was released. In line with the existing

¹³ Lalizas - Omega ISO 12402-2 equipped with integral safety harnesses with a grip for attaching safety lines.

¹⁴ Described as safety belts in the Safety Certificate.

¹⁵ EPIRB - Emergency Position Indicating Radio Beacon.

recommendation¹⁶, the straps holding the liferaft were attached via a hydrostatic releaser, but using a section of rope passing through the releaser's thimble tied up using 'reins' to the handle of the liferaft.



Photo 6. The method of securing the liferaft to the mismatched bed. The painter was probably not tied to the fixed part of the yacht.

The instructions for attaching the hydrostatic releaser state that it should be connected *'using a shackle to a firm point on the deck or bed of the liferaft'*.

¹⁶ Regulation of the Ministry of Transport, Construction and Maritime Economy of 28 February 2012 on the safety of navigation by seagoing yachts, Annex 1 - Equipment for sea-going yachts up to 24 m in length.

The liferaft fell overboard. It probably did not open because the painter that should open the liferaft was not connected to the yacht.



Photo 7. Photo taken after the yacht was brought into the port of Władysławowo. The hydrostatic releaser can be seen hanging, and below it the straps securing the liferaft together with the slip-hook are lying down.

From questioning of the crew, it appears that shortly before the accident the crew noticed the absence of the liferaft. This prevented the option of attempting to rescue the sailor, who had fallen overboard, by launching the liferaft close to him.

On the second Delphia 47 type sailing yacht offered for charter by Premium Yachting, the liferaft is properly mounted. Both the bed of the liferaft and the hydrostatic releaser fittings are done correctly.



Photo 8. The liferaft's bed is matching the size of the rigid container.



Photo 9. Correct fitting of the hydrostatic releaser.

Another decisive problem for the safety of navigation was that the blocks installed on the sheet rails were too big in relation to the thickness of the sheet ropes.



Photo 10. Jib sheet block on port side

Despite being tied in figure-eight knots, the ends of the sheets were sliding through the blocks and crew members were forced to go out to the bow to grab the ends and put them back through the blocks. Unfortunately, the crew did not find a way to secure the ends of the sheets in such a way as to prevent them from repeatedly 'escaping' (the sheets should have been within reach of the watchkeepers located in the cockpit at all times).

4.2. Human factors

The weather forecasts for the planned sailing route from Władysławowo to Karlskrona were read by the yacht's Master using the 'Windy' weather app installed on her mobile phone. No use was made of the current and indicative weather forecast prepared by the Maritime Weather Forecast Office in Gdynia and broadcasted by the Polish shore station 'Polish Rescue Radio', which announces the current and forecasted weather conditions for designated areas of the Baltic Sea 4 times a day¹⁷.

¹⁷ Polish Rescue Radio broadcasts weather forecasts on VHF channels 05, 61, 62, at 07:35, 13:35, 19:35 and 01:35 hrs.



Similarly, the Vessel Traffic Service 'VTS Bay of Gdańsk' (*VTS Zatoka Gdańska*) provides vessels with information on the current and forecasted local hydrometeorological situation¹⁸ as part of their duties. Copies of up-to-date weather forecasts are also available in the harbour master's offices.

Based on the information read from the 'Windy' app the crew decided to commence the voyage. The information read on the phone screen and contained in this app is insufficient to make decisions based on it about navigating safely at sea, especially in winter. As soon as the vessel departed from port and lost mobile phone coverage, access to the app became impossible and the crew did not attempt to obtain weather forecast from other sources, despite the apparent increase in wind force and state of the sea. There was a working Navtex receiver on board the yacht which, if properly set up, was capable to record current weather forecasts for this area from at least 3 stations. In the opinion of the crew, the fact that no 'Gale warnings' were received by the Navtex receiver was a confirmation that the weather is not expected to deteriorate.

With no mobile phone coverage and no information on the current and forecasted weather conditions, the crew found themselves in an area of rough state of the sea and severe gale-force wind of 9° Beaufort, which had previously been forecasted for the Southern Baltic by the Maritime Weather Forecast Office in Gdynia.

The yacht found herself in a weather area in which she should not sail due to a restriction in the Yacht Safety Certificate¹⁹.

The crew's statements regarding indisposition due to seasickness, and therefore the loss of required concentration and attention while sailing, and the ability to cope with physical exertion, are not consistent. The fact is that some of the crew were unable to perform any activity, while others performed their assigned duties despite the symptoms of seasickness and weakness.

