FINAL REPORT

SMAIC
STATE MARINE ACCIDENT INVESTIGATION COMMISSION

# 84/17

## Serious marine casualty

## m/v Kamelia

Loss of control and bumping against the Nabrzeże Cementowe wharf in the Port of Szczecin on 23 August 2017

**July 2018**

The investigation of a serious marine casualty of the vessel *Kamelia* was conducted under the State Marine Accident Investigation Commission Act of 31 August 2012 (The Journal of Laws item 1068 as amended) 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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## 2. Facts

On 23 August 2017, while sailing along the fairway to the port of Szczecin at 18:00 the vessel lost control of the rudder near the *Babina* beacon and started an uncontrolled turn to starboard. Despite the fact that the bow thruster was working with full power to port, the pitch propeller was set at *full astern* and the right anchor was cast 1.5 shackles into the water, the bow of the vessel leaned against the Nabrzeże Cementowe wharf. As a result of the impact, the underwater part of the wharf and the vessel's bow were damaged. Following the process of unloading on 26 August 2017, the vessel stayed in the port until August 30 to remove the defects and damage which it had suffered during the collision with the wharf and malfunctions of the control system of the pitch propeller

## 3. General Information

### 3.1. Ship Particulars

| | |
|---|---|
| Name: | *Kamelia* |
| Flag: | Maltese |
| Owner: | HS Kamelia OÜ, Tallinn (Estonia) |
| Operator: | Hansa Ship Management OU, Tallinn (Estonia) |
| Classification society: | RINA |
| Type: | General cargo vessel |
| Call sign: | 9HA3170 |
| IMO Number: | 9188958 |
| Gross tonnage: | 2999 |
| Year of built: | 1999 |
| Power: | 2200 kW (Deutz MWM T.B.D. 645 L6) |
| Width: | 13.17 m |
| Length overall: | 95.16 m |
| Hull material: | Steel |


*Photograph 1: Current photograph of m/s Kamelia*

### 3.2. Voyage Particulars

| | |
|---|---|
| Ports en route: | St.Petersburg (the Russian Federation) |
| Port of destination: | Szczecin |
| Type of navigation: | Seagoing |
| Manning: | 9 Russians |

### 3.3. Accident Information

| | |
|---|---|
| Kind: | Serious marine casualty |
| Date and time of the event: | 23 August 2017 at 18:00 |
| Geographical position of the event: | φ = 53° 30.76 N; λ = 014° 37.99’ E |
| Geographical area of the event: | Entrance channel to the port of Szczecin |
| Nature of the water region: | Internal sea waters |

| | |
|---|---|
| Weather during the event: | Wind WNW 1-2° B, sea state 1, air temp. 23° C, water temp. 17° C |
| Operational status of the vessel during the event: | Loaded vessel |
| Place of the accident on board: | Bulbous bow |
| Consequences of the accident to the vessel: | Indentation of the bulbous bow at starboard of the following dimensions: 300 x 300 mm and the depth of 80 mm, and at portside of the following dimensions: 300 x 150 mm and depth 50 mm |
| Consequences of the accident for the port infrastructure: | Damage of the edge of the underside of the wharf of the following dimensions: 3.5 m x 0.35 m x 1.0 m – the concrete crumbled and reinforcement was damaged; and the steel sheet piling was exposed; damage to the sheeting at a length of 2.8 m and a depth of about 3.0 m from the bottom of the sheet, 7 pieces of Larssen segments of sheet piling were flattened and bent about 80 cm (deflection arrow) |


*Photograph 2: Damage of the bulbous bow visible on the exterior*

### 3.4. Shore Services and Rescue Action Information

Following the accident at 18:00, by radio (at Channel 16 VHF) the master asked for the assistance of two tugboats. At 18:45, *Serwal 3* tugboat, and at 19:00 *Hermes* tugboat approached the vessel waiting in drift, and they gave their towlines to the vessel. *Serval 3* was connected to the vessel at the bow through the hawse pipe and *Hermes* at the starboard stern with a towing bar. At 20:10, once the vessel was docked portside to the Nabrzeże Wegierskie wharf both tugboats were discharged.

