



SAFETY INVESTIGATION REPORT

201606/035

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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 *HS ROSSINI* **Fatal fall during bunker operations** **in the port of Durban, South Africa** **19 June 2016**

SUMMARY

At about 2145 on 19 June 2016, an engineer from the container vessel *HS Rossini*, was fatally injured when he fell on the deck of bunker barge *Smit Bongani*.

HS Rossini had arrived in Durban, South Africa for container operations. While at berth, barge *Smit Bongani* manoeuvred alongside *HS Rossini* to supply bunkers. The bunker hose was connected and the third engineer climbed down the pilot ladder to read the fuel flow meter. On his way back, he fell off the pilot ladder to the deck of *Smit Bongani* and sustained fatal head injuries.

The cause of the fall was neither related to the vessel's operations nor to defects in the ladder, which was being used.

However, the safety investigation analysed the situation from the perspective of missing barriers which would have otherwise prevented the fall to the barge.

The MSIU has issued two recommendations to the Company designed to enhance safety of crew members working aloft and over the ship's sides.



FACTUAL INFORMATION

Vessel

HS Rossini is a 39,753 gt fully cellular container ship, registered in Malta. She was owned by HS Rossini Shipping Co. Ltd., and managed by Hansa Shipping GmbH & Co KG., Hamburg, Germany. The vessel was built in 2012 at Rongcheng Shenfei Shipyard, Shidao, Republic of China and was classed with Det Norske Veritas-Germanischer Lloyd (DNV GL).

HS Rossini had a length overall of 228.00 m, a moulded breadth of 32.30 m and a moulded depth of 20.30 m. The vessel had a summer draught of 12.50 m at corresponding summer deadweight of 46,020 tonnes. *HS Rossini* had a carrying capacity of 3,421 TEUs and was fitted with four cranes for cargo operations.

Propulsive power was provided by a 6-cylinder, Wartsila 6RT-flex82C, two stroke single acting, direct drive diesel engine, producing 27120 kW at 102 rpm. This drove a single fixed propeller to give a service speed of 22 knots.

Ship's crew

HS Rossini had a crew complement, which satisfied the Minimum Safe Manning Certificate issued by the flag State Administration. There were 22 persons on board from Croatia, Montenegro, Serbia, Romania and the Philippines. The working language was English.

The deceased crew member was 32 years old from Montenegro. He had started his career as an engineer with Hansa Shipping in February 2013. On 01 July 2014, he qualified as an engineering officer of the watch in terms of STCW Regulation III/1. Since then, he had been employed as a third engineer on *HS Paris*, *HS Caribe* and *HS Shackleton*. He joined *HS Rossini* on 10 May 2016.

Environmental conditions

At the time of the accident, it was dark and there was a light to gentle Southwesterly breeze and calm sea. The sea and air temperatures were 22°C and 20°C respectively.

Narrative¹

On 19 June 2016, *HS Rossini* was port side alongside at Durban Container Terminal. At about 1955, *Smit Bongani*, a local bunker supply barge, manoeuvred alongside *HS Rossini* (Figure 1).

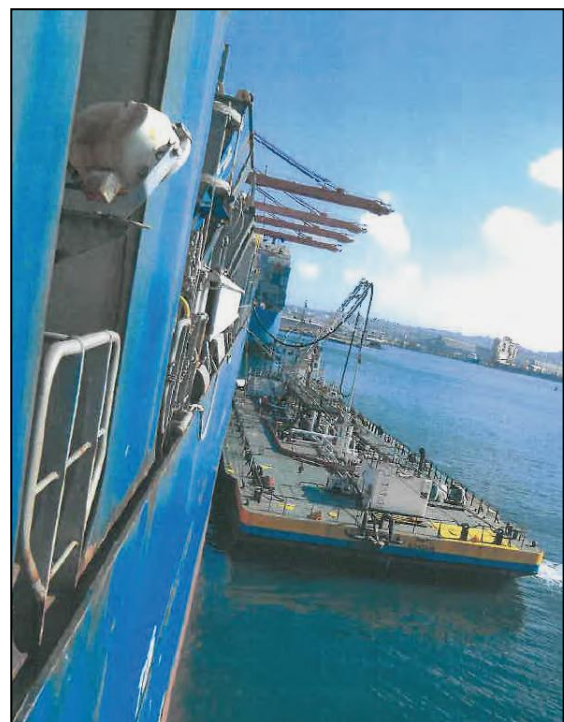


Figure 1: Bunker supply barge *Smit Bongani* alongside *HS Rossini*

A pilot ladder was secured over the ship's starboard rail, abreast of cargo bay 13. The vertical distance of the ladder from the main deck to the bunker supply barge deck was about 9.5 m (Figure 2). Artificial light from the vessel and the bunker barge illuminated the pilot ladder. Meanwhile, bunker stations were called on *HS Rossini*. The second engineer filled in the bunker checklist while

¹ Unless otherwise stated, all times are ship's time (UTC +2).

the third engineer, a fitter and two engine ratings assembled at the bunker station on the main deck.