The decision to continue the voyage using the engine caused the yacht's hull to run much more violently on the waves, with the associated difficult sailing conditions. The appropriate solution should have been to stop proceeding towards the destination port and start storming using the available sails until the weather will improve. Storming techniques for yachts of various types are extensively described in sailing manuals, dedicated in many cases to this subject alone. This

¹⁸ VTS Bay of Gdańsk announces weather forecasts on VHF channel 16 and 66 at 07:05, 13:05, 19:05 and 01:05 hrs.

¹⁹ Sailing in wind force up to 8° B.



would allow the hull to work more smoothly on the waves and provide relief to crew members severely affected by seasickness, without undertaking risky manoeuvres.

As the watchkeeper noticed almost immediately the colleague who had fallen overboard, his initial decision to start the circulation and throw the lifebuoy with two connected mooring ropes must be considered correct. This manoeuvre, when done correctly, is called 'circulating with lifesling'²⁰ and sometimes 'trawling'. After a tightening lap around the person overboard, it is necessary to slow down or even stop the yacht and manually heave up the ropes so that the person overboard can grasp one of them or the lifebuoy at the end. Unfortunately, successive laps without reducing speed or even stopping the engine caused that the man overboard ones grabbed the rope was not able to keep it.

4.3. Organisational factors

It is clear from the crew's statements that there were no set duties that the watchkeepers and other crew members were allowed to carry out without consulting the Master. After deciding to lower the sails and continue the voyage using only engine, the watchkeepers of the changing watch arbitrarily decided how to lower the sails and went out on deck without waiting for the Master to enter the cockpit. The Master intended to supervise this action and did not intend to send any of the crew on deck. She believed that, despite the difficulties, the main sail can be lowered to the extent that it will be possible to proceed using the engine.

It was also possible to use the reflines²¹ to lay the sail on the boom, which could be accessed from the port and starboard side of the cockpit. They were clearly marked.

²⁰ Jerzy Kuliński 'Baltic practice on a small yacht (after years)' (Praktyka bałtycka na małym jachcie (po latach)) compiled by Zbigniew Klimczak, published by Nowator - Kartuzy 2013 and also; Andrzej Pochodaj 'Man overboard' published by Oficyna Wydawnicza Alma-Press.

²¹ Reflines (reefing lines) are used to reduce the area of a sail by shortening its length, that is, reefing.

