



PKBWM

PAŃSTWOWA KOMISJA BADANIA
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FINAL REPORT

112/19

very serious marine accident

Sailing yacht “Lilla W”

**Yacht thrown onto the beach after overturning
on the approach to the port of Klaipėda
on 15 September 2019**

September 2020



The investigation of a very serious marine accident of the “*Lilla W*” sailing yacht was conducted on the basis of the Act of 31 August 2012 on the State Marine Accident Investigation Commission (Journal of Laws of 2019 item 1374, consolidated text) as well as norms, standards and recommended procedures agreed within the International Maritime Organisation (IMO) and binding on the Republic of Poland.

In accordance with the provisions of the above-mentioned Act, the objective of the investigation of a marine accident or incident is to ascertain its causes and circumstances in order 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 (Article 40(2) of the Act on the SMAIC).

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1. Facts

On 14 September 2019, at approx. 20:00 LT (CEST)¹ – 18:00 UTC, the “Lilla W” sailing yacht left the Gdańsk Marina with the intention of reaching Klaipėda. A crew of 7 was on board. Around midnight, the yacht passed Hel and set course for Klaipėda.

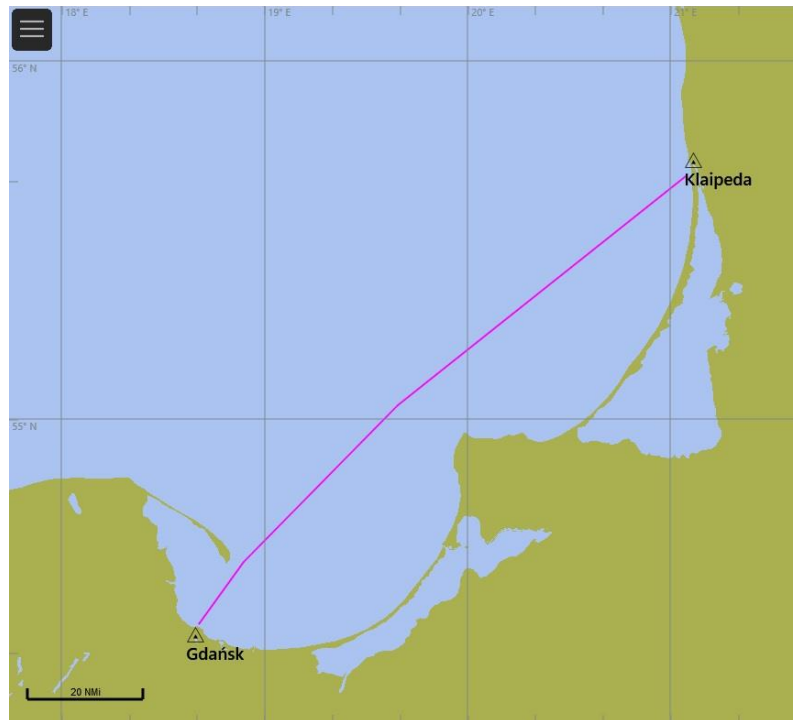


Figure 1. The cruise route of the “Lilla W” yacht, 14-15 September 2019

On the next day, 15 September, after a night and a day of sailing with a stormy west wind, around 17:30 LT (EEST) – 14:30 UTC, the yacht was within line of sight of the coast, south of the Klaipėda port entrance, and was heading towards visible Klaipėda lighthouse, searching for the entrance range lights and the port entrance.

The mainsail was furled (the foresail was taken in all the way) and the engine was started. The yacht was sailing almost parallel to the shore less than a mile northward, encountering rising waves and experiencing increasing difficulties in holding to the course. The captain was helming, looking out for the front light of the entrance range, and every now and then taking out a tablet from a locker on which he was conducting navigation. Apart from the captain, the

¹ During the entire journey, the local time of Poland (CEST) was adopted on the yacht as the ship time. The events which occurred near Klaipėda, in Lithuanian waters, are further described here using the local time of Lithuania (EEST).



2nd mate and 3rd mate were in the cockpit.

Around 18:10, a wave hitting PS flooded the cockpit and caused the yacht to list strongly, taking the captain and 3rd mate overboard. The 3rd mate, fastened with a safety harness, hung overboard and the captain whose harness did not withstand the pull was drifting at a distance behind the yacht's stern.

The 2nd mate took over the helm, issued an alarm and turned the yacht around to approach the captain. He managed to get a lifebuoy on a rope, but the ropes of the running rigging which had been washed overboard from the cockpit blocked the propeller and the engine stopped.

The yacht, drifting inertly towards the shore, was successively hit by further waves, taking overboard the 2nd mate and the sailors who went out to the cockpit to pick up the captain and 3rd mate from the water, and finally tipping over the yacht mast down for a moment. As a result, there was only one person left on the yacht who did not leave the cabin at all. The rest of the people were in the water by the yacht, and the captain and 3rd mate who had fallen out earlier were drifting far from the yacht, with no further possibility of helping them from the yacht.

At 18:41 the yacht, drifting and devoid of the mast during the overturn, hit the bottom in shallow water and was thrown onto the shore (beach) by the wave.

Around 18:45, six people from the "Lilla W" were on the beach. The seventh person (3rd mate) went missing. The rescue services which arrived at the beach provided medical aid to the survivors and made an unsuccessful attempt to resuscitate the captain who was lying unconscious on the beach and died. All the survivors were placed in a hospital in Klaipėda. The body of the 3rd mate was found in the inner port of Klaipėda a few days later.



Photograph 1. The “Lilla W” yacht on the beach on 17 September

2. General Information

2.1. Sailing yacht particulars

Name	Lilla W
Flag	Poland
Owner/ Charterer/ Operator	BZ WBK Leasing S.A. / W.A. MEBLOTECH-BIS / Agencja Żeglarska KUBRYK
Yacht type	Bavaria 37 Cruiser
Call sign	SPS 3579
IMO number	none
Displacement	8500 kg
Construction year	2018
Engine power	built-in engine 28 kW
Length overall	10.90 m
Width	3.67 m
Hull construction material	polyester-glass laminate
Minimum crew	2 people (Day Coastal Skipper + yachtsman) according to the Safety Certificate



2.2. Yacht cruise information

Ports en route	-
Port of destination	Klaipėda (Lithuania)
Type of navigation	seagoing
Crew information	7 persons

2.3. Marine accident information

Type	very serious marine accident
Date and time of event	15 September 2019 at approx. 18:10 LT (EEST) – 15:10 UTC
Geographical position of the event	$\varphi = 55^{\circ} 42.69'N$, $\lambda = 021^{\circ} 04.23'E$
Geographical area of the event	South outer roadstead of the port of Klaipėda
Nature of the water region	coastal waters
Weather during the even	Good visibility, moderate in rainy squalls, wind W 9 B, sea state 6
Operating state of the yacht during the event	en route on the engine, commercial cruise with a tourist crew
Accident effects for the yacht	Yacht damaged by the surf after the overturn and being thrown onto the beach
Accident effects for the people	The captain and the 3rd mate died after falling overboard, the remaining five people were hospitalised in Klaipėda with symptoms of hypothermia and as a preventive measure for observation (less than 7 days).

2.4. Description of the “Lilla W” yacht

The “Lilla W” was a *Bavaria 37 Cruiser*, built in 2018. These yachts are serially built by the German shipyard Bavaria Yachtbau G.m.b.H. These are tourist yachts, often operated by both charter companies and in individual offshore and oceanic sailing in all waters. According to the manufacturer’s CE marking, the yacht complied with the requirements of the design category “A” (Ocean), but at the request of the shipowner, the Polish Yachting Association, in the registration procedure of the **commercial yacht** a limitation was reserved in the issued



Certificate of Seaworthiness for the “Lilla W” regarding the sailing area to “3” – offshore sailing (“with wind <8 B and significant wave height <4 m”). Therefore, the Maritime Office in Gdynia issued the *Safety Certificate* for the “Lilla W” allowing the yacht to sail commercially at a wind force of 8° B, without specifying the permissible wave height.

Bavaria 37 Cruiser is a sailing sloop with a built-in auxiliary diesel engine. Sails – mainsail and foresail – were furled/reefed on rollers (mainsail furled to the mast). Lines for operating the sails were running to the cockpit. The yacht was not equipped with trysails.

The interior of the “Lilla W” was built in a system of 3 double cabins. On commercial cruises, the cabins were occupied by guests-customers, and the captain employed by the organiser slept on a small sofa in the lounge. The permissible number of people on the yacht was 8 according to the CE, CS and SC.

The yacht was purchased new, intended for charter operation. The shipowner provided the equipment (deck, technical, rescue, navigation and hotel).

The cockpit was covered with a dodger which was torn off during the accident by the impact of one of the waves. The first recorded image from the monitoring camera shows the yacht already after the overturn without any traces of the dodger. Only the articulated fixings/ends of tubes of the dodger frame remained on the cabin roof.

2.5. Information on shore services involved and rescue operation

Participants of the rescue operation on shore which started at 18:30 LT included teams of the Lithuanian Border Guard (VSAT), Coast Guard (PAR), Police (VPK), and Fire and Rescue Department (PGD). The actions consisted in providing assistance to six survivors on the beach and in the near surf zone, and searching the coastline and the breakwater. One person (the captain) was resuscitated on the beach with no success. From the air, the search for the seventh person – the missing 3rd mate – was conducted by a helicopter² of the Lithuanian Air Force (KOP) without success.

The search and rescue operation was completed on 15 September at 20:35 LT.

3. Description of circumstances of the marine accident

The cruise began on Saturday, 14 September 2019. The crew reported on the yacht in the Gdańsk Marina at 16:00. At 18:00, the captain conducted safety training and presented the

² According to the SAR report, the helicopter joined the operation at 18:37 LT. The monitoring shows the helicopter visible above the scene of the accident at 19:33 LT.



weather forecast to the participants which he had previously read in person on his tablet using online application *windy*. The forecast predicted very strong westerly winds, so the captain ruled out following the original itinerary including Karlskrona, Sweden, and Bornholm. He presented two alternative options of the cruise to the crew – going to Hel and sailing further, remaining in the Gulf of Gdańsk area until the end of the cruise, or going to Klaipėda and – when the crew rests and the weather clears up – continuing to sail north along the Lithuanian and Latvian coast. The crew, with one exception,³ undaunted by the clear announcement of spending a difficult or even very difficult first day at sea, opted for the second option.

Neither the current NAVTEX forecast, the VTS Gulf forecast at 19:05 nor the PR I forecast at 20:05 was received, despite having the appropriate receivers on the yacht.

Around 20:30 the yacht left the Gdańsk Marina, simultaneously reporting with VHF to the Gdańsk Harbour Master the intention to go to the Gulf of Gdańsk with 7 crew members on board, which was noted by the officer on duty at the port authority, and headed towards the sea, following the port channels and further along the fairway.

At midnight the yacht passed the traverse of the Hel lighthouse. At 00:05 the captain listened to the VTS Gulf forecast in the cabin, forecasting the wind of 7-8° B for the South-Eastern Baltic. The forecast was not recorded and that is how sailors on watch remembered fragment of it in the cockpit.⁴ The yacht did not have a formal logbook or navigation notebook.

After passing Hel and setting course for Klaipėda, the yacht began to experience strong wind and waves. Most of the sailors (except for the captain and the 3rd mate) suffered from seasickness to a large extent and stayed below deck until the accident, unable to operate the yacht. The yacht was basically helmed by the captain and the 3rd mate, periodically – initially and in the final phase – supported by the 2nd mate, also feeling seasick.

