



SMAIC
STATE MARINE ACCIDENT
INVESTIGATION COMMISSION

FINAL REPORT

92/18

Very serious marine casualty

**m/y Mietus II
and m/v Begonia S**

**Collision of vessels at the Baltic Sea
on 4 November 2018**

November 2019



The investigation of a very serious marine casualty of a motor yacht *Mietus II* and a vessel *Begonia S* was conducted under the State Marine Accident Investigation Commission Act of 31 August 2012 (The 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 casualty or incident under the above-mentioned Act is to ascertain its causes and circumstances to prevent future casualties 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 casualty or incident.

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

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1. Facts

On November 4, 2018 at 04:50¹ there was a collision of *Mietus II*, a motor yacht under the Polish flag with *Begonia S.* a vessel under the flag of the Cook Islands, in the Baltic Sea about 12 NM south of the port of Rønne on the island of Bornholm. After the collision, *Begonia S* continued its voyage and *Mietus II* stopped in a drift. As a result of the collision, the bow part of the yacht was damaged and water flooded its interior. At 04:55 the skipper sent a distress message by VHF and at that time the crew and passengers of the yacht were launching the raft. At the command of the skipper, passengers and crew, a total of 16 people of Polish nationality took seats in the raft. After checking the muster list, the painter of the raft attached to the side of the yacht was cut off. Danish emergency services sent helicopters and two rescue units: FRB-19 and Mads Jakobsen.

FRB-19 took on board a passenger with a head injury, and the other vessel took the remaining 15 survivors from the raft, and both rescue vessels went to the port of Rønne to provide medical assistance to the survivors. During the rescue operation, *Begonia S*, which returned to the scene of the accident, offered its help to the rescuers. The Danish services instructed *Begonia S* to go to the anchorage of the port of Rønne to give explanations concerning the suspected participation in the collision with *Mietus II*. Before the end of the rescue operation, *Mietus II* sank.



Photograph 1: "Mietus II" capsizing after the collision

¹ Time of events is in local time (LT)



2. General Information

2.1. Ship Particulars

2.1.1. Mietus II



Photograph 2: „Mietus II” motor yacht



Name of the yacht	Mietus II	POL 9585
Flag	Poland	
Owner	M.M.	
Classification society	PRS S.A.	
Type	Motor yacht	
Call sign	SPS 2891	
IMO number	None	
Displacement (mLDC)	None	
Year of built	1966/2011	
Power	406 kW	
Length overall	20.04 m	
Width	5.30 m	
Hull material	Wood	
Minimum crew	3	

2.1.2. Begonia S



Photograph 1: Begonia S at the anchorage of the port of Rønne



Name of the vessel	Begonia S
Flag	The Cook Islands
Owner	Marenero Shipping Ltd.
Operator	Marenero Shipping Ltd.
Classification society	Bureau Veritas
Type	General cargo carrier
Call sign	E5U2842
IMO number	9445540
Gross tonnage (GT)	8837
Year of built	2007
Power	2990 kW
Length overall	140.38 m
Width	20,00 m
Hull material	Steel
Minimum crew	12
Type of VDR (S-VDR) recorder	Furuno VR – 3000

2.2. Voyage Particulars

2.2.1. Mietus II

Ports en route	Recreational angling without calling at ports
Port of destination	Kołobrzeg
Type of navigation	Coastal navigation
Manning (numer, nationality)	3 Poles
Information about passengers	13 Poles

2.2.2. Begonia S

Ports en route	Newport (UK)
Port of destination	Gdańsk (PL)



Type of navigation	International navigation
Information about cargo	Ballast
Manning	12 Turks, 4 Georgians, 1 Indian
Information about passengers	No passengers

2.3. Accident Information

Type	Very serious marine casualty
Date and time of the accident	4 November 2018 at 04:50
Geographical position of the accident	$\varphi = 54^{\circ} 53,6' N, \lambda = 014^{\circ} 39,5' E$
Geographical area of the accident	The Baltic Sea
Nature of the water region	Coastal waters
Weather during the accident	Wind SE 3 - 4° B, sea state 2, air temperature + 10° C, good visibility,
Operational status of the vessel during the accident	m/y <i>Mietus II</i> – under way; m/v <i>Begonia S</i> – under way
Consequences of the accident to the vessels	m/y <i>Mietus II</i> – sinking of the yacht; m/v <i>Begonia S</i> – minor damage to the paintwork of the hull
Consequences of the accident to the people	m/y <i>Mietus II</i> - one passenger suffered head injury due to a fall during the collision of the vessels

