



## SAFETY INVESTIGATION REPORT

201812/023

REPORT NO.: 21/2019

December 2019

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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This safety investigation has been conducted with the assistance and cooperation of the Hellenic Bureau for Marine Casualties Investigation.

### **MV *NEW ISLAND*** **Fatal fall in cargo hold** **in position 36° 01.2' N 027° 58.0' E** **28 December 2018**

### SUMMARY

On 28 December 2018, *New Island* was at anchor, Southeast of Rodos Island, Greece, in a ballast condition, awaiting orders.

The crew were carrying out scraping and touch-up painting in cargo hold no. 3. The work was paused at around 1500 for a coffee break, at which point, the crew members started exiting the hold. In the process, one of the able seafarers (ABs) fell onto the tank top, inside the cargo hold.

The alarm was raised and the injured crew member was lifted out of the cargo hold by the use

of a stretcher and the vessel's crane. A medical evacuation was arranged while, in the meantime, the crew member was given first aid by the vessel's crew members.

The AB was pronounced dead on arrival at the hospital. The safety investigation concluded that, in all probability, the immediate cause of the accident was loss of balance whilst exiting the cargo hold.

Following the actions taken by the Company, no safety recommendations have been made.



## FACTUAL INFORMATION

### The vessel

*New Island* was a 27,306 gt Maltese-registered bulk carrier, managed by Hind Maritime Enterprises S.A. based in Greece, and owned by Vionaval Maritime S.A. The vessel was built by Minami Nippon Ship Building Co. Ltd., in Japan, in 2002.

*New Island* was classed with the Nippon Kaiji Kyokai (ClassNK). The vessel had a length overall of 189.90 m, a moulded depth of 16.7 m, and a moulded breadth of 31.0 m. The supramax bulk carrier had a deadweight of 47,306 tonnes, was fitted with five steel cargo holds and four cargo cranes.

Propulsive power was provided by a MITSUBISHI B&W 6S50MC 6-cylinder, two stroke, slow speed, internal combustion engine, which produced 7,428 kW at 111 rpm. This drove a single, fixed pitch propeller to reach a service speed of 13 knots.

### Crew

*New Island's* Minimum Safe Manning Certificate stipulated a crew of 15. At the time of the accident, the vessel had a crew complement of 21. The crew complement included a master, a chief mate, a second and third mate, a chief engineer, one second and two third engineers, an electrician, a bosun, five ABs, a fitter, three oilers, a cook, and a messboy. All crew members were Syrian nationals.

### The fatally injured AB

The fatally injured AB was 40 years old. He had spent 15 years at sea, out of which, 10 were served in the rank of AB. He had served the Company for about eight years as an AB. He had obtained his certificate as a rating forming part of a navigational watch, issued by the Syrian General Director of Ports, 12 years prior to the accident. The AB had joined *New Island* on 07 June 2018 from El Dekheila, Egypt.

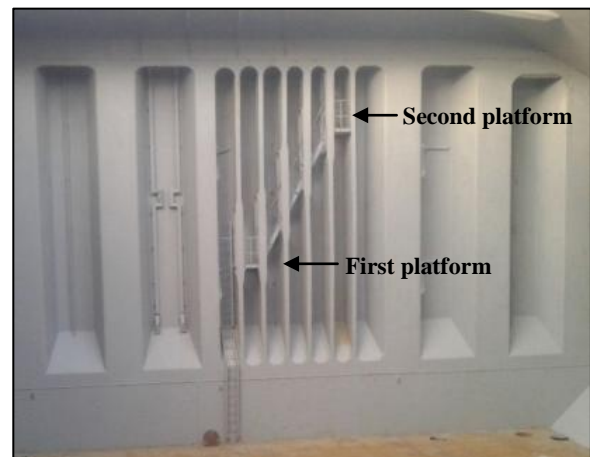
The other crew members did not notice any unusual behaviour from the AB on the day of the accident. His pre-joining medical fitness certificate declared him fit for sea service.

