



# SAFETY INVESTIGATION REPORT

201203/014

REPORT NO.: 03/2013

February 2013

The Merchant Shipping (Accident and Incident Safety Investigation) Regulations, 2011 prescribe that the sole objective of marine safety investigations carried out in accordance with the regulations, including analysis, conclusions, and recommendations, which either result from them or are part of the process thereof, shall be the prevention of future marine accidents and incidents through the ascertainment of causes, contributing factors and circumstances.

Moreover, it is not the purpose of marine safety investigations carried out in accordance with these regulations to apportion blame or determine civil and criminal liabilities.

#### NOTE

This report is not written with litigation in mind and pursuant to Regulation 13(7) of the Merchant Shipping (Accident and Incident Safety Investigation) Regulations, 2011, shall be inadmissible in any judicial proceedings whose purpose or one of whose purposes is to attribute or apportion liability or blame, unless, under prescribed conditions, a Court determines otherwise.

The report may therefore be misleading if used for purposes other than the promulgation of safety lessons.

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***MV KADRI***  
**Fatality of Crew Member and**  
**Serious Injury of another Crew Member**  
**in position 58°13.8'N 021°15.9'E**  
**11 March 2012**

## SUMMARY

On Saturday 11 March 2012 between the hours of 0350 and 0400, the motor vessel *Kadri*, experienced increasing weather conditions and sea state whilst navigating off the coast of Estonia. At one point in time, the vessel rolled heavily, first to starboard side then port side.

This resulted in two crew members, the second mate, and the chief engineer, both on the bridge at the time, being flung from their stationary positions. The second mate sustained severe rib injuries.

The chief engineer suffered a severe head injury and was bleeding profusely. First Aid was administered and communications established with shore emergency response parties.

Having assessed the injuries of the two crew members, and after consulting with a medical doctor from the Emergency

Medical Centre ashore, it was decided to initiate a MEDEVAC. However, before arriving ashore, the chief engineer succumbed to his injuries. The second mate was hospitalised and received the necessary medical treatment.

Three recommendations have been made to the managers of the vessel intended to address risks and other important facets of the safety management system.



## FACTUAL INFORMATION

### Vessel and Crew

*Kadri* is a 3117 GT multi-purpose dry cargo carrier, built by Ferus Smit, Hoogzand, Netherlands in 1995, and is registered in Malta. She is owned by Hansa Shipping Ltd., managed by Hansa Ship Management, and classed with Bureau Veritas. The vessel has an overall length of 99.86 m and a breadth of 13.63 m.

*Kadri* has one hold and one hatch. She is ice-classed 1A and is engaged in international trade. At the time of the accident, she had a crew of nine. All crew members were Russian except for one AB who was an Estonian national. The vessel was manned in accordance with her Minimum Safe Manning Certificate.

The crew complement comprised a master, chief mate, second mate, chief engineer, second engineer, two ABs, an AB / cook and one motorman.

The second mate was in charge of the navigational watch at the time of the accident. In addition to the navigational watch, his other duties included chart correction and general safety.

### Environment conditions

The accident happened at about 0350. Gale warnings were issued for the area being traversed by *Kadri* and received on board by Navtex stations Bodo and Niton on 10 March at 1630 and 11 June at 0300 respectively.

Estonia Meteorological and Hydrological Institute gave winds increasing at midnight to between  $15 \text{ ms}^{-1}$  and  $20 \text{ ms}^{-1}$ , with 2 m to 4 m wave heights creating weather conditions, which were boisterous with an increasing sea and swell, causing the vessel to pitch and roll heavily at times.

### Narrative

On Saturday evening, 10 March 2012, *Kadri* left Tallinn, Estonia in ballast, bound to Liepaja, Latvia. At midnight, the second mate took over the navigational watch.

It was stated that it was company's policy to have the officer in charge of the navigational watch (OOW) accompanied by a look-out. However, the second mate also stated that although it had been recorded in the deck logbook that an AB was present on the bridge, in reality he was alone. It was also stated that the surname entered in the deck logbook was that of the motorman.