## 4. Circumstances of the Accident

On 23 August 2017 *Kamelia*, the vessel under a Maltese flag arrived from Sankt Petersburg (the Russian Federation) to the roadstead of Świnoujście. At 14:15 the pilot came on board on the traverse of the buoys no 13 and 14. Once the pilot had embarked the vessel it continued its journey by fairway to Szczecin. Apart from the pilot, the crew of the bridge was composed of the master, a OOW and a maneuvering helmsman. In the port channel in

Świnoujście the vessel was controlled manually, and both anchors at the bow were prepared for casting. After entering the Szczecin Lagoon, the control of the vessel was switched to the autopilot. The journey ran smoothly until the place of turning at the *Babina* beacon. Just before passing the traverse of the *Babina's* beacon when turning from the 174° course to the 198° course by changing the setting on the autopilot, a steering system failure occurred. The rudder automatically turned more than 20° to starboard. Immediately the manual control was restored and the rudder was turned to port and the speed of the vessel was reduced. After the maneuvers, the vessel turned to port, it set perpendicularly to the fairway and came out with its bow section 3 m beyond the boundary of the fairway to the east. The overall length of the vessel exceeded by 5 m the available width of the fairway in the underwater part. The hull, completely losing its speed, leaned its underwater part on the escarpment of the fairway at 17:40. The pilot informed by VHF the duty officers of the port authority about the incident.

In order to return to the fairway at the 198° course, the vessel went full astern while the bow thruster was set at its maximum position to starboard. After setting the vessel on its course, the journey was resumed, reaching the speed of about 7.5 knots. The chief officer was steering the vessel at that time. At about 5:55 pm, on the traverse of the beacon no 58, the attempt was made to use the autopilot for steering the vessel. Once the master switched the main rudder to the autopilot mode, it automatically turned to starboard by 20° - 25°. The vessel started turning to starboard approaching the Nabrzeże Cementowe wharf and the Alfa wharf where a vessel m/v *Doggersbank* was moored. In order to stop further turn to starboard, first the thruster was laid hard to port. Then, to stop the vessel and additionally to prevent it from making the turn at 17:59 the right anchor was cast, no less than one and a half shackle, into the water. Turning of the vessel ceased at the course perpendicular to the wharf but the propeller could not be steered full astern. At 18:00, m/v *Kamelia* at a speed of about 0.8 knots bumped perpendicularly to the edge of the wharf its bulbous bow against the underwater part of the Nabrzeże Cementowe wharf. After the collision m/v *Kamelia* completely lost its speed. The bow of the vessel during the contact with the wharf immersed by ca 15-20 cm, and the bulbous bow slipped under the edge of the wharf to the point where the stem stopped at a distance of about 10 cm from the upper edge of the wharf. A moment later, the bulbous bow and the whole vessel bounced back from the underwater part of the wharf. As a result of the bounce the bow of the vessel emerged from water and the vessel moved back by ca 7-10 m and stopped in the drift.


*Photograph 3: M/v Kamelia in contact with the Nabrzeże Cementowe wharf*

The pilot informed the HMO of Szczecin about the situation, and then informed the master of the vessel about the need to order two tugboats necessary to continue the journey. According to the pilot's request, the master of *Kamelia* arranged two tugboats. The vessel had remained in drift until the tugboats arrived. After arriving at 18:45 *Serwal 3* tugboat was fastened from the central hole at the bow. At 18:55 *Hermes* tugboat was fastened rigidly at the starboard stern. At 19:00 m/v *Kamelia* resumed the trip to the Nabrzeże Węgierskie wharf. During the journey in the towing train, each time when it was necessary to loosen the towlines to make turns, m/v *Kamelia* tended to turn to starboard.

