



SAFETY INVESTIGATION REPORT

202210/005

REPORT NO.: 15/2023

October 2023

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.

© Copyright TM, 2023.

This document/publication (excluding the logos) may be re-used free of charge in any format or medium for education purposes. It may be only re-used accurately and not in a misleading context. The material must be acknowledged as TM copyright.

The document/publication shall be cited and properly referenced. Where the MSIU would have identified any third party copyright, permission must be obtained from the copyright holders concerned.

This safety investigation has been conducted with the assistance and cooperation of Equatorial Guinea.

MV PORT GDYNIA **Fatal fall of a stevedore,** **during cargo operations** **in the port of Bata, Equatorial Guinea** **07 October 2022**

SUMMARY

During the early hours of 07 October 2022, *Port Gdynia* was moored alongside in the port of Bata, Equatorial Guinea. Cargo operations had been stopped due to heavy rain and stevedores had left the vessel.

Upon resuming cargo operations, crew members noticed that one stevedore had fallen into cargo hold no. 1 and had suffered fatal injuries.

No person witnessed the accident, but the safety investigation believes that a gap between distal and proximal cues may have been the main contributory cause of the accident.

The MSIU has issued one recommendation to the Company to disseminate the findings of the safety investigation to its fleet.



MV Port Gdynia

FACTUAL INFORMATION

Vessel

Port Gdynia, was a 3,093 TEU¹ container vessel (**Figure 1**) built in 2011 by Gryfia Repair Shipyard, Szczecin, Poland and was registered in Malta. The vessel was owned by C Aranda S.P. Z.O.O. and managed by Polskie Linie Oceaniczne S.A. of Poland. The Polish Register of Shipping (PRS) acted as the classification society as well as the recognised organization, in terms of the International Safety Management Code, for the vessel.

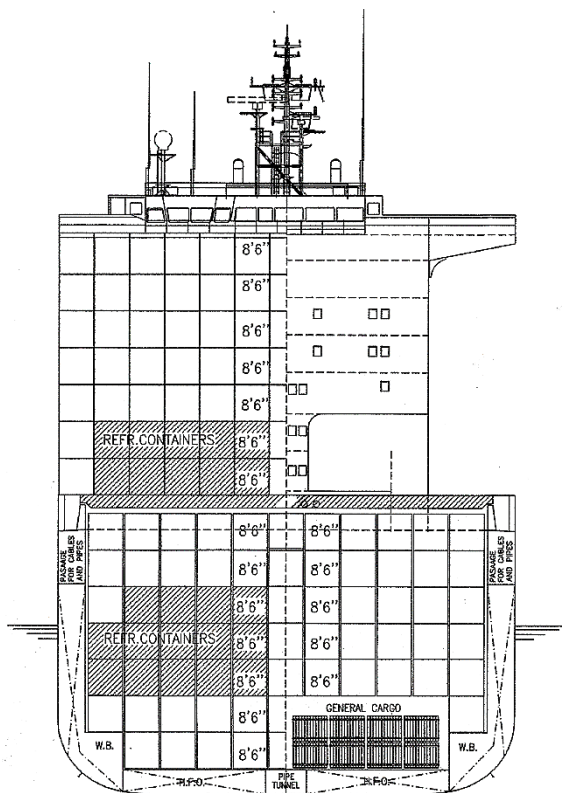


Figure 1: Midship section of *Port Gdynia*

Copyright: Morska Stocznia Remontowa Gryfia S.A.

Port Gdynia was a 34,642 gt vessel with a length overall of 220.00 m, a moulded breadth of 32.24 m, and a moulded depth of 18.70 m. The vessel had a summer draught of 12.15 m and a corresponding deadweight of 41,956 tonnes. Three cranes were

installed on deck, each with a Safe Working Load (SWL) of 40 tonnes.

Propulsive power was provided by a 7-cylinder HCP 7K80MC-C, two stroke, slow speed direct drive marine diesel engine, producing 26,270 kW at 104 rpm. This drove a single, right-handed fixed pitch propeller, enabling *Port Gdynia* to reach a maximum speed of 22.0 knots.

