



MINISTRY OF JUSTICE OF THE REPUBLIC OF LITHUANIA  
TRANSPORT ACCIDENT AND INCIDENT INVESTIGATION DIVISION

Serious accident with Estonian flag fishing vessel  
Reval Viking (IMO 9211030) and  
Lithuanian flag fishing vessel Lokys (IMO 9226736),  
that occurred on  
19 August 2019  
in Barents Sea

## **SAFETY INVESTIGATION REPORT**

No. (L-19/12) 1A-108  
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## FOREWORD

The safety investigation is conducted in accordance with Casualty Investigation Code, adopted by IMO resolution MSC.255(84), Commission Regulation (EU) No. 1286/2011 of 9 December 2011 adopting a common methodology for investigating marine casualties and incidents developed pursuant to Article 5(4) of Directive 2009/18/EC of the European Parliament and of the Council, Article 48 of Maritime Safety Law of the Republic of Lithuania and 'Description of the procedure for drawing up and submission of reports and safety recommendations for safety investigations into maritime accidents and incidents', approved by the Order No. 1R-386 of the Minister of Justice of the Republic of Lithuania on 30 December 2015, 'Concerning approval of the Description of the procedure for drawing up and submission of reports and safety recommendations for safety investigations into maritime accidents and incidents'.

*The purpose of the safety investigation is to prevent the occurrence of accidents and incidents in the future, rather than establish blame or liability. The safety investigation is conducted independently of any judicial or administrative proceedings, to apportion blame or liability, are not related to them, and have no impact thereupon.*

Each safety investigation shall be concluded with a report in a form appropriate to the type and seriousness of the accident or incident. The report shall contain, where appropriate, safety recommendations, which shall in no case create a presumption of blame or liability for accident or incident.

The safety investigation report shall not be used as evidence in a judicial or administrative process seeking to apportion blame or liability, because this was not established in the course of the safety investigation and it is not compatible with the objective of the safety investigation.

The safety investigation report is based only on the data established during the safety investigation. The information is published to inform the maritime industry and the public of the general circumstances of the accident or incident. Extracts may be published without specific permission providing that the source is duly acknowledged, the material is reproduced accurately and it is not used in a derogatory manner or in a misleading context.

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## SUMMARY

Owner of seagoing ship	Reval Seafood OU	Marlinas JSC
Operator of seagoing ship	Reval Seafood OU	Marlinas JSC
Building yard of seagoing ship	Ørskov Christensens Staalskibsværft A/S, Kingdom of Denmark	Ørskov Christensens Staalskibsværft A/S, Kingdom of Denmark
Name of seagoing ship	Reval Viking	Lokys
Type of seagoing ship	Fishing	Fishing
Flag of seagoing ship	Republic of Estonia	Republic of Lithuania
IMO number	9211030	9226736
Place of the accident	Barents sea 76°23.7' North, 36°22.9' East	
Date and time of the accident	19 April 2019 2:08 (Coordinated Universal Time) <sup>1</sup>	
Injuries / fatalities	None	None
Persons onboard	Crew – 21 Passengers – 0	Crew – 22 Passengers – 0

### Synopsis

At 2:08 on 19 August 2019, in the Barents Sea, the fishing vessel Reval Viking (IMO No. 9211030) registered in Estonia collided with the fishing vessel Lokys (IMO No. 9226736) registered in the Lithuanian Register of Seagoing Ships. At the time of the collision Lokys was hoisting trawls and Reval Viking had already completed trawl hoisting and was proceeding at a speed of about 11 knots. Due to the impact Lokys sustained penetration damage of the underwater part of the hull, significant damage of the hull above the waterline, the starboard side cabins have been severely damaged. Reval Viking sustained significant damages to the stem, upper and lower forecastle decks. Following the accident, both vessels reached the port of Tromsø in the Kingdom of Norway. No information on environmental damage or injuries was received during the safety investigation.

<sup>1</sup> UTC (*Coordinated Universal Time*) is used in the report, unless provided otherwise. Lithuanian summer time is UTC+3.

## **Safety Investigation**

At 21:22 on 19 August 2019, Lithuanian time, the Lithuanian Transport Safety Administration notified Investigator-In-Charge of Maritime Accidents and Incidents, appointed by the Minister of Justice of the Republic of Lithuania (hereinafter – Investigator-In-Charge) about the accident. On 3 September 2019 Investigator-In-Charge started a preliminary assessment of the accident and cooperation with the Estonian Safety Investigation Bureau (*Ohutusjuurduse Keskus*). On 14 September 2019 Investigator-In-Charge decided to start safety investigation of serious accident. The safety investigation was conducted in close cooperation with the Estonian Safety Investigation Bureau.

## 1

## FACTUAL INFORMATION

## 1.1. Narrative

The circumstances of the accident are described on the basis of the testimony of the ships' crews, historical data from the European Maritime Safety Agency's SEG<sup>2</sup>, records from the logbooks and other information obtained during the safety investigation.

On 18-19 August 2019, Reval Viking and Lokys were engaged in shrimp fishing by trawls in the Barents Sea. Figure 1 shows the routes of the ships from 21:00, 18 August, until 2:08, 19 August (Reval Viking route is shown in blue, Lokys – in red). In the vicinity of the accident site more vessels were fishing. As the latter are not directly related to the accident, they are not shown in Figure 1.

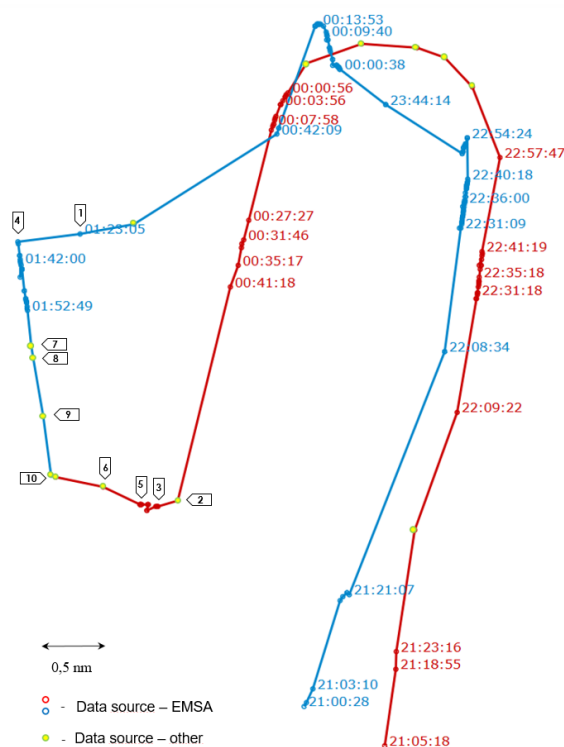


Fig. 1. Reval Viking and Lokys routes

<sup>2</sup> Ecosystem of the specialised system (SafeSeaNet), developed for European Union Member States to exchange maritime information by electronic means.