Figure 2: The pilot ladder, down to the bunker supply barge

The chief mate and crew members from *Smit Bongani* boarded the vessel and connected a supply hose in way of cargo bay no. 5. The chief mate then discussed the bunkering protocol with the chief engineer and requested fuel flow meter readings to be taken from the bunker supply barge.

The reading of the flow meter was delegated to the third engineer. Wearing a hard hat, a pair of safety shoes and an overall, the third engineer went down the pilot ladder and read the fuel flow meter. Soon after, he left to board *HS Rossini*. On his way up, at about 2145, he fell off the pilot ladder. The third engineer landed on the bunker supply barge deck, bleeding profusely from the head.

Post-accident actions

A crew member on the barge witnessed the fall. He immediately informed the barge master, who in turn reported the accident to the port authorities. At 2215, an emergency medical team boarded *Smit Bongani*.

However, the team was unable to revive the injured person. At 2245, the engineer was pronounced dead.

Bunkering company procedure

The Company's Safety and Environmental Management Manual (SEMM), Document C06 addressed bunkering operations. It stated that "a failure during bunkering operations may cause several consequences for the environment, ship and the crew."

The Document required a procedural agreement with the bunker supply barge, the establishment of radio communication channels, calling the local pollution response team and to agree on clean up procedures. The chief engineer, who was responsible for bunkering operations, also had instructions in a technical letter (Circular Letter 10) which, *inter alia*, stated that "...whenever taking bunkers, it is important that the tanks of the shore or barge supplier are sounded to make sure that the quantity supplied is in accordance with the delivery note."

Working aloft

Company's SEMM, Document C11 addressed working conditions, necessitating outboard and aloft works. It outlined general safety measures, which had to be considered prior to and during the work.

Key elements of the procedures included:

- master's responsibility for safety measures required for work aloft or outboard;
- assigning of an officer to implement and supervise safety actions and fill in the necessary work permit;
- vessel's conditions before permitting work outboard;
- prohibiting work aloft / outboard during the night, poor visibility and bad weather;

- filling up of checklist by the officer or engineer responsible for planning the work;
- physical and mental condition of crew members;
- required protective clothing / gear by crew members tasked to work aloft or outboard; and
- rescue and first aid equipment required during the actual work.

Working at height requirements and guidance

EU Directive 2001/45/EC of the European Parliament and of the Council of 27 June 2001 prescribes minimum provisions for the health and safety of workers for temporary work at a height. The Directive provides for ladders, which may be used if other equipment is not justified because of the low level of risk, the short duration of use or existing features on site cannot be altered. In any case, the Directive stresses that arrangements must be made to arrest falls to prevent injury to workers.

The UK's Merchant Shipping and Fishing Vessels (Health and Safety at Work) (Work at Height) Regulations, 2010 (SI 2010 No. 332), define 'work at height' as work on a ship including access or egress from any place on a ship except by a permanent stairway, gangway or companionway. Ascent and descent are included in the terms 'access' and 'egress'. Further guidance on these regulations is provided in the MCA's Marine Guidance Note 410 and the Code of Safe Working Practices for Merchant Seamen.

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, and to prevent further marine casualties or incidents from occurring in the future.

Fatigue

The Record of Hours of Work / Rest for the month of June was made available to the MSIU. The Record showed that the third engineer's minimum hours of rest stipulated by the MLC and the STCW Convention had been met. Moreover, there was no action by the third engineer which suggested that fatigue should be considered as a contributing factor to this accident.

Physiological condition of the casualty

At the time of the accident, the third engineer was 32 years old. He had been declared fit for sea duty, with a recently issued medical certificate, that was valid until 23 July 2017. The MSIU had no evidence which suggested that the third engineer had exhibited symptoms of illness, fatigue, shortness of breath or chest pains prior to the accident.

Dynamics of the fall

There was no evidence of abrupt vessel movements at the time of the accident, or that the ladder was improperly rigged / slippery rungs. A crew member on *Smit Bongani* did witness the fall and reported that the third engineer was straining as he climbed up the ladder. Half way up, he momentarily paused, lost his hold on the ladder and fell down.

A post mortem was carried out on 30 June 2016 by Durban Forensic Pathology Services (DFPS). The clinical laboratory tests, toxicological and histological examination concluded that the cause of death was severe head injury. However, the post mortem

examination also found that the immediate cause of the fall was myocarditis and myofibre damage.

Affected trade-offs

It is the opinion of the MSIU that the decision taken by the third engineer to board the bunker supply barge without following the numerous procedures and literature available and mentioned elsewhere in this safety investigation report should not be analysed in isolation. His decision was not taken in a vacuum.