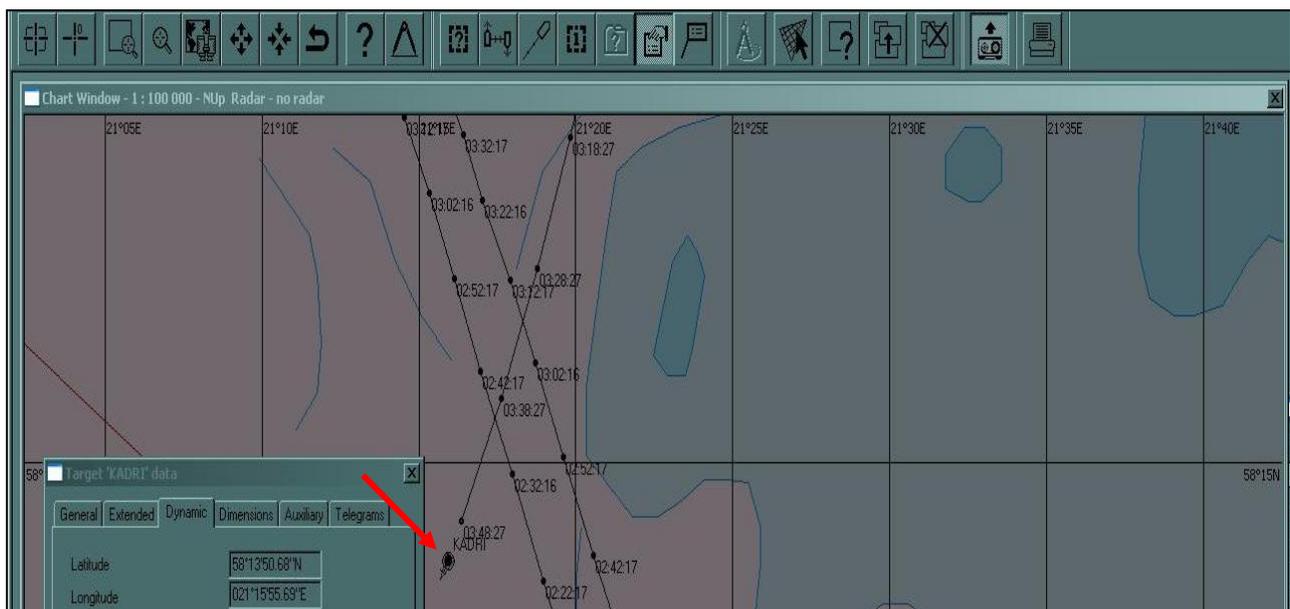


Figure 1: *Kadri*'s AIS track indicating her geographical position at the time of the accident

Between 0000 and 0100, the weather was moderate. However, at about 0200, *Kadri* started experiencing heavy swell and strong wind gusts. Until the time of the accident, the vessel continued to maintain her course (Figure 1), although she was continuously sheering due to the wind. This necessitated the second mate to correct the course by several degrees.

Sometime just before 0350, the chief engineer entered the bridge through the central door. The second mate recalled that the chief engineer was irritated on the fact that the vessel was rolling and pitching, and that his personal belongings were scattered across his cabin floor.

The second mate stated that he was more focused on the navigational watch rather than the chief engineer's comments. Moreover, he thought that his watch would soon be handed over to the chief mate for the 0400 - 0800 navigational watch.

At one point in time, the chief engineer stepped towards the helm and commented that he would be altering course in order to solve the situation and minimise the ship's movements. The second mate stated that he looked at the rudder indicator and observed the change in course on the GPS. A few seconds after the course alteration, the vessel heeled heavily over to starboard side and then to port side.

As a result of the heel to starboard side, the second mate lost his balance and hit against the navigator's drawer unit (furniture); then, during the heel to port side, the accelerating force took him from the navigator's drawer unit to one of the navigator's table corner.

At this point, the second mate received his serious injuries. Overcome by the vessel's accelerating forces, he could not see the chief engineer. The damages to the bridge furniture were considerable and commensurate to violent accelerations of the ship (Figures 2 – 4).

After the heel to the port side, the vessel seemed to stabilise although vibrating strongly. Soon after, the second mate went down to the rest room and met the chief mate in the alleyway. Together they proceeded to the bridge.