### 1.1.1. Reval Viking route and actions before the accident

At 21:00 on 18 August 2019, the master came into the wheelhouse, the ship was engaged in trawling. Fishing master was in charge of navigational watch.

At 22:00 master took over the navigational watch from the fishing master. The fishing master finished the work and went to rest, leaving the ship's crew to deal with the problems caused by the trawls. To maintain a safe distance between the vessels, master by 68 radio channel contacted Lokys, which was trawling and proceeding nearby in the same direction, requesting her to keep to the starboard. Lokys changed her heading more to the northeast. The distance between the ships became more than 6 cables<sup>3</sup> (Figure 1).

22:50 the towed trawl hooked to the seabed. The master invited fishing master to the wheelhouse.

23:05 the fishing master came to the wheelhouse and started handling trawls by the fishing gear.

At 1:23:05 on 19 August 2019, trawls were hoisting on board. The ship's position was 76°25.8'N, 36°24'E, heading 266°, speed 2.1 knots (1 position, Fig. 1). The fishing master, using controls in the winch control panel, was hoisting trawls on board and was dealing with the problems with the trawls.

1:36:49 trawls were hoisting on board, ship's position was 76°25.7'N, 36°21.7'E, heading 169.8°, speed 2.2 knots (4 position, Fig. 1).

2:00 trawls hoisting was nearing to completion. The ship's position was 76°24.8'N, 36°22.2'E, heading 176°, speed 2.1 knots (7 position, Fig. 1). As more fishing vessels were fishing in the vicinity, an option to proceed for trawling to another fishing ground with no vessels nearby, was discussed. At that time, the trawl master came into the wheelhouse. He reported damages sustained to the trawls and started to coordinate further fishing plans. The persons in the wheelhouse were standing in the way that they could not see monitors of the navigational equipment. The fishing master, while not agreeing with the master (who was in charge of the navigational watch), took over the control of the vessel and began to increase the speed of the vessel. There are no records in the logbook about the transfer of control of the vessel. According to the fishing master, he had spotted Lokys in the AIS<sup>4</sup> monitor at a distance of 0.5 – 0.7 nautical miles, proceeding southwest. Nobody who was present in the wheelhouse checked the position of nearby ships by all other available navigational means.

2:02 the ship's position was 76°24.7'N, 36°22.3'E, course 170°, speed 4.2 knots (position 8, Fig. 1). Automatic steering control mode was enabled, trawls hoisting was nearing to completion.

2:05 all trawls were hoisted out of the water. The ship's speed was further increased. Crewmembers in the wheelhouse discussed the results of fishing.

2:06 the ship's position was 76°24.2'N, 36°22.6'E, course 170°, speed about 11 knots (point 9, Fig. 1). Those in the wheelhouse were still discussing the results of fishing.

2:07 the trawl master left the wheelhouse.

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<sup>3</sup> One cable is equal to 185.2 meters (1/10 nautical miles).

<sup>4</sup> Automatic Identification System.

### 1.1.2. Lokys route and actions before the accident

At 0:00 on 19 August 2019 master took over the navigational watch from the second mate. Ship was engaged in trawling, her heading was towards the south, about 195°, speed about 2 knots.

1:27 the ship's position was 76°23.5'N, 36°27.5'E, speed 2.3 knots. The ship's heading was changed to the southwest (position 2, figure 1).

1:30 the master, using the trawl winch, started to hoist trawls on board and turned on the ship's warning lights as stipulated in paragraph 2(a) (ii) of the Annex 2 of COLREG<sup>5</sup>. Ship's speed was 2 knots, heading 283°. The master was focused on fishing and was engaged in working with the trawl winch. He was standing by winch control panel and was turned towards the stern. According to the master, he checked the position of nearby ships using navigational equipment but did not identify a collision risk.

1:36:27 the ship's position was 76°23.4'N, 36°26.8'E, heading 250.5°, speed 2.3 knots (position 3, Fig. 1), trawls were hoisting on board.

1:44:38 the ship's position was 76°23.5'N, 36°26.1'E, heading 287.3°, speed 1.5 knots (position 5, figure 1), trawls were hoisting on board.

1:55 the ship's position was 76°23.6'N, 36°24.8'E, heading 288°, speed 2.2 knots (position 6, Fig. 1), trawls were hoisting on board.

### 1.1.3. Course of the accident and actions following the accident

There was no radio contact maintained between both vessels prior the collision. Shortly before the collision, Reval Viking fishing master came from the winch control panel towards the main navigational controls, located in the centre of the wheelhouse. In a few meters distance of the bow of the Reval Viking, he spotted the starboard side of the Lokys. Reval Viking fishing master quickly switched the steering mode to manual, turned the steering wheel to the starboard and set the propeller pitch to 'full astern'.

2:08 Reval Viking and Lokys collided at position 76°23.7'N, 36°22.9'E (position 10, Figure 1). Reval Viking, at a speed of about 11 knots, by her bow, struck the starboard side of Lokys in the area of frame No. 95. At the moment of collision Lokys was engaged in trawl hoisting. Due to impact Lokys temporarily listed 30°- 40° to port.

2:15 Lokys crew inspected the ship and identified the ingress of seawater into two diesel fuel tanks. Diesel fuel was pumped by the crew into other fuel tanks.

2:30 Lokys crew finished hoisting trawls and started to proceed to the port of Troms, Kingdom of Norway.

