



Marine Safety Investigation Unit



Transport Malta



MARINE SAFETY INVESTIGATION REPORT

Safety investigation into a crew member fatality on the
Maltese registered bulk carrier

PERTH I

in position 26° 05.5' N 055° 49.0' E

on 31 May 2016

201605/030

MARINE SAFETY INVESTIGATION REPORT NO. 11/2017

FINAL

Investigations into marine casualties are conducted under the provisions of the Merchant Shipping (Accident and Incident Safety Investigation) Regulations, 2011 and therefore in accordance with Regulation XI-I/6 of the International Convention for the Safety of Life at Sea (SOLAS), and Directive 2009/18/EC of the European Parliament and of the Council of 23 April 2009, establishing the fundamental principles governing the investigation of accidents in the maritime transport sector and amending Council Directive 1999/35/EC and Directive 2002/59/EC of the European Parliament and of the Council.

This safety investigation report is not written, in terms of content and style, 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 objective of this safety investigation report is precautionary and seeks to avoid a repeat occurrence through an understanding of the events of 31 May 2016. Its sole purpose is confined to the promulgation of safety lessons and therefore may be misleading if used for other purposes.

The findings of the safety investigation are not binding on any party and the conclusions reached and recommendations made shall in no case create a presumption of liability (criminal and/or civil) or blame. It should be therefore noted that the content of this safety investigation report does not constitute legal advice in any way and should not be construed as such.

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LIST OF REFERENCES AND SOURCES OF INFORMATION

Crew members *MV Perth I*

Managers *MV Perth I*

GLOSSARY OF TERMS AND ABBREVIATIONS

AB	Able Seafarer
C.I.R.M.	International Radio Medical Centre
DPA	Designated person ashore
E	East
Gt	Gross tonnage
ILO	International Labour Organization
IMO	International Maritime Organization
kW	Kilowatt
LT	Local time
M	Metres
Mg	Milligrammes
MLC	Maritime Labour Convention
MM	Millimetre
MSIU	Marine Safety Investigation Unit
Mt	Metric tonnes
MV	Motor vessel
N	North
No.	Number
OOW	Officer of the watch
OPL	Outside port limits
PPE	Personal Protective Equipment
Rpm	Revolutions per minute
STCW	International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended
SWL	Safe working load
UAE	United Arab Emirates
UK	United Kingdom
UMS	Unmanned machinery space

SUMMARY

Perth I loaded a cargo of 33,000 mt of Kaolin Clay and 11,000 mt of Feldspar in Bahrain bound for Mina Saqr Port in Ras Al Khaimah, UAE. Discharge of the bulk cargo commenced on 27 May 2016 and was completed on 30 May 2016.

Upon completion of cargo operations, *Perth I* proceeded to off port limits (OPL) where she remained adrift, while the crew cleaned and prepared the cargo holds for the next cargo of stone aggregate, which was to be loaded in the same port. At 0600, on 30 May 2016, the cleaning operations of all the cargo holds were commenced.

At approximately noon, on 31 May 2016, the chief mate inspected cargo hold no. 1 and observed cargo residue behind the water ballast line. He requested the area to be cleaned, and asked the bosun to ask one of the ABs to remove the cargo residue from behind the ballast line after dinner.

It was during the cleaning of the cargo residue in cargo hold no. 1 that the AB slipped and fell from the port side hopper tank. After a number of hours in the ship's hospital, assisted by the other crew members, the master managed to arrange for the injured AB to be eventually transferred to a hospital ashore. Soon after, however, the master was informed that the injured AB had succumbed to his injuries.

The Marine Safety Investigation Unit (MSIU) determined that in all probability, the immediate cause of the fatal injuries was the fall from a height during the cargo hold cleaning operations. Taking into consideration the safety actions taken by the Company, no recommendations have been made by the MSIU.

1 FACTUAL INFORMATION

1.1 Vessel, Voyage and Marine Casualty Particulars

Name	<i>Perth I</i>
Flag	Malta
Classification Society	Bureau Veritas
IMO Number	9583550
Type	Bulk Carrier
Registered Owner	Hansa Liner Services Co.
Managers	Hansa Liner Services Co.
Construction	Steel (Double bottom)
Length overall	189.99 m
Registered Length	185.64 m
Gross Tonnage	33044
Minimum Safe Manning	16
Authorised Cargo	In ballast
Port of Departure	Mina Saqr, United Arab Emirates
Port of Arrival	Off Port Limits (OPL)
Type of Voyage	Short International
Cargo Information	Not Applicable
Manning	20
Date and Time	31 May 2016 at 1845 (LT)
Type of Marine Casualty	Very Serious Marine Casualty
Place on Board	Cargo hold
Injuries/Fatalities	One fatality
Damage/Environmental Impact	None
Ship Operation	Special Service - Drifting
Voyage Segment	Arrival
External & Internal Environment	Clear weather, Southwesterly moderate breeze and slight to moderate sea with a Southwesterly 1.2 m swell. Air temperature of 35 °C.
Persons on Board	20

1.2 Description of Vessel and Management

Perth I, a 33,044 gt bulk carrier (Figure 1), was built in 2009 in China and was registered in Valletta. She was owned and managed by Hansa Liner Services Co., of Greece and classed by Bureau Veritas (BV).