They were sailing downwind with a strongly reefed mainsail. The genoa sail was completely furled. Sometimes the yacht surfed down high waves and there were uncontrolled abrupt changes in tack.

Navigation was conducted only by the captain on his own tablet with the Navionics app. There was no navigation on paper maps or navigation records in any form. The stationary navigation plotter located centrally in the cockpit was turned on after passing Hel and the captain set the lubber line on it leading to Klaipėda which the helmsmen were to follow. It

³ The objections raised by this one person concerned the tourist aspects, not the nautical aspects of the plan.

⁴ In reality, the forecast also spoke of gusts of 9° B in the eastern part of the area.



was not convenient because the plotter's screen was not clearly visible from the position at the steering wheels on the sides. Once the plotter was set up, the captain did not operate it anymore and instructed the crew not to touch any buttons on it or even change the scale of the image. Precise steering was not possible and – worried about the possibility of encroaching on the border of the Russian Federation waters in the vicinity of which the marked line was running – two planned turns were made, going further to the sea at the point of closest approach.

No further weather forecasts or navigational warnings were received while sailing. Around 03:30 the yacht left the nominal range of VHF transmitters of the Witowo Radio. The NAVTEX receiver was not used.

At approx. 15:00 the bag with the lifeline attached to the lifebuoy on the SS was damaged. The line previously placed in the bag was taken out of it, coiled and tied on the guardrail.

Between 15:00 and 16:00 the captain went inside the yacht for a short rest on the lounge sofa, leaving the 2nd and 3rd mates on board.

After 16:00 of the ship time (CEST) the yacht caught sight of the shore and the Klaipėda lighthouse tower towards which it was heading was identified. Around 17:00 (18:00) EEST, the mainsail was furled and the engine started. At the same time, a random person strolling on Smiltnė beach⁵ began to observe a vessel with a mast working hard on a wave, sailing without sails along the coast towards north, with the portside to the wave and the bow pointing at the breakwater. This observer could distinguish the persons sitting in the cockpit.⁶

At 18:07 EEST, the person from the crew of the “Lilla W” staying in the cabin saw a map on the screen of own phone showing a short distance to Klaipėda and the exact local time. The captain was sitting in the cockpit at the PS steering wheel, the 3rd mate at the SS steering wheel, and the 2nd mate at the companionway. The rest of the crew remained below deck and were not called to readiness for the manoeuvres which the captain was planning upon entering the port canal.

⁵ Beach on the Curonian Peninsula, adjacent to the southern entrance breakwater to Klaipėda.

⁶ The observer saw 2 people – captain and 3rd mate – sitting at the steering wheels on PS and SS. The third person – 2nd mate – was not seen as he was hidden behind the dodger near the companionway.



Photograph 2. Image from the monitoring camera at 18:09 LT (EEST).

Photograph 2 above shows the view on the entrance range line (the front light is visible) near the moment the first wave hit the yacht. The yacht (and the accident site) is to the left – south.

The captain and the 3rd mate were in inflatable lifejackets with integrated safety harnesses, attached to the tubes of the pushpit. The 2nd mate, wearing a similar jacket, was attached to handrail running along the companionway.

Shortly after 18:07, the yacht was hit by a wave which took the captain and the 3rd mate overboard. The 2nd mate remained in the cockpit, but lost his glasses which made further actions difficult. Nevertheless, he took over the helm and turned the yacht round towards the captain drifting in the water behind the yacht whose harness did not hold him by the yacht. The 3rd mate was hanging on his harness outside the pushpit, unable to climb aboard.

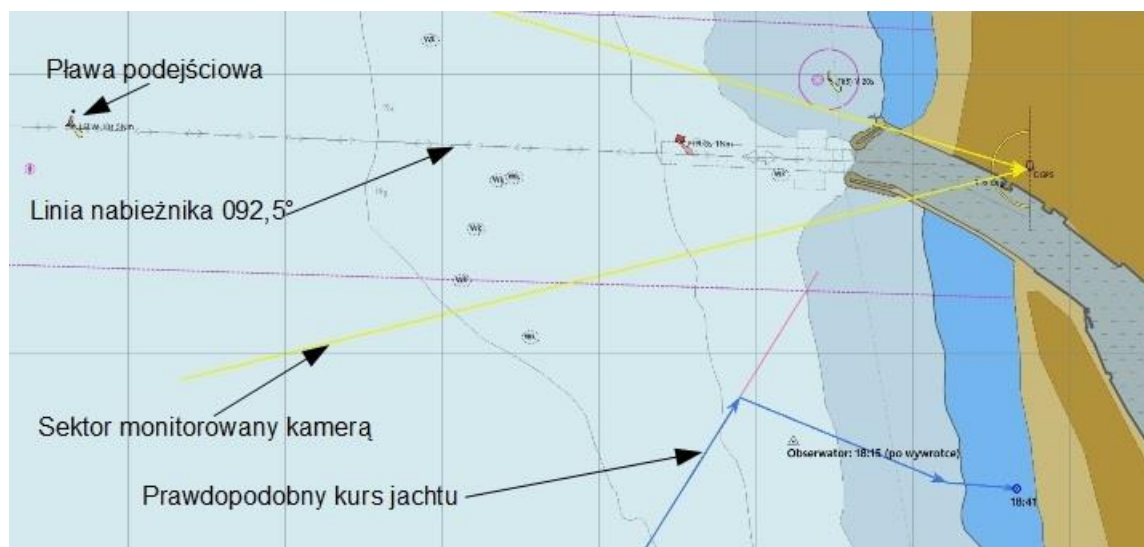
The 2nd mate raised the alarm, called the remaining yachtsmen to take people out of the water and ordered them to transmit the DISTRESS alert by means of the VHF radio station.⁷ Even before the next three crew members were on board, the engine stopped. The yacht lost navigability.

During the attempts to pick up the 3rd mate from overboard and the captain grabbing hold of the lifebuoy tied with a rope to the yacht, the second wave hit the yacht, taking everyone from the cockpit overboard. Shortly thereafter, the third wave overturned the yacht, breaking

⁷ The 1st mate issued this alert, but to no avail. No DSC signal from the yacht was received.

the mast. As a result of these waves, the captain and the 3rd mate lost contact with the yacht. Out of four people in the water next to the yacht, one managed to get back on deck, and the other three began to swim/drift towards the shore. They were all wearing filled inflatable lifejackets, sometimes damaged to varying degrees.

At 18:15 the aforementioned observer on the beach noticed a drifting yacht without a mast and immediately raised the alarm by calling the emergency 112 number.



Pława podejściowa – Sea buoy

Linia nabeżnika 095,5° – Range line 095.5°

Sektor monitorowany kamerą – Sector monitored by the camera

Prawdopodobny kurs jachtu – Probable yacht course

Obserwator: 18:15 (po wywrotce) – Observer: 18:15 (after the overturn)

Figure 2. Approach of the “Lilla W” yacht to the port of Klaipėda on the ENC S-57 map.

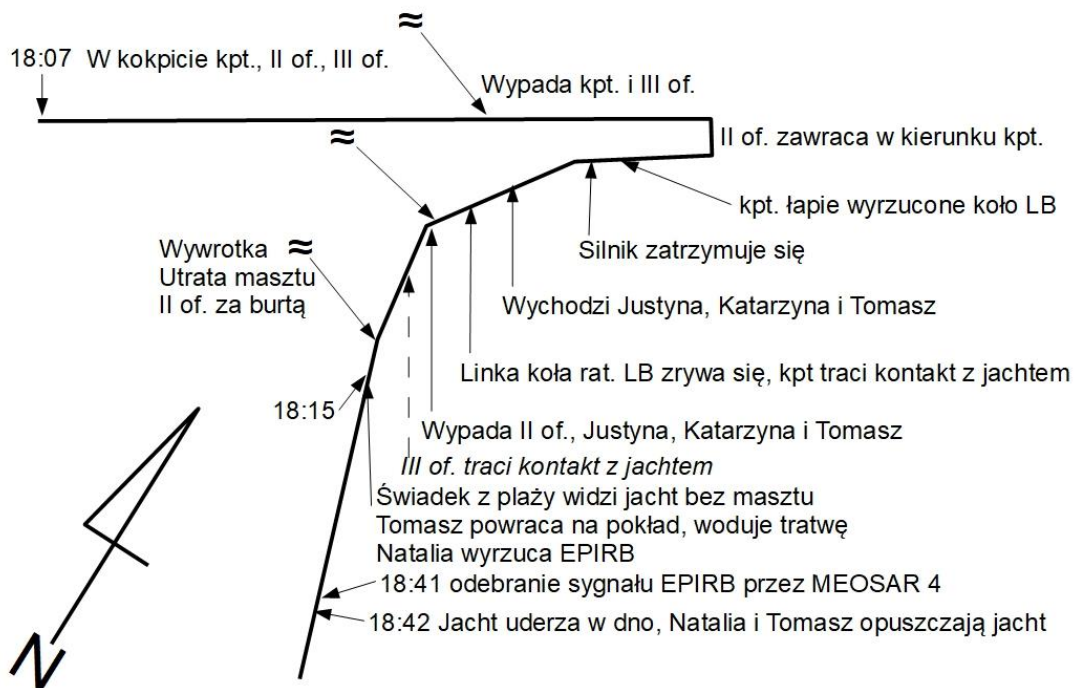
There were now only two crew members on the yacht for whom it was the first contact with any sailing yacht. The life raft was thrown out and it opened properly, but the painter broke under the pressure of the wind and the waves. Neither of these two even managed to attempt to board the raft which drifted empty to the beach. The EPIRB was thrown into the water, one signal rocket was fired but it hit the inside of the cabin and went out immediately flooded with water of another wave.

At 18:28 the operator of the port entrance monitoring camera received the incident notification and started searching for the scene. The camera, constantly directed at the entrance on range line, did not capture the approaching yacht so far. Since 18:29 the camera began to record the image of the mastless yacht and people in the water.



Photograph 3. Image from the monitoring camera at 18:09 LT (EEST).

At 18:41 the Cospas-Sarsat MEOSAR system received a signal from the EPIRB, indicating the position on the edge of the shore.



18:07 W kokpicie kpt., II of., III of. – 18:07 In the cockpit: captain, 2nd mate, 3rd mate

Wypada kpt. i III of. – Cpt and 3rd mate fall out

II of. zawraca w kierunku kpt. – 2nd mate turns round towards the cpt



kpt. łapie wyrzucone koło LP – cpt catches the PS lifebuoy thrown
Silnik zatrzymuje się – Engine stops
Wychodzi Justyna, Katarzyna i Tomasz – Justyna, Katarzyna and Tomasz go out
Linka koła rat. LB zrywa się, kpt. traci kontakt z jachtem – Rope of the PS lifebuoy breaks, cpt loses contact with the yacht
Wypada II of., Justyna, Katarzyna i Tomasz – 2nd mate, Justyna Katarzyna and Tomasz fall out
III of. traci kontakt z jachtem – 3rd mate loses contact with the yacht
Wywrotka – Overturn
Utrata masztu – Loss of the mast
II of. za burtą - 2nd mate overboard
Świadek z plaży widzi jacht bez masztu – A witness at the beach sees a yacht without a mast
Tomasz powraca na pokład, woduje tratwę – Tomasz comes back on board, launches the raft
Natalia wyrzuca EPIRB – Natalia throws the EPIRB out
18:41 odebranie sygnału EPIRB przez MEOSAR 4 – 18:41 MEOSAR 4 receives the EPIRB's signal
18:42 Jacht uderza w dno, Natalia i Tomasz opuszczają jacht – 18:42 The yacht hits the bottom, Natalia and Tomasz leave the yacht

Figure 3. The chronology of events during the accident.

