



# **STATE COMMISSION ON MARITIME ACCIDENT INVESTIGATION**

## **SIMPLIFIED REPORT 59/14**

**Serious marine casualty**

**M/T JUTLANDIA SWAN**

Grounding in the fairway in Świnoujście  
on the day of 30 December 2014

**July 2015**

The examination of a marine casualty of Jutlandia Swan was conducted under the State Commission on Maritime Accident Investigation Act of 31 August 2012 (The Journal of Law item 1068) as well as norms, standards and recommended procedures agreed within the International Maritime Organisation (IMO) and binding the Republic of Poland

The objective of the investigation of a marine accident or incident under the above-mentioned Act is to ascertain its causes and circumstances to prevent future accidents and incidents and improve the state of marine safety.

The State Commission on Maritime Accident Investigation does not determine liability nor apportion blame to persons involved in the marine accident 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 Commission on Maritime Accident Investigation Act).

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## 1. Facts

On December 30, 2014 at 16:18 the ship Jutlandia Swan unmoored from the CPN-2 fuel berth in Świnoujście. At 16:25 the alarm “high temperature of cooling water at the outlet of the ME in the high-temperature circuit” activated in the engine room. The chief engineer ordered the second and third engineers to determine the cause of the temperature rise in the cooling system of the main engine (ME). The engineers were not able to establish the reason for malfunctioning of the cooling. At the request of the chief engineer the master reduced the propeller pitch twice to diminish the load of the engine.

At 15:30 the “ME load reduction” alarm was activated. At the same time, the chief engineer noticed that the valve No. 010 in the cooling water system of the ME was closed, which disabled the flow of water to the radiator. After opening the valve No 010 there was a sharp drop in the pressure of cooling water for the ME in the high-temperature cooling circuit and the “ME automatic stop” alarm was activated causing immobilization of the main engine and loss of propulsion.

It was impossible to restore the propulsion, therefore for the safety of the ship and navigation on the fairway the master turned the ship to the western part of the fairway and at 16:35 he dropped port anchor. Shortly after dropping anchor, the ship stopped with her bow between buoys “A” and “B” setting across the fairway on the west side. When the ship stopped at anchor, it turned out that the bow of the ship went aground.

The first officer checked the condition of cargo and ballast tanks. There was no leakage of water into tanks. Two tug boats ”Odys” and “Uran” were used to pull the ship off the ground.

## 2. General Information

### 2.1. Ship Particulars

Ship's name:	Jutlandia Swan
Flag:	Denmark
Shipowner (operator):	Uni – Tankers A/S Denmark
Classification society:	DNV-GL
Vessel's type:	tanker
Call signal:	OYIO2
IMO number:	9350757

Gross tonnage (GT):	11711
Year of built:	2008
Power:	6300 kW (MAK 6 M 32 )
Width:	22,4 m
Length overall:	147,5 m
Hull material:	steel
Minimum crew:	13 men
Type of the VDR recorder:	Furuno VR 3000



*Photograph 1: The tanker Jutlandia Swan*

## **2.2. Voyage particulars**

Ports en route:	Świnoujście
Port of destination:	Rotterdam (the Netherlands)
Type of navigation:	international
Manning:	14 Filipinos, 1 Dutchman, 1 Pole, 1 Ukrainian

## **2.3. Accident Information**

Kind:	serious marine casualty
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Date and time of event:	30.12.2014 16:35 LT (15:35 UTC)
Geographical position of the accident	$\phi = 53^{\circ} 55.761' N$ ; $\lambda = 014^{\circ} 16.568' E$ the head of the western breakwater between boys „A” and „B” (exit from the port of Świnoujście)
Geographical area of the accident:	the Bay of Pomerania
Nature of the water region:	coastal, territorial waters
Weather during the accident:	visibility 10 Mm, wind SW 3° B, sea state 1, outgoing current 1,4 w
Operating state of the ship during the accident:	loaded – 16488.1 tons of fuel oil
Place of the accident on board:	underwater part of the hull
Effects of the accident on the ship:	abrasion of paint in the underwater part of the bow at port side
Effects of the accident for port infrastructure:	none

#### **2.4. Shore Services and Rescue Action Information**

No rescue operations were conducted. The accident resulted in the need to pull the ship off the ground by 2 tug boats: “Odys” and “Uran” and to inspect the underwater part of the bow section of the hull.