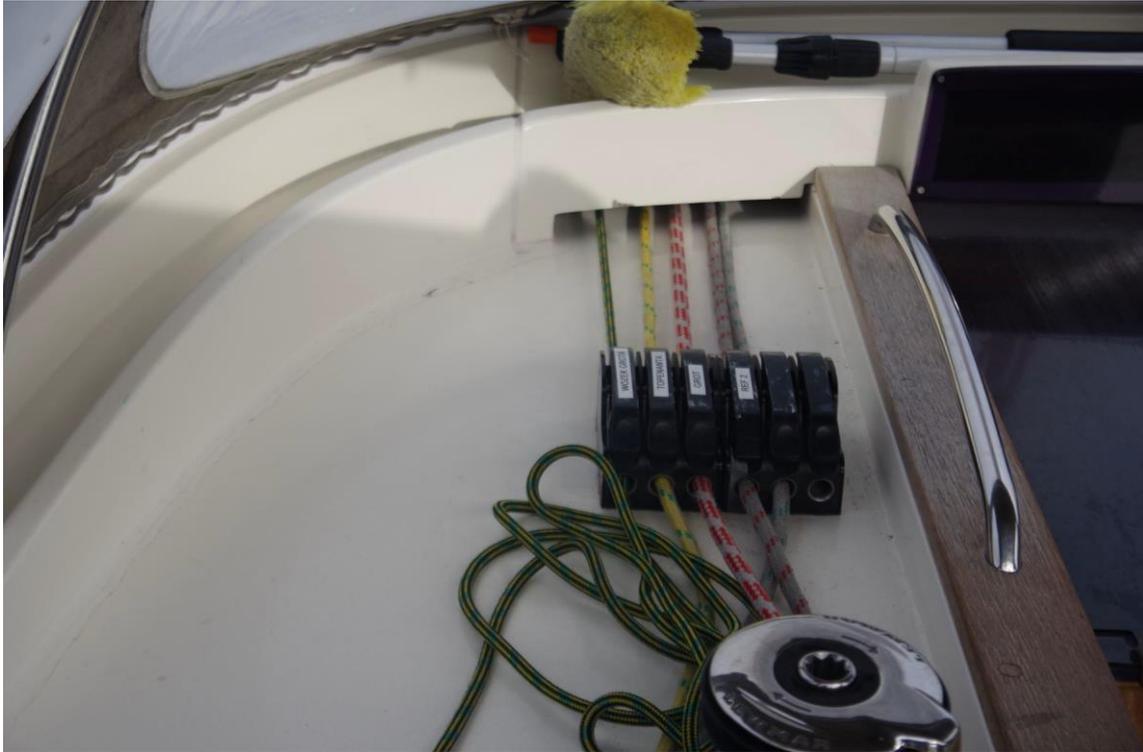


Photo 11. Access to the reflines from the cockpit - port side

Despite the lack of previously lost life-saving appliances, during the sail back to Władysławowo, using only the jib, the watchkeeper went out on deck several times to grab the ends of the jib sheets, which were slipping freely through the sheet blocks despite the tied figure-eight knots. Only physically exhausted, and fearing undue risk, the watchkeeper alerted the Master about the situation and at 03:32 it was decided to call for assistance and ask for towing to the port.

On Figure 3, on the route determined by the received AIS signals (using VesselFinder) the following positions are plotted:

1. Drifting position, waiting for towing assistance

$$\varphi = 55^{\circ} 25,800 \text{ N}, \lambda = 018^{\circ} 32,000 \text{ E}$$

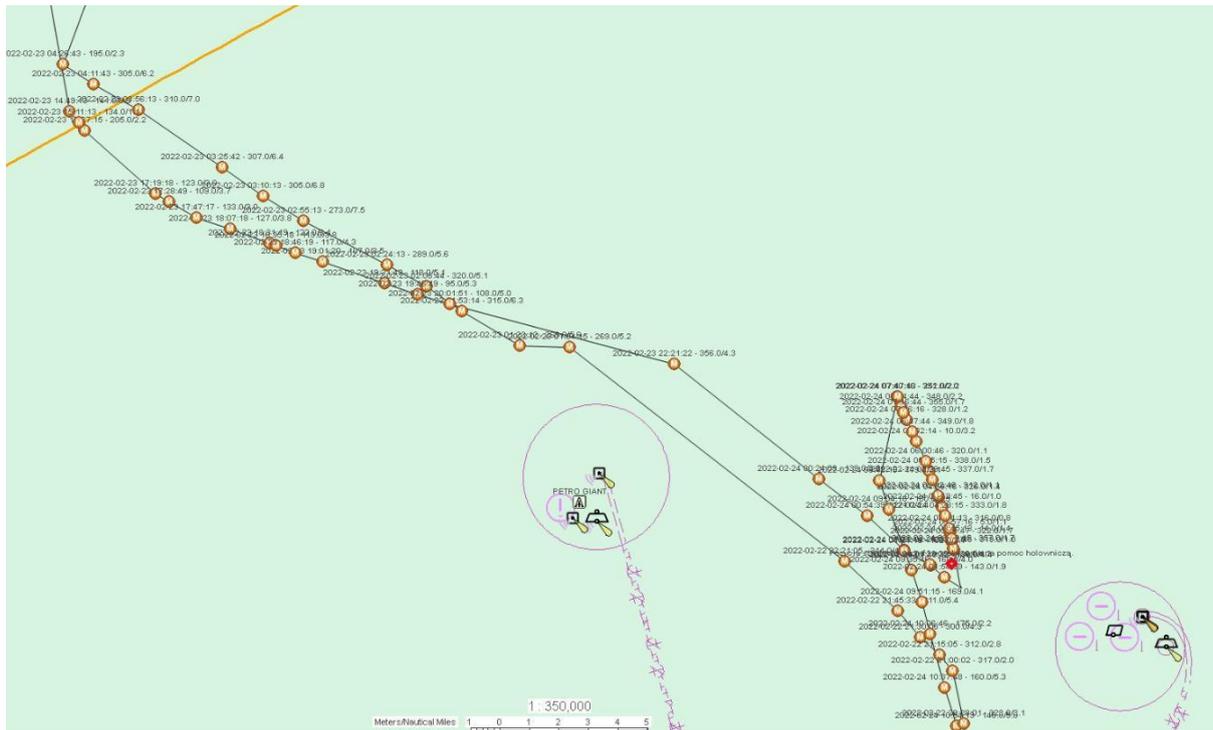


Figure 3 - The red mark indicates the stopping position of the yacht. In addition, the marked positions show the direction of drift while awaiting assistance from the SAR vessel 'Sztorm'.