At 18:42 the drifting yacht hit the bottom. The last two people from the yacht left the deck and reached the shore with the waves where they joined the other participants of the cruise, except for the 3rd mate who was missing. The observer from the beach and rescue teams which appeared on the shore at 18:40 started helping the survivors and made an unsuccessful attempt to resuscitate the unconscious captain.

The coastal crews and helicopter were looking for the missing 3rd mate to no avail.

The body of the 3rd mate was found on 26 September (fully dressed but without a lifejacket) in the Klaipėda port near berth 56, where it had to be drifted by the current entering the port. 10 days after the accident, the wreck of the “Lilla W” yacht was lifted from the beach and transported overland to the Klaipėda Yacht Club (Smiltynė).



Photograph 4. The “Lilla W” yacht on the beach on 17 September with a visible breakwater



Photograph 5. The “Lilla W” yacht on the beach on 17 September



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

4.1. Mechanical factors

The “Lilla W” yacht found itself in the area of such strong waves and surf that it is hardly expected that a structure (admittedly) meeting the requirements of the “A” (Ocean) design category would be able to withstand impacts of similar water masses and ensure the safety of the crew and the possibility to recover from this situation on their own.

Nevertheless, some deficiencies in the structure, quality and equipment of the yacht can be indicated which have contributed or may have contributed to this course of the accident.

4.1.1. Rescue equipment.

The yacht was equipped with high-displacement (290N) inflatable lifejackets with integrated safety harnesses for all persons. All lifejackets were purchased in March 2018. In use, most of them have been damaged various ways. Everyone left the yacht wearing their lifejackets. Both people who died were wearing lifejackets when they fell overboard; their straps or fittings of the safety harnesses failed under the blows of the waves. The lifejackets were additionally equipped with crotch straps and had no spray hoods. Before going to sea, lifelines were drawn on the deck, running from the base of the pulpit to the mooring cleats on the stern on both sides. The lifelines were made of braided tape and ended by the manufacturer, but they were a bit too short and for this reason they were attached to the base of the cleats with a 4 mm synthetic line woven only three times. During the cruise, the crew did not perform any actions on board, except for the cockpit. There were 3 rings fitted by the manufacturer for hooking the safety harness in the cockpit, one at each helmsman’s position and one near the companionway. These rings were not discussed during training and were not used, and the crew was unaware of their presence and purpose.

There was one lifebuoy on a line on each side of the pushpit. The bag in which the SS lifebuoy line ready for use was placed was torn on the way and the coiled line was hung, tightly tying the coiled line to the pushpit.

An 8-person ISO-9650-1 life raft ready for use was in the rack behind the pushpit. A container with an automatically deployed pneumatic MOB (Dan-Buoy) pole was mounted on the pushpit. This device was not discussed during training and the crew was not aware of its purpose and method of use. As a result of the impact of one of the waves, the handles securing the container to the pushpit tube evidently broke and the container disappeared

without a trace.

The yacht was equipped with the prescribed signalling flares set as well as a compact Nico-Signal launcher.



pałak nad kompasem – bail over the compass

Dan-Buoy

ploter nawigacyjny – navigation plotter

ucho do szelek sternika – ring for the helmsman's harness

Photograph 6. The “Lilla W” yacht in Klaipėda on 3 September 2019 – arrangement of the yacht's equipment (source of the photo: Kubryk/Facebook).



4.1.2. Adequacy of individual life-saving equipment.

On the basis of the collected material, presently it is difficult to assess the adequacy of individual life-saving equipment, mainly lifejackets and safety harnesses, used. During the rescue operation on the beach, it was not a priority of the rescuers to secure these items, and during the investigation and on-site inspection, no specific equipment was associated to individuals and their reported cases.

At present, it is only possible to summarise fragments of accounts of the accident participants regarding the use of this equipment and partial information from the photographic material.

The “Lilla W” yacht was equipped with *Lalizas* automatic high-displacement inflatable lifejackets, *Omega 290N* model, with integrated safety harness.⁸ The straps of the safety harness were equipped with two snap links (without protection) each. Putting on lifejackets and using the harness was the subject of crew training prior to departure from the port. It was a complete novelty for at least two people. During the accident, all three persons in the cockpit were wearing jackets and were strapped to the yacht. The other people put on their jackets while leaving the cabin to the cockpit when called to rescue people overboard, and it can be assumed that they did so in great haste, also having never encountered similar situations before. One person remained inside the cabin, after putting on the jacket.

When the first wave hit, the captain immediately fell off the yacht which means that one of the elements – the strap—>the ring on the harness—>the harness – did not hold (he was attached to the pushpit tube which was bent but did not lose its continuity). Perhaps the D-ring from the harness has torn off, as shown in photo 9. The collected materials indicate that a harness fastened on the companionway handrail with a ring torn out of the jacket and 2 more straps fastened on the pushpit has remained on the yacht. Comparing this with the accounts of the crew, it seems most likely that these two belong to people who detached themselves from the yacht or got out of their lifejackets to swim to the shore (1st mate) or return to the yacht like one of the other crew members. The lifejacket filled up and the captain finally drifted to the beach in inflated lifejacket, but already unconscious and with no signs of life. In this case, it is possible that the lack of a spray hood (optional equipment) may have contributed to the death of the captain.

⁸ The *Lalizas Omega 290N* model complies with the requirements of ISO 12402-2 for lifejackets and ISO 12401 for integrated safety harnesses.



The 3rd mate, who was thrown out of the pushpit by the first wave, was also attached to the tubes of the pushpit. His lifejacket also filled up at once. The harness held him by the yacht until the second wave hit. Again, the lack of the spray hood could have been important here. It was not possible to throw the SS lifebuoy due to tighten coiled line, tied on the guardrail after tearing the bag. The MOB Dan-Buoy pneumatic buoy-pole was not used because the crew did not know the purpose of the container with the pole on the pushpit. The Dan-Buoy pole was not discussed during training of the crew prior to departure. Regardless of this, it is also possible that the first impact of the wave already tore the container of the pole off the pushpit, taking the entire device.

The 2nd mate, also in a lifejacket, at the moment of the impact of the third wave was strapped to the bail protecting the magnetic compass mounted in the cockpit table. After the impact of the wave, he found himself in the water, but the table with the bail did not remained on the wreckage, so we do not know for sure which element did not withstand the impact. The bail over the compass is not intended to be the harness attachment point and is designed to protect the compass against a blow from the top and side rather than resist upward pulling forces. While swimming in the water in an inflated lifejacket, the 2nd mate had difficulties with the crotch strap, the plastic buckle of which unfastened causing the lifejacket to drastically rise over the head. He was dressed in a full oilskin and rubber boots, and as a result had to abandon all attempts of other actions and was constantly pulling the loose lifejacket towards his torso with both hands. This way he drifted ashore.

After the hit of the second wave, the 1st mate found herself in the water, strapped to the yacht, in an inflated lifejacket. She detached herself from the yacht and decided to swim to the shore. The lifejacket fell off, but she managed to put it on her head and swam to the shore. It is unknown whether there was a crotch strap at all or possibly whether it was worn.

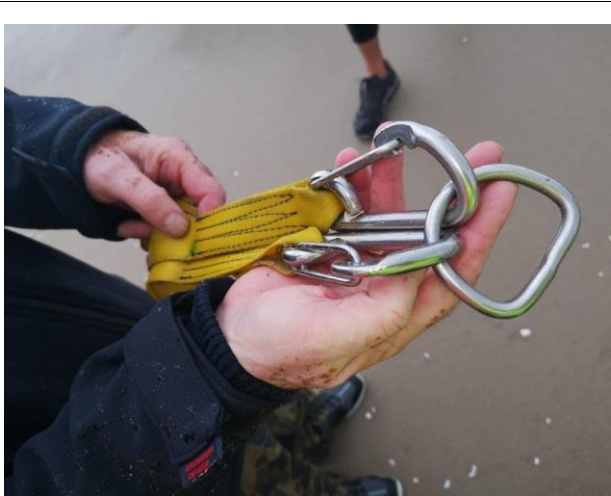
One of the crew members harness broke, but it is not known which element failed. In the water, the lifejacket twisted around her neck.

After the impact of the third wave, another crew member found himself under water. He disentangled himself from the lifejacket, leaving it in the water, climbed onto the yacht, and continued to save himself without the lifejacket. He wanted to use a spare lifejacket from the bow cabin, but the door to that cabin failed to open. Crew member who did not come on deck lifejacket fired still inside the cabin. When the yacht hit the bottom, she left the cabin and, wearing the lifejacket, reached the beach.

Thus, out of six people, only two reached the shore in properly functioning lifejackets, but one of them was lifeless and the other managed not to have any contact with the rough waves of the surf while still in deep water. There is no data on the efficiency of the lifejacket and harness in the case of the seventh person.

Based on this information, the following comments can be made:

- Additional, optional equipment, such as crotch straps and spray hoods, can determine the effectiveness of the life-saving equipment.
- The ISO 12402-2 standard, according to which the design intent for the *Lalizas Omega 290N* lifejackets was adopted, provides for the effective use of such lifejackets “for offshore use under extreme conditions.” The ISO 12401 standard for safety harnesses provides for strength testing with a load corresponding to the free fall of a weight of approx. 100 kg from a height of 1 m (for the harness) and 2 m (for the strap). The question of whether these conditions were exceeded in the case of “Lilla W” remains open.



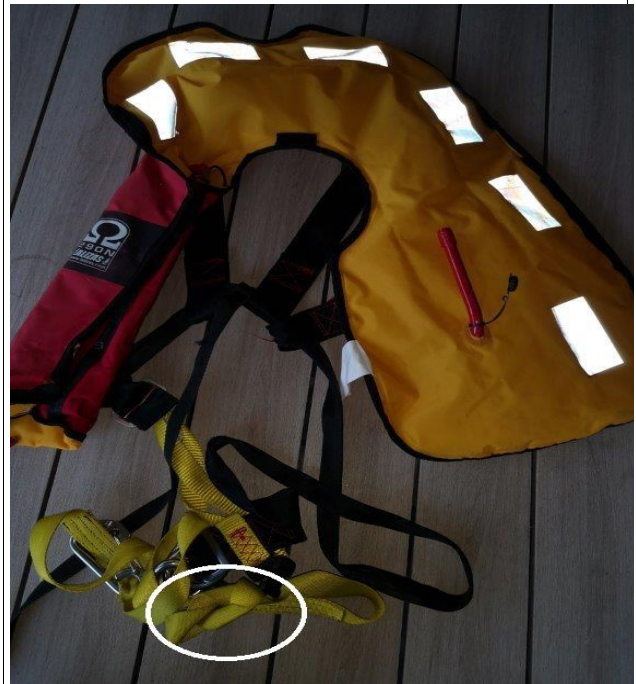
*Photograph 7. Ring pulled out from harness A
(photo by Lars Krogius Baltic Ltd.).*



*Photograph 8. Ring pulled out from harness B
(photo by the SMAIC).*



Photograph 9. Fragment of the harness torn off (photo by the SMAIC).