**Figure 2: Damaged bridge furniture**



**Figure 3: Dented hand rail**



**Figure 4: Damaged cabinet doors**

Upon entering the bridge, they saw the chief engineer lying on the floor and bleeding profusely. The master also appeared on the bridge soon after. The chief mate was instructed to call the other crew members for help. First Aid was then administered.

## MEDEVAC

On 11 March 2012, at approximately 0545 (LT), the Latvian Coast Guard received the request for emergency medical assistance and evacuation of two casualties with serious injuries from *Kadri*.

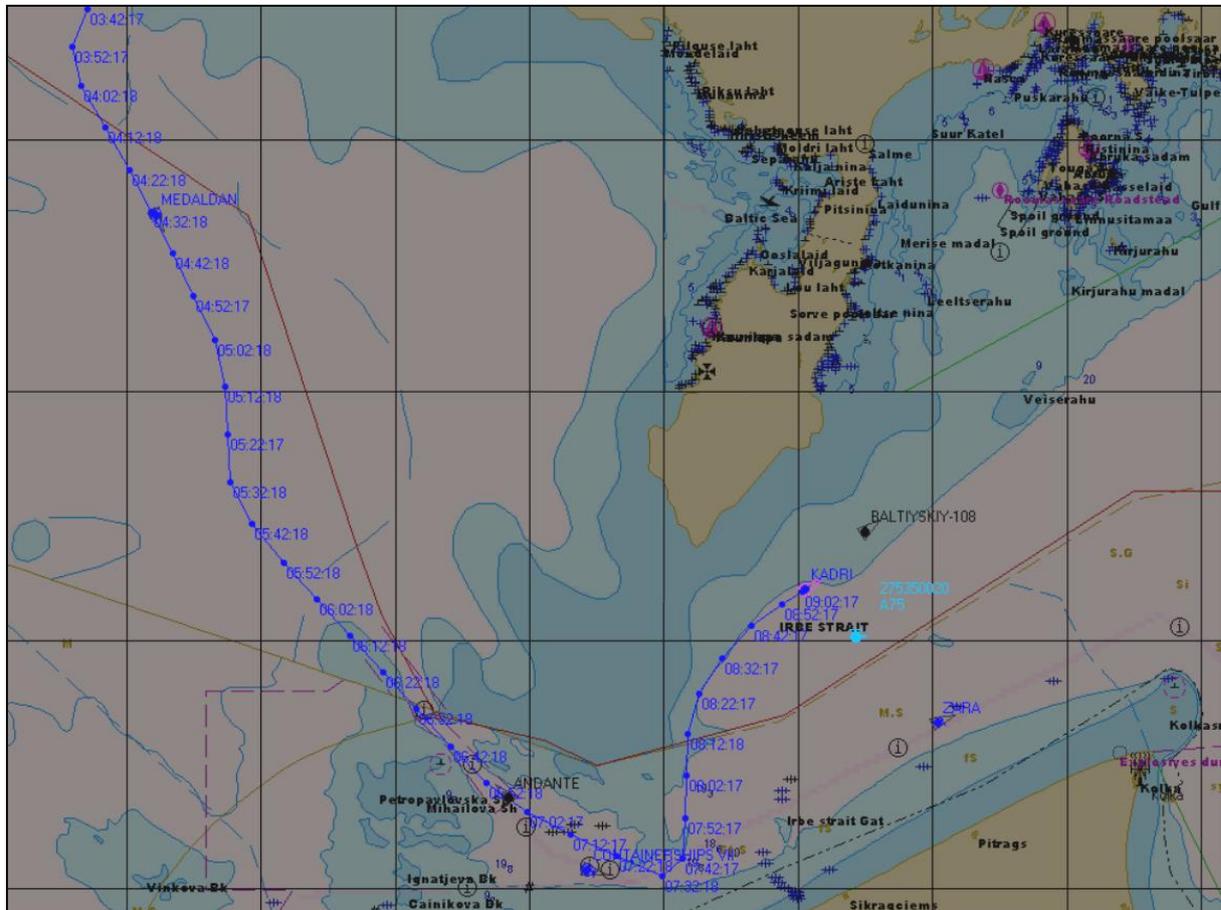


Figure 5: *Kadri*'s alteration of course in preparation for the MEDEVAC

The master called Ventspils Port Control for assistance, but was told that the port was closed because of the stormy weather. He then called Latvia Coast Guard and after being granted the necessary authorisation, *Kadri* altered course (Figure 5) for a possible evacuation (MEDEVAC). Later on, the master was able to consult a medical doctor by radio, and received further medical instructions.