4.4. The influence of external factors, including those related to the marine environment, on the occurrence of the accident

Stormy weather, high and short waves had a decisive influence on the development of events on the yacht, the falling of one of the sailors overboard, and finally the necessity to tow the yacht to the port of Władysławowo. According to the boat's crew, at the time of the accident the wind force was 7° B and the sea state was 4²². The weather forecast announced by the Maritime Weather Forecast Office for the period from 22.02.2022 13:00 hrs to 23.02.2022 01:00 hrs stated that over the next 12 hours 'on the Southern Baltic a southerly wind is expected, rapidly turning to westerly or north-westerly 6 to 8, with gusts up to 9 - 10° B'.

At 10:50 hrs, several minutes after the crew member fell overboard, the 'Petro Giant' drilling platform recorded wind from 287° direction of 9°B force, and wave heights from 2.5 m to 4.5 m.

²² Records from the Yacht Logbook.



At 10:38 hrs, Swedish rescuers informed each other of 3 metre 'heavy' waves at the yacht's position.



Photo 12. Photo taken by Swedish rescuers.

The deterioration in sailing conditions prompted the yacht's crew to decide to continue storming with the engine switched on and the sails lowered. Therefore, it appears that the real weather condition was close to the one forecasted and unknown to the crew in advance. As a result of the decision to continue with the engine, the voyage conditions became even more difficult for the crew due to the rolling, pitching and pounding when hitting the waves.

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

The accident on the yacht 'Yachting' investigated by the Commission is one of several accidents that occurred on the Baltic Sea during the winter period.

The accident investigators are well aware that sailing is for many people a form of active and certainly healthy way of spending time. The collective effort and common goal of sailing to a chosen port of destination has a positive effect on the psyche of those who form yacht crews. However, for sailing to be relaxing and restful, we need to be aware of the possible effects of



direct contact with the nature forces such as water and wind, as well as our own capabilities and limitations associated with being in such an environment.

It is important to note that safe sailing on open sea waters requires the prior acquisition of practice under the guidance of experienced sailors. And this is not just about the sailing techniques themselves, but all aspects that affect safe sailing²³.

A significant proportion of crew sailing at sea are formally qualified to steer and operate the boats on which they have embarked. However, looking at the issue from a practical perspective, many have relatively little practice to keep themselves and their crew safe in difficult weather conditions. Previous practice counted in hours or even days at sea is not enough to navigate safely through stormy sea waters during the winter season.

It is important to remember that, especially in winter, the Baltic Sea is an exceedingly difficult area to sail. The dynamic of the weather changes is extremely rapid, and it is necessary to constantly monitor the weather forecasts to find an area that can provide shelter from stormy weather well in advance. Storm winds changing direction within a short period of time and overlapping waves from different directions, compounded by the shape of the Baltic Sea bottom and shores, make sailing in these conditions dangerous. Experienced and foresighted sailors try to wait out unfavourable weather conditions and, in situations where there is no chance to avoid the stormy weather, use sailing techniques that protect the crew and hull as much as possible from the impact of the wind and waves.

In the Commission's opinion, the dramatic winter tourist voyage was unsuccessful due to little practice and inadequate preparation of the crew for sailing on the Baltic Sea in winter conditions.

It is crucial for sailing on the sea, especially during the winter, to constantly observe weather conditions. Some unexperienced sailors rely on simplistic 'tools' that visualise weather conditions, taking the information contained in popular weather apps as fully dependable.

The 'Windy' application is one of the most currently recognised and popular ways of visualising the weather models that are used in weather forecasting. For the ordinary user, a weather model (numerical weather forecast) is an incomprehensible record of numbers, while an application like 'Windy' gives the possibility to read the streams of numbers in a graphical and

²³ These issues have been described in many sailing guides. Among others, in the previously mentioned book by Jerzy Kuliński, 'Baltic practice on a small yacht (after years)' (*Praktyka bałtycka na małym jachcie (po latach)*).



comprehensible form. There are several well-known and recognised weather models worldwide, which are used by meteorological offices to produce local (for specific regions) synoptic maps. The 'Windy' application visualises several weather models, which can be found in the application menu and compared.