### Environment

At the time of occurrence, the wind was blowing from a Northwesterly direction with force three on the Beaufort wind scale. The sea state was reported to be smooth. The air and sea temperatures were 16°C and 15°C respectively.

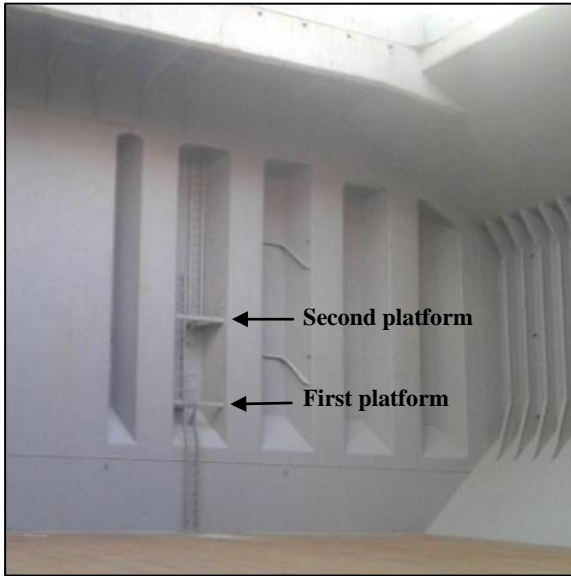
### Means of access to the cargo hold

To access the cargo hold, *New Island* had two points of entry. One entry was located in the aft part of the cargo hold (Figure 1); which was a combination of vertical ladders and an inclined ladder. The first platform was located at 6.0 m above the tank top, while the second platform was located at 10.5 m above the tank top.



**Figure 1: The aft access ladder to cargo hold no. 3, at the aft bulkhead**

The other cargo hold access was located at the forward end of the cargo hold, and consisted of three sections of vertical ladders with two platforms at each interval (Figure 2). The first platform was approximately 3.96 m above the tank top, and the second one was situated at a height of approximately 6.85 m from the tank top.



**Figure 2: The forward access ladder to cargo hold no. 3, at the forward bulkhead**

The latter access was the one that the fatally injured AB was using at the time of occurrence.

Inspections of the ladder carried out by the vessel's crew, after the accident, did not reveal any deformations or other defects in this ladder.

The cargo hold hatch covers were open on that day, and daylight was illuminating the cargo hold.

### **Narrative<sup>1</sup>**

The vessel's last port of call was El Dekheila, Egypt, where a cargo of wheat in bulk was unloaded. On 25 December 2018, the vessel sailed towards the Aegean Sea, in ballast, in order to anchor and wait for further orders.

Cargo hold cleaning and washing had commenced on departure; however, due to adverse weather conditions, these were suspended at noon on 26 December 2018. The cleaning resumed the next day with scraping and touch-up painting in cargo holds nos. 1 and 2.

On the morning of 28 December 2018, a toolbox talk was held by the chief officer. The meeting was attended by the bosun and four ABs. During the talk, the jobs for that day, the tools to be used, relevant risk assessments and Personal Protective Equipment (PPE), were discussed.

AB 1 (deceased) was assigned to scrape relevant areas of cargo hold no. 3 and, after lunch time, was assigned to paint the scraped areas located on the starboard side bilge hopper tank. To execute the latter task, AB 1 was using the paint spray machine, while wearing the relevant PPE. The rest of the ABs (AB 2, AB 3 and AB 4), and the bosun were in the same cargo hold, scraping and painting using paint rollers.

At about 1500, the bosun stopped the work in the cargo hold, for a coffee break. All crew proceeded towards the aft ladder, with the exception of AB 1, who was noticed making his way quickly to the forward access ladder. No items were reported to be seen in his hands, while climbing the forward access ladder. AB 2 and AB 3 were out of the cargo hold, before anyone else. While the bosun and AB 4 were still climbing up the aft access ladder, they heard a loud noise coming from the forward area of the cargo hold. When they looked back, they both saw AB 1, lying on the tank top close to the ladder (Figure 3).