After anchoring the vessel at its port side at 20:10 at the Nabrzeże Węgierskie wharf both tugboats were released. The police arrived on board and carried out an alcohol test of the pilot and crew members. The result of the test was negative. Because the accident damaged the hull of the ship, *Kamelia* lost its class certificate and was inspected by the PSC and the classification society. At the same time, the underwater part of the Nabrzeże Cementowe wharf was inspected at the site of the incident and the waterfront structure was found to be damaged.


*Photograph 4: Underwater photograph of the construction of the Nabrzeże Cementowe wharf after m/v Kamelia had bumped against the wharf*

Similarly, an underwater inspection of the vessel's rudder was made. As a result, no visible damage to the rudder structure or oil leakage was found.

Until the end of the unloading, the specialists called at the site failed to remove the rudder failure. After the unloading, during the change of the mooring place to the Nabrzeże Wrocławskie wharf (Gryfia shipyard test station) it was additionally determined that the control of the pitch propeller is inefficient which resulted in prolongation of the vessel's berthing in Szczecin. It was not until 30 August 2017 that the defects were removed and the RINA inspector issued a relevant class approval. The ship set off from Szczecin at 21:00 on a journey to Riga.

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

The journey of m/v *Kamelia* to the point when the rudder has been spontaneously laid at 20° to starboard had not been different from earlier passages of vessels sailing along the fairway from Świnoujście to Szczecin with a pilot on board.

In the course of the investigation there were determined factors that contributed to the accident. According to the Commission, both events should be treated as a result of malfunction of the steering gear, the autopilot, the adjustable propeller and overlapping human and organizational errors.

### 5.1. Mechanical Factors

A mechanical factor that contributed to the accident was an incorrect operation of the steering gear which automatically laid the rudder to starboard. The delay in overrunning the blades of the propeller to the desired setting was a factor that contributed to the failure to stop the ship from hitting the Nabrzeże Cementowe wharf.

### 5.2. Human Factors (faults and negligence)

An attempt to switch to automatic control was made without assessing the risk, especially the ability to safely stop the vessel in a limited water basin.

The human factor, which largely contributed to the occurrence of the accident, was a failure to check and set a VHF channel of communication between the bridge and the bow. The result was a lack of communication when casting the anchor, and consequently a delay in casting it and imprecise information about the length of the chain to be eased off.

### 5.3. Organizational Factors

The factor which in the opinion of the Commission contributed to the accident was the lack of communication between the bridge and the bow. As a result, casting the right anchor was delayed. In addition, the length of the chain cast into water seems declarative - not real, so its restraining effect was inadequate.

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

There were no external factors influencing the accident. The available information shows that the weather when navigating the fairway was very good, i.e. the force of the wind was 1° B, and the sea level was zero. In addition, the magnitude of the turn, while changing the course, was not significant, so it was unnecessary to lay the rudder to great extent the more so

as the vessels is equipped with a Becker[1] rudder, which does not require a significant and violent movement of a rudder.

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

Both events, that is grounding and bumping against the wharf should be considered inclusively. According to the Commission, both events were caused by an uncontrolled turn of the rudder and the lack of effective speed control of the vessel which would stop it before leaning against the embankment of the fairway and prevent it from bumping into the wharf. In the course of the investigation it has been established that m/v *Kamelia*, before the trip from St. Petersburg, had undergone a repair including docking the vessel and inspecting the propeller shaft and the rudder. It is possible that during the repair either damaged elements had not been replaced or the main rudder elements and the control system of the adjustable blade propeller were damaged after the repair. It results from the entries in the ship's log that everything had functioned properly until the pilot went on board the vessel and it entered the fairway to Szczecin.

According to the information obtained during the investigation, *m/v Kamelia*, after being manned by the pilot at the Świnoujście roadstead, showed significant discrepancies between the data resulting from the pilot card and the actual settings of the adjustable blade propeller during the movement of the vessel. On the card, the speed *full ahead* was marked as a setting of 100% deflection of the lever where in fact the deflection was only 52%, 46% or 42%. In another case, the same deflection of the lever actually meant speed differing by 1.5 knots. From the reports of repairs made during stoppage in Szczecin it appears that the control system of the adjustable blade propeller was inefficient and required the replacement of broken potentiometers.