2:35 Reval Viking crew assessed the collision damages to the ship and started to proceed to the port of Troms as well.

### 1.1.4. Shore authority involvement and emergency response

Shore assistance was not used by collided ships.

## 1.2. Ships' particulars

### 1.2.1. Reval Viking particulars

Particulars of fishing vessel Reval Viking (Fig. 2) are provided in table 1.

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<sup>5</sup> International Regulations for Preventing Collisions at Sea, adopted in 1972 by International Maritime Organization.



Fig. 2. Fishing vessel Reval Viking (photo provided by the operator of the ship)

Table 1. Reval Viking particulars

Flag, registration	Flag of the Republic of Estonia. Registered in the Republic of Estonia.
Classification society	DNV-GL
Identification	International Maritime Organisation (IMO) number: 9211030 Call sign: ESJW Maritime Mobile Service Identity (MMSI) number: 276806000
Main characteristics	Gross tonnage: 2350 Length: 55,296 m Breadth: 14,65 m
Building yard of ship	Ørskov Christensens Staalskibsværft A/S, Kingdom of Denmark
Year of build	2000
Minimum safe manning	Number of crew, indicated in the minimum safe manning document – 11

### 1.2.2. Lokys particulars

Particulars of fishing vessel Lokys (Fig. 3) are provided in table 2.



Fig. 3. Fishing vessel Lokys (photo provided by the operator of the ship)

Table 2. Lokys particulars

Flag, registration	Flag of the Republic of Lithuania. Registered in the Register of Seagoing ships of the Republic of Lithuania.
Classification society	DNV-GL
Identification	International Maritime Organisation (IMO) number: 9226736 Call sign: LYBJ Maritime Mobile Service Identity (MMSI) number: 277558000
Main characteristics	Gross tonnage: 2772 Length: 62,45 m Breadth: 14,6 m
Building yard of ship	Ørskov Christensens Staalskibsværft A/S, Kingdom of Denmark
Year of build	2001
Minimum safe manning	Number of crew, indicated in the minimum safe manning document – 11

### 1.3. Data about the crews

#### 1.3.1. Data about Reval Viking crew

The crew of the ship consisted of 21 seafarers. The master was 60 years old, citizen of the Republic of Estonia. The qualification of the master complied with the requirement laid down in the ship's Minimum Safe Manning Document, issued by Estonian Maritime Administration – to be qualified in accordance with the requirements of Chapter II/2 of the STCW Convention<sup>6</sup>. The fishing master was 57 years old, citizen of the Republic of Iceland. The qualification of the fishing master complied with the requirements laid down in Chapter II/2 of the STCW Convention. Fishing master served onboard Reval Viking since 2013. Seafarers who knew him reported that they have encountered fishing master's risky behaviour while navigating the vessel. Other seafarers were citizens of the republics of Estonia, Ukraine and the Russian Federation.

#### 1.3.2. Data about Lokys crew

The crew of the ship consisted of 22 seafarers. The master was 50 years old, citizen of the Republic of Lithuania. The qualification of the master complied with the requirement laid down in the ship's Minimum Safe Manning Document, issued by Lithuanian Transport Safety Administration – to be qualified in accordance with the requirements of Chapter II/1 of the STCW-F Convention<sup>7</sup>. Master served on board Lokys for 2.5 months. During this time, the ship was undergoing repairs in dock, her fishing equipment was being upgraded. After the repairs were completed, the vessel had been in operation for four days prior to the accident. During this time the crew was trying to get used to work with

<sup>6</sup> STCW Convention – 1978 International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, as amended. The Republic of Estonia is a Party to this Convention. Personnel serving on board fishing vessels registered in the Republic of Estonia shall be certified in accordance with the requirements of this Convention.

<sup>7</sup> STCW-F Convention – 1995 International Convention on Standards of Training, Certification and Watchkeeping for Fishing Vessel Personnel, as amended. The Republic of Lithuania is a Party to the STCW-F Convention from 6 March, 2013. Personnel serving on board fishing vessels, registered in the Register of Seagoing ships of the Republic of Lithuania, is subject to the requirements of this Convention. The Republic of Estonia is not a Party to STCW-F Convention, therefore personnel of Estonian flag fishing vessels is not subject to the requirements of this Convention.

upgraded fishing equipment. The fishing master was citizen of the Republic of Iceland, chief engineer – citizen of the Kingdom of Denmark, other seafarers were citizens of the republics of Lithuania and Ukraine.

#### 1.4. Data on visibility and use of sound signals

The accident occurred at night, but it was daylight hours, twilight, there was no sun.

In the Lokys logbook is stated, that on August 19 at 0:00 visibility was about 6 nautical miles. At about 1:30, when the trawls were started hoisting on board, the fog came in and visibility deteriorated. Lokys logbook records provides, that the visibility at the time of the collision was approximately 2-3 cables.

The Lokys crew provided different visibility data at the time of the collision – some were claiming that the fog was extremely dense and visibility extremely poor, while others witnessed that the visibility due to fog was poor, but it matched the Lokys logbook visibility records.

Reval Viking logbook records provides that visibility at 22:50 on 18 August was about 0.5 nautical miles, at 0:00 on 19 August about 0,3 nautical miles, and visibility at the time of collision was only 30-50 meters.

The Reval Viking crew stated that the visibility at the time of collision was only 30-50 meters.

About half an hour after the accident, the fog dissipated.

Neither the Reval Viking nor the Lokys used sound signals before the accident. The operator of Lokys stated:

*'When working in a fishing vessel group, normally no fog sound signals are used (at the time of the accident, the vessels flying Norwegian, Estonian, Latvian, Lithuanian flags were working in the group and no one was giving a sound signal).'*

#### 1.5. Data on the equipment in the wheelhouse, its operation and use

##### 1.5.1. Lokys wheelhouse equipment, its operation and use

The ship's winch control panel is located in the ship's wheelhouse (Figure 4). When operating it, user stands with his back turned to the ship's bow.