However, it is important to realise that local synoptic forecasts are crucial and to understand what meteorological forecasting methods are.

Methods for producing meteorological forecasts can be divided into four main types:

- the classic synoptic method - a synoptician interprets the image obtained on the map based on the collected data (observations on lower and upper maps, radar images, satellite pictures), using his knowledge and experience, and determines how the weather conditions will change in the nearest future. The synoptic method (trend analysis) is based on observation of the speed and direction of movement of barometric systems, atmospheric fronts, cloud zones and accompanying atmospheric phenomena;
- the analogy method - a forecast is made based on information concerning similar situations in the past. By analysing this information, the synoptician is looking for parameters that are highly correlated with the parameters he/she is trying to forecast. This method involves looking for a synoptic situation in the past that is similar to the current one. Knowing its weather effects, it is assumed that a similar pattern of elements that occurred in the past will also develop during the forecasted period;
- the physical method, also known as the dynamic method - which involves seeking cause-and-effect relationships between atmospheric parameters and weather elements, and predicting meteorological situation development on their basis;
- the numerical methods - are an extension and specific application of the physical method. The atmosphere is a non-linear system and can be described using the equations of atmospheric physics. The mathematical model takes the form of a system of differential equations describing the dynamic and thermodynamic processes in the atmosphere. Many of these equations are written in an approximate form, either to simplify the system or because of incomplete knowledge about the nature of the relationships they represent (the model is therefore an approximation of reality). Solutions of such equations for a limited area require to address initial and boundary conditions. The boundary conditions are taken from another numerical model. The initial conditions are determined from the measurement results.



The quality of numerical weather forecasts is high and improving all the time, and the period they cover is getting longer. Numerical models make it possible to process a huge amount of measurement data and information, but even this forecasting method is not perfect. It is already known that forecasting the behaviour of non-linear systems, which include the Earth's atmosphere, has limitations. It follows from these limitations that **no perfect weather forecast is possible. The slightest inaccuracy in reproducing the initial state of the atmosphere builds up over the course of the calculation, causing differences between the actual and predicted state of the atmosphere.**

Therefore, the optimal strategy is to combine elements of all the forecasting methods described - mathematical modelling and subjective interpretation of statistical, physical and numerical forecasts. Modern synoptic forecasts are based on the results of numerical models, as these models are a tool that facilitates the processing of a huge amount of information in a relatively short time. Invariably, however, an especially important and still recommended by the WMO²⁴ stage of their production is the ongoing verification of the model indications through the analysis of the lower synoptic maps, which include current observations and measurements, observations of the atmosphere using remote sensing methods (satellite and radar), and the analysis of maps of the upper levels of the atmosphere. The content of the synoptic forecast is therefore the result of the model's calculations, conclusions drawn from the development of the synoptic situation, its assessment based on existing knowledge and experience, as well as intuition and knowledge of the specifics of a given area or basin.

In relation to the above explanation, it is important to remember that numerical models presented (visualised) by popular computer applications can be unreliable in forecasting current weather, and certainly in the version when the image refresh occurs every 12 hours²⁵.

To have a complete and most probable picture of weather conditions on the Baltic Sea we should follow the synoptic forecasts announced by several stations in the area we are sailing, and these can be easily tracked even using VHF radio communications. When conducting the investigation, the Commission looked at the records of the route the yacht sailed, thanks to the 'VesselFinder' tracking system, from the moment she left Władysławowo up to the moment

²⁴ WMO - The World Meteorological Organization.