AB 1 had been previously noticed to have passed the first platform on his way up. Although no one saw him fall, it was estimated that he had fallen from a height of about six to seven metres.

<sup>1</sup> Unless otherwise stated, all times in the safety investigation report are ship's time (UTC + 02).



**Figure 3: Simulation of the injured AB, as he was found lying on the tank top**

The bosun called out to AB 2 and AB 3 (who were out of the cargo hold) to inform the bridge and the master about the accident, while he and AB 4, went back to check on the fallen crew member. Although breathing, AB 1 was unconscious.

### **Post-accident events**

The medical team was assembled and the master went inside the cargo hold to assess the situation. On assessment, he ordered the crew to strap the injured crew member in a stretcher and bring him up to the deck, using the ship's crane, while he proceeded up to the bridge. The master called Lindos Port<sup>2</sup>, which was approximately 8.5 nm away, and Rodos Port<sup>3</sup>, which was situated about 35 nm away, several times over the VHF; however, no reply was received from either of these ports, at that time.

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<sup>2</sup> Lindos port is set on the East coast of Rodos Island.

<sup>3</sup> The Island's main port.

The anchor was up at 1545. At 1703, following consultation with shore authorities, the vessel received a call from JRCC Piraeus<sup>4</sup> confirming that the vessel had to proceed to Rodos.

Approximately three hours after the accident, the fatally injured AB was transferred to a Coast Guard boat and taken to a hospital where his death was recorded.

### **Cause of death**

The certificate of death presented to the safety investigation confirmed that the cause of death was a fracture to the thorax (chest) resulting from a fall from a great height.

## **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.

### **Cooperation**

During the course of this safety investigation, the MSIU received all the necessary assistance and cooperation from the Hellenic Bureau for Marine Casualties Investigation.

### **Hours of rest and fatigue**

The fatally injured AB was on day work, for the month of December. The AB had 11 hours of rest, after finishing his work on 27 December. On the morning of 28 December, he had started work at 0800. Work was suspended for one hour between 1200 and 1300.

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<sup>4</sup> JRCC (Joint Rescue Coordination Center) Piraeus is responsible for coordinating search and rescue operations in the Greek SRR (Search and Rescue Region).

Although the MSIU could not confirm the quality of rest of the AB, the records and his behaviour did not indicate that fatigue was a contributing factor.

### Immediate cause of the accident

The MSIU found no clear evidence to determine the cause of the AB's fall. However, statements from the crew indicated that the AB was in a rush to reach the main deck. This could have resulted in a momentary lapse of attention causing him to lose his balance and his subsequent fatal fall.

### Personal protective equipment – missing barrier

Evidence showed that the safety helmet (Figure 4) was found some distance away from the AB's fallen position; which suggests that the chin strap had not been fastened.



Figure 4: Safety helmet worn by the AB, showing visible cracks front and back

It cannot be excluded that the helmet had come off and thus, provided little to no protection to the AB's head. However, it has to be highlighted that the death certificate indicated serious injuries to the chest area as the cause of death.

The gloves worn by the AB (Figure 5) were dirty and stained with paint. Both dirt and paint may have considerably reduced the friction provided by the gloves, contributing

to the AB losing his grip on the ladder while climbing up.



Figure 5: Working gloves worn by the fatally injured AB

The safety shoes used by the AB were worn out, especially the soles (Figure 6). The MSIU, however, could not determine the effects which this may have had on the dynamics of the accident.



Figure 6: Safety shoes worn by the fatally injured AB. Arrows showing signs of thinning soles

While working with the paint spray machine, the AB was reported to be wearing safety goggles and a gas mask (Figure 7). He was not wearing these PPE while climbing up the ladder and therefore, these were not

considered to have hindered the AB's ascent to the main deck.



Figure 7: Cartridge type gas mask used by the AB

### Conditions in the cargo hold

The hatch covers of cargo hold no. 3 were open at the time of occurrence. Natural light was illuminating the space, and therefore lack of illumination was not considered as a contributory factor to this occurrence.