The vessel was fitted with five cargo holds. The hopper tanks inside cargo holds nos. 2, 3 and 4 were identical¹ *i.e.*, 7,340 mm in length and angled at 45°. The hopper tank in cargo hold no. 1 varied slightly in inclination and length due to the curvature of the vessel towards the flare of the bow. The calculated length of the hopper at frame 214 was found to be 7,533 mm with an inclination of 46.56°.

Perth I had a length overall of 189.99 m, a moulded breadth of 32.26 m and a moulded depth of 18.00 m. The vessel had a summer draught of 12.80 m, corresponding to a summer deadweight of 56,781 tonnes. *Perth I* was fitted with four cargo handling deck cranes, each of which had a safe working load (SWL) of 30 tons. The access hatch to cargo hold no. 1, where the accident happened, was positioned at the outboard side of the aft end of the cargo hold. The cargo hold was fitted with eight vertical ladders, four on each side. The rungs were welded in position between the side shell framing. All ladders were of steel construction.

Propulsive power was provided by a 6-cylinder, Kawasaki MAN-B&W 6S50MC-C, two-stroke, slow speed direct drive diesel engine, producing 9480 kW at 127 rpm. This drove a single fixed pitch propeller, reaching a service speed of about 14.20 knots.

The vessel's owners and managers had been issued with a Document of Compliance by BV on 06 November 2015, expiring on 20 December 2020. The vessel held a valid Safety Management Certificate issued by BV on 27 November 2015 with an expiry date of 24 January 2021. No observations and / or non-conformities were raised during the last audit. The vessel had also been issued with a Maritime Labour Convention, 2006 (MLC) Statement of Compliance by BV on 27 November 2015 at Tuticorin, India.

¹ Due to the cargo operations, precise measurements could not be taken during the course of the safety investigation and therefore, measurements, distances, and angles were calculated from the general arrangement plan.

As part of the Safety Management System (SMS), the Company operated a policy of zero tolerance for alcohol and drugs. It was reported that all crew and officers were tested by a third party company for drugs and alcohol during their routine medicals and that random testing was completed annually.

1.3 Crew

Perth I's Minimum Safe Manning Certificate required a crew of 16 for the vessel to retain the Unmanned Machinery Space (UMS) notation. There were 20 crew members on board at the time of the accident. All deck and engine-room officers were Indian, bar for the second engineer, who was a Filipino national. All the deck and engine-room ratings were Filipino, except for the fitter, who was Indian.

The chief mate, who was 34 years old, had been at sea for just over seven years and had served as a chief mate for about 18 months. He joined the vessel in Singapore, about four months before the accident. He held a master mariner's STCW Certificate of Competency issued by the Maritime & Coastguard Agency of the UK. He kept the 4-8 navigational watch.

The fatally injured AB was 43 years old and was reported to be in good health prior to the accident. He had completed a medical fitness examination in Manila, Philippines on 21 January 2016. The examination was completed in compliance with the 'ISM / STCW Code regulation I/9 and ILO conventions 147 and MLC 2006'. He was declared fit for sea service for two years from the date of issue.

This was the AB's fifth contract with Hansa Liner Services Co., having joined the vessel in Singapore on 07 March 2016. He had been serving in this rank with the Company for two years. Upon joining the vessel, the AB completed the Company's 'Safety Familiarisation Card', which included training of Personal Protective Equipment (PPE), Accident Prevention and the Permit to Work System, and Entry into Enclosed Space.