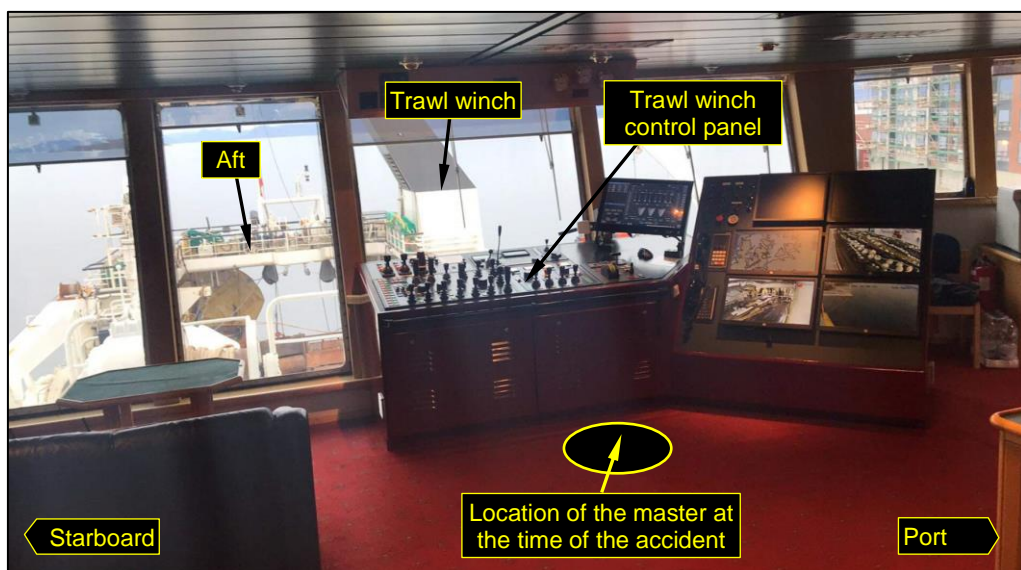


Fig. 4. Lokys wheelhouse and location of the master at the time of the accident

All navigational equipment worked properly. All audible alarms, warning about possibility of collision were turned off. A visual warning alarm of the radar equipment was set to warn of a navigational obstruction.

Prior the collision master saw that this visual warning was signalling, but he ignored it. This practice was common when fishing in the vicinity of other vessels. Master spotted the Reval Viking only when the ships collided.

### **1.5.2. Reval Viking wheelhouse equipment, its operation and use**

The trawl winch control panel is placed in the ship's wheelhouse, similarly as on board Lokys. When operating it, user stands with his back turned to the ship's bow. All navigational equipment worked properly. Two radars and ECDIS<sup>8</sup> were in operation, their audible alarms warning about possibility of collision, were turned off. A visual warning alarm of the radar equipment was set to warn of a navigational obstruction, when the distance to it become equal to 3 cables. ECDIS visual collision alarms were also activated.

## **1.6. Data on human factors and navigational duties**

The safety investigation did not identify any health problems of the Lokys or Reval Viking navigational officers, there is no data about their abnormal psychological condition. No information was received about alcohol or drug abuse.

### **1.6.1. Navigational watch onboard Reval Viking**

There were three navigational officers on board, who were qualified to carry out navigational duty – master, fishing master and second mate. Navigational watch was organized in different way when the vessel was proceeding to or from the fishing ground and when fishing.

When the vessel was proceeding to or from the fishing ground, the navigational watch for the master, the fishing master and the second mate was organised on the basis of the 8 hours shift.

While fishing, the navigational watch for the master and the fishing master was organised on the basis of the 12 hours shift. The fishing master's watch was scheduled from 10:00 at day time, and the master's – from 22:00 at night. The second mate, while fishing, did all the other fishing work as needed, including assistance in the wheelhouse. In addition to navigational duties, these navigational officers supervised the fishing and operated the trawl winch by using the trawl winch control panel.

The working time records in the master's working time record sheet provides, that on 17 August, the master has been in service since 22:00 until 13:00 on 18 August. The master's rest period began at 13:00 on 18 August and continued until 22:00. The master did not complain of fatigue or lack of rest.

The working time records in fishing master's working time record sheet provides that until 22:00 on 17 August the fishing master's hours of work and rest complied with the applicable requirements. On 17 August the fishing master's rest period began at 22:00 and continued until 6:00 on 18 August. On August 18 the fishing master worked from 6:00 until 22:00 pm. After 1 hour rest he continued to work from 23:00 until 3:00 of 19 August.

According to the fishing master, prior the accident, he worked 42 hours without sleep under difficult circumstances, as he had to fix problems with trawls. Nevertheless, he stated, that he did not feel particularly tired, as he often had to work long hours without sleep and he was used to it.

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<sup>8</sup> Electronic Chart Display and Information System.

### 1.6.2. Navigational watch onboard Lokys

There were three navigational officers on board, who were qualified to carry out navigational duty – master, fishing master and second mate. Navigational watch was organized in different way when the vessel was proceeding to or from the fishing ground and when fishing.

When the vessel was proceeding to or from the fishing ground, the navigational watch for the master, the fishing master and the second mate was organised on the basis of every 8 hours shift.

While fishing, the navigational watch for the master and the second mate was organised on the basis of the 12 hours shift. The second mate's watch was scheduled from 12:00 at day time, and the master's – from 0:00 at night. The fishing master, while fishing, did all the other fishing work as needed, including assistance in the wheelhouse. In addition to navigational duties, these navigational officers supervised the fishing and operated the trawl winch by using the trawl winch control panel.

Prior and at the moment of the accident the Lokys master in the wheelhouse was alone.

The master's working time records in the working time record sheet indicates, that the master's hours of rest complied with the applicable requirements. The master did not complain of fatigue or lack of rest.

### 1.7. Data about the consequences of the accident

The accident caused severe damage to the Reval Viking bow (Figure 5), upper and lower forecastle decks, hull plating and internals. Reval Viking underwater part of the bow was inspected by divers, no serious damages were detected.

The accident caused severe damage to the Lokys hull's starboard side in the area of frame 95, about 7 meters above the waterline (Figure 6). In the impact zone two cabins were arranged, which were completely destroyed, their furniture, equipment were broken, items damaged. One other cabin was also slightly damaged. There were no people in the damaged cabins at the moment of the accident.