2.4. Shore Services and Rescue Action Information

On 4 November 2018 at 04:55 the skipper of *Mietus II* sent a distress message on VHF channel 16 giving the name and position of the yacht. After several attempts to make contact, the skipper reported to Lyngby Radio that the vessel was flying a Polish flag. Other information could not be obtained and at 05:00 Lyngby Radio transmitted a distress message to all vessels, stating the position of a vessel in distress. JRCC DK ordered helicopters and rescue units FRB-19 and Mads Jakobsen stationed in Rønne to start rescue operations. At 05:15 FRB-19 left the port of Rønne and at 05:35 the boat sailed up to the liferaft drifting with shipwrecked people from *Mietus II*. It was found that there were 16 people on board, generally in good condition, whereas



one person suffered a deep wound on the forehead and was the only one taken on board the FRB-19. The rescue boat remained near the raft until 5:50 when Mads Jakobsen arrived. The other rescue vessel took the remaining 15 survivors on board and the life raft in tow. After receiving confirmation from the skipper of *Mietus II* that there were 16 people on the yacht and all of them were evacuated to the life raft, the head of the rescue operations (OSC) decided to end the search and both rescue boats went to the port of Rønne, releasing vessels and helicopters at the scene of the accident from further duties. Among the vessels reporting to participate in the rescue operation there was also *Begonia S*, which at 05:07 informed Lyngby Radio about going to the scene of the accident and which later offered to participate in the rescue operation. Danish rescuers in action refrained from assistance of the vessels which had arrived at the vicinity of the rescue operations. After the arrival of FRB-19 and Mads Jakobsen to Rønne at 6:35, the survivors were taken to hospital for medical examination and for possible medical assistance.

3. Circumstances of the Accident

On 27.10.2018 at 19:05 the vessel, *Begonia S* left the port of Newport (UK) going in ballast to the anchorage of the port of Gdańsk (PL), where it intended to arrive to on 4 November 2018 at ca. 22:00. There were 17 crew members on board, including the master and two deck officers, as well as 4 deck ABs and 1 deck apprentice. On 4 November 2018 at 4:00 a watch on the bridge was taken by a chief officer together with a watchkeeping O/S. The ship was following a 103° course at a speed of about 10.5 kn. Visibility was good, the sky was completely cloudy. Both radars were turned on and set to a range of 6 miles, oriented to the North, the center of the radar image was shifted from the center of the screen, ARPA was set in the manual object acquisition mode. The watchkeeping officer was performing the duties checking the operation of the devices and the position of the vessel, and in the meantime he was conducting visual and radar observation. The O/S on watch was conducting visual and radar observation from a standing position behind the right console at the (S-band) radar screen. A signal from the bridge navigational watch alarm system (BNWAS) caused the watchkeeping officer to walk to the console and while turning off the signal, he looked towards the vessel's bow, where he saw the light of an object near the bow on the starboard. The O/S on watch observed the same thing at that time. In order to avoid a collision, the watchkeeping officer switched the control from automatic to manual and put the rudder to port, then he approached the front windows on the

bridge and soon felt two consecutive bumps on the hull. The collision of vessels took place at 4:50. The watchkeeping officer returned to the rudder and changed the rudder to the midship and then to starboard to stop the vessel from turning left and returning it to its original course. During these manoeuvres, at first, the vessel deviated by ca. 30° to port. The above manoeuvres were going on for 3.5 minutes, after resuming the course, the watchkeeping officer called the shipmaster to the bridge and informed him of the event. After hearing the distress messages at 05:07, the master informed Lyngby Radio about his intention to go to the place of rescue operation. After the rescue operation was over, the master was instructed by Danish authorities to anchor near the port of Rønne.