Crew members and the injured stevedore

The vessel complied with the Minimum Safe Manning Certificate issued by the flag State Administration. The crew comprised of 18 members, *i.e.*, four deck officers, four engine-room officers, and 10 ratings.

All crew members were Polish nationals, bar for the third officer, who was from Ukraine. The official communication language on board was Polish.

The safety investigation was informed that the fatally injured stevedore was a national of Equatorial Guinea. During *Port Gdynia*'s stay in port, he was working inside deck crane no. 1.

Environment

The accident happened during the morning twilight. Artificial light was switched on the main deck. The cargo operations had been in progress for more than a day prior to the accident.

The wind was Southerly Force 3, and the sea state was calm inside the port area. A spell of heavy rain was experienced in the early morning hours of 07 October 2022. Visibility was generally good. No swell was reported to have been entering the port area at the time of occurrence. Sunrise at the port of Bata was at around 0600².

¹ Twenty-foot equivalent unit.

² Retrieved from: [Sunrise and sunset times in Bata, October 2022 \(timeanddate.com\)](https://www.timeanddate.com)

Cargo holds

At the time of occurrence, cargo operations were in progress in three cargo holds:

- cargo hold no. 1 -
Bay 06 - centre hatch cover open.
Loading not yet started.
- cargo hold no. 4 -
Bay 26 – port and starboard hatch covers open.
Loading in progress.
- cargo hold no. 6 -
Bay 42 – port and starboard hatch covers open.
Loading in progress.

The procedure on board was to have a crew member on stand-by at the time of opening / closing of the pontoon hatch covers. This would allow the crew members to keep an eye for any damages to the vessel's equipment / hull during the hatch cover movements.

The vessel was also equipped with portable stanchions, serving as a physical barrier between the cross-bay's walkway and the cargo hold opening (**Figures 2 and 3**). These stanchions were one metre high, with ropes passing horizontally through welded eyes at the top and mid-way to the deck. They were normally fitted when the cargo hatch covers were removed.



Figure 2: Stanchions and rope fitted on the forward side of bay 06



Figure 3: Stanchions and rope fitted on the aft side of bay 06 and passing through crane no. 1's platform

Narrative³

Port Gdynia arrived at Bata anchorage on the morning of 06 October 2022 and was made fast starboard side alongside at around 1130. The vessel had to unload 253 full containers, load 264 empty containers, and carry out several re-stow moves.

By 1330, about 10 stevedores had boarded the vessel and within a few minutes, cargo operations were commenced, using the vessel's three deck cranes. Stevedores were operating the cranes and acting as signal persons to guide the crane operators during loading and unloading of containers⁴. The unloading operations had been completed by 0315 of the following day.

Cargo operations were suspended at 0345, when heavy downpour started in the area. A hand-over of the port watch from the second officer to the third officer took place at 0600. Cargo operations resumed at around 0624, after the rain intensity had reduced to moderate / slight. At about 0700, the centre hatch cover pontoon of bay 06 was opened

³ Unless otherwise stated, all times are vessel time (UTC +1).

⁴ Unlashing and lashing of cargo containers was to be carried out by the vessel's crew members. The crew members would also open the relevant hatch cover cleats before the start of the cargo operations.

by the stevedores and lowered on the port side hatch cover of the bay, in preparation for loading.

However, at approximately 0724, the third officer, who was carrying out routine inspection on deck, observed a group of five stevedores gathered near bay 06, where cargo operations were yet to commence. While trying to comprehend what had happened, he noticed a body at the bottom of the empty cargo hold. He immediately notified the chief officer of the matter.

The chief officer proceeded on site, while the vessel's medical officer (second officer) was called to assist. Eventually, it was confirmed that a stevedore had fallen into the cargo hold and landed on the tank top of bay 06, row 01 (Figure 4).



Figure 4: The location where the stevedore was found

The fatally injured stevedore, who was wearing an orange coverall, and a pair of safety boots, was found about 5.5 m from the nearest vertical ladder. His legs were hanging over the bottom of row 01's edge, into the row 00's space.

The chief officer, together with the medical officer, checked for the stevedore's pulse and signs of breathing, however, no vital signs were detected. The crew members could observe that the stevedore had suffered fractures to his limbs and was bleeding from his head.