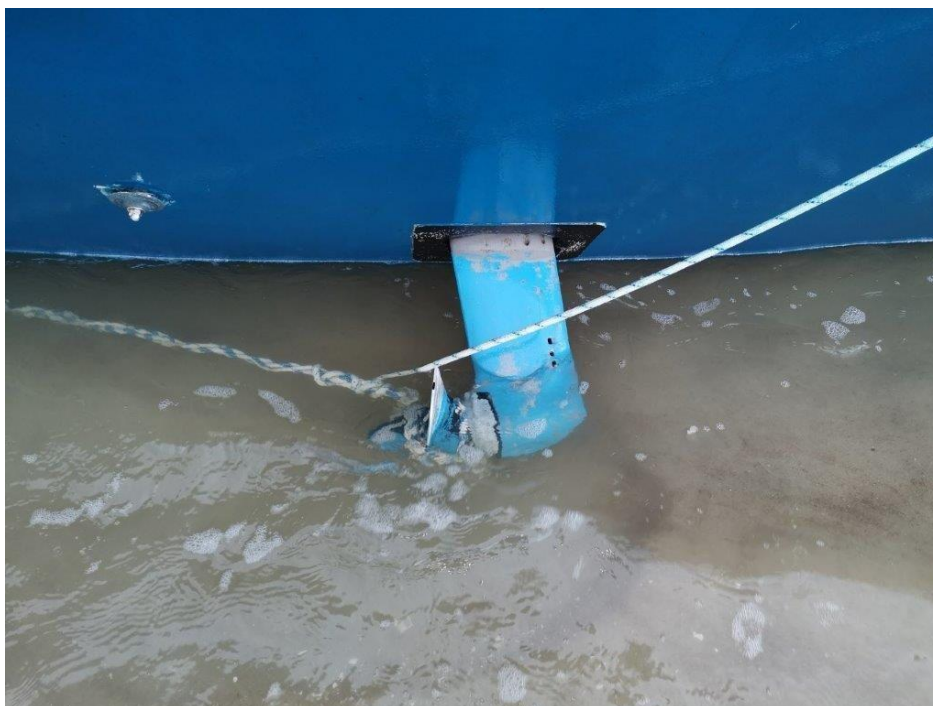


Photograph 10. The strap tied with a knot (photo by Lars Krogius Baltic Ltd.).

4.1.3. Bags or lockers for slack ropes of the running rigging. Cockpit table.

During the manoeuvre to approach the man overboard started by the 2nd mate after the captain's fall, the engine stopped because the ropes of the running rigging wound on the propeller, taken from the cockpit by the same wave that took the captain. The loose ends of the sheets of the furled sails were hung on the corresponding capstans as loose coiled lines, ready for use. The yacht was equipped with bags or lockers to protect slack ropes from being swept or washed away by wind or waves, but the action of a very large wave could protrude the ends of the ropes from the bags.. Initially, the erected dodger provided certain cover, but the wave also took the entire dodger, easily tearing the frame tubes from the fittings that fastened them to the cabin roof. Tightly closed bags, permanently attached to the hull, give a chance of avoiding significant sections of slack ropes from falling overboard, but in this case the ends of the ropes may have been placed in the bags hurry and carelessly. In this particular case, it is doubtful whether the efficient engine of this power, which the "Lilla W" had, would have allowed the inexperienced crew remaining on board to move away from the surf area, effectively taking two people who fell out first from the water. Nevertheless, as the immobilisation of the engine with the ends of ropes falling overboard is always a serious risk and a frequent cause of accidents, taking effective measures to prevent this situation is an

important element of yacht preparation.



Photograph 11. Ropes of the running rigging blocking the propeller (photo by Lars Krogius Baltic Ltd).

The table mounted centrally along the cockpit, broke too easily under the pressure of successive waves and the crew in the cockpit during sudden heels. A navigation plotter and a magnetic compass, covered with a stainless-steel bail from the top, were mounted on the table.. The 2nd mate was taken overboard by the wave as he was strapped into the bail of the compass with his safety harness strap. The 2nd mate found himself in the water not attached to the yacht, but it is not known which parts of the harness and/or the attachment point did not withstand the pull. It should be noted that the cockpit table, apart from its obvious function, is not only a structure which serves as a place for the installation of navigation devices – the plotter and magnetic compass – but it is also of great importance for the safety of the crew, providing a point of support for people and dividing the open space of the spacious cockpit, limiting the possibility of a fall and the momentum of a person losing their balance or grip. Therefore, the structure of the table should be strong enough to withstand a fall with the whole weight of one or even more people, e.g. when the yacht is significantly listed. The use of a few relatively thin screws is certainly insufficient from this point of view.



Photograph 12. Traces of screws securing the cockpit table (photo by M. Cesnauskis).

4.2. Human factors (fault and neglect)

4.2.1. The crew and their qualifications

There were 7 people on board of the “Lilla W” on the cruise which ended with the accident: the captain sailing the yacht, five customers of the “Kubryk” sailing agency which organised the cruise, and an additional person (3rd mate) invited by the captain. The participants were embarked as the crew and divided into 3 two-person watches, each consisting of a mate and a crew member. The captain was functioning outside of watches.

A commercial cruise on a commercial yacht was to be of a tourist and training nature, and various people had different expectations as to the impressions, experience and knowledge acquired during the 7-day cruise.

The captain (*died as a result of the accident*) was an experienced, 63-year-old sailor, regularly working as a skipper on similar yachts, on similar cruises in different waters. He had the Yachtmaster Offshore certificate of competence issued by the Polish Yachting Association (PZZ) in July 2017 and the Sailing Instructor certificate of competence issued by the PZZ in 2013. He also had a valid Integrated STCW Safety Certificate (only the captain had such a safety certificate on the yacht). He also had the SRC radio certificate issued by the British RYA. (only the captain had a radio certificate on the yacht). While introducing himself to the crew of the “Lilla W,” he estimated his sailing experience at 40 years and 100,000 miles.

The captain knew the yacht and the water region. In 2019 alone, as part of the “Kubryk”



agency, he conducted 12 week-long Baltic cruises on the “Lilla W” and on another yacht of the *Bavaria 37 Cruiser* type, “Pan Kubryk.” He conducted these cruises in weekly cycles from 27 April, with a break of about two months in July and at the beginning of August. He visited the port of Klaipėda on the “Lilla W” a week before the accident, on the previous cruise.

The 1st mate, a sailor with extensive experience in regatta sailing in international and Olympic centerboard classes at the championship level, went on this cruise to gain experience in sea cruising with which she had nothing to do so far. She had the Competent Crew certificate of competence (issued by the PZZ in 2015). In spite of excellent fitness and extensive experience with sea water, also in direct contact, sea sickness made it impossible for her to participate in sailing until the accident.

The 2nd mate, PZZ Offshore Skipper certificate of competence (obtained as a result of extending the Day Skipper’s qualifications held for many years), Croatian Voditelj Brodice (boat skipper) certificate, and experience in conducting several cruises on his own on similar yachts in Croatia. He went on the cruise to learn about the practice and procedures in sailing in the Baltic Sea, including night sailing. Shortly before the accident, his seasickness began to subside.

The 3rd mate (*died as a result of the accident*) was probably invited to participate in the cruise by the captain. He was the only person, apart from the captain, not affected by seasickness. He had the Offshore Skipper certificate of competence (issued in 2012).

According to the “Lilla W” Safety Certificate, the minimum professional crew is two members: a captain with the certificate of competence of at least an offshore skipper and a deck officer with the certificate of at least a competent crew. In addition to the above-mentioned PZZ certificates of competence, the integrated STCW Safety Certificate and Radio Certificate SRC, in accordance with the regulations for commercial seagoing yachts⁹, the captain should also have a certificate of training in the use of radar and the ARPA (he did not have it), because the “Lilla W” yacht was equipped with a radar.

One crew member had the PZZ Competent Crew certificate of competence and experience from two Adriatic cruises. It was her first contact with the Baltic Sea. She did not participate in sailing the yacht due to seasickness.

⁹ Regulation of the Minister of Maritime Economy and Inland Navigation of 29 January 2018 on the qualifications and training of crew members of commercial yachts and the conditions for obtaining them (Journal of Laws of 2018, item 490)



Two more crew members, who had no contact with sailing or any type of yachts before, went on the cruise for tourism to find out what kind of experience could be expected in this way of travelling. They were both experienced athletes and travellers, with excellent physical skills and fitness. Until the accident, they were excluded from the watch because of seasickness.

4.2.2. Alarm notifications and the use of communication devices on the yacht

Notification of the accident was made to the emergency 112 number by a random stroller, looking for amber thrown away by a storm on the beach. The distress alert sent by means of the yacht's DSC VHF radio station by the 1st mate immediately after the first persons' fall overboard was ineffective and was not received by the services. The alarm with the 406 MHz EPIRB thrown overboard¹⁰ was received in the Cospas-Sarsat system by the MEOSAR 4 satellite about 5-10 minutes after throwing the radio beacon and coincided with the moment the yacht hit the bottom by the beach.

The DSC VHF stationary yacht radio station was used by the captain to listen to the VTS Gulf weather forecast on the traverse of Hel. In the course of the accident, attempts were made to send an emergency alert from it, but probably the inexperienced 1st mate, who only listened to the initial training before leaving port, pressed the DISTRESS button too briefly.¹¹

The NAVTEX receiver was not turned on and used.

The Roberts radio receiver with the long wave range, allowing the reception of sea forecasts broadcast on Polskie Radio Program I, was not used.

The VHF handheld radio was left in the locker and was not taken out or used.

The impossibility of transmitting a DSC Distress signal may also be due to the fact that the first violent attack of the surging wave and falling overboard of two crewmembers was a shock for the crew and in such conditions it was difficult to act rationally, and in addition the VHF transmitter could already be damaged then, because after the next waves and finally the yacht capsized, all radio and navigation equipment was completely destroyed, which can be seen in the photo below.

¹⁰ The radio beacon was thrown into the water by the person acquainted with the EPIRB only during the cursory training of the crew before departure. According to the instructions, in case of very rough sea, the free release of the radio beacon by the vessel's side should be avoided due to the possibility of its damage as a result of an impact against the hull. The radio beacon was violently thrown by the surf waves which – due to the instability of the antenna's position – may also explain the several-minute delay in receiving the signal by the MEOSAR satellite.

¹¹ In order to send the simplest alarm "undesigned" DSC, the button with a flip cover must be pressed and held for at least 3 seconds.



Photograph 13. Radio and navigation station after the accident.

4.2.3. The use of navigation equipment by the crew

During the cruise the captain navigated, using his own tablet with the *Navionics* application. The stationary navigation plotter was only turned on after going out to open sea to avoid AIS alerting in port and in the Gulf, and then it was used only to display the lubber line which the helmsmen were to follow. On this plotter, the scale was not changed and the map was not browsed.

Paper maps *Delius Klasing Sportbootkarten Satz 13 (Poland and Litauen)* held on the yacht were not used. Sailing directions *Porty Bałtyku. Polska i Litwa*¹² which could be found on the yacht were not consulted on this cruise, but the captain had previously visited Klaipėda on the “Lilla W” and other yachts as the operator of a vessel many times.

No records were made in a logbook or any notebook (there was no obligation according to the regulations).. The radar was not turned on and used throughout the cruise.

4.2.4. Awareness of issues related to safety and rescue

During the hearings, inspection and analysis of the collected material, several gaps in the crew’s awareness of various safety issues could be noticed. Some are simply related to the lack of knowledge of crewmembers with little experience in sea cruising and some are due to

¹² Jörn Heinrich. *Porty Bałtyku. Polska i Litwa* [Baltic ports. Poland and Lithuania]. Wyd. Almapress, Warsaw 2011.



insufficient information provided during training.

Ultimately, the following points were not decisive in the balance of the “Lilla W” yacht’s accident, but it is worth considering emphasising these issues in the programmes of future training, exams or “case study” discussion workshops.