When asked by the consulting doctor whether alcohol was involved, the master stated that this was unlikely.

The approximate position of the vessel at the time of request was 57° 42.2' N 021° 30' E.

The Latvian Coast Guard was informed that two persons have fallen and sustained severe injuries on the vessel's bridge due to heavy pitch and roll experienced during adverse weather conditions and undesirable sea state. At 0905, Air Force helicopter LAF-104 arrived on site to airlift and transfer the injured crew members to Riga.

At 0910, the MEDEVAC from *Kadri* was successfully completed by the Latvian

Coast Guard. Due to fuel shortage, it was decided to proceed with the casualties to Ventspils City Hospital. However, at 0940, the chief engineer was pronounced dead by the paramedics on board the helicopter. Records indicated that his death had in fact occurred before the evacuation started. It was also confirmed that the second mate had sustained severe injuries to the chest and broken ribs.

*Kadri* resumed her voyage to the port of Liepaja in Latvia.

### **Autopsy and toxicological results**

The autopsy concluded that the cause of death was multiple fractures of the sternum, spinal column and the ribs. The injuries were compatible with a fall from a height or a blow against a blunt object. It was not excluded that the chief engineer fell head first. The autopsy concluded that the injuries were not characteristic of an assault or self-defence and could have occurred over a short period of time or several hours.

The toxicological tests revealed that the blood had a concentration of 1.17 mgg<sup>-1</sup> ethanol, whilst the urine sample had 1.43 mgg<sup>-1</sup> ethanol. Whilst the report concluded that the amount of alcohol in the blood was equivalent to light intoxication, it was also stated that since the urine sample contained ethanol, it was indicative that the death occurred during the elimination of alcohol from the system.

## **ANALYSIS**

### **Aim**

The purpose of a marine safety investigation is to determine the circumstances and safety factors of the accident as a basis for making recommendations, to prevent further marine casualties or incidents from occurring in the future.

### **Cooperation**

During the course of this safety investigation, MSIU received all the necessary assistance and cooperation from the Estonian Safety Investigation Bureau and the Latvian Transport Accident and Incident Investigation Bureau.

### **Potential intoxication by alcohol**

The toxicological results made available to MSIU showed alcohol intoxication, but no drug or medicine content. Whilst remarking that the chief engineer had not been wearing working shoes, the second mate was under the impression that the chief engineer was under the influence of alcohol. Moreover, he recalled that one AB had told him that he had observed alcohol bottles inside the chief engineer's cabin.

### **Watchkeeping practices**

There was no designated look-out during the second mate's navigational watch. Although this does not have any apparent bearing on the dynamics of the accident, however, it does not reflect company's procedure and a healthy on board safety climate.

In addition, the safety investigation revealed other important factors which indicated that the navigational OOW did not follow the 'Master's Standing Orders'. For instance, he did not alert the master when:

- it became apparent that the vessel was going to encounter extreme weather conditions and sea states; and
- it was suspected that the chief engineer seemed to be under the influence of alcohol on the bridge and was interfering with the navigational watch.

There was no evidence which would have indicated that the Master's Night Order Book extracts had been recorded.

Moreover, taking into consideration the circumstances under which the accident happened, it seemed that the master neither took into consideration the forecasted bad weather nor did he review contingency courses.

The documentary evidence provided by the coastal State (Figure 1) indicated that no attempts to alter course were made in order to reduce the ship's heavy movements. It was therefore evident that the Company Procedures Manual (Safe Navigation), namely Chapter 3, section 3.8 – Heavy weather conditions, regarding adverse weather were not followed<sup>1</sup>.

### **Influence of alcohol**

The company's Drug and Alcohol Abuse Policy (Safety / Quality Management Manual – Chapter 2) reflected the company's concern to ensure that all crew members will be able to respond to any emergency situation at any time. It was the master's responsibility to enforce the company's policy, which stated that "...the use of alcohol at any time during the employment of a seafarer on board vessel is totally restricted."<sup>2</sup> Moreover, as part of their SMS, all crew members had declared that they were familiar with the company's safety and environmental protection policies.