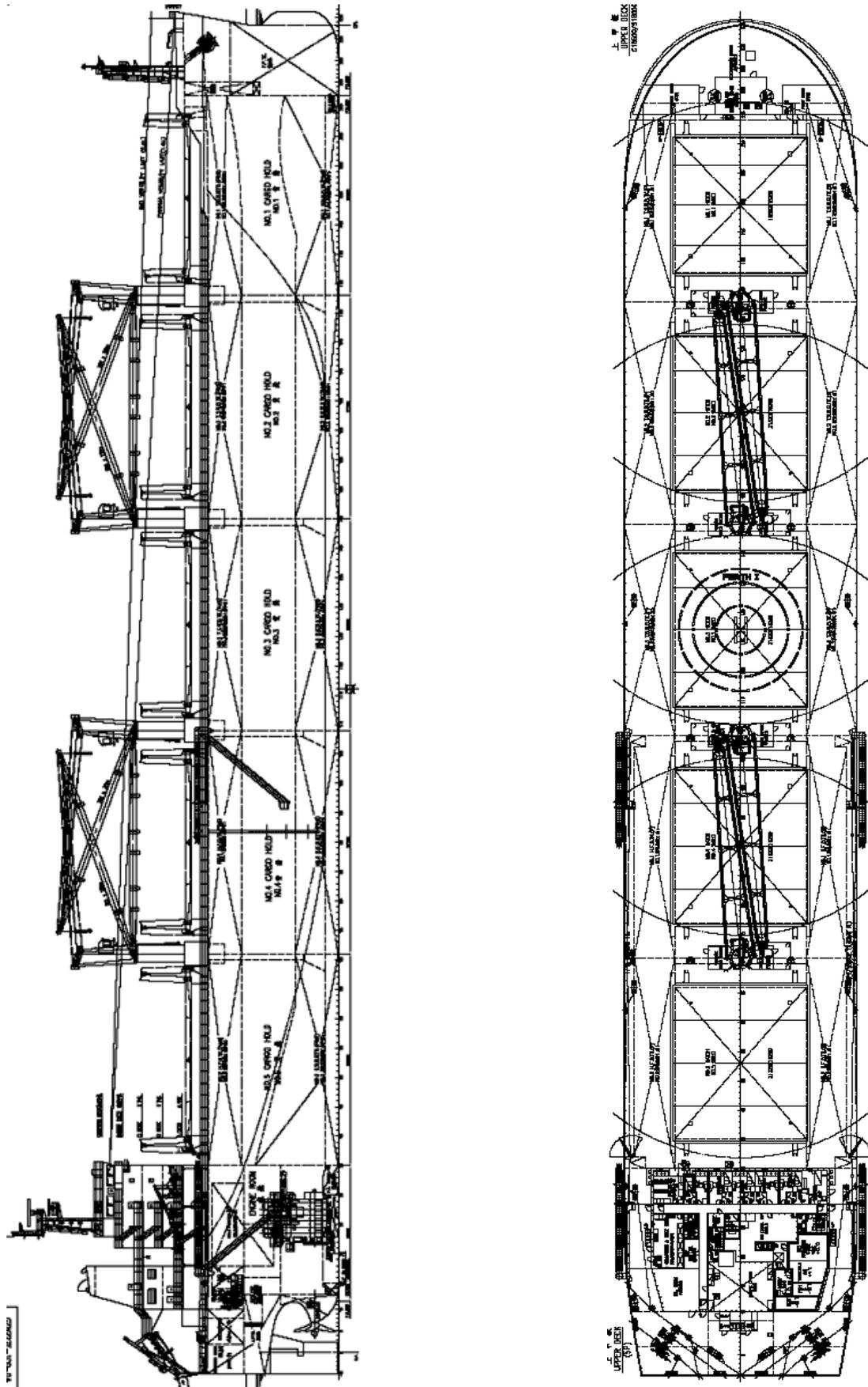


Figure 1: General Arrangement MV Perth I

1.4 Environment

The weather was clear with a Southwesterly moderate breeze and slight to moderate sea with a Southwesterly 1.2 m swell. The air temperature was 35 °C and sea temperature was recorded at 32 °C. The movement of the vessel was not recorded in the deck log book. However, both the master and the chief mate reported that there was slight movement and the vessel was pitching and rolling gently.

1.5 Narrative

After loading 33,000 mt of Kaolin Clay and 11,000 mt of Feldspar in Bahrain, *Perth I* proceeded to Mina Saqr Port in Ras Al Khaimah, UAE to discharge the cargo. Discharge of the bulk cargo commenced on 27 May 2016 and was completed on 30 May 2016. Upon completion of the cargo operations, the vessel proceeded to OPL where she remained adrift. This provided the necessary time to the crew members to clean and prepare the cargo holds for the next cargo of stone aggregate, which was to be loaded in the same port. The drafts of the vessel were recorded as 4.50 m fwd and 7.50 m aft.

At 0600 on 30 May 2016, the cleaning operations in all the cargo holds were commenced. The chief mate reported that the cargo holds were always swept clean first and then washed with sea water (by rigging the fire hoses) in order to remove the residues of the previous cargo. This was then followed by a final inspection of the cargo hold after it would have dried.