²⁵ This version of the 'Windy' application was used by the Master of the yacht. In the 'Windy Premium' version, updates take place every 3 hours.

when a low state of battery voltage caused the signal from the AIS transmitter with which the yacht was equipped to disappear.²⁶

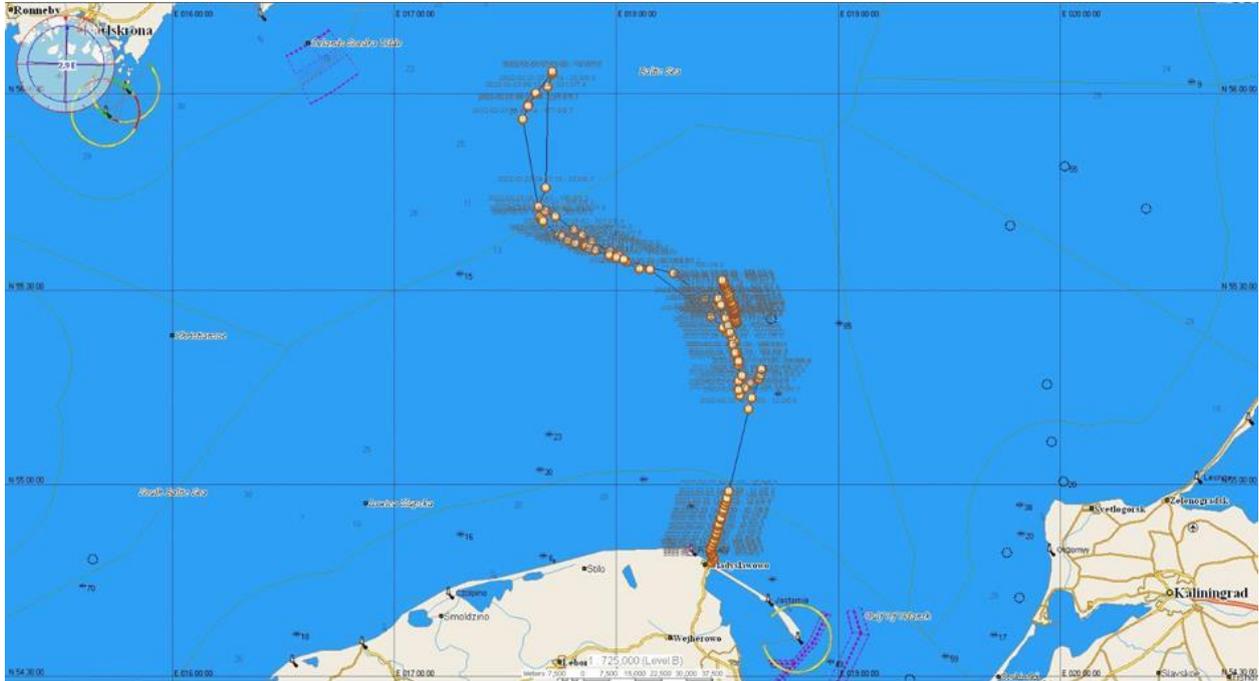


Figure 4 - Record of vessel movement in the 'VesselFinder' system.

The yacht's movement recorded using the Shipping Safety Information Exchange System (SWIBŻ)²⁷ covered only part of the route travelled by the yacht. AIS signal reception is limited in this system to the range of receiving stations located on the Polish coast.

²⁶ The vessel's traffic record disappeared on 23 February 2022 at approximately 06:09 hrs when the Polish AIS receiving stations stopped receiving the signals transmitted by the AIS transceiver installed on the yacht.

²⁷ A tool for the exchange of nautical safety information. System supporting the work of VTS Gulf of Gdańsk duty officers.