The accident also caused damage to the Lokys underwater part of the hull. Figure 6 shows penetration damages to two diesel fuel tanks.



Fig. 5. Reval Viking bow damages (photo provided by the operator of the ship)



Fig. 6. Lokys starboard damages (photos provided by the operator of the ship)

## 1.8. Additional information

### 1.8.1. Requirements for conduct of vessels in restricted visibility

Requirements set out in the COLREG:

*'Rule 3. General definitions*

<...>

*(l) The term 'restricted visibility' means any condition in which visibility is restricted by fog, mist, falling snow, heavy rainstorms, sandstorms or any other similar causes. <...>*

*Rule 19. Conduct of vessels in restricted visibility*

*(a) This Rule applies to vessels not in sight of one another when navigating in or near an area of restricted visibility.*

*(b) Every vessel shall proceed at a safe speed adapted to the prevailing circumstances and conditions of restricted visibility. <...>.*

*(c) Every vessel shall have due regard to the prevailing circumstances and conditions of restricted visibility when complying with the Rules of section I of this part. <...>.*

*Rule 35. Sound signals in restricted visibility*

*In or near an area of restricted visibility, whether by day or night, the signals prescribed in this Rule shall be used as follows:*

*<...>*

*c) <...> a vessel engaged in fishing <...> shall <...> sound at intervals of not more than 2 minutes three blasts in succession, namely one prolonged followed by two short blasts. ‘*

**1.8.2. Look-out requirements**

Requirements, set out in the COLREG:

*‘Rule 5. Look-out*

*Every vessel shall at all times maintain a proper look-out by sight and hearing as well as by all available means appropriate in the prevailing circumstances and conditions so as to make a full appraisal of the situation and of the risk of collision.’*

Requirements, set out in the STCW-F Convention:

*‘Chapter IV. Watchkeeping*

*<...>*

*Regulation IV/1. Basic principles to be observed in keeping a navigational watch on board fishing vessels*

*<...>*

*4.6. Look-out*

*4.6.1 A proper look-out shall be maintained in compliance with Rule 5 of the International Regulations for Preventing Collisions at Sea, 1972. It shall serve the purpose of:*

*4.6.1.1. maintaining a continuous state of vigilance by sight and hearing as well as by all other available means, with regard to any significant changes in the operating environment;*

*4.6.1.2 fully appraising the situation and the risk of collision, stranding and other dangers to navigation; and*

*<...>*

*4.6.2. In determining that the composition of the navigational watch is adequate to ensure that a proper look-out can continuously be maintained, the skipper shall take into account <...> the following factors:*

*4.6.2.1. visibility, state of weather and sea;*

*4.6.2.2. traffic density, and other activities occurring in the area in which the vessel is navigating;*

*<...>*

*4.6.2.4. the additional workload caused by the nature of the vessel's functions, immediate operating requirements and anticipated manoeuvres;*

*<...>*

*4.6.2.12. the configuration of the wheelhouse, to the extent such configuration might inhibit a member of the watch from detecting by sight or hearing any external developments.’*

Requirements, set out in Part A of the STCW Code<sup>9</sup>:

*'Chapter VIII. Standards regarding Watchkeeping*

*<...>*

*Section A-VIII/2. Watchkeeping arrangements and principles to be observed*

*<...>*

*Part 4 – Watchkeeping at sea*

*<...>*

*Part 4-1 – Principles to be observed in keeping a navigational watch*

*<...>*

*Lookout*

*14. A proper lookout shall be maintained at all times in compliance with rule 5 of the International Regulations for Preventing Collisions at Sea, 1972, as amended and shall serve the purpose of:*

*.1 maintaining a continuous state of vigilance by sight and hearing, as well as by all other available means, with regard to any significant change in the operating environment; .*

*.2 fully appraising the situation and the risk of collision, stranding and other dangers to navigation;*

*<...>*

*15. The lookout must be able to give full attention to the keeping of a proper lookout and no other duties shall be undertaken or assigned which could interfere with that task.*

*<...>*

*17. In determining that the composition of the navigational watch is adequate to ensure that a proper lookout can continuously be maintained, the master shall take into account all relevant factors, including those described in this section of the Code, as well as the following factors:*

*.1 visibility, state of weather and sea;*

*.2 traffic density, and other activities occurring in the area in which the vessel is navigating; .*

*<...>*

*.4 the additional workload caused by the nature of the ship's functions, immediate operating requirements and anticipated manoeuvres;*

*.5 the fitness for duty of any crew members on call who are assigned as members of the watch.'*

### **1.8.3. Requirements for the use of navigational equipment**

Requirements, set out in the COLREG:

*'Rule 7. Risk of collision*

*<...>*

*(b) Proper use shall be made of radar equipment if fitted and operational, including long-range scanning to obtain early warning of risk of collision and radar plotting or equivalent systematic observation of detected objects.'*

<sup>9</sup> Seafarers' Training, Certification and Watchkeeping Code. Annex. Part A. Mandatory standards regarding provisions of the annex to the 1978 International Convention on Standards of Training, Certification and Watchkeeping.

Requirements, set out in the STCW-F Convention:

*'Chapter IV. Watchkeeping*

*<...>*

*Regulation IV/1. Basic principles to be observed in keeping a navigational watch on board fishing vessels*

*<...>*

*4.4. Navigational equipment*

*4.4.1 The officers in charge of the watch shall make the most effective use of all navigational equipment at their disposal.*

*4.4.2 When using radar the officer in charge of the watch shall bear in mind the necessity to comply at all times with the provisions on the use of radar contained in the applicable regulations for preventing collisions at sea.'*

Requirements, set out in Part A of the STCW Code:

*'Chapter VIII. Standards regarding Watchkeeping*

*<...>*

*Section A-VIII/2. Watchkeeping arrangements and principles to be observed*

*<...>*

*Part 4 – Watchkeeping at sea*

*<...>*

*Part 4-1 – Principles to be observed in keeping a navigational watch*

*<...>*

*Performing the navigational watch*

*<...>*

*37. The officer in charge of the navigational watch shall use the radar whenever restricted visibility is encountered or expected, and at all times in congested waters, having due regard to its limitations.'*

#### **1.8.4. Requirements for safe speed**

Requirements, set out in the COLREG:

*'Rule 6. Safe speed*

*Every vessel shall at all times proceed at a safe speed so that she can take proper and effective action to avoid collision and be stopped within a distance appropriate to the prevailing circumstances and conditions.*

*In determining a safe speed the following factors shall be among those taken into account:*

*(a). By all vessels:*

*(i) the state of visibility;*

*(ii) the traffic density including concentrations of fishing vessels or any other vessels;*

*(iii) the manoeuvrability of the vessel with special reference to stopping distance and turning ability in the prevailing conditions;*

*(iv) at night the presence of background light such as from shore lights or from back scatter of her own lights;*

*(v) the state of wind, sea and current, and the proximity of navigational hazards;*

(vi) the draught in relation to the available depth of water.