On 31 May 2016, cargo hold cleaning operations were still underway. Cargo hold no. 1 had already been cleaned in way of the tank top and the side hopper plates². It was reported that only a small amount of cargo residue remained lodged behind a ballast line in the forward part of the cargo hold and the chief mate had requested to be cleaned.

At 1800, AB 1 and AB 2 made their way into cargo hold no. 1, wearing safety shoes, coveralls, a safety helmet with a chin strap, palm coated working gloves and a safety harness. The tools which they carried consisted of a 6,000 mm aluminium single

² Prior to the entry of cargo hold no. 1, the Company's Permit to Work document had been completed.

ladder, a bucket containing a safety line, a scoop, some rags, and several plastic garbage bags. The tools were lowered into the cargo hold.

It was reported by AB 2 that once inside the cargo hold, he positioned the aluminium ladder between frame nos. 214 and 213, which was below the forward fixed vertical ladder on the port side of cargo hold no. 1. Subsequently, he witnessed AB 1 ascending the ladder with a full body harness and securing himself to the lower rung of the fixed steel ladder. AB 1 then commenced working with his hands to remove the cargo residue. AB 2 stated that the safety line was not rigged up for use.

AB 2 reported that he was sweeping the cargo residue which was being dislodged from behind the ballast line and falling down on the tank top. AB 2 recalled that he was placing the residue inside a bag, when at approximately 1845, he heard a loud noise; he turned around and looked upwards. At that moment, he witnessed AB 1 rolling down the hopper tank (Figure 2) and coming to rest on the tank top below.

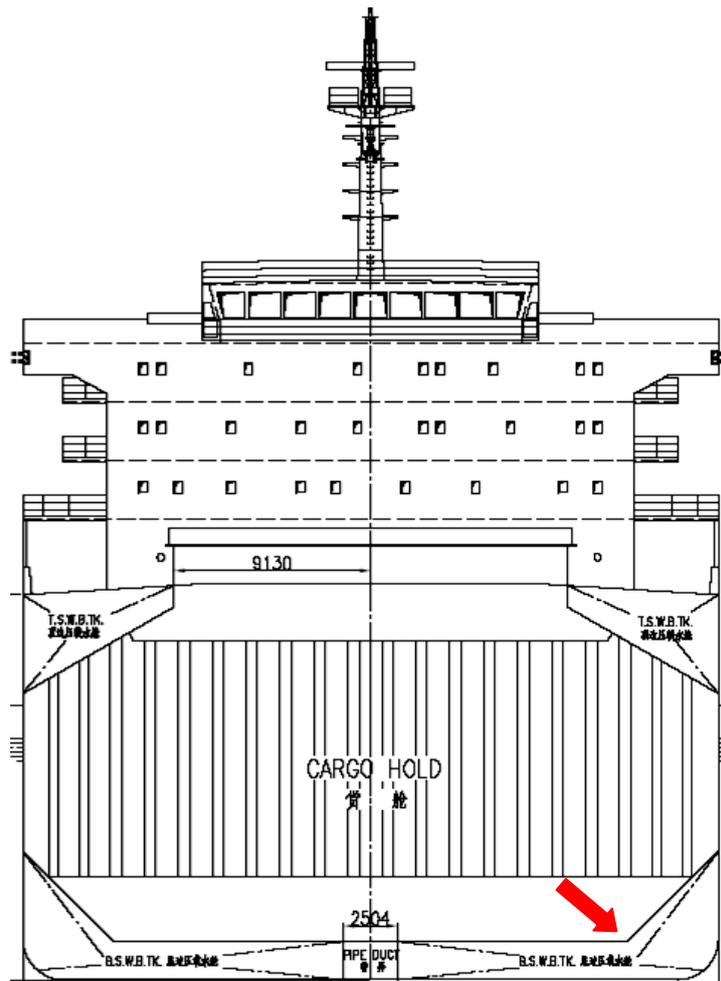


Figure 2: General arrangement of the cargo hold no. 1, showing the accident site

1.5.1 Post-accident events

AB 2 immediately reported the accident with his portable radio to the bridge, where the chief mate was the officer in charge of the navigational watch (OOW). The OOW raised the alarm and made an announcement on the public address system, instructing all crew to muster on the main deck in way of cargo hold no. 1. AB 2 reported that AB 1 was lying on his right side, in a foetal position. He was holding his right arm at the wrist and complaining of severe pain in the area.