The ship was inspected by the Port State inspectors of the Safety of Shipping Inspectorate of the Harbour Master’s Office in Świnoujście. The inspection did not reveal any deficiencies or non-compliance.

#### **3. Circumstances of the Accident**

On December 30, 2014 at 15:00, after completion of loading of fuel oil at the CPN-2 wharf in Świnoujście, the crew of Jutlandia Swan began to prepare the ship to set for sea.

The ME was tested and it was working for about 20 minutes in idling without any load while at the same time the rinsing of the gas side of the turbine was done. At. 16:05 the preparation of the ship to set for sea was completed. The draught at the bow and at the stern was 9.48 m, the ship was on even keel.

At 16:00 the pilot came aboard. At 16:05 the control of ME was handed over to the bridge. The master of the ship, the first officer and the pilot were on the bridge during manoeuvres.

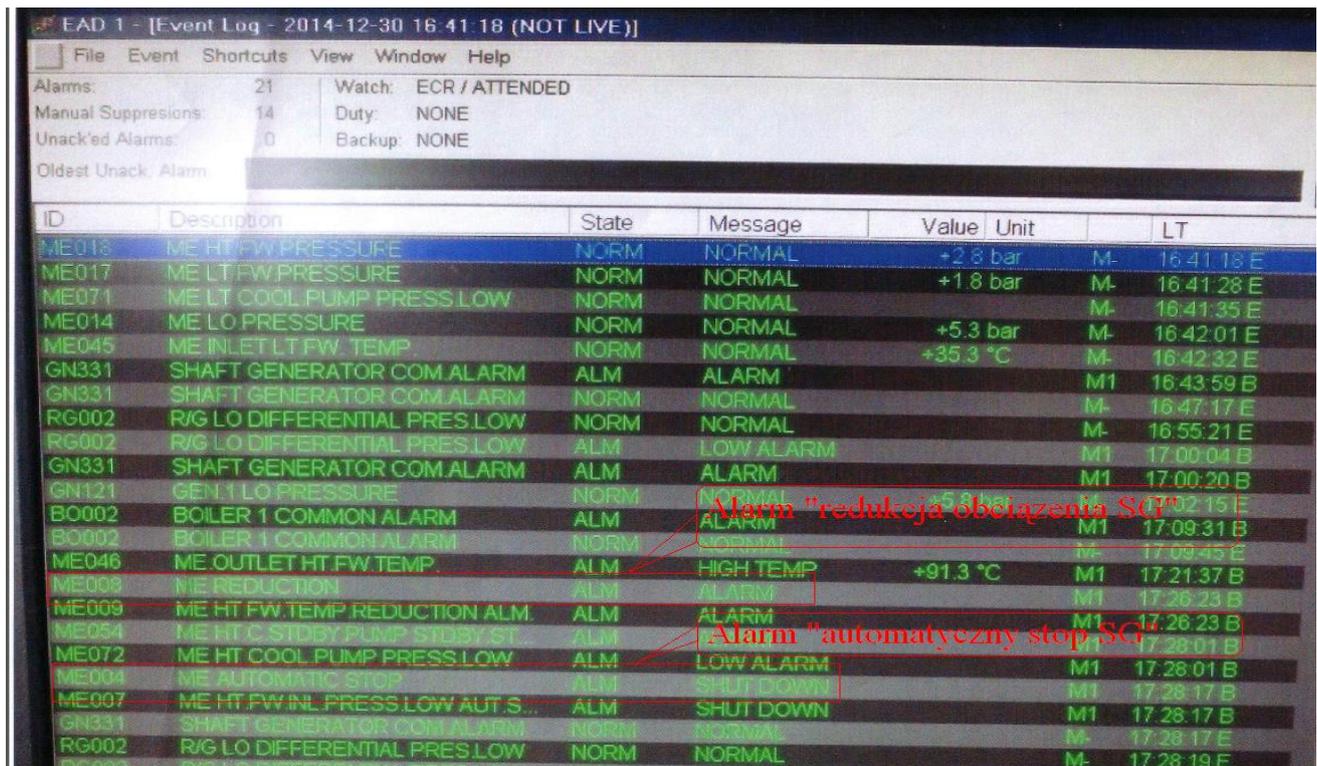
At about 16:07 the manoeuvres began. Unmooring was done by the master from the starboard wing of the bridge as the pilot instructed. Port exit manoeuvres took place without tug boats.