The fittings and structure of the forward access ladder, as inspected by the ship's crew after the accident were found to be free from any defects or deformities. The condition of the forward access ladder was therefore not considered to be contributory to this accident.

### Risk Assessment

A specific risk assessment for cargo hold entry, (D-06)<sup>5</sup> was completed for that day. The risk assessment identified two hazards in relation to the use of cargo hold access ladders (Figure 8).

<sup>5</sup> Risk Assessment Form, Record Number D-06: Cargo Hold Entry Edition: 1, Amendment: 00, Valid since: 1 July 2010.

Ship's Name:		MV NEW ISLAND
Work Activity Being Assessed :		CARGO HOLD ENTRY
Hazard Analysis of the Intended Work Activity		
Hazard No.	Description of Identified Hazard	Existing Control Measures to protect personnel from harm
6	Fall from cargo hold access ladders	Cargo hold main access is the access fitted with the "Australian ladder". Access with vertical ladder as emergency exit
7	Fall from cargo hold vertical access ladder (height > 2m)	Whenever a vertical ladder of height >2m has to be used, a safety harness should be worn by the seaman who use it.

Figure 8: Extract from Risk Assessment (D-06), showing identified hazards nos. 6 and 7, and their existing control measures

With the existing control measures for hazard no. 6, the risk factor, as assessed by the chief officer and the master, was high. In order to reduce the risk, the additional control measures put in place were: "wear safety shoes, helmet, leather gloves."

The risk assessment identified the access fitted with the Australian ladder<sup>6</sup> as the main access to the cargo hold, while the vertical access ladder as an emergency exit. It further specified that a seafarer, who uses a vertical ladder of more than two metres in height, had to wear a safety harness.

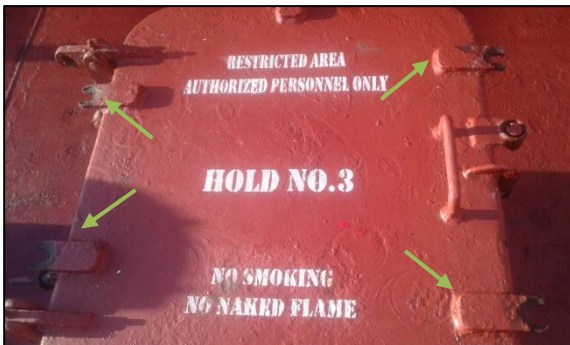
Considering the existing control measures in place (safety harness) for hazard no. 7, the related risk factor was assessed as very low. However, evidence available to the safety investigation did not indicate that a safety harness was readily available at the bottom of the vertical ladder. Nor were any symbolic barriers present to indicate that the vertical ladder should be used as an emergency exit only.

Since the risk assessment was relying only on the immaterial barrier of the crew's knowledge of its contents, in the opinion of the safety investigation, the risk factor for hazard no. 7 should have been higher and additional mitigating factors should have been considered.

<sup>6</sup> An inclined ladder that has intermediate platforms between the tank top and the deck. Reference: (<http://www.agriculture.gov.au/SiteCollectionDocuments/biosecurity/export/plants-plant-products/plant-exports-manual/bulk-vessel-terms-definitions.pdf>)

It is probable that the crew members exiting the cargo hold did not raise the point that the forward ladder was being used without the use of a safety harness.

For the vertical access ladder to be used as an emergency exit, the access hatch on deck would have to be kept open while personnel are in the cargo hold – as its means of securing were butterfly nuts (Figure 9) which could be only operated from the main deck. Thus, the MSIU believes that the access hatch for the forward vertical access ladder was open at the time of the accident and was readily available for AB 1 to use.



**Figure 9: Access hatch to cargo hold no. 3. Butterfly nuts securing points (green arrows)**

### Other findings

As observed in Figure 8 of this safety investigation report, the risk assessment specified that whenever a vertical ladder of more than two metres is used, a safety harness should be worn by the crew member making use of it (Hazard no. 7).