The chief and second mates, the fitter, oiler, and another AB entered inside the cargo hold, followed by the master. The chief mate recalled that on entering the cargo hold, he saw AB 1 straight away lying on his right side but could not see any external injuries. He also stated that the aluminium ladder was observed flat on the tank top and leaning against the hopper tank. It was further reported that AB 1 was conscious, able to communicate with him, and to describe the pain he was experiencing.

The chief and second mates reassured AB 1, while at the same time tried to make an assessment of the injuries. The chief mate observed a mild abrasion to the left side of the frontal lobe of the head. At this time, AB 1 was holding his right arm in way of the wrist area and complaining of severe pain in the area. It was also reported that AB 1 was neither bleeding nor was there any loss of blood after the accident³.

At the time, on the basis of what was observed, both the master and the chief mate were of the opinion that the injuries sustained by AB 1 were not life threatening. They also stated that rudimentary first aid was administered to AB 1's wrist and a mild anaesthetic spray applied.

In the meantime, a cargo net containing a wooden pallet was lowered into the cargo hold. Six crew members lifted AB 1 carefully into a 'Neil Robertson' stretcher, which was then placed on top of the wooden pallet. The cargo net with the injured AB was then hoisted out of the cargo hold, by means of cargo crane no. 1 at about 1915.

From the main deck, the injured AB was transferred to the ship's hospital. The master proceeded to the bridge to notify both the Company's DPA and the Crew Department

³ An MSIU inspection of the overall, which was worn by AB 1 at the time of the accident, confirmed that there were no blood stains which would have indicated bleeding.

of the accident. The master was requested to seek medical advice from the Company's doctor.

The chief mate stated that he had also cut the injured AB's safety harness, boiler suit, and underwear. Moreover, the second mate commenced administering first aid and to clean the injured areas with antiseptic lotion. He also applied pain relief spray to the leg and hand and administered 100 mg of *Diclofenac Sodium* for pain relief.

1.5.2 External medical assistance

Both the chief and the second mates confirmed that the only visible injuries were limited to:

- abrasion of the left frontal lobe of the forehead;
- abrasion of the left shoulder;
- abrasion of the left leg in way of the knee area; and
- swelling of the right arm, in way of the wrist.

At 1920, the master tried to call the Company's doctor, but was unsuccessful. Nonetheless, the extent of the injuries was considered as minor, even because the injured AB was conscious, talking, and able to move his limbs, although complaining of pain in the area. At 2000, the master decided to proceed towards the port of Mina Saqr so that medical evacuation could be arranged, given that the vessel was only due to berth in two days time.

At 2020, a medical report was emailed to the Company's doctor. It was reported that "the casualty's condition conscious, able to speak and listen, able to breathe properly, able to excrete. Vomited once and resting now" [sic]. At about 2230, *Perth I* anchored within the port's dedicated anchorage area, in position 26° 00.70' N 055° 58.76' E. The injured AB's condition was reported to be stable as at 2300.

At approximately 0200, the two crew members who were observing the AB informed the master that the AB's condition was deteriorating. By this time, the master had still not received feedback on the medical report, which he had sent at 2020 to the Company's doctor. Further attempts to call the Company's doctor were again unsuccessful.

The master proceeded to the ship's hospital and noticed that the injured AB was now having difficulty to breathe and was in great pain. The swelling on his head and left knee were observed to have turned dark black. The second mate had also administered oxygen and pain relief medicines. Due to the regression in the AB's health condition, the master contacted the ship's loading agents to arrange for an immediate disembarkation.

The master was informed, however, that the discharge agents had not yet completed the immigration formalities and therefore were unable to assist. Eventually, after several attempts, the master made contact with the discharge agents and informed them of the critical situation on board. The agents confirmed that they will make the necessary arrangements to order the services of a launch; however, they cautioned that this could only be done during daylight hours.

The DPA and the Crewing Manager were again contacted by the master at about 0245 to inform them of the AB's deteriorating condition. He also informed them that a medical evacuation would not happen until daylight hours. The master was advised to contact Mina Saqr Port Control and request immediate assistance. According to the master, Saqr Port Control was contacted at 0330 and medical assistance was formally requested. The MSIU was informed that Mina Saqr Port Control instructed the Master to contact the agents to make the necessary requirements for a medical evacuation.

Further attempts to contact the Company's doctor remained unsuccessful. At 0340, the master sent an email to the International Radio Medical Centre (C.I.R.M.). In his request for radio medical advice, the master described the injured AB's conditions as "...critical, he is unable to breathe, unconscious and unable to bear the acute pain."