At 16:25 after the departure from the wharf the control of the ME was handed over from the wing to the bridge and the pilot took over the control of the ship. Steering of the ship was manual. The master was controlling the speed of the ship by adjusting the pitch of the propeller as instructed by the pilot. The master was gradually increasing the speed of the vessel to 8 knots which corresponded to the pitch position setting 6 (50% of the ME load).

After increasing the speed of the ship, in the engine control room the chief engineer noticed on the monitoring of the ME cooling system a rapid increase of the cooling water temperature at the outlet of the ME. The second engineer confirmed to the chief engineer that all valves on the cooling system pipeline were opened after the inspection of the thermostatic 3-way valve No. 012. The temperature of the cooling water was rising continuously. The chief engineer sent a second and third engineers to the engine room in order to find the cause of the temperature rise. The second engineer reported that no causes for the increase of cooling water temperature were found.

At 16:25:40 the “cooling water high temperature at the ME outlet” alarm was activated in the high-temperature circuit. The master, following the advice of the chief engineer, reduced the ME load twice, at 16:25 and 16:28, by changing the pitch of the propeller.

At 16:30:26 the security system in the ME remote control system automatically activated the “ME load reduction” alarm due to the high temperature of the cooling water (Photograph 2).



ID	Description	State	Message	Value	Unit	LT
ME018	ME HT FW PRESSURE	NORM	NORMAL	+2.8 bar	M-	16:41:18 E
ME017	ME LT FW PRESSURE	NORM	NORMAL	+1.8 bar	M-	16:41:28 E
ME071	ME LT COOL PUMP PRESS LOW	NORM	NORMAL		M-	16:41:35 E
ME014	ME LO PRESSURE	NORM	NORMAL	+5.3 bar	M-	16:42:01 E
ME045	ME INLET LT FW TEMP.	NORM	NORMAL	+35.3 °C	M-	16:42:32 E
GN331	SHAFT GENERATOR COM.ALARM	ALM	ALARM		M1	16:43:59 B
GN331	SHAFT GENERATOR COM.ALARM	NORM	NORMAL		M-	16:47:17 E
RG002	R/G LO DIFFERENTIAL PRES.LOW	NORM	NORMAL		M-	16:55:21 E
RG002	R/G LO DIFFERENTIAL PRES.LOW	ALM	LOW ALARM		M1	17:00:04 B
GN331	SHAFT GENERATOR COM.ALARM	ALM	ALARM		M1	17:00:20 B
GN121	GEN 1 LO PRESSURE	NORM	NORMAL	+5.9 bar	M-	17:02:15 E
BO002	BOILER 1 COMMON ALARM	ALM	ALARM		M1	17:09:31 B
BO002	BOILER 1 COMMON ALARM	NORM	NORMAL		M-	17:09:45 E
ME046	ME OUTLET HT.FW TEMP.	ALM	HIGH TEMP	+91.3 °C	M1	17:21:37 B
ME009	ME REDUCTION	ALM	ALARM		M1	17:26:23 B
ME009	ME HT FW TEMP REDUCTION ALM.	ALM	ALARM		M1	17:26:23 B
ME054	ME HT C STDBY PUMP STDBY ST.	ALM	ALARM		M1	17:28:01 B
ME072	ME HT COOL PUMP PRESS LOW	ALM	LOW ALARM		M1	17:28:01 B
ME004	ME AUTOMATIC STOP	ALM	SHUT DOWN		M1	17:28:17 B
ME007	ME HT FW INL PRESS LOW AUT S...	ALM	SHUT DOWN		M1	17:28:17 B
GN331	SHAFT GENERATOR COM.ALARM	NORM	NORMAL		M-	17:28:17 E
RG002	R/G LO DIFFERENTIAL PRES.LOW	NORM	NORMAL		M-	17:28:19 E