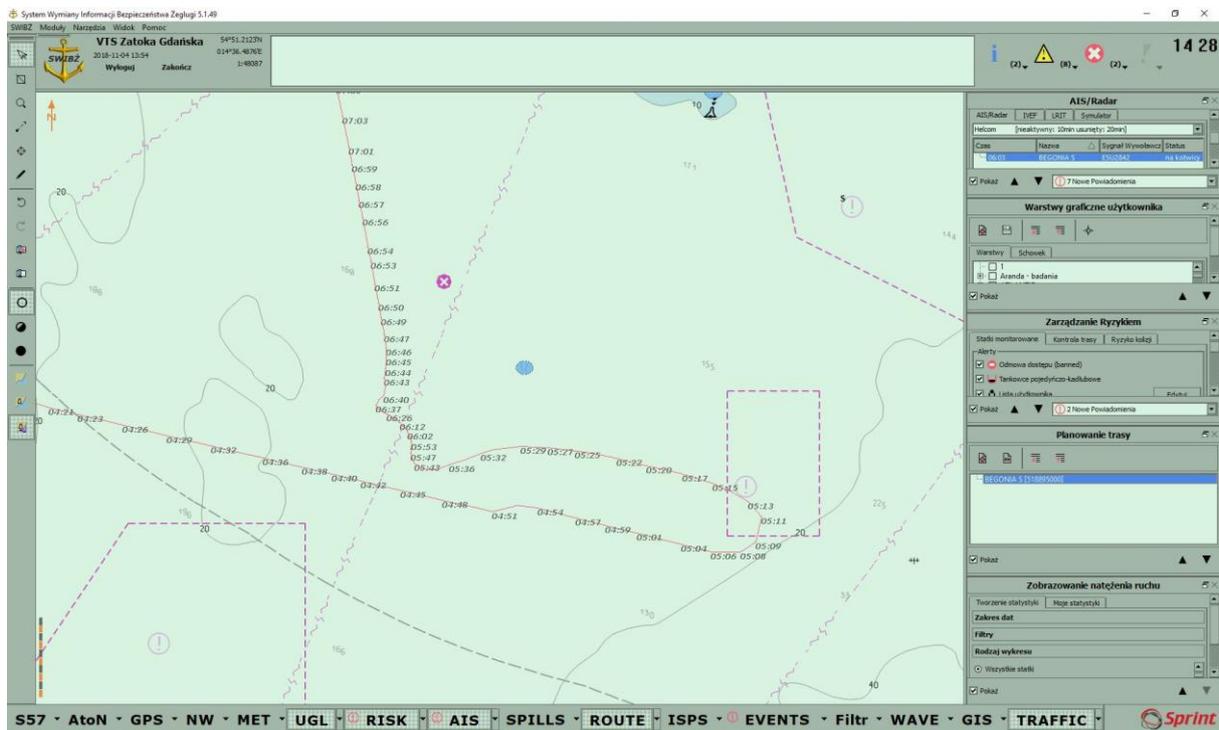


Figure 1: The route of „Begonia S” on 4 November 2018

On 3 November 2018, the commercial yacht, *Mietus II* led by the skipper, with two crew members and 13 anglers, set off from the port of Kolobrzeg to the fishery located west of the island of Bornholm (DK). Before the yacht's departure to the sea, the radar was turned on and set at the range of 3 NM, with the centre of the radar image extending off the center of the screen. Navigation lights and two VHF radios, including one with DSC, were also switched on. The skipper personally led the yacht out of the port to the KOL buoy located about 1 NM from the port heads and handed it over to the engineer. The watchman kept the 325° course until 02:30, i.e. until the watch was turned over to the helmsman. The yacht was moving at an average



speed of 7.8 kn sailing with, initially southern, and then south-eastern wind, with a force of 3° B and at sea level 2. The helmsman noticed the lights of the vessel at the same time as its echo appeared on the radar, i.e. at a distance of ca. 4 NM and approximately 30° on the port side. The yacht was following the unchanged course after the helmsman made the assumption that, in accordance with the provisions for preventing collisions at sea, he should keep the course and speed.² After reducing the distance between the two vessels below two cable-lengths, the helmsman decided to turn to starboard without changing the control method, i.e. remaining on the follow up mode. At the same time, he woke up the skipper of the yacht resting on the bridge informing him about the threat of collision. The skipper immediately switched control from automatic to manual and put the rudder to starboard. This action was insufficient to avoid a collision and the yacht's bow hit the starboard side of the bow of *Begonia S*, after which the yacht, while continuing its turn to starboard, bounced back with its port side against the starboard side of *Begonia S*.



Photograph 2: Place of impact of the bow of „Mietus II” into the hull of “Begonia S”³

Subsequently, the vessels moved away from each other, and *Mietus II* was laid to, deck work lights were turned on. The helmsman sent by the skipper inspected the damage in the bow and reported to the skipper the unsealing of the hull and damage to the railing. Railings were filled with liquid heated during periods of low temperature to prevent ice accumulation and improve

² The Regulation 15 of the Convention on the International Regulations for Preventing Collisions at Sea (COLREG)

³ On the hull above the waterline one can see stains of liquid from a damaged bow railing



the comfort of anglers who rested or kept hold on these railings during fishing. Just before the collision, one of the passengers was going back to the passenger rooms down the deck from the stern and while descending the companionway at starboard - at the moment of collision - he fell, cutting his forehead. Some of the other passengers fell out of their berths during the collision. After the collision, the passengers started coming up to the deck; some of them saw a vessel sailing away. The awakened engineer went to the engine room and found out that there was no sign of water inflow. At 04:55, the skipper sent a distress message on the VHF radio, and then he kept the communication with Lyngby Radio and additionally he activated the distress message on the VHF radio with DSC. During this time, the crew and passengers launched the life raft first onto the deck, then into the water and after opening it moored it to starboard. Passengers dressed in clothes they managed to take from the passenger rooms and with lifejackets on, gathered on board awaiting further decisions of the skipper. During this time, a significant increase in water level was found in the bow section of the yacht, which did not decrease despite the activation of both pumps. At ca. 05:10 at the skipper ordered, passengers and the crew went over from the yacht to the raft. While manning the raft, the skipper took the EPIRB, which he activated after sailing away from the sinking yacht. After checking that all people were on the raft, the skipper ordered to cut off the raft painter attached to the yacht. The raft started drifting towards the bow of the yacht allowing to make a visual assessment of the degree of damage to the vessel, and then, moving faster, it drifted away from the yacht.

The survivors who were near the entrance to the raft noticed helicopters coming from the island of Bornholm (DK) and surface vessels sailing for help. The illuminated yacht that was sinking without the list was also in sight. After about 20 minutes, the first rescue unit – FRB-19 reached the raft. At 05:50 shipwrecked people transferred from the raft on board both rescue vessels sailed to the port of Rønne.