C.I.R.M. replied at 0400, advising that medical oxygen should be administered for 20 minutes every hour, ice wrapped in cotton cloth should be applied on the head and kept on the injured area as much as possible. It was also advised that "*no medicine should be administered at present (No Aspirin)*"⁴ and that the injured AB should be disembarked from the vessel for a shore side medical facility as soon as possible.

⁴ The anti-thrombotic action of Aspirin is associated with an increased risk of bleeding. Therefore, the drug is contra-indicated in people who are, *inter alia*, receiving certain type of medication and who

The response from C.I.R.M. was subsequently relayed to Mina Saqr Port Control, however, the master stated that the Port Control explained again that they could not assist and that the ship's agents should be contacted first.

The master checked on the injured AB at 0440 and reported the following observed symptoms to C.I.R.M.:

- not able to move left leg and right hand due to acute pain;
- now not able to speak;
- cannot open eyes fully / right eye is responding to light;
- making arrangements for his evacuation to shore medical facility; and
- blood pressure measured at 142/100; body temperature 37.5 °C; pulse rate 78.

Later during the night, the DPA contacted the master to inform him that both agencies had been instructed to assist with the medical evacuation of the injured crew member. Eventually, Mina Saqr Port Control contacted the vessel at about 0600 and informed them that arrangements had been made for the medical evacuation.

At 0700, the injured AB was observed to be sleeping but taking shallow breaths. Statements gathered from the crew members suggested that basic first aid was administered throughout the night⁵. The first aid was reported to consist of administering medical oxygen when the injured AB complained of difficulties to breath and applying mild anaesthetic spray to the right wrist and left knee.

At about 0900, the supply boat *Inchcape 5* manoeuvred port side alongside *Perth I*. The injured AB was placed in a 'Neil Robertson' stretcher at 0910 and was safely lowered to *Inchcape 5* at 0915⁶. Later during the day, the master was informed by email that the injured AB had been pronounced dead upon arrival at the hospital⁷.

may have suffered (or are suspected to have suffered) serious injuries because of an increased risk of haemorrhage.

⁵ Limited records were maintained on what medical treatment was administered and on the continuous monitoring of vital signs.

⁶ The Master stated that just before the injured AB was evacuated from the vessel, evidence of throat and stomach movement were captured on a mobile phone.

⁷ At the time of writing of this safety investigation report, the MSIU had neither received a copy of the autopsy report nor the toxicological results.

The vessel remained within the Mina Saqr anchorage until 17 June 2016 and an investigation was carried out by the local police force. On 18 June 2016, at 2048, the UAE Coast Guard granted permission to the vessel to berth in Mina Saqr Port and load stone agitate. The vessel berthed at berth no. 10 at 2306 on the same day. The MSIU was then able to board the ship to carry out the onsite safety investigation.

2 ANALYSIS

2.1 Purpose

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.

2.2 Inspection of Cargo Hold No. 1

An inspection of the accident site was carried out during the on board visit after the vessel berthed alongside. Due to the ongoing cargo loading operations in the cargo hold, access was very limited. The cargo hold was noted to have no corrosion to the tank top and side plating. Minor breakdown of the epoxy coating was observed on the tank top and hopper tank.

It was reported that at the time of the occurrence, AB 1 was standing on the lower rung of the vertical fixed side ladder in way of side shell frames 214 and 215 (Figure 3). The calculations suggested that he had been working at a height of between 8,000 mm and 9,500 mm above the tank top of cargo hold no. 1 on the port side. Both the master and the chief mate stated that the aluminium ladder was positioned flat against the hopper tank (Figure 4) and that no other equipment and obstructions were present in the cargo hold at the time of the accident.

The aluminium ladder used by AB 1 to access to the top of the hopper tank had a length of 6,000 mm and the distance between the top of the aluminium ladder and the lower rung of the fixed steel ladder had been calculated to be 1,500 mm.