Information from Bata's terminal operator⁵

Information provided by Bata's terminal operator indicated that the heavy rain had subsided at about 0640 and cargo operation on board had been resumed. However, at about 0715, the stevedore team observed that the stevedore working inside crane no. 1 had not returned to work. Following a short search, he was found on the tank top in bay 06, by one of the stevedores.

Stevedore practices observed by the vessel's crew members

A general observation by one of the crew members described the stevedores work as dangerous. He often observed stevedores climbing on top of containers to execute their job.

Furthermore, it was not the practice among the stevedores to inform the vessel's crew members on the progress of cargo operations. The safety investigation was also informed that the stevedores were unable to communicate in English.

⁵ Times referred to in this section may not necessarily be synchronized with the vessel's time.

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 this safety investigation, MSIU received assistance and cooperation from the *Registro de Buques y Empresas Marítimas*, *Ministerio de Transporte, Correos y Telecomunicaciones* of Equatorial Guinea.

Immediate cause of the accident

The stevedore's external injuries suggested that they had been caused by a fall from a height. However, no autopsy report was provided to the MSIU to corroborate this. The safety investigation was also informed that prior to the accident, the stevedore was working inside crane no. 1. In the absence of any direct witnesses, and given that the stevedore was assigned to work in the area, it was considered highly likely that the stevedore had fallen from a height of at least 16 metres⁶.

Location of the fall

As mentioned elsewhere in this safety investigation report, the fatally injured stevedore was found about 5.5.m from the nearest vertical ladder. Since his final position was deemed too far off from the ladder, it was considered highly unlikely that he had slipped while ascending / descending that ladder (**Figure 5**).



Figure 5: Position of the body and the nearest vertical ladder

The centre hatch of bay 06 had been opened and placed on the port side hatch cover of the same bay. The removal of the centre hatch provided access to rows 01, 00 and 02 of the cargo hold for loading. It was not excluded that before the stevedore fell into the cargo hold, he was either standing on the starboard side hatch cover, or on the cross bay between bay 06 and bay 10, near the vessel's crane structure (**Figure 6**).

Crane's maintenance access hatch

Given the position of the body, the safety investigation also assessed the possibility of a fall through the crane's maintenance access hatch. It was noticed that the access hatch was almost directly above the location where the stevedore had been found (**Figure 7**). That all depended on the position of the cabin (*i.e.*, the angle of rotation) *vis-à-vis* the position from where the stevedore was found. The MSIU was unable to obtain specific and precise information on the crane's last known position.

⁶ This is the approximate height from the open hatch cover to the bottom of the tank top, in row 01 of bay 06.

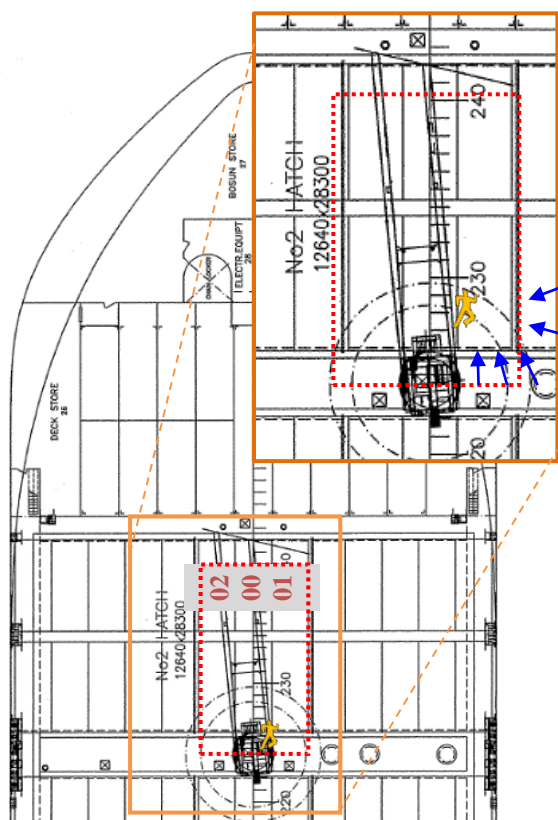


Figure 6: GA plan extract showing the open access to the cargo hold's centre relative to the fatally injured stevedore's location. Inset – arrows showing possible locations from where the stevedore could have fallen

Copyright: Morska Stocznia Remontowa Gryfia S.A.