(b). Additionally, by vessels with operational radar:

(i) the characteristics, efficiency and limitations of the radar equipment;

(ii) any constraints imposed by the radar range scale in use;

(iii) the effect on radar detection of the sea state, weather and other sources of interference;

(iv) the possibility that small vessels, ice and other floating objects may not be detected by radar at an adequate range;

(v) the number, location and movement of vessels detected by radar;

(vi) the more exact assessment of the visibility that may be possible when radar is used to determine the range of vessels or other objects in the vicinity.'

### 1.8.5. Requirements to be observed in keeping a navigational watch

Requirements, set out in the STCW-F Convention:

*'Chapter IV. Watchkeeping*

<...>

*Regulation IV/1. Basic principles to be observed in keeping a navigational watch on board fishing vessels*

<...>

*2. The skipper of every fishing vessel shall ensure that watchkeeping arrangements are adequate for maintaining a safe navigational watch. Under the skipper's general direction, the officers of the watch are responsible for navigating the fishing vessel safely during their periods of duty, when they will be particularly concerned with avoiding collision and stranding.*

<...>

*4.3. Navigation*

<...>

*4.3.4. The officer in charge of a navigational watch shall not be assigned or undertake any duties which would interfere with the safe navigation of the vessel.'*

Requirements, set out in Part A of the STCW Code:

*'Chapter VIII. Standards regarding Watchkeeping*

<...>

*Section A-VIII/2. Watchkeeping arrangements and principles to be observed*

<...>

*Part 4 – Watchkeeping at sea*

<...>

*10. The master of every ship is bound to ensure that watchkeeping arrangements are adequate for maintaining a safe navigational or cargo watch. Under the master's general direction, the officers of the navigational watch are responsible for navigating the ship safely during their periods of duty, when they will be particularly concerned with avoiding collision and stranding.*

*Part 4-1 – Principles to be observed in keeping a navigational watch*

<...>

*Performing the navigational watch*

<...>

24. *The officer in charge of the navigational watch shall:*

<...>

*.3 continue to be responsible for the safe navigation of the ship, despite the presence of the master on the bridge, until informed specifically that the master has assumed that responsibility and this is mutually understood.*

<...>

27. *The officer in charge of the navigational watch shall not be assigned or undertake any duties which would interfere with the safe navigation of the ship.*

<...>

31. *A proper record shall be kept during the watch of the movements and activities relating to the navigation of the ship.'*

### 1.8.6. Requirements for fatigue prevention

Reval Viking seafarers were subject to 1 January 2019 version of the Estonian Seafarers Employment Act, where following provisions on the crew rest regime are provided:

*'§ 48. Daily rest time*

*An agreement by which a crew member is left with less than ten hours of rest time over a period of 24 hours is void. Over a period of 24 hours the rest time may be divided into two periods, provided the duration of one period is at least six consecutive hours. The time between two consecutive rest times may not exceed 14 hours.'*

Lokys seafarers were subject to 28 June 2019 version of the 'Description of the Peculiarities of Working Time and Rest Time in the Spheres of Economic Activities', approved by the Resolution of Government of the Republic of Lithuania No. 496 of 21 June 2017 'On the Implementation of the Labour Code', where following provisions on the crew rest regime are provided:

*'CHAPTER VIII*

*PECULIARITIES OF WORKING TIME AND REST TIME ON BOARD FISHING VESSELS*

*56. <...>. The on-board working and rest schedule shall be such as to guarantee a minimum rest period of 10 hours per day and a minimum rest period of 77 hours per 7-day period. This daily rest period may be divided into no more than 2 periods, one of which shall not be less than 6 hours and the interval between 2 consecutive rest periods shall not exceed 14 hours.'*

Requirements, set out in the STCW-F Convention:

*'Chapter IV. Watchkeeping*

<...>

*Regulation IV/1. Basic principles to be observed in keeping a navigational watch on board fishing vessels*

<...>

*4.2 Fitness for duty*

*The watch system shall be such that the efficiency of watchkeeping personnel is not impaired by fatigue. Duties shall be so organized that the first watch at the commencement of a voyage and the subsequent relieving watches are sufficiently rested and otherwise fit for duty.'*

Requirements, set out in the STCW Convention:

*Chapter VIII. Watchkeeping*

*Regulation VIII/1 Fitness for duty*

*1 Each Administration shall, for the purpose of preventing fatigue:*

*<...>*

*.2 require that watch systems are so arranged that the efficiency of all watchkeeping personnel is not impaired by fatigue and that duties are so organized that the first watch at the commencement of a voyage and subsequent relieving watches are sufficiently rested and otherwise fit for duty.*

### 1.8.7. Effects of fatigue

The Guidelines on Fatigue<sup>10</sup> provides:

*'8. These guidelines should be taken into consideration when:*

*<...>*

*.4 conducting casualty or accident/incident investigations*

*<...>*

*Module 1*

*<...>*

*Effects of fatigue*

*42. When a person is affected by fatigue, performance on the job can be significantly impaired. Impairment will occur in every aspect of human performance (physically, emotionally, and mentally) such as in decision-making, response time, judgement, hand-eye coordination and countless other skills. When impairment due to fatigue, such as impaired memory or poor communication, coincides with other risks in the environment, incidents can result. This is evidenced in a number of maritime casualties in which fatigue was a contributory factor. Maritime studies have also confirmed the association between fatigue and poor performance.*

*43. People are poor judges of their own level of fatigue, performance and decision-making. The following is a sample of fatigue's known effect on performance:*

*.1 Fatigued individuals become more susceptible to errors of attention and memory (for example, it is not uncommon for fatigued individuals to omit steps in a sequence).*

*.2 Fatigued individuals will often select strategies that have a high degree of risk on the basis that they require less effort to execute.*

*.3 Fatigue can negatively affect an individual's ability to identify and respond to stimuli.*

*.4 Fatigue can also negatively affect problem-solving, which is an integral part of handling new or challenging tasks.'*

<sup>10</sup> Guidelines adopted on 24 January 2019 by International Maritime Organisation's Maritime Safety Committee Circular MSC.1/Circ.1598.