<sup>1</sup> Company procedures specified that the Master, engine-room, and crew were to be informed without delay and to have speed and course adjusted accordingly.

<sup>2</sup> This policy is more stringent than the new STCW Convention requirements, which entered into force on 01 January 2012. The new amendments require Administrations of contracting Parties to establish an alcohol limit of not greater than 0.05% blood alcohol content level (BAC) or 0.25 mg<sup>l</sup><sup>-1</sup> alcohol in breath or a quantity of alcohol leading to such alcohol concentration for masters, officers and other seafarers, performing designated safety, security and marine environmental duties.

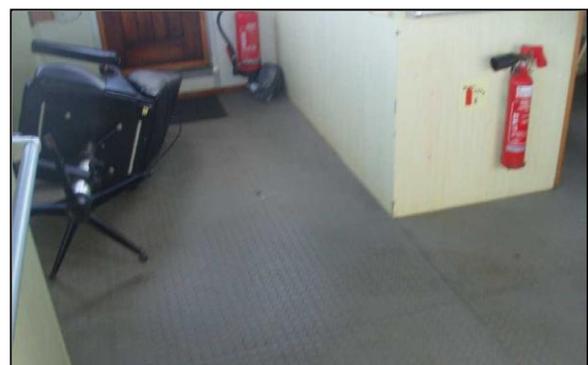
Notwithstanding the above-mentioned policy, it was claimed by one crew member that the chief engineer may have been consuming alcohol whilst on board; a claim, which was in fact later confirmed by the toxicological tests carried out during the post-mortem examination.

Based on the observations of the second mate and the claim that there were empty bottles in the cabin, it would appear that the master was not implementing and enforcing properly the company's Alcohol and Drug Abuse Policy.

Effects of alcohol depend on several physiological factors. However, alcohol is considered to impair motor co-ordination and judgment and in combination with the violent ship movements, it was not excluded that the injuries sustained by the chief engineer were the result of the combined effects of slow reaction times and ship movement.

### **The bridge pilot chair**

One of the photographs taken after the accident showed that the type of chair used on the bridge was not appropriate, in that it was unsecured and with roller wheels (Figure 6).



**Figure 6: Kadri's bridge pilot chair following the accident**

This resulted in the chair being flung in an uncontrolled manner across the bridge deck, when the vessel pitched and rolled violently. It was not excluded that this

could have worsened the injuries of both crew members.

### **Safety culture**

A company culture, which has safety as a core value, will necessitate all parties (ashore and on board) to share common values and beliefs, which collectively guarantee an overriding and unconditional priority to safety on board.

It is acknowledged, however, that a safety culture is not created or engineered – at least not easily. Every company needs to establish (safety) goals and communicate them in a clear and strong manner to personnel ashore and on board alike. This is crucial because only clear safety goals will contribute to a role played by motivated crew to reach the very same (safety) goals.

If safety goals are crucial, their setting and persons' attributes are holistically vital for the achievement of a safety culture on board. Studies have shown that people are neither deterministically controlled by their environment nor entirely self-determining.

Instead, they exist in a state of reciprocal determinism with their environments whereby they and the environments influence one another in what researchers define as a perceptual dynamic interplay.

Whether it is an intoxicated crew member or the absence of a look-out during a navigational watch, or the input of false records in the deck's logbook, the climate on board the ship (the safety environment) did not reflect a situation where safety goals were considered to be a core value in the on-board safety management.

This accident was considered to be a snapshot of the safety culture on board. As such, the events reported above do not reflect a strong focus on safety. Moreover,

the events were analysed in the light of another very similar accident.

In a previous accident on board a different ship but under the same managers, it was recommended that effective monitoring of the vessel should be carried out with respect to the implementation of the Company's Drug and Alcohol Policy. The safety investigation report was published after this accident has happened and whilst this safety investigation was open<sup>3</sup>.

What is being discussed above are persons' factors (including attitudes and beliefs) and behavioural factors (safe and unsafe working practices), which are crucial components of a safety culture. These factors, which seemed to be lacking on board, were crucial since they would have definitely influenced and impacted one another. So much so that behaviour and persons' factors represent the human dynamic of occupational safety.