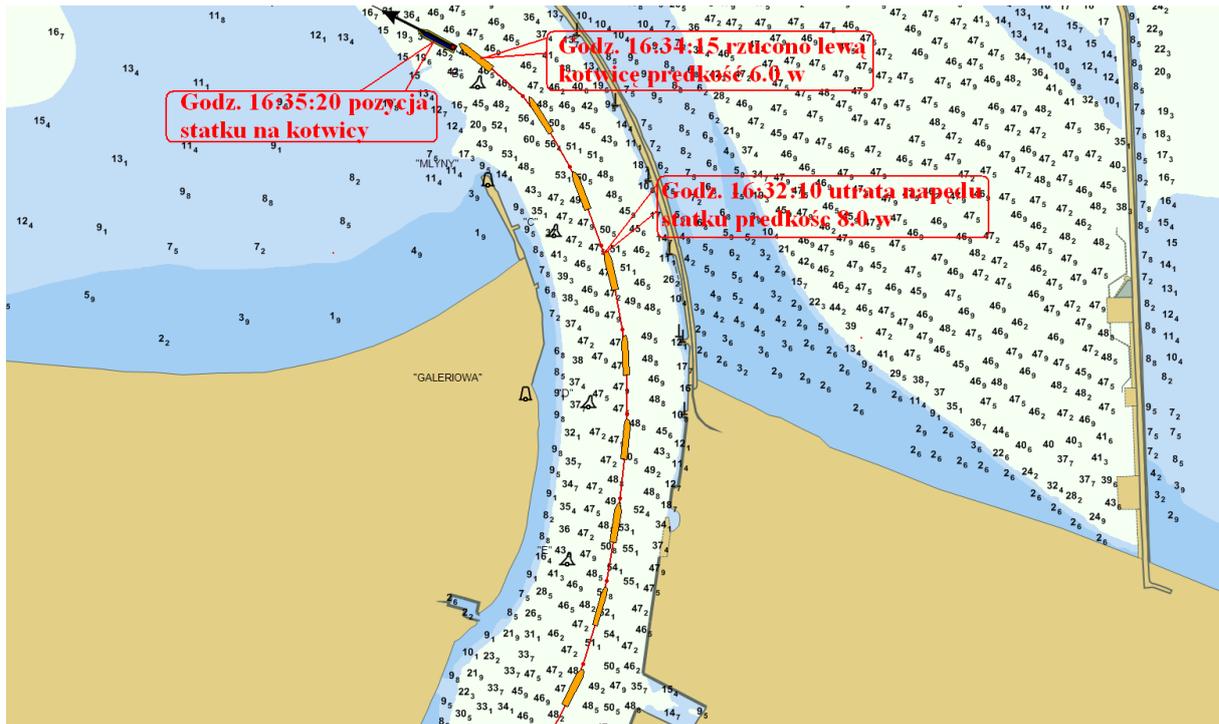
*Photograph 2: The alarm activated in the ME control system*

At 16:32 the chief engineer found out that the valve No. 010 on the ME cooling water pipeline was in the closed position. The valve was opened, and a moment later there activated the “ME cooling water pressure low” alarm. At 16:32:10 there activated the "ME automatic stop” alarm which caused immobilization of the ME by triggering the “shutdown” function in the engine control and protection system. Upon the loss of power the ship had a speed of about 8 knots and was approaching the port exit heads.

At 16:34 the pilot informed the VTS duty officer about the lack of propulsion and the intention to drop anchor.

At 16:34:15 port anchor was dropped on the western side of the fairway, 2 shackles in water. After dropping anchor, the ship lost her speed. At. 16:35:20 the ship’s pilot informed the VTS that the ship was at anchor between the heads on the western side of the fairway and that 2 tug boats were needed to refloat the ship.

At ca. 16:46 the master requested on the phone to the agent for 2 tug boats. After refloating the ship with the help of tug boats “Uran” and “Odys”, at ca. 18:14 “Jutlandia Swan” was directed to the CPN-2 wharf to inspect the underwater part of the hull.