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

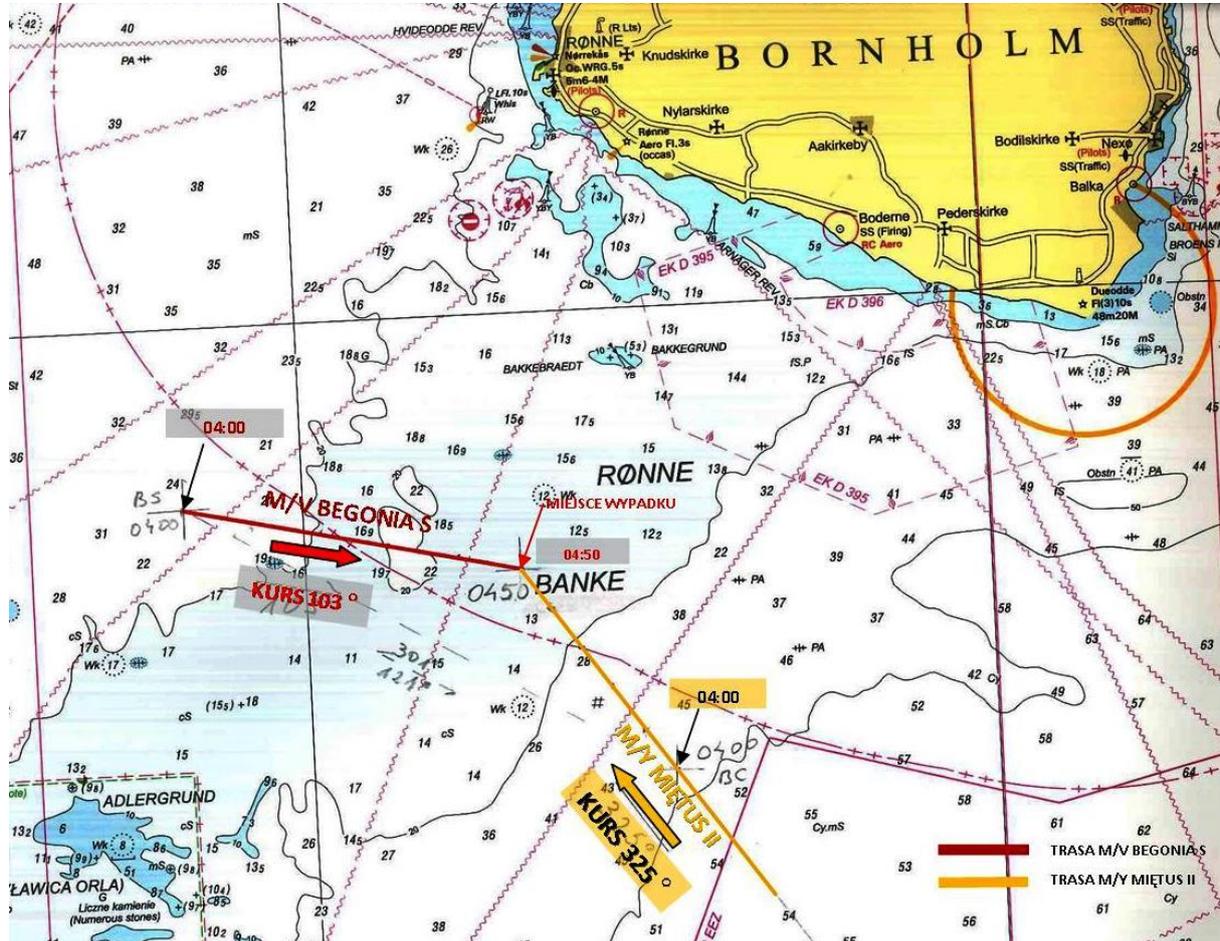


Figure 2: Routes of vessels until the collision

4.1. Mechanical Factors

4.1.1. Performance of Vessels and Equipment

Both *Begonia S* and *Mietus II* were fully functional vessels with efficient navigation and communication equipment and navigation lights installed in accordance with the requirements of the COLREG Convention. Two radars manufactured by Furuno Electric Co. Ltd. (9 GHz and 3 GHz) with 25 kW output signal were installed on *Begonia S*, and on *Mietus II* there was a Furuno Electric Co. Ltd. (9 GHz) radar with an output power of 3 kW. According to the information provided by the crew, all radars were operational. Both vessels were equipped with navigation lights meeting the requirements of Regulation 22 of the COLREG Convention, i.e. mast lights of *Begonia S* were visible from a distance of 6 NM, side lights from a distance of 3 NM, and in relation to *Mietus II*, the mast lights were visible from a distance of 5 NM, and side



lights from a distance of 2 NM. Systems signaling the failure of navigation lights were installed on both vessels. Rear view mirrors were installed on *Mietus II* outside the wheelhouse (just like in the car) allowing the observation of anglers moving on both sides from the bridge. At night, these mirrors reflected the glow of side lights, which was an additional confirmation of their efficiency. Both vessels had two VHF radios - operational and turned on. Despite their communication radio devices, none of the vessels had tried to make contact with the other to warn about the possibility of collision or then to provide assistance. On *Begonia S*, the travel data recorder (S-VDR) had been out of order since 26.10.2018, therefore the administration of the flag state issued a dispensation letter on 04.11.2018 confirming the vessel's ability to navigate during the period of equipment malfunction. The failure of this device had no cause and effect relationship with the accident, but was a hindrance in the process of accident investigation due to the lack of radar image recordings.