It was noticed that the aft access ladder to the cargo hold, consisted of a six metre-high vertical ladder. In the understanding of the MSIU, this would require the crew to wear a safety harness to climb this stretch of ladder. However, no evidence was found to indicate that a safety harness was being used by the crew members to climb the aft vertical ladder that was part of the aft access ladder.

During the course of the safety investigation, it was revealed that the crew members understood that there was a clear distinction

between the aft access ladder and the forward one. They also understood that using the aft access ladder, wearing safety shoes, a helmet and leather gloves would be less hazardous.

Considering the above and taking into account the six metre-high vertical section of the aft access ladder, the safety investigation is of the view that the control measures identified for hazards nos. 6 and 7 may be problematic given that, the risk assessment did not require the use of a safety harness while using the aft access ladder.

### Perception and acceptance of risk

It remained unclear to the safety investigation as to why the fatally injured crew member was in a hurry to make his way out of the cargo hold. The use of the forward access ladder was attributed to the fact that the aft access ladder was already being used by two crew members. Given the apparent haste with which the crew member made his way towards the forward ladder and out of the cargo hold, it was not excluded that the wearing of a safety harness, even if one was available, would have been viewed as a time consuming process and which would have also hindered him from a rapid exit.

## CONCLUSIONS

1. The AB fell from a height of approximately six to seven meters onto the tank top;
2. It is probable that dirty gloves had considerable reduction in friction characteristics;
3. The fittings and structure of the forward vertical access ladder, used by the AB, were found to be free from any defects and deformities that could have contributed to his fall;
4. With the hatch covers open, natural light was illuminating the cargo hold;
5. Although the Risk Assessment D-06 required the use of a safety harness, the fatally injured crew member was not wearing a safety harness at the time of the accident;
6. Incorporeal barrier systems did not include the requirement to wear a safety harness while using the vertical access ladder.

any worn or damaged PPE found is to be replaced accordingly.

The risk assessment on cargo hold entry has been amended by the Company to include the requirement of wearing a safety harness for all vertical access ladders (forward & aft), having a height of more than two metres.

The accident details and analysis carried out by the Company were circulated within the fleet, and additional safety training was provided to the crew.

## SAFETY ACTIONS TAKEN DURING THE COURSE OF THE SAFETY INVESTIGATION<sup>7</sup>

During the course of the safety investigation the Company had identified the need to clearly mark both ends of the vertical ladder, with signs that such ladder is to be used as an emergency exit only and to be used with a safety harness.

Furthermore, the Company now requires that the minutes of the toolbox meetings, when job orders and risk assessments are discussed; are recorded and signed by all participants. In addition, during the tool box meeting, an inspection of the PPE is required to be carried out by the job supervisor, and

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<sup>7</sup> Safety actions shall not create a presumption of blame and / or liability.



**SHIP PARTICULARS**

Vessel Name:	<i>New Island</i>
Flag:	Malta
Classification Society:	Class NK
IMO Number:	9258349
Type:	Bulk Carrier
Registered Owner:	Vionaval Maritime S.A.
Managers:	Hind Maritime Enterprises S.A.
Construction:	Steel
Length Overall:	189.90 m
Registered Length:	182.11 m
Gross Tonnage:	27,306
Minimum Safe Manning:	15
Authorised Cargo:	Break bulk cargo

**VOYAGE PARTICULARS**

Port of Departure:	El Dekhiela, Egypt
Port of Arrival:	Waiting orders
Type of Voyage:	Short international voyage
Cargo Information:	In ballast
Manning:	25

**MARINE OCCURRENCE INFORMATION**

Date and Time:	28 December 2018 at 15:10 (LT)
Classification of Occurrence:	Very Serious Marine Casualty
Location of Occurrence:	36° 01.2' N 027° 58.0' E
Place on Board	Cargo Hold No. 3
Injuries / Fatalities:	One fatality
Damage / Environmental Impact:	None
Ship Operation:	At Anchor
Voyage Segment:	Waiting orders
External & Internal Environment:	Sea state smooth. Wind North West, Beaufort Force 3. Air temperature 16°C and Sea temperature was 15°C.
Persons on board:	25