This analysis is being made because persons and behavioural issues would have been manifested in lack of ownership, commitment, and proactive behaviour towards complementing the company's efforts of establishing a sound safety culture on board.

Persons' factors are influenced by numerous other factors – not least a 'visible' safety programme. This is not to say that the management company was lacking in its Statutory obligations. However, what seemed to be lacking (and this was manifested during the course of the events), was a programme, which went beyond practical safety management aspects and instead addressed employee attitude.

Such programmes would have necessitated periodic safety related training, inspections

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<sup>3</sup> Safety Investigation Report 08/2012 was published in July 2012.

and more frequent visits on board by safety managers. This would have gradually helped employees to understand that the company is running a safety programme because safety was a true value and not just a concern to satisfy Statutory obligations.

The programme would have necessitated that crew members to be involved, thereby leading to the ownership and commitment mentioned above. Crew members' involvement would then have led to initiatives and proactive actions. Notwithstanding the above, the safety investigation did not come across any records which would have indicated an approach towards this direction.

#### **Other safety issues – Kadri's safe manning**

The vessel's safe manning was in accordance with the Minimum Safe Manning Certificate issued by the flag State Administration. Notwithstanding, nine crew members could have been problematic, especially for short international voyages. Short international voyages result in more frequent port visits, many port manoeuvres, and discharge/loading of cargoes and actually longer hours of duty by crew members.

As a matter of fact, no look-out had been established for the navigational watch and the OOW was alone on the bridge in congested waters. Evidence did not indicate that the master had raised any previous concern on the matter with the ship managers.

## **CONCLUSIONS**

1. The safety investigation does not exclude that the chief engineer was under the influence of alcohol at the time of the accident. This may have altered his perception of risk to an extent that he believed that by taking over the helm and altering the vessel's course, he could deal with the problem at hand.
2. The company's Alcohol and Drug Abuse Policy was neither being implemented nor enforced on board.
3. The evolving events did not reflect on-board valued and engrained safety culture.
4. The stressful situation at hand demanded the navigational OOW's complete concentration. He was unaware that the master's Standing Orders were being violated and that the master should have been called on the bridge. This prevented early decisions from being taken, for instance, to alter course in order to avoid the ship's violent accelerations in heavy weather conditions.
5. The design/style of the chair was not adequate for shipboard use. Rather than specifically strengthened and secured to the deck, the design/style of the chair was inadequate for shipboard use.
6. The absence of a look-out during the navigational watch at night may be attributed to the number of crew

## **RECOMMENDATIONS**

Hansa Shipping Ltd. is recommended to:

**03/2013\_R1** Adopt a more thorough involvement and enhance on board inspections, open and informal communication and frequent contacts with the crew members serving on board ships under its management.

**03/2013\_R2** Conduct a risk assessment in order to identify and mitigate risks associated with fittings / loose furniture on board.

**03/2013\_R3** Reconsider the safe manning of the ship, taking into consideration the IMO Principles on Safe Manning, as amended *i.e.* IMO Assembly Resolutions A.890(21) and A.955(23).

## SHIP PARTICULARS

Vessel Name:	<i>KADRI</i>
Flag:	Malta
Classification Society:	Bureau Veritas
IMO Number:	9114725
Type:	Multipurpose dry cargo
Registered Owner:	Hansa Shipping Ltd.
Managers:	Hansa Ship Management OU
Construction:	Steel
Length Overall:	99.86 m
Registered Length:	92.95 m
Gross Tonnage:	3117
Minimum Safe Manning:	9
Authorised Cargo:	Dry cargo

## VOYAGE PARTICULARS

Port of Departure:	Tallinn, Estonia
Port of Arrival:	Liepja, Latvia
Type of Voyage:	Short International
Cargo Information:	In ballast
Manning:	9

## MARINE OCCURRENCE INFORMATION

Date and Time:	11 March 2012 at about 03:50 (LT)
Classification of Occurrence:	Very Serious Marine Casualty
Location of occurrence:	58° 13.8'N 021° 15.9'E
Place on board	Bridge
Injuries / fatalities:	One serious injury and one fatality
Damage/environmental impact:	None
Ship Operation:	On passage
Voyage Segment:	Mid-water
External & Internal Environment:	Near gale north westerly winds and good visibility. The sea was rough and an air temperature of 0°C.
Persons on board:	9