*Photograph 3: Trajectory of movement of Jutlandia Swan from the VDR recording*

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

On December 29, 2014 second engineer made a technical review of improperly functioning thermostatic 3-way valve No. 012 in the ME cooling system in the high-temperature circuit. For this purpose, the pump of high-temperature cooling circuit was turned off and the valves Nos. 007, 011 and 010 were closed (Figure 1). The pipeline was drained and after the review of the valve, the same valves according to the report of the second engineer were opened, and the system was prepared for normal operation. After starting the cooling water system all parameters of ME were found within normal working conditions.

On December 30, 2014 after the ship's departure from the wharf and increasing her speed, there was a cooling system failure causing the loss of power. As a result of the lack of propulsion the master of Jutlandia Swan, bearing in mind the safety of navigation and the ship in the fairway, made a maneuver of dropping port anchor. It caused that the ship stopped on the western side of the fairway and her bow ran aground.

The investigation revealed that the loss of propulsion was caused by the failure of the cooling system by leaving a manual butterfly valve of the ME cooling system in the closed position.

The "Jutlandia Swan" is driven by a pitch propeller through a gearbox by means of a medium-speed engine MAK 6 M 32. The ship's engine is protected from damage by immediate stop if the parameters of the engine (low pressure of lubricating oil, low pressure of cooling water), or the number of rotations (i.e. protection from overspeed) exceed the limit values.

### 4.1. Mechanical Factors

A mechanical factor, which indirectly contributed to the accident, was a closed valve No. 010 of the ME cooling system, causing a lack of supplying the radiator with cooling water which caused the temperature of the coolant to rise above the limit value together with the reduction in ME load. Low pressure of cooling water due to opening of the valve No. 010 was a mechanical factor that caused immobilization of propulsion. The air collected in the pipeline between the valve No. 012 and the valve No. 010 reached the cooling water suction pump causing sudden drop of pressure and activating the "ME automatic stop" alarm. The restoration of the ME performance and the ship's propulsion required to eliminate the air from the pipeline and pumps of the cooling water system.