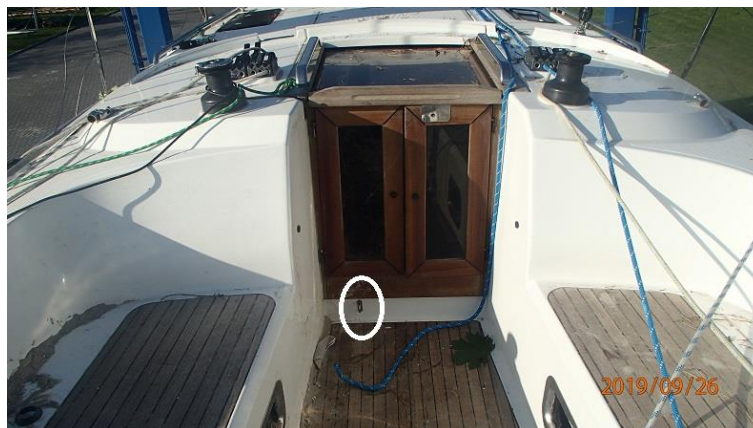
1. The technique of sailing downwind on the reefed mainsail alone and then on the engine, without using or even preparing the headsail, trysail or slightly reefed mainsail adopted by the captain seems questionable. The captain can always select the sails and sailing technique according to his own experience and known characteristics of a particular vessel, but this method of sailing should not be taken as a rule. The captain argued that the mainsail rigging was more durable and could withstand uncontrolled twists and shifting of the boom¹³. It is possible that the only foresail on the yacht, in the captain's opinion was too light for severe weather conditions and should be spared, but in such a situation going to sea in stormy weather is all the more doubtful. A yacht on which sailing in a storm is expected should be equipped with appropriate sails, at least a furled genoa of a diverse surface density, heavier at the clew and lighter at the luff.
2. The method of securing jackstays running on the deck from the bow to stern was questionable. While the durability of the braiding itself, used instead of the steel cord, does not raise any objections, the use of 3-4 mm synthetic cord folded three times (tied with a knot) instead of an appropriate strap or hook may not be sufficient and certainly significantly reduces the strength of the whole. For example, the *World Sailing* regulations for regatta yachts require the use of 1x19 steel ropes with a diameter of at least 5 mm or equivalent. According to the same regulations, a traveler made of synthetic cord can be used to fasten a taut lifeline cord provided that the length of the traveler cord is no more than 10 cm and it is replaced frequently enough.

¹³ It is worth noting that the uncontrolled returns and the related rapid flipping of the boom, regardless of the load on the rigging, additionally carries a serious threat to people who could be hit by the boom or sheets. It happened, for example, in the case of "Portowiec Gdański III" (report of the PKBWM No. 55/17), and in the case of the yacht "CV-21" (report of MAIB No. 7/2017).



Photograph 13. Fastening of the jackstay on the stern (photo by M. Cesnauskis).

3. On the “Lilla W” yacht, the handle for the EPIRB was placed far from the companionway in the bow corner of the main cabin, probably with the intention to maximally protect the radio beacon from mechanical damage. However, even if the EPIRB is not of the hydrostatically released type, it is worth mounting it near the companionway, preferably to be able to reach it without going deeper into the cabin. As for the method of activation, see footnote 10 in Section 4.5.



*Photograph 14. The harness ring, e.g., for those crossing the companionway
(photo by M. Cesnauskis)*

4. Some members of the “Lilla W” crew thought they should not wear lifejackets before



going up on deck. This view probably follows from several sources where it is indeed justified: from the instruction on the behaviour of passengers of commuter aircrafts (applies to manual activation of inflation only after exiting the plane), from the instruction on rigid bulky “cork” lifejackets, and from recommendations on easily overturn inland cabin yachts. In these cases, staying inside the cabin with a lifejacket on is indeed not advisable. In the case of a seagoing yacht and an inflatable lifejacket, especially with an integrated safety harness, it would be wrong to assume as a rule that the lifejacket is to be put on only on board. In conditions which require clipping in, the person entering the deck should already wear a lifejacket/harness put on properly and, even before leaving the companionway, should hook to the ring placed by the companionway for this purpose for protection while crossing the cockpit edge. The “Lilla W” yacht type *Bavaria 37 Cruiser* was equipped with 3 harness rings fitted by the manufacturer – 2 for helmsmen and 1 for securing the entry and exit of a person from the cabin. Keep in mind that yachts of this type are the most frequent charter boats, most of the time sailing in favourable conditions or standing in marinas, and are rarely prepared to regularly encounter storms. For example, the *World Sailing* regulations provide for the necessity to equip yachts with points of safe and simultaneous attachment for 2/3 crew members (beside the jackstays).

4.3. Organisational factors

4.3.1. Cruise planning

The decision to leave Gdańsk on the day before the accident and go to Klaipėda was at risk from the very beginning due to the forecasted hydrometeorological conditions. When making this decision, the captain – in consultation with the crew – relied on the forecast “windy” displayed graphically on the tablet screen. The conclusion from the analysis of this image, made by the captain at around 17:00 CEST, was to expect a “very strong westerly wind” and the associated exclusion of the scenario of a cruise to Karlskrona and Bornholm. In the discussions with the crew, the terms “storm” or “storm warning” were not mentioned, nor were the numerical indications of the wind force or sea state. After making the decision to sail to Klaipėda, but when it was still possible to turn back to Gdańsk without problems or enter, e.g., Hel, the captain listened to the VTS Gulf forecast at 00:05 CEST. This forecast was partially heard by the crew. The forecast has come true completely.

The sailing guide by Jörn Heinrich which could be found on the yacht describes the entrance to Klaipėda as follows (p. 192):



The approach to Klaipėda is possible by day and at night... When the wind is stronger, there are also steep, crammed waves and a strong current parallel to the coast, reaching the speeds of up to 3 knots near the breakwater heads. ...During storms from the west, Klaipėda should not be approached, because breaking waves may smash the yacht before entering.

Earlier, on p. 188, the author makes a general remark about this body of water:

In the south-eastern Baltic Sea, the waves tend to be the highest in the entire Baltic Sea due to the possibility of a long fetch.

Popular Imray sailing guide *The Baltic Sea and Approaches* includes a similar warning on p. 376:

The town and the harbour entrance are clearly visible from seaward and the entrance, heavily used by commercial shipping, is well marked for entry at any time, though it would become hazardous for small craft in strong onshore (westerly) winds.

Another sailing guide popular in Poland, *Ports of Latvia and Lithuania*¹⁴ by Jerzy Kuliński, includes a directly formulated practical warning on p. 63:

...in the case of strong onshore winds, especially from the W to N sectors, give up calling at Klaipėda. ...Even though the entrance between the breakwaters is quite wide (over 300 m), it is considered dangerous, especially for a yacht without a powerful engine. No few ships, no few yachts have been destroyed near or even on the breakwaters of Klaipėda.

Comparing these general warnings with specific forecasts available on the evening of 14 September and at night on 15 September 2019, it can be concluded that even though the cruise and entry to Klaipėda were not objectively impossible, there were numerous factors which should have stopped the crew of the “Lilla W” yacht from the intention to sail this section at this time.

4.3.2. Preparation of the yacht and the crew

The “Lilla W” yacht was a new vessel. The equipment was complete. The sailing gear, devices and mechanisms were operational (except for the bag with the SS lifebuoy rope).

Weather forecasts available on the yacht as well as other – widely available, widespread on the Internet and by the radio – left no doubt that the cruise would take place in extremely difficult conditions. However, the yacht put to sea prepared as for any other offshore cruise under typical conditions, without taking into account the possibility of encountering extreme conditions.¹⁵ The passage to Klaipėda was not objectively impossible but required the utmost caution and careful undertaking of all possible preparatory steps in anticipation of various

¹⁴ Jerzy Kuliński, *Porty Łotwy i Litwy. Przewodnik dla żeglarzy*. Wyd. Kartuzy 2011.

¹⁵ According to the shipowner’s guidelines, the yacht should not be operated in stormy conditions.



difficult situations.

Five out of seven people on board had never experienced a storm at sea. The other two – the captain and the 3rd mate – probably had been in harsh conditions before, but they also did not take any special steps to prepare themselves to remain fully operational. Both were too lightly dressed and did not have waterproof footwear which made the captain (who was personally helming the yacht on board most of the time) freeze which increased stress and impatience. Probably until the last 1-2 hours before the accident, the captain expected that – as usual – he would come to the vicinity of the port, see the heads and simply sail the yacht on the engine between the breakwaters.

The initial safety training of the crew did not cover several elements which could have influenced the course of the accident. The use of rings for harness straps fitted by the manufacturer (at the helms and at the companionway) was not discussed. Oral description of the VHF DSC alarm broadcasting procedure turned out to be insufficient – perhaps there was no clear and legible instruction on the cabin wall next to the stationary radio station. The function and use of the Dan-Buoy pole to be given to a man overboard was not covered. Sailing gear was left in the ordinary coastal order. The set of fenders was hanging freely on the pulpit. Loose ends of ropes in the cockpit were hanging from winches, unprotected from being washed overboard or secured too loosely in bags. The navigational equipment – radar, AIS, handheld radio – was not prepared and turned on. There were no permanent navigational records in the event of failure of electronic devices. No paper maps were prepared.

4.3.3. Yacht's approach to the port

The “Lilla W” yacht approached the port of Klaipėda from the south, probably following a course leading directly to the heads of the breakwater. A witness on the beach estimated that the yacht was sailing parallel to the shore. The captain and the mates helming the yacht present in the cockpit could clearly see the land and the lighthouse being the rear and upper light of the range. As the captain was approaching the port, above all he was constantly looking for the front and lower light of the range lights to set on the entrance course in the range.

This way the yacht got so close to the shore and to the southern breakwater that it entered the zone of strong waves, making it difficult to control the yacht. Shortly before the accident, one of the crew members saw the distinctive white domes of tanks of Klaipėdos Nafta AB at a short distance and to the left of the bow which means that the yacht's course was perhaps

closer to the lighthouse than to the heads. High waves and hard work of the yacht on the wave made it impossible to see the breakwater and the shoreline.

The captain was not using a stationary navigation plotter. Every now and then he took the tablet with the *Navionics* application from the locker in the cockpit table, but the efforts of the captain and the crew in the cockpit focused on a visual search for the front and lower light of the range.

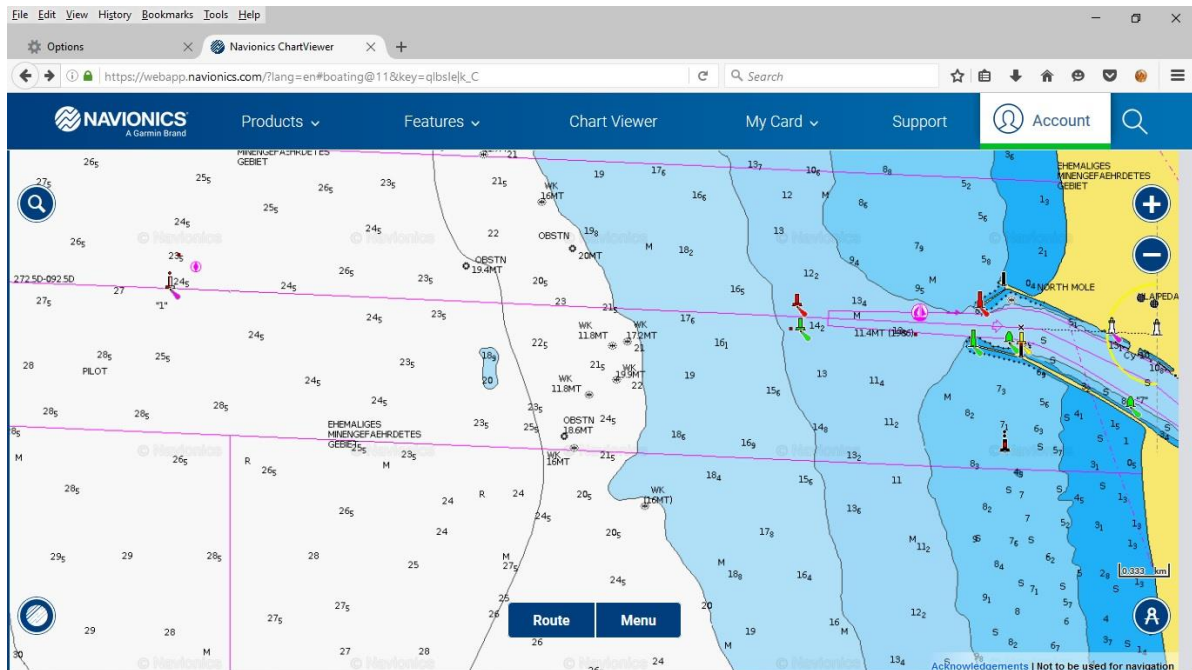


Figure 4. Approach on the Navionics map (source: Navionics, online preview).