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# 2

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## ANALYSIS

### 2.1. Visibility

Lokys and Reval Viking crews rated visibility differently. At the time of the accident some crew members estimated the visibility to be 370-550 meters, others – only 30-50 meters, and others said the fog was extremely thick at the time of the accident. This shows that the two ships passed through different intensity fog areas before the accident, visibility was constantly changing. At the moment of the accident visibility was limited and the ships collided in a restricted visibility area.

### 2.2. Actions prior to the accident

#### 2.2.1. Look-out and use of navigational equipment

Navigational watch on board Lokys was carried out by the master, he was alone in the wheelhouse. The ship was engaged in trawling and from about midnight she was proceeding towards south. From 1:27 ship began hoisting trawls and her heading was changed to the southwest. The master was focused on fishing and engaged with the trawl winch control panel, standing with his back turned to the bow. Lokys master at 1:30 checked the position of nearby ships using navigational equipment, he did not identify a collision risk.

Navigational watch onboard Reval Viking was carried out by the master. There was also the fishing master in the wheelhouse, who was engaged with the trawl winch control panel. At about 1:36 Reval Viking's heading was changed to the south. Since in the wheelhouse the navigational environment was not monitored, it was not noticed that the Lokys was already proceeding southwest after changing her heading.

At about 2:00 the trawl master came into the Reval Viking's wheelhouse. All three seafarers, while standing in the Reval Viking's wheelhouse place from where they could not see monitors of navigational equipment, discussed fishing results and plans. At the same time, without agreeing with the master and with no agreement on who of them shall remain responsible for look-out, the fishing master took over the control of the vessel.

In accordance with the STCW Convention, only officers of the navigational watch are responsible for navigating the ship safely during their periods of duty, when they will be particularly concerned with avoiding collision and stranding.

Therefore the ship operator should foster a safety culture and prevent the recurrence of similar situations. Everybody in the wheelhouse shall always know who of the navigational officers is in charge of the navigational watch and who

of them is part of the navigational watch, and any changes in the composition of the navigational watch shall be recorded in the logbook.

Taking this into account:

*SR-2020-L-03*

*It is recommended to Reval Seafood OU develop and implement measures for its vessels, explaining when the deck officers in the wheelhouse are considered as part of the navigational watch and obligating to make records into logbook about the changed composition of the navigational watch.*

*SR-2020-L-04*

*It is recommended to Reval Seafood OU develop and implement measures for its vessels, ensuring the prevention of any navigational action, that is not agreed with the officer-in-charge of the navigational watch.*

Although Reval Viking fishing master at about 2:00 had spotted Lokys in the AIS monitor at a distance of 0.5 – 0.7 nautical miles, he did not identify a collision risk. Collision risk was not assessed by all available navigational means.

From 1:44 until the collision, Reval Viking and Lokys headings had little change: the Reval Viking was proceeding with about 175° heading and the Lokys – 283°. Both vessels were engaged in hoisting trawls.

These circumstances show that the seafarers in the wheelhouses of the two collided ships were focused on fishing. None of the collided ships were maintaining a continuous state of vigilance by sight as well as by all other available means, no assessment with regard to any significant changes in the operating environment was carried out.

### **2.2.2. Vessels' speed before the accident**

Taking into account that both ships were navigating in or near an areas of restricted visibility, navigational officers should have followed the COLREG Rule 19, which requires each ship to proceed at a safe speed adapted to the prevailing circumstances and conditions of restricted visibility.

Until about 2:00 the speed of Reval Viking and Lokys was similar - the ships were moving at about 2 knots. The speed of the Lokys which was hoisting trawls, did not change significantly until the collision.

At about 2:00 the speed increase of Reval Viking was started. The Reval Viking fishing master, who increased the speed, has not agreed in advance regarding this action with the master, who acted as officer in charge of the navigational watch. At 2:05 the Reval Viking finished hoisting trawls and her speed was further increased. At 2:06 the Reval Viking speed reached 11 knots. Such speed was not safe and was chosen without taking into account the visibility, which, according to the Reval Viking crew, was only 30-50 meters.

Also, the risk of collision was not adequately assessed by the available navigational means, the ship's further route was not clearly planned. Both while increasing the speed and when the 11 knots value was achieved, the navigational environment continued to be unobserved. Only a few seconds before the collision, the fishing master, while coming to the front part of the wheelhouse, identified Lokys in few meters distance of the bow of the Reval Viking. To avoid the collision was no longer an option.

### 2.2.3. Usage of sound signals

Taking into account that Reval Viking and Lokys were navigating in or near an areas of restricted visibility, in accordance with COLREG Rule 35 both vessels were required to give sound signals at intervals of not more than 2 minutes. This requirement was not complied with, and this practice was widespread not only among Lokys and Reval Viking, but also among fishing vessels in vicinity. As a result, Reval Viking's and Lokys' officers in-charge on navigational watch were unable to identify collision hazard by listening.

### 2.3. Reval Viking master's and fishing master's work and rest time

According to the records in the master's working time record sheet and other information collected during the safety investigation, the master has been in service since 22:00 of 17 August until 13:00 of 18 August. Then the master until 21:00 had 8 hours rest. This means that during the 24 hours period before the accident master's rest time was 8 hours. According to the records in the fishing master's working time record sheet, the fishing master has been in service since 6:00 of 18 August until 3:00 of 19 August, with a 1 hour rest on 18 August from 22:00 until 23:00. This means that during the 24 hours period before the accident his rest time was 3 hours 50 min.