4.1.2. Radar Detectability of Objects

On *Mietus II*, which had a radar set at 3 NM with an extended centre of the radar image and relative motion northward, the echo of *Begonia S* was detected from the moment the echo entered the range set by the watchman, i.e. at a distance of about 4 NM. On *Begonia S*, where both radars were set on the 6 NM range with extended centres of radar images, oriented northward, the echo of the yacht was not detected by the watchkeeping officer, neither before nor after the collision. The vessel's radar antennas were 25-30 m above sea level during the voyage. There were no restrictions on radar observation in the sectors from the bow to the starboard traverse. The impulse power of the installed radars was 25 kW ensuring full detection of sailing vessels. The Commission analyzed the radar image from the shore radar, whose antenna is located at a height of about 28 meters above sea level, and the pulse power is similar to the radars of the vessel. On the day of the departure to sea, *Mietus II* was visible on the shore radar screen until it moved more than 14.3 NM away from the radar. It should therefore be assumed that there was a technical possibility of detecting the yacht on the radar screens of *Begonia S*.



Figure 3: „Mietus II” on the coastal radar while going to sea

4.2. Human Factors

4.2.1. Qualifications of the Crew

There were 17 crew members on board *Begonia S*, who met the requirements specified by the administration and included in the Safe Handling Certificate (SMC) - a minimum crew of 12 people. The crew had documents in accordance with the requirements of the flag State and STCW Convention. *Mietus II* had a crew of three with qualifications in accordance with the requirements set out in the yacht's safety card. On 4 November 2018, on the bridge of *Begonia S*, the watch was performed by: the chief officer and the watchkeeping O/S, while on *Mietus II* there was a one-man watch on the bridge kept by a motorboat helmsman. Therefore, formal requirements regarding the manning of watch on both vessels were met.

4.2.2. Rest Hours

There was a three watch system on *Begonia S*. The chief officer and a watchkeeping O/S were on watch between 04-08 and 16-20, meeting the requirements of working and rest hours⁴. The crew of *Mietus II*, the day before, had been employed on a 12-hour cruise, which ended at 17:00.

⁴ MLC and STCW Conventions

At 22:00, after replenishment and boarding a group of 13 anglers, the vessel went out to sea again. The helmsman keeping watch before the collision, had his last period of rest between 22:00 and 2:30. In total, during the 24 hours preceding the accident, the helmsman had about 8 hours of rest.

4.2.3. Observation

On *Mietus II*, since 02:30 the observation and control over the yacht had been conducted by the helmsman. From the control place, an unlimited observation towards the bow and to both sides, as well as the ability to observe the radar screen and other devices were ensured. At night the decks were darkened and only at the stern, at the back of the superstructure there was a light illuminating the entrance to the toilet. The explanations of the crew submitted to the Commission confirm that the visual and radar observation were correct and allowed for an early detection of the approaching *Begonia S*.

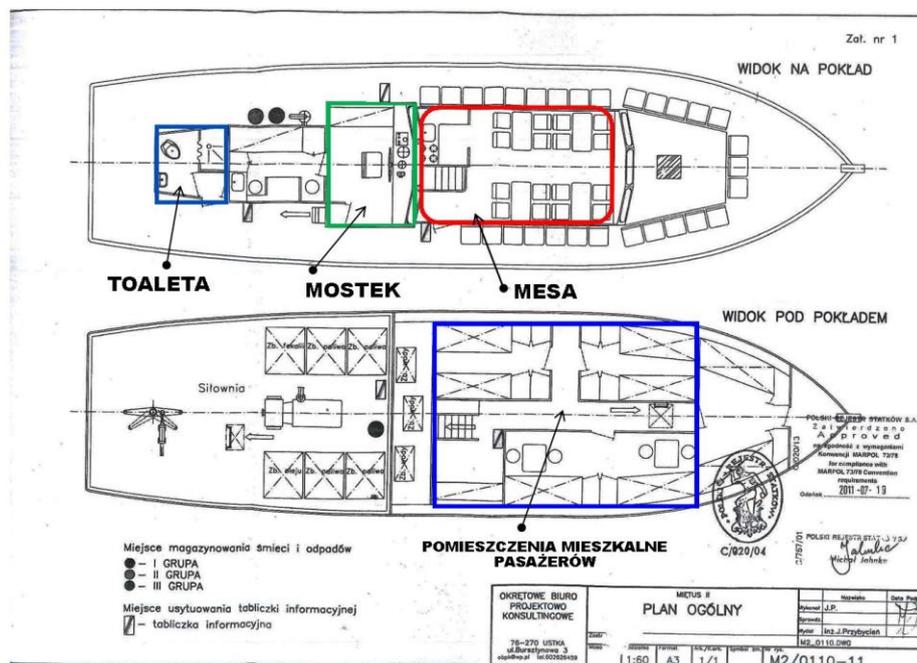


Figure 4: Plan of accommodation aboard „Mietus II”



Photograph 3: The bridge of „Mietus II”

Aboard *Begonia S*, the watchman was conducting visual and radar observation while staying in front of the right radar screen on the bridge before the collision.