During the approach, the captain did not discuss the approach plan with the mates and did not mention the specific direction of the range¹⁶ or the possible start of the approach near the deepwater buoy “1” put on the 092.5 range line and therefore the line of the recommended entrance course. Buoy “1” is situated around 3 NM from the heads. The accident took place a little less than 1 NM from the coast and a little less than 1 NM south of the heads. The description of the “Klaipėda-entrance” lower light of the range in the *List of Lights and Fog Signal* of the HOPN (Publication No. 523) available on the yacht indicates that it is “visible on range line.”

¹⁶ About 1 hour before the accident, when asked by the 2nd mate whether the entrance to the port was straight from the sea, the captain replied in the affirmative and noted that it would not be easy (“it will be quite a trick”).

WYBRZEŻE LITEWSKIE							
Nr	Rejon, nazwa i położenie	Pozycja geograficzna N E	Charakterystyka światła, okres, rytm [s]	Wys. św. n.p.m. [m]	Nominalny zasięg światła [M]	Opis konstrukcji	Uwagi
1	2	3	4	5	6	7	8
Nabieżnik KLAIPĖDA – wejściowy							
3328 3345.9	– światło dolne	55 43.7 21 05.5	Q W	31	16	Czerwona, metalowa, ażurowa wieża, biały prostokąt, czarny pas pionowy, biały romb.	Widoczne w linii nbż.
3328.1 3346	– światło górne Klaipėda 285 m od św. dolnego	55 43.7 21 05.7	Iso W 6s	45	18	Okrągła, betonowa wieża, czarne i białe pasy poziome, w linii nbż. czarny pas pionowy, galeria, laterna.	000° – 180° Świaci całą dobę. AIS.
							Nbż. krk 092.5°.

Figure 5. Description of the range in the List of Lights of the HOPN 523

KLAIPEDA:							
12000 C 3345.9	-Entrance Range, front.	55° 43.7' N 21° 05.5' E	Q.W.	102 31	16	Red framework tower, white diamond and rectangular daymarks, black stripe; 95.	Visible on range line only.
12004 C 3346	--Rear, 285 meters 092°30' from front.	55° 43.7' N 21° 05.7' E	Iso.W. period 6s	148 45	18	White round tower, black bands, black stripe and platform; 121.	Visible 000°-180°. Shown 24 hours. Reserve light range 8M. AIS (MMSI No 002770110).

Figure 6. Description of the range in the NGA List of Lights, Pub. No. 116.

The NGA *List of Lights, Radio Aids and Fog Signals* (Publication no. 116), widely available online, formulates this comment more explicitly, stating clearly that this light is visible *only* on range line. Moreover, due to the type of physical structure of the range front light, the light itself with its day mark is also not visible from the traverse or from directions distant from the range line.

The description of the approach to Klaipėda in the sailing guide by Jörn Heinrich owned (see footnote 7 on p. 17) clearly recommends:

The approach is from buoy 1 marking the centre of the fairway (LFI 6s, 55° 43.83' N 020° 59.72 E). From here, following course 092.5, we reach the port entrance after 2.8 NM. The range lights are on line 092.5, lower light (Q.31m16M), upper light on the Klaipėda lighthouse (Iso.6s45m18M).

The same recommendation can be found in other sailing guides.

The Baltic Sea sailing directions of the HOPN *Polish Coast* (Publication No. 502) do not cover the coast of Lithuania.

During the approach, no attempt was made on the “Lilla W” to find buoy “1” visually,



using GPS or the radar, which was switched off the entire time. No attempt was also made to determine the position of the yacht to the port entrance by these means, only expecting the range lights to emerge in visual observation. Finding and identifying the approach buoy was not part of the approach plan.

Until the moment of notification of the accident, the port officer on duty did not know about the approaching yacht, as there was no prior radiotelephone or telephone contact from the “Lilla W,” and the yacht’s AIS was turned off.¹⁷ In the captain’s opinion, the radiotelephone contact was to be established after entering the port canal and to be used to call for opening of the footbridge over the canal leading to the “Old Castle” Marina. The captain did not plan for consulting the port officer on duty on the most secure entry method (e.g. about the strength and direction of the current) and was hoping that in the severe weather conditions the authorities would not strictly require the entrance notification procedure.¹⁸ In fact, Klaipėda’s port regulations¹⁹ provide:

51. Under conditions of the wind with the speed exceeding 20 m/s, no sailing of any vessels, their mooring, outgo and re-mooring are permitted without a separate permit of the Master of the Seaport.

The captain’s attention was largely diverted from navigating by the behaviour of the yacht which, after furling the mainsail, was propelled only by the engine and easily deviated from the course on the wave.

During a conversation with the crew, the captain did not consider partially unfolding the foresail to stabilise the yacht on a downwind course or ensure steerability in case the engine stopped.

4.4. The influence of external factors, including the marine-related ones, on the accident

The accident of the “Lilla W” yacht on the approach to Klaipėda was entirely the result of the impact of surf waves and storm wind in the coastal shallowing zone. No vessel should be in this area under that conditions at that time. The conditions – wind force up to 9° B and sea state 6 – were as forecast.

¹⁷ An AIS transponder is functioning at the Klaipėda lighthouse under the supervision of the port authority.

¹⁸ Notification of entry is required by the Lithuanian Border Guard under all conditions (source: BSCN, *Useful information Lithuania 2019*).

¹⁹ *The Regulations of Navigations of Klaipėda State Seaport*.



1. The MMFO IMGW forecast

MORSKA PROGNOZA POGODY NA BAŁTYK POŁUDNIOWY I POŁUDNIOWO-WSCHODNI

Ważna od godz. 01:00 dnia 15.09.2019 do godz. 13:00 dnia 15.09.2019

SYTUACJA BARYCZNA Z GODZINY 18:00 UTC:

Rozległy klin wyżowy znad Europy Centralnej powoli słabnie. Zatoka niżowa znad Wysp Brytyjskich i Morza Północnego przemieszcza się na wschód.

OSTRZEŻENIE PRZED SZTORMEM NA BAŁTYK POŁUDNIOWY I POŁUDNIOWO-WSCHODNI, ZATOKĘ POMORSKĄ, WYBRZEŻE ŚRODKOWE I ZATOKĘ GDAŃSKĄ

BAŁTYK POŁUDNIOWY:

Wiatr południowo-zachodni 5 do 6, w porywach 7, wzrastający na 7 do 8, na północy i wschodzie w porywach 9 w skali B. Stan morza 4, później 5. Temperatura powietrza około 16°C. Widzialność dobra do umiarkowanej, w ciągu dnia deszcz.

BAŁTYK POŁUDNIOWO-WSCHODNI:

Wiatr południowo-zachodni 6 w porywach 7, wzrastający na 7 do 8 w porywach 9 w skali B. Stan morza 3 do 4, później 5 do 6. Temperatura powietrza około 15°C. Widzialność dobra do umiarkowanej. W ciągu dnia deszcz.

MORSKA PROGNOZA POGODY NA BAŁTYK POŁUDNIOWY I POŁUDNIOWO-WSCHODNI - SEA WEATHER FORECAST FOR THE SOUTHERN AND SOUTH-EASTERN BALTIC

Ważna od godz. 01:00 dnia 15.09.2019 do godz. 13:00 dnia 15.09.2019 - Valid from 01:00 on 15.09.2019 to 13:00 on 15.09.2019

SYTUACJA BARYCZNA Z GODZINY 18:00 UTC - BARRIC SITUATION AT 18:00 UTC

Rozległy klin wyżowy znad Europy Centralnej powoli słabnie. Zatoka niżowa znad Wysp Brytyjskich i Morza Północnego przemieszcza się na wschód. - Extensive ridge from Central Europe is slowly weakening. A trough from the British Islands and the North Sea is moving east.

OSTRZEŻENIE PRZED SZTORMEM NA BAŁTYK POŁUDNIOWY I POŁUDNIOWO-WSCHODNI, ZATOKĘ POMORSKĄ, WYBRZEŻE ŚRODKOWE I ZATOKĘ GDAŃSKĄ - STORM WARNING FOR THE SOUTHERN AND SOUTH-EASTERN BALTIC, POMERANIAN BAY, CENTRAL COAST AND GULF OF GDAŃSK

BAŁTYK POŁUDNIOWY - SOUTHERN BALTIC

Wiatr południowo-zachodni 5 do 6, w porywach 7, wzrastający na 7 do 8, na północy i wschodzie w porywach 9 w skali B. Stan morza 4, później 5. Temperatura powietrza około 16°C. Widzialność dobra do umiarkowanej, w ciągu dnia deszcz. - South-west wind 5 to 6, with gusts as high as 7, increasing to 7 and 8, north and east with gusts as high as 9 on B scale. Sea state 4, later 5. Air temperature around 16°C. Visibility good to moderate, rain during the day.

BAŁTYK POŁUDNIOWO-WSCHODNI - SOUTH-EASTERN BALTIC

Wiatr południowo-zachodni 6 w porywach 7, wzrastający na 7 do 8 w porywach 9 w skali B. Stan morza 3 do 4, później 5 do 6. Temperatura powietrza około 15°C. Widzialność dobra do umiarkowanej. W ciągu dnia deszcz. - South-west wind 6, with gusts as high as 7, increasing to 7 and 8, with gusts as high as 9 on B scale. Sea state 3 to 4, later 5 to 6. Air temperature around 15°C. Good to moderate visibility. Rain during the day.

The SHMI NAVTEX forecast (J station – Gislövshammar – Sweden)



FINAL REPORT 112/19



PKBWM

PAŃSTWOWA KOMISJA BADANIA
WYPADKÓW MORSKICH

ZCZC IB65
141538 UTC SEP
BALTIC SEA MET WARNINGS

GALE WARNING

SKAGERRAK: W-SW 14-17 M/S. THIS EVENING AND NIGHT TOWARDS SUNDAY 16-19 M/S. FM SUNDAY MORNING W 18-22 M/S.
KATTEGAT: NIGHT TWRDS SUNDAY SW 14-17 M/S. FM LATE SUNDAY MORNING W, IN THE NORTHERN PART INCR TO 18-20 M/S.
SOUTHEASTERN BALTIC: NIGHT TOWARDS SUNDAY SW 14-17 M/S. FM SUNDAY MORNING 16-19 M/S. SUNDAY AFTERNOON TURNING
W.
CENTRAL BALTIC: NIGHT TWRDS SUNDAY SW 14-17 M/S. SUNDAY MORNING 15-19 M/S. SUNDAY AFTERNOON W.
NORTHERN BALTIC: NIGHT TOWARDS SUNDAY SW 14-16 M/S. SUNDAY MORNING 14-18 M/S. SUNDAY AFTERNOON WEST.
GULF OF RIGA: SUNDAY MORNING SW 15-18 M/S.