This data about rest time shows, that the Reval Viking master's and fishing master's rest time prior to the accident did not meet the requirements for fatigue prevention (see section 1.8.6). The master's rest time within 24 hours was 2 hours less than required, the fishing master's - even several times less than required, and as provided by the fishing master himself, he worked as much as 42 hours prior the accident with no sleep.

Although the master of the Reval Viking did not complain of fatigue or lack of rest and the fishing master stated that he did not feel extremely tired because he often had to work long hours without sleep and was accustomed to it, according to the International Maritime Organization's Guidelines on Fatigue, fatigued people are poor judges of their own level of fatigue, performance and decision-making. Moreover, these guidelines states that fatigued individuals often select strategies that have a high degree of risk on the basis that they require less effort to execute. Therefore, it is very likely, that insufficient rest and lack of sleep might have had a negative impact on the fishing master to fully assess the navigational environment before taking over the control of the vessel from the master and to risk by choosing a vessel speed of 11 knots. Fatigue could also have had an adverse impact on the master's decisions concerning navigation, in assessing the situation or when monitoring the navigational environment.

Insufficient rest of the master and the fishing master was caused by unplanned additional fishing-related activities on board. Taking this into account:

SR-2020-L-05

*It is recommended to Reval Seafood OU develop and implement measures to ensure that, even in the event of unplanned fishing-related activities, its vessels maintain the required work and rest regime, in particular for those working in the wheelhouse.*

### 2.4. Organisation of navigational watch on board Lokys

The Lokys master's rest time was in accordance with the requirements, the master did not complain of fatigue or lack of rest.

Prior and at the moment of the accident the Lokys master in the wheelhouse was alone. The master was focused on fishing and engaged with the trawl winch control panel, standing with his back turned to the bow.

The master saw the visual warning, signalling about the navigational obstruction, but he ignored it. This practice was common when fishing in the vicinity of other vessels. The master identified the Reval Viking only when ships collided.

Pursuant to the requirements of STCW-F Convention, the officer in charge of a navigational watch shall not be assigned or undertake any duties which would interfere with the safe navigation of the vessel.

These circumstances show that at certain fishing stages a single navigational officer in the wheelhouse cannot properly carry out navigational watch in parallel with his or her fishing duties. Taking this into account:

*SR-2020-L-06*

*It is recommended to JSC Marlinas develop and implement measures for it's vessels, ensuring that during the fishing, officer in charge of navigational watch does not assume any duties that interfere with the safe navigation.*

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# 3

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## CONCLUSIONS

### 3.1. Cause of the accident

The accident occurred when ships Reval Viking and Lokys did not notice each other in time, while proper lookout was not carried out on board of both ships.

### 3.2. Safety deficiencies and safety issues

1. Within few hours prior to and during the accident, Reval Viking and Lokys have been navigating in or near areas of restricted visibility. Neither of the vessels properly addressed this circumstance.

2. While navigating, the continuous state of vigilance by sight as well as by all other available means was not maintained on board Reval Viking and Lokys.

3. In the wheelhouses of both collided ships all audible alarms, warning about possibility of collision, were turned off. Operational visual collision alarms were ignored.

4. Prior to collision, the Reval Viking was navigating in a dense fog area with very limited visibility, at a speed of 11 knots.

5. Reval Viking and Lokys, while navigating in or near an areas of restricted visibility, did not give sound signals as required by COLREG Rule 35. As a result, officers in-charge of navigational watch of the ships were unable to identify collision hazard by listening.

6. Navigational watch in the Reval Viking wheelhouse prior and at the moment of the collision was carried out by the master, however, 8 minutes before the collision, control of the vessel was taken over by the fishing master who began to increase the speed of the vessel. The fishing master has not agreed in advance with the master on taking over of the control of the vessel, as well as on the further route, and who of them shall remain responsible for look-out. The collision hazard was not assessed by all available means before increasing speed.

7. 8 minutes prior the collision, trawl master came into the Reval Viking wheelhouse. He reported to the master and fishing master about damages sustained to the trawls and started to coordinate further fishing plans. This circumstance distracted the navigational officers in the wheelhouse, and the navigational environment continued to be unobserved.

8. The Reval Viking fishing master worked 42 hours without sleep prior to the accident, therefore his rest time before the accident was well below what was required. Insufficient rest and lack of sleep might have had a negative impact on

the fishing master's ability to fully assess the navigational environment before taking over the control of the vessel from the master and to risk by choosing a vessel speed of 11 knots.

9. The Reval Viking master's rest time prior the accident was below what was required. Insufficient rest could also have had an adverse impact on the master's decisions concerning navigation, in assessing the situation or when monitoring the navigational environment.

10. Prior and at the moment of the accident, the Lokys master in the wheelhouse was alone. He was focused on fishing. As a result, the master had very limited ability to carry out proper look-out.

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# 4

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## SAFETY RECOMMENDATIONS

Safety recommendation: with a view to avoiding accidents and incidents in the future, the safety investigation authority drew up a proposal based on the information collected on the basis of the safety investigation, and other sources, for instance, other safety studies.

Safety recommendations shall in no case create a presumption of blame or liability for an accident or incident.

The following Safety Recommendations are made in this report:

**SR-2020-L-03**

*It is recommended to Reval Seafood OU develop and implement measures for its vessels, explaining when the deck officers in the wheelhouse are considered as part of the navigational watch and obligating to make records into logbook about the changed composition of the navigational watch.*

**SR-2020-L-04**

*It is recommended to Reval Seafood OU develop and implement measures for its vessels, ensuring the prevention of any navigational action, that is not agreed with the officer-in-charge of the navigational watch.*

**SR-2020-L-05**

*It is recommended to Reval Seafood OU develop and implement measures to ensure that, even in the event of unplanned fishing-related activities, its vessels maintain the required work and rest regime, in particular for those working in the wheelhouse.*

**SR-2020-L-06**

*It is recommended to JSC Marlinas develop and implement measures for its vessels, ensuring that during the fishing, officer in charge of navigational watch does not assume any duties that interfere with the safe navigation.*