Photograph 4: The bridge on „Begonia S”



Photograph 5: The passage between front windows and the panel



Photograph 6: The bridge on starboard of „Begonia S”

In that place, the distance from the front windows of the bridge is about 1.5 m. The watchkeeping officer on the bridge was combining observation with other watchkeeping duties. He was not conducting continuous visual and radar observation. ARPA was set for manual echo acquisition and therefore could not detect and track the echo of *Mietus II* even if it was visible on the radar screen. It is a mistake not to use the possibility of automatic radar echo acquisition as a support for the navigator in detecting and assessing the risk of collision with other vessels. During the watch, the watchkeeping officer was comparing information obtained from the automatic identification system (AIS) with the radar image, finding vessels signaled by AIS on it. The lack of continuous radar observation by a suitably qualified officer meant that the weaker echoes could go unnoticed.

It should be assumed that the radar observation carried out by the watchman cannot be considered effective and meeting the requirements of the COLREG and STCW conventions. Visual observation carried out by the watchman from behind the desktop contained significant limitations with regard to its effectiveness. This was due to the radar screen shining and minimum artificial light that was transferred to the bridge from the navigation part. An additional difficulty in observing the sea surface was lighting of the deck on both sides of the



superstructure. The evidence of the influence of the above-mentioned factors on the quality of observation was the fact that *Mietus II* was noticed only at a distance of about 40 m from *Begonia S*, and the yacht was observed by the officer of the watch and not the O/S whom the lookout duties were entrusted to. By analyzing the information obtained, the Commission was not able to assess why the yacht's echo had not been detected on the radar screen despite the technical possibility of both radars to do so. The reason could be wrong settings of radar operating parameters removing weaker echoes, conducting occasional radar observation or assuming that all vessels have AIS installed. When conducting other accident investigations, the Commission noted that since vessels had been furnished with AIS devices, the quality of radar observations carried out by watchkeeping officers had decreased.

4.2.4. Ability to Estimate the Risk of Collision

Due to a late detection of the yacht, at a distance of about 40 m from the bow, the watchkeeping officer of *Begonia S* had no chance to analyze the risk and could only take actions to minimize the effects of the collision. There was also no time for any communication or attention signal. On *Mietus II*, the vessel, *Begonia S* was being observed for at least 20 minutes until the collision. The observation officer assumed that, in accordance with the provisions of the COLREG Convention, the ship would change course, giving way. No radar plot was carried out, but only visual observation confirming the invariability of bearings on *Begonia S*. Despite having the radar and the ability to precisely determine the distance of the vessel from the yacht, no action was taken to avoid the collision at the moment it became clear that the sole operation of *Begonia S* may not be sufficient to avoid the collision. Actions taken by the helmsman - waking up the skipper and turning to starboard were done too late. Despite doubts as to the correct behavior of *Begonia S*, the helmsman of *Mietus II* did not try to give light or sound signals to draw attention or to radio communicate with the vessel, and above all to wake the skipper in good time.



Time (LT)	Distance between the vessels (NM)
04:00	14,0
04:10	11,4
04:20	8,4
04:30	5,7
04:40	2,6
04:50	0,0

Table 1: Estimated distance between the vessels

4.2.5. Language Barrier

The reason why the helmsman of *Mietus II* did not communicate with the approaching *Begonia S* was the lack of knowledge of English. During the investigation of the accident, it was found that also the ability of the watchkeeping officer of *Begonia S* to communicate in English was substantially limited. The analysis of communication between the yacht and Lingby Radio showed equally significant language limitations while communicating the distress message by the skipper of *Mietus II*.

4.2.6. Evasive Steering

Seeing the inevitability of collision, the helmsman of *Mietus II* had started the turning manoeuvre with the automatic steering system switched on. When the skipper was woken up, he switched the control system from automatic to manual and put the rudder hard to starboard. Just before the collision, the yacht was in the middle of a sharp turn to starboard. The watchkeeping officer of *Begonia S*, after noticing the yacht right at the bow, put the rudder to port. It should be assumed that due to the mass of the vessel and the associated inertia, there was no significant change in the course of the vessel until the moment of collision. The effect of the collision of two hulls was significantly minimized due to the fact that the yacht managed to change its course by about 50° to starboard before hitting the vessel's bow. At the original courses of both vessels, the resultant approach speed was about 17 kn. At the time of a significant change of course by *Mietus II*, this speed decreased to the yacht's own speed, and was further reduced as a result of entering circulation. It should be estimated that the impact on

the hull occurred at a speed of about 5 - 6 kn. This situation protected the wooden yacht from complete destruction of its hull structure at the moment of impact.



Photograph 7: Damage to the bow of „Mietus II”

4.2.7. Reduction of Psychological Abilities at Night Watch

Analyzing the circumstances of the accident in question, the Commission noticed that the crew of *Mietus II* had a 5 hour break between the previous voyage and the voyage during which the accident occurred. Given the activities related to the arrival of the yacht to the port and its departure from the port, this break was in fact about 4 hours. The helmsman who took the watch at 02:30 had time to rest after the yacht left the port of Kołobrzeg, i.e. from around 22:30. However, the conditions in which he rested could have had a negative impact on the quality of his sleep, as a result of which he took over the watch with a sleep deficit (he was not rested), and the night watch had additionally contributed to a serious reduction in his mental fitness and to his fatigue. Mental fitness during work at night decreases, especially when the employee performs monotonous work, consisting in repeating the same activities. In addition, the influence of factors such as silence or inadequate lighting of the workplace can increase the feeling of sleepiness of an employee working at night.