Therefore, the control of the vessel's speed on the fairway was quite troublesome and required constant adjustments. During maneuvers against sudden turn to starboard before 18:00 the speed of the vessel was about 4.5 knots. After casting the right anchor and unsuccessful attempts to steer the adjustable blade propeller to work *full astern*, the speed

[1] This type of a rudder is more effective than the conventional one also at a low speed of a vessel. In a typical construction of the Becker rudder the blade of the rudder can be turned up to 45° to the side; to the same angle of 45° can be turned additional blade mounted on the main rudder blade.

diminished to 2.5 knots. At the time of impact against the wharf the speed diminished to 0.8 knots. The delay in casting the right anchor turned out to be critical for the course of the events. It was caused by a disagreement between the pilot and the master of the vessel and different assessment of the navigational situation. The master of the vessel wanted to turn the rudder to port and maximize the speed of *m/v Kamelia*. On the other hand, in the pilot's opinion, the distance between the vessel and the Nabrzeże Cementowe wharf did not give a chance of success to avoid the contact of the starboard side with the wharf. As a result, the maneuver proposed by the pilot to drop anchor and adjust the pitch propeller was delayed, and in fact there lacked just a few meters (in time it is a delay of a dozen or so seconds) for the vessel to stop at a safe distance from the wharf.

The pilot's actions should be evaluated positively, because the decision of dropping the right anchor prevented *m/v Kamelia* from turning further, which was very likely to prevent a collision with *m/v Doggersbank* docked at the Alfa wharf (extension of the Nabrzeże Cementowe wharf to the north). At the same time, the pilot ordered to give warning signals with the typhoon to draw attention of the ship's crew, engaged in cargo operations, to the situation taking place in front of the bow of their vessel.

Dropping anchor agreed as a result of the discussion between the master and the pilot was further delayed due to the lack of communication between the bridge and the forecastle. A member of the crew who had been sent to the bow before the turn had a VHF radiotelephone without first checking if the working channel corresponds to the channel set in the VHF at the bridge. As it turned out later, the channels were different, probably 73 and 67. As a consequence, the pilot repeatedly commanded the master to drop the right anchor before the crew realized what was going on and finally the anchor was dropped into the water. As it was determined after a while, the pilot suggested 1 shackle to the water, but the lack of communication did not ensure that precisely that length of the chain had been given out. As it turned out when heaving up the chain - 1.5 shackles had been given out, which corresponded to additional, at least, 12 meters of freedom for the forward movement of the hull. That additional length of the chain influenced the movement of the vessel’s bow towards the wharf, and as a result contributed to the impact of the bulbous bow against the structure of the wharf.

## 7. Safety Recommendations

The State Marine Accident Investigation Commission has found it justified to refer safety recommendations, which are proposals for actions that may contribute to the prevention of similar accidents in the future, to:

### 7.1. The Operator of the Vessel

During the vessel's SMS (safety management system) audits it should be stressed that the crew should correctly implement the procedures regarding the preparation of the vessel before entering/leaving the port and navigation with the pilot. This applies in particular to the control of the steering gear and the efficiency of the control system of the adjustable blade propeller.

Introduction of the effective emergency communication system between the bridge and maneuvering positions.

## 8. List of Photographs



## 9. Glossary and Abbreviations

Deutz MWM (*Deutz Motoren-Werke Mannheim*) – the engine producer
RINA – the Italian classification society

## 10. Information Sources

Notification of the accident.
Hearing of witnesses.
Materials from the master of the vessel.
Materials from the operator of the vessel.
Materials from the classifier.
Materials from the user of the Nabrzeże Cementowe wharf.

Materials from the Harbour Master of Szczecin

## 11. Composition of the Investigative Team

The team conducting the examination was composed of:
the team leader: Eugeniusz Chodań – the Chairman of the SMAIC.
the team member: Marek Szymankiewicz – the Secretary of the SMAIC.