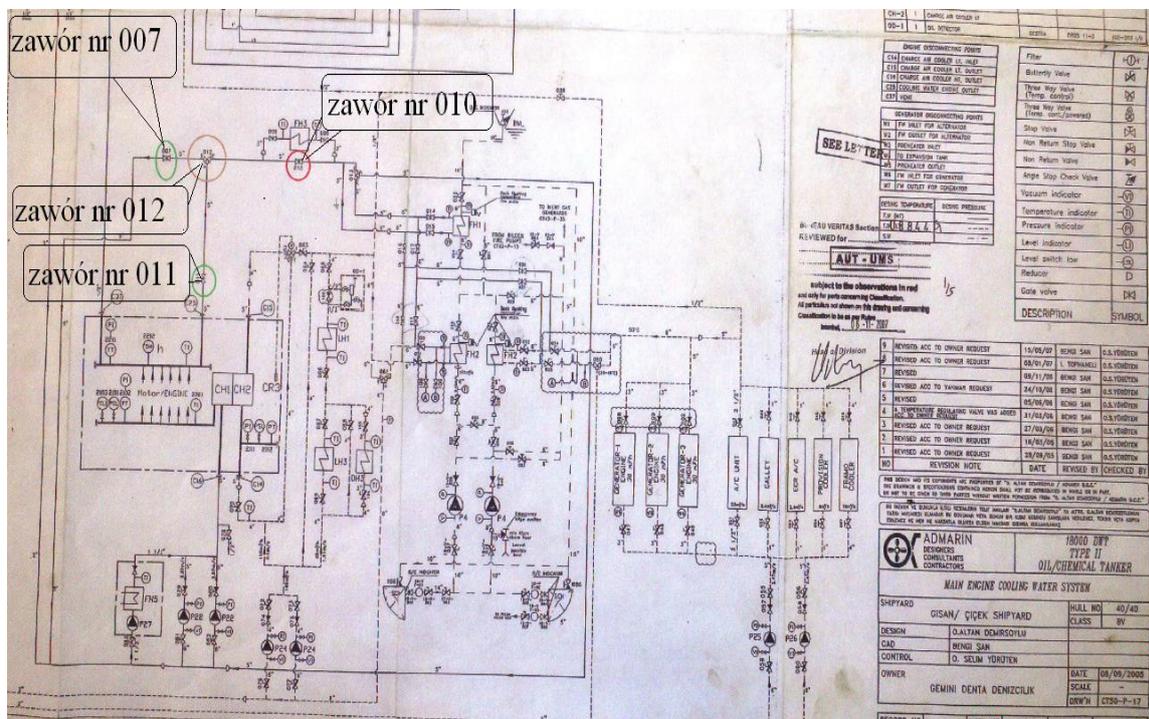


Figure 1: ME cooling system

#### 4.2. Human Factors (fault and neglect)

According to the Commission, the valve No. 010 left in the closed position after the repair made it impossible to check the operation of the ME cooling water system properly. While the ship was in port and the ME was working at low load, the raise of the cooling water temperature above the permissible value was not observed because underheated cooling water at the ME outlet through a thermostatic 3-way valve circulated in the so called small cycle without the radiator.

The engineer on watch when preparing the engine room for work had not checked proper setting of valves in the system of cooling water of the high-temperature ME but he had limited himself to the observation of pressure and temperature on a computer monitor.



Photograph 4: Manual butterfly valve No. 010

#### 4.3. Organizational Factors

The Commission concluded that the instructions related to the preparation of the ship to leave and enter the port made up for engineers on watch, were not effective and could lead to inconsistencies and shortcomings. These instructions were developed by the chief engineer and they were not checklists. They did not contain all the elements affecting the verification of the operational status of systems and devices during preparation of the ship's engine room to enter or leave the port.

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

The Commission acknowledged that leaving the valve No. 010 closed in the cooling water system after inspecting the thermostatic three-way valve was an oversight that prevented proper venting of the system. During port exit manoeuvres engineers limited themselves to observing the ME operating parameters displayed on the monitor of the control system in the engine control room which proved to be insufficient.

The engine crew did not fully control the correct operation of the ME cooling water system; they did not verify the correct positioning of valves, after the inspection and repair of the thermostatic three-way valve, and during the preparation of the engine room to leave the port and the manoeuvre of departure from the wharf.

The procedure contained in the ship's Safety Management Manual concerning the preparation of the ship's engine room to enter the port and leave the port requires the engineer on watch to check the correct position of the opening and closing of valves in the cooling water system, and to control pressure and temperature.

The Commission concluded that the ship's Safety Management Manual did not contain checklists designed to prepare for the entry of the ship into port or departure from the port for the engineers on watch by the ship's operator. Preparation of the engine room and ME was carried out on the basis of a combined list serving as an instruction for preparation and launching of the engine room for exit from the port developed and signed by the chief engineer and posted in form of a laminated poster in the engine control room.

The lack of procedures in the ship's Safety Management Manual regarding the use of the labeling system, information tags during inspections of devices and the preparation of the engine room for maritime or port traffic, contributed to leaving the valve No. 010 in the closed position. When inspecting and preparing the engine room for movement the engineers did not observe the principle of good seamanship and did not use the *tag in/out* system which is placed in the engine control room as the so called information board where information about the actual operational status of important systems, equipment and valves is displayed. Such a system allows the users to minimize the possibility of error.

Pending the development of this report, the owner of the vessel identified the causes and circumstances of the accident and made recommendations for the ships' crews and made changes in the ship's Safety Management Manual. He developed checklists for the preparation of the ship to leave or enter the port along with instructions for their observance by watch

engineers and the chief engineer, taking into account the differences in the design of ship's systems and devices.

There was introduced a *tag in/out* marking system that will help identify the operational status of devices and systems in the engine room, informing the watch engineer which devices are excluded from service and have "under repair" status.

The State Commission on Maritime Accident Investigation considering the corrective actions taken by the operator of Jutlandia Swan after the accident and prior to the publication of the report resigned from formulating safety recommendations.

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## 8. Glossary and Abbreviations

ME – main engine

UTC – the Universal Coordinated Time

## 9. Information Sources

Notification about the accident

Ship's documents

Declarations of witnesses

VDR recording

## 10. Composition of the Accident Investigative Team

The team conducting the investigation was composed of:

the Team Leader - Tadeusz Gontarek, a Member of the State Commission on Maritime Accident Investigation,

the Team Member – Krzysztof Kuropieska, a Member of the State Commission on Maritime Accident Investigation.