As much as it was implicit, the third engineer may have found himself in a situation where he had to choose between either going through an 'extensive' checklist and preparation of (other personal safety) equipment, or, just board the bunker supply barge and climb up again *HS Rossini* to commence the bunkering operation.

As much as this may seem to suggest a situation where the third engineer borrowed from safety, in actual fact, it was a choice, which reflected his perception of what seemed to be a very straight forward task. After all, one has to submit that the actual fall was not the direct result of an action or omission by the crew member involved. Compared to other tasks which are normally carried out on board, going down a pilot ladder was not more intricate. The fact that no risk assessment was carried out prior to the use of the ladder, was also suggestive of this.

There was no choice for the third engineer but to go down the pilot ladder and check the flow meter. The use of the rescue boat was not an option. The rescue boat was a combined lifeboat and rescue boat, located on the port side of the vessel. The vessel was moored port side alongside and therefore the use of the rescue boat to reach the bunker barge was impossible.

Once the necessary hoses were rigged and the appropriate valves operated, the checking of the flow meter would have been the last necessary check by the crew members before the actual bunkering commences. Delaying this task would have meant delaying the bunkering operation and possibly not fitting with the time slots, which the bunker supply barge had for the rest of the night.

It was therefore not excluded that time was a resource which the third engineer felt he did not have in abundance. Taking the risk to go down the pilot ladder without a safety harness had immediate and tangible results, which outweighed the benefits of other possible options. The demand for efficiency was higher than the thoroughness of the operation and the trade-off between efficiency and safety eventually materialised.

CONCLUSIONS

1. The immediate cause of the fall was neither related to the operations of the vessel nor to the actions or omissions of the crew member involved;
2. Half way up the ladder, the crew member momentarily paused, lost his hold on the ladder and fell down;
3. The crew member may have found himself in a situation where he had to choose between either going through an 'extensive' checklist and preparation of other personal safety equipment, or go down the bunker supply barge and on board his ship again to commence the bunkering operation;
4. The crew member's perception of climbing the ladder was of a very straight forward task;
5. It was impossible to lower the rescue boat (on port side) to reach the bunker barge because the ship was moored port side alongside;

6. Delaying the checks of the flow meter would have meant delaying the bunkering operation and possibly not fitting with the time slots, which the bunker supply barge had for the rest of the night;
7. Time was a resource which the third engineer felt he did not have in abundance;
8. Taking the risk to go down the pilot ladder without going through the necessary procedure to use a safety harness, had immediate and tangible results, which outweighed the benefits of other possible options.

RECOMMENDATIONS

Taking into consideration the findings of this safety investigation and the safety actions already taken, Hansa Shipping GmbH & Co. KG. is recommended to assist crew members:

14/2017_R1 in the preparation of a risk assessment for bunkering operations;

14/2017_R2 in the use of a safety harness when using the pilot ladder.

SAFETY ACTIONS TAKEN DURING THE COURSE OF THE SAFETY INVESTIGATION²

Following the accident, an internal safety investigation was carried out by the Company. Although the cause of the accident had not been identified by the Company, four preventive measures were considered and adopted on all Company managed vessels:

- i. risk assessments have to be carried out before any work aloft and during the night is carried out;
- ii. work may only be carried out by two crew members to ensure that one of the crew members is overseeing the other;
- iii. additional safety equipment, including a safety harness, has to be utilised; and
- iv. the accident is discussed on board all vessels as part of an additional safety meeting.

² **Safety actions and recommendations should not create a presumption of blame and / or liability.**

SHIP PARTICULARS

Vessel Name:	<i>HS Rossini</i>
Flag:	Malta
Classification Society:	DNV GL
IMO Number:	9565338
Type:	Container
Registered Owner:	HS Rossini Shipping Co. Ltd.
Managers:	Hansa Shipping GmbH & Co. KG., Germany
Construction:	Steel
Length Overall:	228.0 m
Registered Length:	212.5 m
Gross Tonnage:	39753
Minimum Safe Manning:	13
Authorised Cargo:	Containers

VOYAGE PARTICULARS

Port of Departure:	Rio de Janeiro, Brazil
Port of Arrival:	Durban, South Africa
Type of Voyage:	International
Cargo Information:	33,018 mt of containerised cargo
Manning:	22

MARINE OCCURRENCE INFORMATION

Date and Time:	19 June 2016 at 2145 (LT)
Classification of Occurrence:	Very Serious Marine Casualty
Location of Occurrence:	Durban Container Terminal
Place on Board	Overside
Injuries / Fatalities:	One fatality
Damage / Environmental Impact:	None
Ship Operation:	Alongside/bunkering
Voyage Segment:	Arrival
External & Internal Environment:	It was dark with a light to gentle Southwesterly breeze and calm sea. The sea and the air temperatures were 22 °C and 20° C respectively.
Persons on board:	22