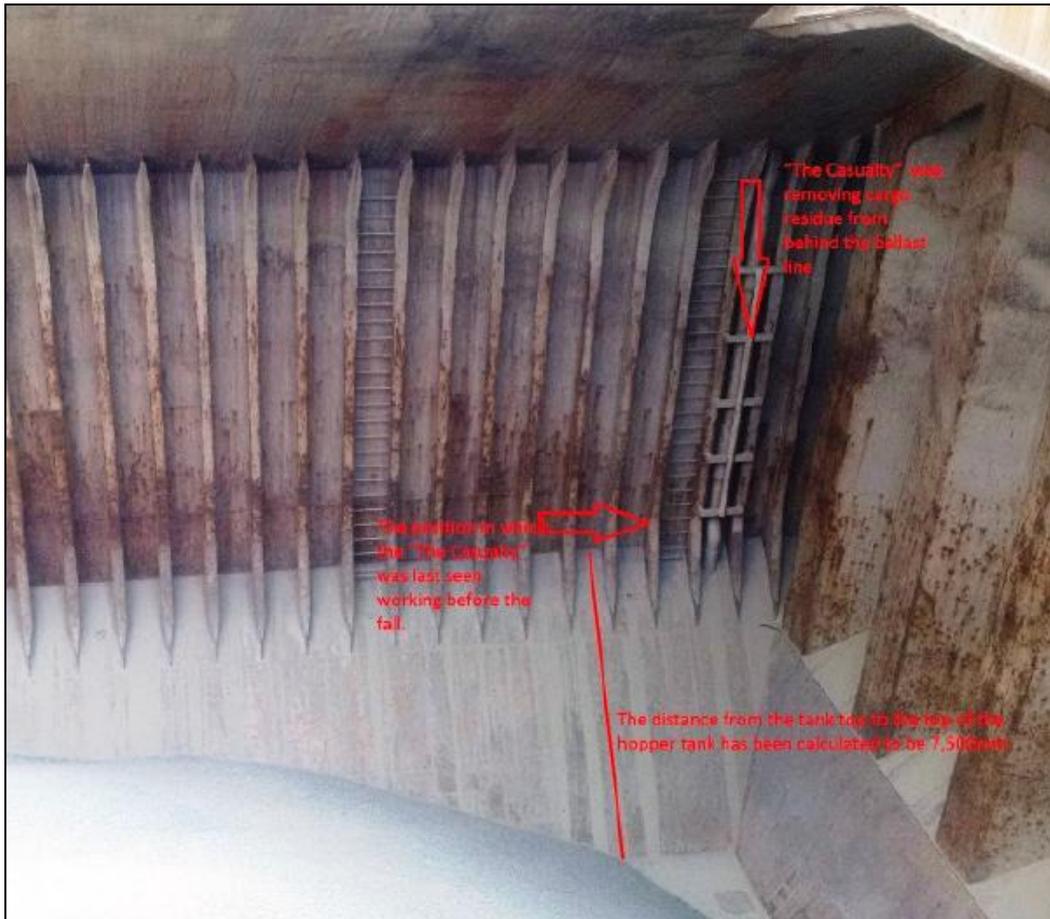


Figure 3: Position of the AB when he was cleaning cargo residues behind the ballast line

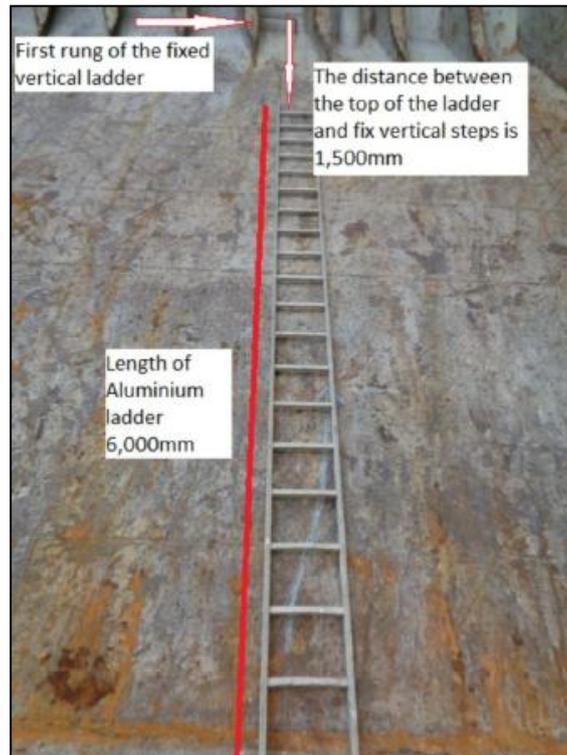


Figure 4: Aluminium ladder positioned flat on the hopper tank

AB 2 stated that he had his back to AB 1 when the latter fell and therefore he was unable to state the exact location from which AB 1 had lost his balance. AB 2 did state, however, that he assumed that his colleague was descending the fixed steel ladder as the work was nearing completion and consequently, he had unclipped his safety harness. AB 1's medical report stated that he was 1,600 mm tall. The distance between the two ladders has been calculated as 1,500 mm. Consequently, AB 1 would have had to hold one of the lower rungs of the fixed vertical steps and then fully extend his body for his feet to reach the first step of the aluminium ladder when descending.