NEAR GALE WARNING

LAKE VAENERN: NIGHT TOWARDS SUNDAY SW 14-17 M/S.
THE SOUND: FM SUNDAY MORNING W AT TIMES 14 M/S.
THE BELTS: FM NIGHT TOWARDS SUNDAY SW TEMPO 14 M/S. DURING SUNDAY W.
WESTERN BALTIC: FM NIGHT TWRDS SUNDAY SW TEMPO 14 M/S. DURING THE DAY W.
SOUTHERN BALTIC: FM NIGHT TOWARDS SUNDAY SW 14-17 M/S. SUNDAY AFTERNOON W.
GULF OF FINLAND: FM SUNDAY MORNING W-SW 14-17 M/S. DECR SUNDAY EVENING.
SEA OF AALAND: FROM NIGHT TOWARDS SUNDAY SW ABOUT 15 M/S. DECR SUNDAY MORNING.
ARCHIPELAGO SEA: NIGHT TWRDS SUNDAY SW 15 M/S. DECR SUNDAY NOON.
SOUTHERN SEA OF BOTHNIA: NIGHT TOWARDS SUNDAY S-SW 15 M/S. DECR LATE SUNDAY MORNING.
NORTHERN SEA OF BOTHNIA: NIGHT TOWARDS SUNDAY S-SW TEMPO 15 M/S. DECR SUNDAY MORNING.
THE QUARK: SUNDAY MORNING TEMPO SE-S 15 M/S.
BAY OF BOTHNIA: FM SUNDAY MORNING E OR SE 15 M/S.
NNNN

- Numerical forecast from the GFS model from Saturday evening (cursor near Klaipėda).

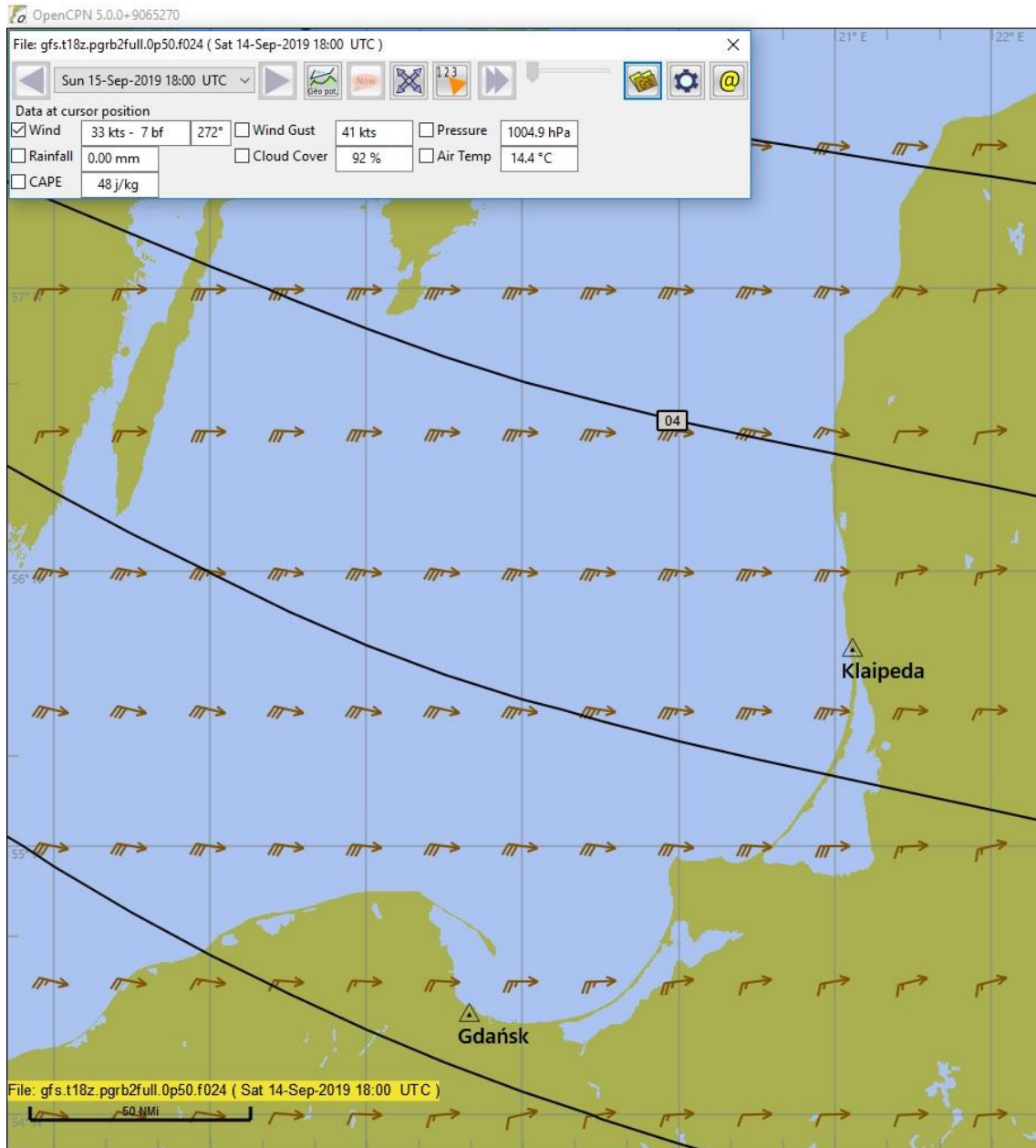


Figure 7. The GFS forecast visualised in the OpenCPN navigation programme.



3. The ICM synthetic numerical forecast

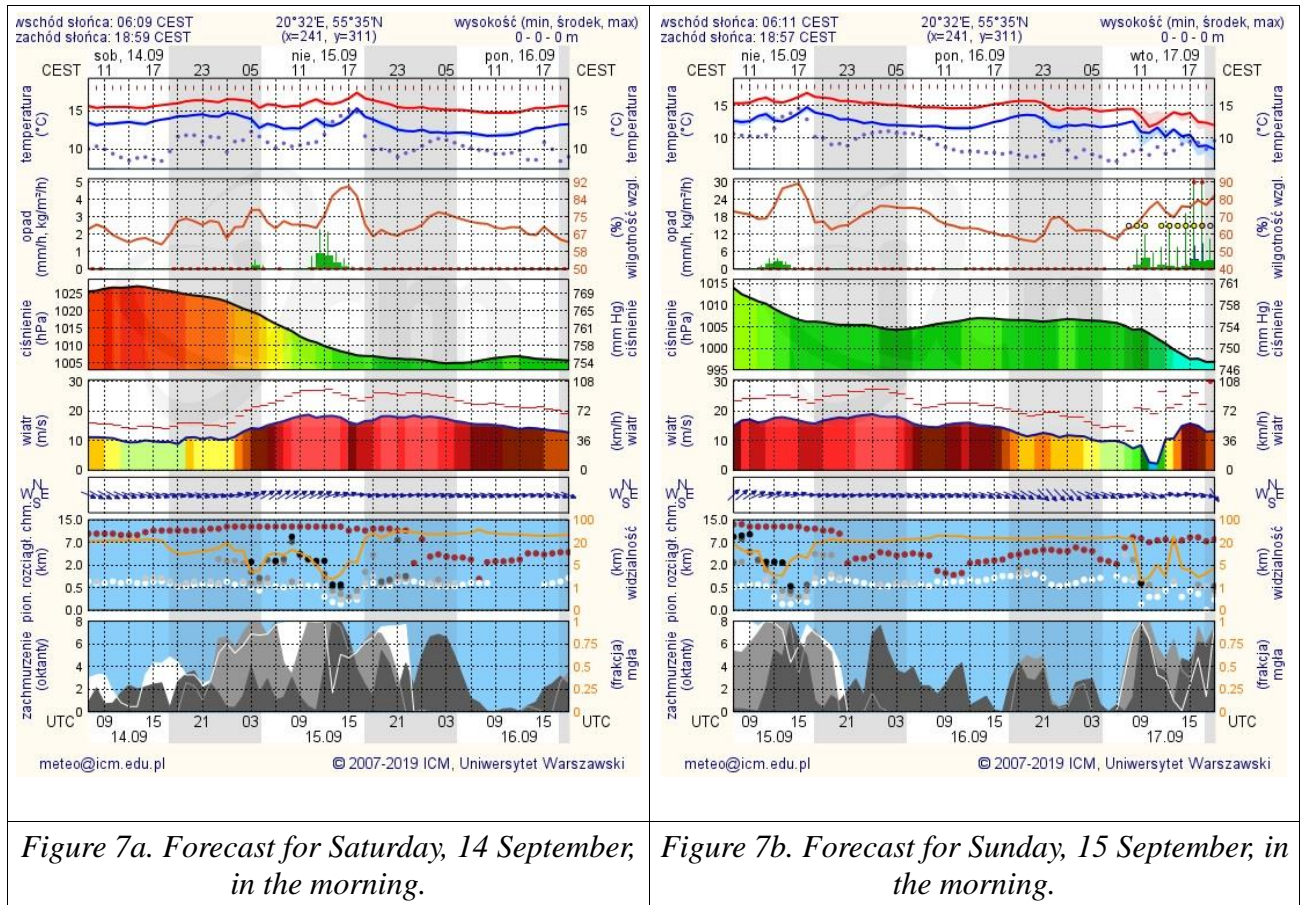


Figure 7a. Forecast for Saturday, 14 September, in the morning.

Figure 7b. Forecast for Sunday, 15 September, in the morning.

- wschód słońca – sunrise
- zachód słońca – sunset
- wysokość (min, środek, max) – height (min, center, max)
- zachmurzenie (oktanty) – cloud cover (oktas)
- pion. rozciągł. chm. – vertical cloud extension
- wiatr – wind
- ciśnienie – pressure
- opad – precipitation
- temperatura – temperature
- mgła (frakcja) – fog (fraction)
- widzialność – visibility
- wilgotność wzgl. – relative humidity

4. Numerical wave forecast of the ICM from Saturday night to Sunday at 18:00

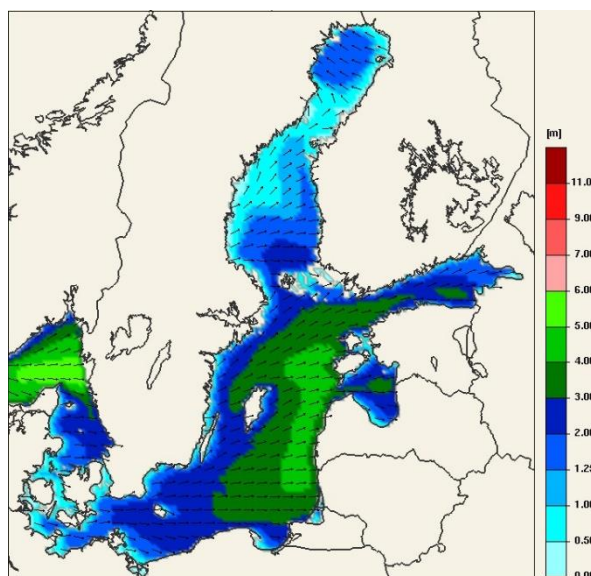


Figure 8. The ICM wave forecast.

Forecast 3 (although in a different visualisation) was taken into account at the beginning of the cruise. The received forecast 1 did not change the decision. The other forecasts were not received.