The division of the watch into 4 hours is correct in its assumption that the crew taking over the watch at night has time for uninterrupted rest (sleep) and in correct conditions before taking the watch over. It should be borne in mind that the quality of sleep is affected by the conditions in



which it occurs. Electric light or noise, even if they are not a reason to wake up, change the characteristics of sleep, negatively affecting its quality.

Based on the results of numerous studies, it was shown at what points during twenty-four hours, the man's ability to work is reduced. Human reactions to stimuli are slowed down to their maximum between 23:00 and 6:00.

At night, the functions of the organ of vision and hearing are impaired, the time of psychomotor reaction is extended compared to the daytime. Night work is less tolerated by the human body because it is difficult to adapt the human body to a constantly changing rhythm of activity during twenty-four hours. It is believed that the main factors that expose an employee working at night to mistakes or accidents are: sleep deprivation, temporary loss of consciousness, fatigue and deterioration of mood.

If, before starting work at night, a person performing this work was exposed to a sleep deficit, then the decrease in his mental performance during night work was greater. The abovementioned sleep deficit and night work together constitute a double negative effect of deterioration in mental performance of a person. Such negative effects should be removed as far as possible due to the poorer quality and efficiency of night work, but above all due to its safety.

4.3. Organizational Factors

4.3.1. Organization of Watch on *Begonia S*

The watchkeeping officer was carrying out radar observation and additionally he was performing other watchkeeping activities. For unknown reasons, he did not detect the echo of a 20-meter yacht on the radar screen. He completed radar observations by observing the receiver of the automatic echo identification system (AIS). The watchkeeping O/S also carried out radar observations despite the lack of appropriate qualifications. Complementary visual observation from a place near the radar console was not effective. When there was a thread of the collision, the watchkeeping officer put the rudder to port and then he continued to control the rudder. The Commission considers this to be erroneous because effective ship manoeuvring at that critical time required the watchman to take the helmsman's role and the watchkeeping officer should be able to keep an eye on the situation to minimize the effects of collision on both vessels while obtaining information concerning the other vessel. In addition, the *hard to port* manoeuvre was



very dangerous for the other vessel when, after rubbing against the vessel's side again, it was near the stern of *Begonia S*.

Despite the deck lights of the yacht were lit immediately after the collision, the vessel's watchkeeping crew did not recognize the object with which the collision had just occurred and did not take any action other than calling the master to the bridge.

4.3.2. Organization of Watchkeeping on *Mietus II*

It was a practice on the yacht to keep a one-man watch. After going to sea from Kolobrzeg, the skipper turned the watch over to the engineer, who then at 02:30 turned it over to the helmsman. The Commission noticed that it was incorrect to keep a one-man watch by the engineer whose qualifications do not provide for such a watch. The license held entitles to perform the function of a motorboat engine operator. It should be noted that keeping watch by an engineer had not been related to the accident.

Keeping a one-man watch at night is another matter. There are no binding international or national regulations in this respect. The Commission's view in this respect is contained in the conclusions.

Investigating the accident, the Commission found that after the collision, the skipper did not announce a general alarm for the crew and passengers. The explanation that the passengers, after the collision, started to come up on deck from the accommodation premises, in the opinion of the Commission, was not a sufficient reason to refrain from announcing the alarm.

4.4. Influence of External Factors, Including the Marine-related Ones on the Accident

At the time of the collision there were good hydro-meteorological conditions. The wind force of 3° B and the state of the sea 2 allowed for safe navigation of both vessels. Full cloudiness and good visibility guaranteed easy observation of navigation lights and light signals of other vessels. Hydro-meteorological conditions did not affect the occurrence of the investigated casualty.



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

After the analysis, the Commission concluded that the reason for the collision of *Begonia S* with *Mietus II* on 4 November 2018 at 4:50 in the waters of the Baltic Sea, around 12 NM south of the port of Rønne on the island of Bornholm (DK), was a lack of proper observation by the crew of the navigational watch on *Begonia S* and incorrect assessment of risk and delayed action of the helmsman of *Mietus II* to avoid the collision. In the opinion of the Commission, both of the above mentioned reasons were related to the slowdown of watchkeeping responses to stimuli and impairment of the functions of the organ of vision and hearing, which occur in people working at night, especially in the hours preceding sunrise.

In the opinion of the Commission, the key reason for this and many similar accidents is a poor organization of watchkeeping which permits incorrect observation. In periods of good visibility, correctly conducted visual observation significantly exceeds observation using technical devices in terms of the quality of information obtained. The use of radar and other devices is reasonable as long as they are functional, properly adjusted depending on the existing observation conditions (e.g. sea state, rainfall, etc.) and also and above all as long as they are operated by an observer having the appropriate skills to conduct effective radar image observation and the ability to analyze it.

The crews of navigational watch should be fully aware of the fact that not all vessels operating at sea are equipped with AIS and even if they are, this device may be temporarily out of order. The above applies especially to small vessels whose detection on radar screens requires greater diligence in conducting radar observations than simple confirmation of the presence of echoes signaled by AIS.