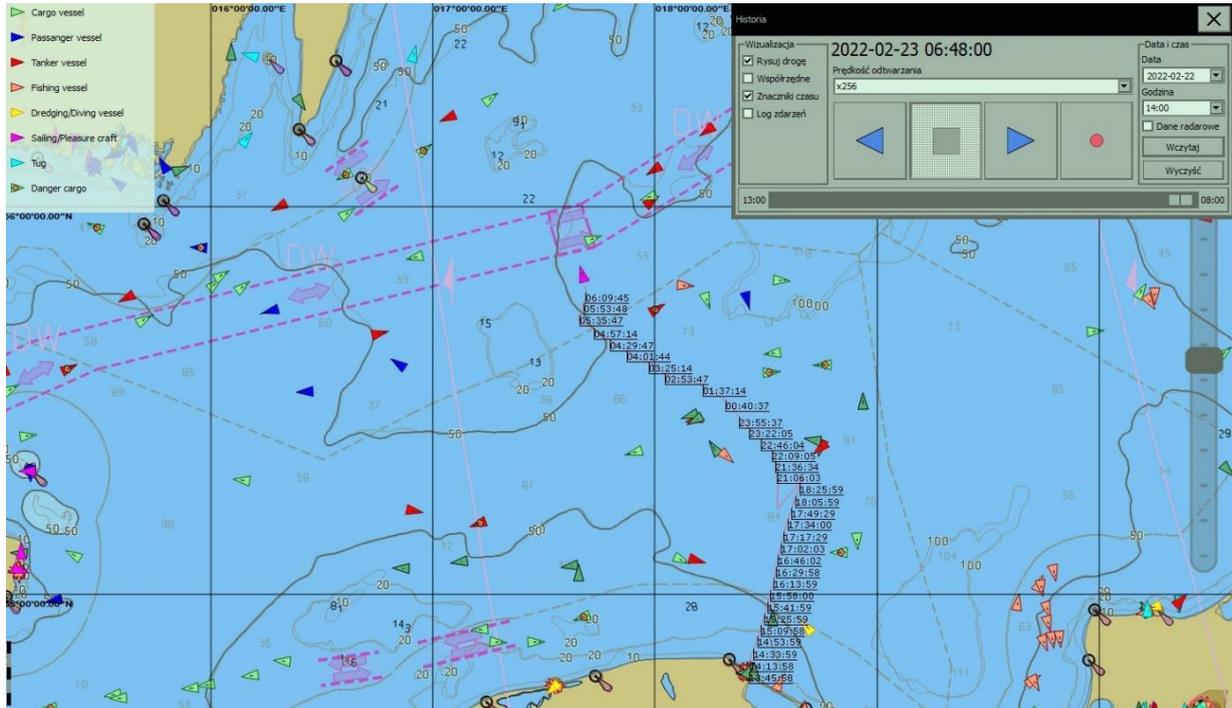


Figure 5 - Record of the sailing yacht 'Yachting' movement as recorded in the SWIBŻ application.

6. Safety recommendations

The State Marine Accident Investigation Commission has found justified to make recommendations to improve safety on sea yachts to OK Events Kasper Orkisz - operating under the name Premium Yachting.

6.1. Premium Yachting

In connection with the business of chartering seagoing sailing units, the Commission draws attention to the need for a careful and fully controlled system to prepare the units from a technical point of view. Those responsible for the preparation and delivery of the yachts to charterers should be suitably qualified and have the required knowledge in relation to the activities performed.

7. Recommendations for the sailing community

The State Marine Accident Investigation Commission addresses the content of this report to the widely understood sailing community.



Let the results of the investigation of the accident that occurred on the sailing yacht "Yachting" in connection with her tourist voyage on the Baltic Sea during the winter season be a warning to subsequent crews intending to sail on the sea during this particular time. The accident described here, as well as previous reports of the State Marine Accident Investigation Commission on similar events on yachts, should become an incentive to analyse all the factors that determine safety during a sea voyage. The catalogue of these factors is exceptionally large. It has also been expertly described in guides written by experienced sailors.

In relation to the accident described, it was particularly important to:

- follow the weather conditions and analyse weather forecasts from reliable sources well in advance,
- 'man overboard' manoeuvres. This is a basic manoeuvre to be performed to rescue a crew member who has fallen overboard. It should be practised in extremely wind and wave conditions using sail, sail and engine, as well as on the engine itself. We cannot learn this manoeuvre by reading manuals. This skill and proficiency determine the life of a crew member who has fallen overboard. It is important to remember that most accidents involving a member of the yacht's crew falling overboard occur while working on the mainsail,
- familiarisation with storming techniques. Unfortunately, an unforeseen deterioration of the weather conditions can occur at any time, and even more so during the winter season. Storming techniques are highly dependent on the size and type of the yacht.
- the ability to draw knowledge from navigational publications, especially from Sailing Directions²⁸, which provide detailed information about the areas on which the voyage is planned.

8. Information Sources

Notification of the accident.

Materials from hearing of the sailing yacht crewmembers.

Sailing yacht registration documents and certificates.

Expert report prepared by Rafal Wojtyra from SMAIC.

Report on the rescue operation by the Polish SAR service.

²⁸ Sailing Directions - A type of nautical guide, a detailed description of a particular sea area, with information relevant to maritime safety described.



Report on the rescue operation by the Swedish SSR service.

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11. Composition of the accident investigation team

The team conducting the investigation activities consisted of:

team leader - Marek Szymankiewicz - Secretary of the SMAIC

team member – Tadeusz Gontarek – Member of the SMAIC