Although the safety investigation is of the opinion that the AB must have unclipped his safety harness and lost his footing while transitioning between the two ladders⁸, the MSIU did not exclude the possibility that AB 1 lost his footing due to the vessel's movement. It was reported that the vessel was rolling and pitching gently. Although the conditions were neither rough nor considered to have posed a significant risk to the crew members inside the cargo hold, the weather may have been a contributing factor, had the vessel pitched at the same time that AB 1 unclipped his safety harness.

2.3 Cargo Hold Entry Procedures

A Permit to Work for the cargo hold cleaning had been completed on 31 May 2016 in accordance with the Company's procedures. The Permit to Work was prepared by the chief mate and countersigned by the master. The chief mate then handed the Permit to Work over to the bosun, who instructed AB 1 and AB 2 on what was required, after which, they all signed the Permit to Work document.

All sections of the Permit to Work document had been completed. Ventilation and lighting were not deemed to be required as the cargo hold hatch was open at the time of the accident and the natural light was deemed sufficient for the task. It was reported that a toolbox talk was completed at 1500.

AB 2 had a portable VHF radio to communicate with the duty officer on the bridge whilst carrying out the cargo cleaning duties inside the cargo hold. It is the opinion of the MSIU that AB 2 had been distracted with the cleaning up of the area below the

⁸ As previously mentioned, there was no safety line rigged for the purpose of this task.

hopper tank and that his main focus as the stand-by man had been compromised. It was not excluded that he was the only crew member (together with the fatally injured crew member) inside the cargo hold because the task / complexity may have not been perceived to require any additional crew members in attendance.

The assessment mentioned above did not bear any signatures, bar that of the chief mate and the master, who prepared and approved the assessment respectively. The chief mate reported that the risks were conveyed both to AB 1 and AB 2 during the tool box talk. It was noted that the Risk Assessment issued was initially completed on the 01 March 2013, although the risk library is reviewed annually during the course of the Management Review Meeting⁹.

The 'Company's SMS' Revision 01, dated 10 May 2013, contained details of all forms in the SMS Manual. It was of note that no specific forms, checklists or specific text were available for cargo hold cleaning operations¹⁰.

2.4 Medical Assistance

The information available to the MSIU suggested that the crew members assisting their injured colleague received limited medical assistance via radio. It was of concern to the safety investigation that the assistance was limited to an extent that the crew members were unable to appreciate that a person may vomit a short time after an accident (as it happened to the injured crew member) because of head / brain injuries.

⁹ The MSIU has been informed that the last Management Review Meeting prior to the accident had been carried out in October 2015. Moreover, it has been explained that masters are instructed to include additional hazards and take relevant control measures, based on the prevailing circumstances.

¹⁰ It has to be stated, however, that when cargo hold cleaning is carried out, it is expected that a risk assessment, work plan meeting, and permit to work procedures are adopted. The Company had also adopted the UK's Code of Safe Working Practice for Merchant Seamen.

**THE FOLLOWING CONCLUSIONS AND SAFETY
ACTIONS SHALL IN NO CASE CREATE A
PRESUMPTION OF BLAME OR LIABILITY.
NEITHER ARE THEY LISTED IN ANY ORDER OF
PRIORITY.**

3 CONCLUSIONS

Findings and safety factors are not listed in any order of priority.

3.1 Immediate Safety Factor

- .1 The immediate cause of the fatal injuries was the fall from a height inside the cargo hold during cleaning operations;
- .2 The distance between the two ladders had been calculated to be 1,500 mm. Consequently, AB 1 would have had to hold one of the lower rungs of the fixed vertical steps and then fully extend his body, for his feet to reach the first step of the aluminium ladder when descending to the cargo hold tank top;
- .3 The AB must have unclipped his safety harness and lost his footing while transitioning between the two ladders.

3.2 Latent Conditions and other Safety Factors

- .1 AB 2 had been distracted with cleaning up the area below and that his main focus as the stand-by man had been compromised;
- .2 No specific forms, checklists or specific text were available in the Company's SMS for cargo hold cleaning operations;
- .3 The medical assistance which the crew members received was very limited.

4 ACTIONS TAKEN

4.1 Safety Actions Taken During the Course of the Safety Investigation

During the course of this safety investigation, the Company took the following safety actions:

- In accordance with Section 9 of the ISM Code, an internal investigation was carried out and the findings of the investigation were shared with the MSIU and the crew members serving on board Company ships;
- All masters and chief mates are required to attend courses in medical care and first aid, risk assessment, and incident and accident investigation and analysis;
- The relevant sections of the safety management manual have been amended to include information on the cleaning of cargo holds and related safety precautions;
- Additional contact details have been added to the Company's official list to be used in cases of emergency on board.