Furthermore, based on the analysis of this accident, the Commission came to the following conclusions:

- knowledge of English is very important in international shipping, bearing in mind the necessity of establishing communication with another vessel or shore station, especially when it is necessary to call for help;
- similarly to ships subject to SOLAS and STCW conventions, during periods of limited visibility (night, fog) the watchkeeping on the bridge should be two-handed and if this is impossible, it should be considered to change the watchman more frequently;
- to increase the chance of detecting small vessels with limited or low visibility, they should be equipped with an automatic identification system (AIS) type A or B;



- an important element in ensuring safety of navigation is to ensure proper rest hours and adopt a standard of minimum 10-hours of rest on yachts in each 24-hour period;
- the skipper must ensure that the number of passengers on board a vessel is not greater than the number of passengers required by the security document.

The State Marine Accident Investigation Commission is requesting the Cook Islands' maritime administration to review this report and take any action it deems appropriate to improve safety.

6. Safety Recommendations

The State Maritime Accidents Investigation Commission has found it justified to address safety recommendations constituting proposals of actions that may contribute to prevention of similar accidents in the future to the following entities:

6.1. Begonia S Operator

- the operator of Begonia S is recommended to bring this safety investigation report to the attention of crew members serving on board fleet vessels in order to be studied and discussed during the safety meetings carried out onboard the vessel;
- the operator of Begonia S is recommended to ensure that the proper bridge watch and lookout service is maintained onboard fleet vessels during watches, in particular at night;
- the operator of Begonia S is recommended to ensure that the master standing orders are properly complied with by the OOW onboard fleet vessels during navigation watches;
- the operator of Begonia S is recommended to ensure that safety instruction and training for emergency situations are regularly carried out onboard fleet vessels.

6.2. Mietus II Operator

- the operator of Mietus II is recommended to bring this safety investigation report to the attention of crew members serving on board fleet vessels in order to address the importance of undertaking proper safety measures for every „guest” group taken on board in port and at sea;
- the operator of Mietus II is recommended to review watch keeping procedures to ensure that the master could be relieved in the course of navigation by watchkeeper holding a competence



certificate sufficient to comply fully with the International *Regulations for Preventing Collisions at Sea*.

6.3. Minister Competent for Maritime Industry

To improve the detectability of fishing boats and commercial yachts at night (a collision of a commercial yacht, *Mietus II* with a vessel, *Begonia S*) or in poor visibility (a collision of Polish yacht, *Baltic Condor* with Danish HSC, *Express 1*), to enable SAR service to detect a vessel and provide quick aid (sinking of *SWI 82*) as well as to set true route of a vessel for the purpose of investigation carried out by proper organs, the Commission has recommended to introduce obligatory AIS system on those vessels.

6.4. President of the Office of Electronic Communication

To ensure that the SRC certificate holders have proper knowledge necessary to send effective distress message using all kinds of electronic devices on board, the Commission has recommended to carry out the analysis of training programs and the scope of examination for SRC certificate and undertake appropriate measures.

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10. Glossary and Abbreviations

- AIS - Automatic Identification System
- ARPA - Automatic Radar Plotting Aid
- B (Beaufort) - wind force scale
- BNWAS - Bridge Navigational Watch & Alarm System
- COLREG - International Regulations for Preventing Collisions at Sea
- Distress - emergency communication in danger
- DMAIB - Danish Maritime Accident Investigation Board
- DSC - Digital Selective Calling
- ECDIS - electronic chart display and information system
- EPIRB - Emergency Position Indicating Radio Beacon
- GMDSS - Global Maritime Distress and Safety System
- GT - Gross Tonnage
- JRCC DK - Joint Rescue Coordination Center Denmark
- kW - kilowatt (power unit)
- LAT - φ - Latitude
- LOA- length over all
- LON- λ Longitude
- LT - Local Time
- MAYDAY - radiotelephonic emergency signal
- MLC - Maritime Labour Convention
- Mm – nautical mile
- MMSI - Maritime Mobile Service Identity
- OSC - on-scene coordinator



PB - starboard

PKBWM - (SMAIC) State Marine Accident Investigation Commission

PRS – Polish Register of Shipping

RIB - Rigid Inflatable Boat

SAR - Search and Rescue Service

S band radar – radar working within the range of S (10 cm wave)

SOLAS - International Convention for the Safety of Life at Sea

SRC - Short Range Certificate

STCW - The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers

S-VDR - Simplified Voyage Data Recorder

UTC - Universal Time Coordinated

VHF - very high frequency (30-300 MHz)

VTS - Vessel Traffic Service

k – knot (speed unit)

11. Participation of Substantially Interested States

DMAIB (Danish Maritime Accident Investigation Board) and the Cook Islands Transport Ministry actively participated in the investigation of a very serious maritime casualty - the collision of the motor yacht, *Mietus II* with the vessel, *Begonia S*.

12. Information Sources

Materials from direct depositions of the participants of the accident from both vessels

Materials and photographs (used in the report) from DMAIB and Martinoli & C.S.R.L.

Information and photographs submitted by the operator, Polish Register of Shipping and authorities

Footage of underwater exploration published on

<https://www.youtube.com/watch?v=svUTCT0RHv8> (a frame used as photograph 9)

VTS recording of maritime traffic submitted by maritime authorities



13. Composition of the Investigative Team

Team leader: Tadeusz Wojtasik – the Chairman of the SMAIC.

Team member: Marek Szymankiewicz – the Secretary of the SMAIC.