5. Description of the investigation results, including safety issues and investigation conclusions

The main cause of the accident was a navigation error – the approach path to the port taken was incompatible with the recommended one which resulted in the yacht entering the surf zone. A factor contributing to the accident was the initial decision to start sailing to Klaipėda at all, despite the forecasted hydrometeorological conditions in the South-Eastern Baltic Sea. The captain, when embarking on this voyage, clearly exceeded the limitations of both the shipowner's manual and the yacht's Safety Card due to the predicted sea state. Having the entire crew voted for the decision to sail to Klaipėda, already knowing the weather forecast for this area, was a bad solution, although it was democratic. Two crew members with no sailing experience, one no sea experience and two on a yacht in the Baltic Sea for the first time, should not put any pressure on the captain. Sea-related risks can only be assessed by those who know them, i.e. only 3-4 people on a yacht with sea experience.

Because of the impact of the extremely rough sea experienced by the yacht during the wrongly conducted approach, it is hard to expect that any preventive measures or any



equipment typically available could guarantee the safety of the crew. Nevertheless, there are several factors which could ultimately have an impact on a different balance of event's consequences.

- a) Fastening of the harness straps in the rings fitted by the manufacturer low above the cockpit floor, instead of higher on the pushpit tubes, could reduce the force of the wave affecting people, and probably prevent the 3rd mate from being thrown outside the pushpit.
- b) Poorly stowed and attached lifebuoy lines could have contributed to the failure to rescue two people when they fell overboard first, resulting in their death. The SS lifebuoy was not used at all as the line was tightly tied after the bag was damaged/torn. The PS lifebuoy broke off the line – according to the account of the 2nd mate – after a sharp tug on the unrolling, initially tangled line. According to the regulations,²⁰ the yacht should be equipped with one lifebuoy on a line and the other one not tied to the yacht, but connected with a flag pole with a line and equipped with a light buoy. The photos and accounts indicate that both lifebuoys probably had lines, one – a light buoy, and none – a pole (a light buoy and/or a pole on a line is pointless – cf. the accident of the “Vagant” yacht (WIM 108/17)).
- c) Equipping inflatable lifejackets with spray hoods and crotch straps²¹ could increase the chances of survival²² for those who fell overboard first and drifted in the water for a long time.
- d) Better securing of the sections of ropes on deck in appropriate sacks or lockers provided for this could prevent the immobilisation of the engine and rendering the yacht unable to manoeuvre; simple hanging of the coiled lines on the capstans turned out to be insufficient, and even the cover of the dodger was illusory, as the wave easily took the entire dodger.
- e) Failure to contact the Port Authority in Klaipėda during the yacht's approach to the port also had an impact on the fact that the officer on duty did not notice the situation of the yacht and thus the rescue operation was delayed.
- f) The inability to send the distress signal with the VHF/DSC, despite a short training before the yacht went to sea, contributed to the delay in the rescue operation by the coastal

²⁰ Regulation on the safe navigation of seagoing yachts. Annex 1, part I point 1(b) (Journal of Laws item 1557).

²¹ Spray hoods, similarly to crotch straps, are optional accessories under the ISO 12402 standards.

²² There is no data about the causes of death of the captain and 3rd mate. The accounts indicate that the captain probably drowned in spray, while drifting in an inflated lifejacket.



services.

g) More comfortable living and working conditions of the captain might have had allowed him to avoid excessive fatigue and freezing, and thus – making hasty and nervous decisions.

It is normal for the captain to sleep on a couch in the saloon at sea, especially in a storm, the essence of which is the general living conditions of the captain. Not having your own cabin, a place for an isolated rest in a port or in the mild conditions at sea, a place to change in privacy, especially at a certain age, is a factor that increases overall fatigue. While you can come to terms with the several days inconvenience of the captain, who has an eye on everything, staying in these conditions for many weeks is very tiring.

The material collected so far does not allow explaining how an experienced captain who knew the yacht and the area of the cruise could have approached this extremely difficult situation, practically until the last moment, the same way as under normal weather conditions. There are several possibilities here:

1. excessive fatigue of the captain who had been conducting week-long cruises on the “Lilla W” for 4 weeks nonstop,²³
2. excessive routine in coming into Klaipėda – the nearest foreign port – frequently and it has probably never happened to him under difficult conditions.

6. Safety recommendations

The State Marine Accident Investigation Commission found it justified to address safety recommendations which are a proposal of an action that may contribute to preventing a similar accident in the future to:

6.1. “Bavaria Yachtbau GmbH” Shipyard

1. The Commission recommends strengthening the cockpit table mount in the Bavaria 37 Cruiser model and in any other type of yacht.
2. It is recommended to equip yachts with tightly closed bags, more resistant to breaking or tearing, permanently attached to the hull, where loose ends of ropes can be stowed, thus preventing large sections of slack ropes from falling overboard, getting caught in the engine propeller and, consequently, immobilising it.

7. Recommendations

The State Marine Accident Investigation Commission considered it justified to issue

²³ The captain’s apparent fatigue was noticed by the crew.



recommendations to improve safety on seagoing yachts.

7.1. “KUBRYK” Sailing Agency

1. The Commission recommends a detailed analysis of the comments and conclusions indicated in this report, in particular with regard to the captains of commercial yachts making decisions to go to sea in unfavorable weather conditions and the preparation of the yacht and crew for the voyage.

2. Earlier sending to potential members of the yacht's crew or placing on the agency's website "Sea Yacht Safety Instructions", which will contribute to better familiarization with the safety issues on the yacht by them before embarking on the yacht.

7.2. To the broadly understood yachting community

The State Marine Accident Investigation Commission addresses the content of the prepared report to the broadly understood yachting community. Emphasising the issues raised in the report as defective or reprehensible actions in the programmes of future training, exams or “case study” discussion workshops. In particular:

- Carefully collecting information on weather conditions forecast for the entire voyage route and making adequate decisions on leaving a port or changing the route and destination port.
- Emphasising the importance of adjusting the voyage plan to the experience and sea resilience of the crew in training and examinations.
- In addition to the required safety equipment assigned to the yacht, its rational arrangement, ready for use and conducting detailed training for the entire crew of the yacht.
- Reliable securing of lines, such as buoyant lines of life buoys or yacht rigging lines, against falling overboard and getting caught in the engine propeller.

7.3. Recommendations for the registration of the EPIRB

The Commission, with a view to enabling the rescue centre and SAR services to quickly contact persons who can provide information on the crew and the vessel from which the emergency call signal was received, reiterates the recommendation regarding the correct entry of up-to-date contact information into the EPIRB database, previously formulated in the final report on a very serious marine accident, sinking of the Xela yacht on 22 June 2019 in the Baltic Sea (WIM 54/19).

The EPIRB registration procedure adds two contacts to the national database – the formal owner and the second contact, available 24 hours a day. It seems that in the case of commercially operated yachts, especially in long-term charter organised by an agency where



the formal owner may not have daily contact with the vessel, it is necessary to take care of the requirement to update the 24-hour-contact.

The website of the COSPAS – SARSAT, in the section on the registration of the radio beacons, includes the following text: *“Registering your beacon may make the difference between life and death. By registering your beacon you allow search-and-rescue authorities in an emergency to retrieve crucial information about you, your aircraft or vessel, and people who can provide valuable information about you (your emergency contacts).”*

One should bear in mind that in addition to the requirement to obtain an appropriate radio permit issued by the UKE, the entry in the records kept by the ULC is also necessary. The information submitted for entry into the records is used only for the purpose of conducting an effective rescue operation. Properly filled out contact details of a person other than the owner, who may be on the vessel and need assistance, will allow the rescue centre to quickly contact people who can provide information about the crew and the vessel from which the emergency call was received.

The importance of this information is evidenced by the situations related to three accidents investigated by the SMAIC:

- WIM 76/16 fire and sinking of the SUNRISE yacht on the Baltic Sea on 20 October 2016,
- WIM 20/17 sinking of the REGINA R yacht in the Pacific Ocean on 8 April 2017,
- WIM 54/19 sinking of the XELA yacht on the Baltic Sea on 22 June 2019.

The Commission emphasises that at present there is no other effective device with a global coverage which can operate automatically in a situation where the life of the crew is at risk.

Information for sailors, including registration of the EPIRB and the PLB, has been included in the original study of the Department of Maritime Economy of the MMEIN under the name *Przewodnik dla żeglarzy i armatorów jachtów* [Guide for sailors and yacht owners], which can be found on the websites of the MMEIN and maritime offices.²⁴

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²⁴ <https://www.gov.pl/web/gospodarkamorska/przewodnik-dla-ze-glarzy-i-armatorow-jachtow>



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10. List of terms and abbreviation used

AIS – Automatic Identification System
HOPN – Hydrographic Office of the Polish Navy
MMFO – Maritime Meteorological Forecasting Office
BSCN – Baltic Sea Cruising Network
CEST – Central European Summer Time
DSC – Digital Selective Calling
DMO – Director of the Maritime Office



EEST – Eastern European Summer Time
EPIRB – Emergency Position-Indicating Radio Beacon
GFS – Global Forecast System
GPS – Global Positioning System
ICM – Interdisciplinary Centre for Mathematical and Computational Modelling
IMGW – Institute of Meteorology and Water Management
IMO – International Maritime Organisation
ISO – International Standards Organisation
ITU – International Telecommunication Union
cbl – cable length (0.1 NM)
kN – kiloNewton
KOP – Air Force / Lithuanian Armed Forces
PS – Port side
LRC – Long Range Certificate
LT – Local Time
MAIIM – Marine Accidents and Incidents Investigation Manager (Lithuania)
MOB – Man Over Board
NM – nautical mile
MMSI – Maritime Mobile Service Identity
MRCC – Maritime Rescue Coordination Centre (Klaipėda)
MRCK – Marine Rescue Coordination Centre (Gdynia)
NCDC – National Climatic Data Centre
NW – North-West (wind)
PAR – Coast Guard Team
SS – Starboard side
PGD – Fire and Rescue department of the Ministry of the Interior of the Republic of
Lithuania
RYA - The Royal Yachting Association
SAR – Search and Rescue
SIS – Substantially Interested State
SMHI – Sveriges meteorologiska och hydrologiska institut



SWIBŻ – System for the exchange of shipping safety information (Pol. *System Wymiany Informacji Bezpieczeństwa Żeglugi*)

SOLAS – Convention on Safety of Life at Sea

SRC – Short Range Certificate

VHF – Very high frequency (here: marine radio)

UTC – Universal Time Coordinated

VPK – Klaipėda Country Police Headquarter

VSAT – State Border Guard Service at the Ministry of the Interior of the Republic of Lithuania

11. Participation of Substantially Interested States (SIS)

The Ministry of Justice of the Republic of Lithuania Transport Accident and Incident Investigation Division actively participated in the investigation of a very serious marine accident of the “Lilla W” yacht.

12. Sources of information

Materials gathered during the hearings of the accident participants.

Operations’ reports from the MRCK Gdynia and the MRCC Klaipėda.

Recording of the monitoring camera of the entrance to the port of Klaipėda.

Photographic materials from the on-site inspection made by the SMAIC, the MAIIM and expert, Lars Krogus Baltic Ltd.

Correspondence with the “Kubryk” Sailing Agency – operator of the “Lilla W” yacht.

The Figures use maps imaged with the OpenCPN navigation programme – www.opencpn.org.

Data of the GFS numerical forecast from the NCDC’s Archive (USA) – www.ncdc.noaa.gov.

Expert opinion prepared by Piotr Carlson.

13. Composition of the Accident Investigative Team

Team Leader – Grzegorz Suszczewicz – Vice Chairman of the Commission

Team Member – Monika Hapanionek – Member of the Commission