The access hatch faced forward (Figure 8) and provided access to, *inter alia*, the floodlights fitted to the crane. The hinges were fitted away from the front windowpane and therefore, the access hatch panel had to be pulled open towards the driver seat. Being an access panel, it was naturally wide enough for a person to go through. Then, the stevedore did not appear to have a large physique and would have managed to pass through.

Photos confirmed that there were no material defects which could have caused an accidental opening of the hatch. Therefore, it would have been a voluntary action by the stevedore if indeed, he slipped out of the cabin through the maintenance access hatch. The safety investigation, however, could neither confirm this nor determine why the

stevedore would have accessed the maintenance hatch, given that it led to nowhere, and he had no reason to go through it. In this respect, this hypothesis was not pursued any further.

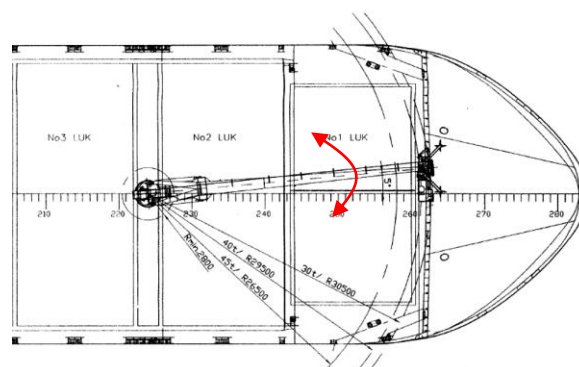
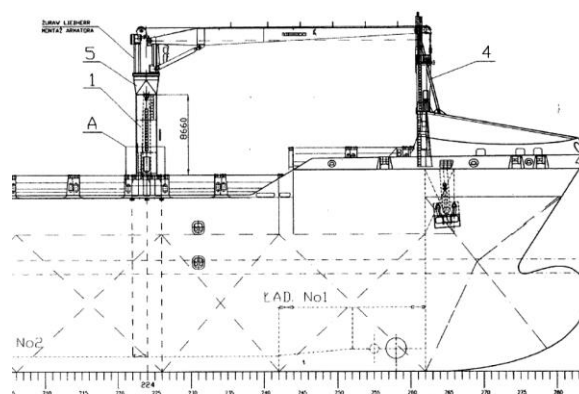


Figure 7: Deck crane details over cargo hold no. 1



Figure 8: Maintenance access hatch inside the deck crane's cabin

Time of the fall

The MSIU was unable to establish the exact time when the stevedore fell into the cargo hold. The safety investigation was informed by the crew members that the centre hatch cover for bay 06 had been opened at about 0700. However, it was also reported that there were no crew members in attendance when the hatch cover was opened by the stevedores. Taking into consideration the level of water that was observed at the bottom of bay 06, the MSIU believes that the centre hatch cover for the bay had been opened prior to the start of the heavy rain *i.e.*, before 0345⁷.

Information provided by the terminal indicated that stevedores had organised a search party for the stevedore as soon as it was noticed that he did not report back to work and that he was missing (which was sometime around 0715). It is believed that if the stevedore had just started his shift, he would have boarded *Port Gdynia* with his colleagues who had all been assigned tasks / stations. Therefore, there would not have been a need to organise a search to locate him, as they would have been aware of his whereabouts.

Additionally, the extent of bleeding observed on the tank top indicated that the stevedore may have been inside the cargo hold for quite some time. It was considered highly likely by the safety investigation that his fall had occurred at the time the cargo operations had been stopped because of the heavy rain.

Weather and lighting

Cargo operations had been stopped due to a spell of heavy rain. Being an equatorial region, this was a common occurrence with Bata's rainiest months being September, October, and November, with an average

rainfall of 2,400 mm⁸. Consequently, visibility during these rain spells would have been greatly impacted. If the accident happened at the time that cargo operations were stopped, it was not excluded that the reduced visibility may have contributed to the fatally injured stevedore's unknowingly stepping inside the perimeter of the open cargo hold.

The artificial lighting in the area, coupled with the heavy rain, may have also cast shadows around bay 06 and the vessel's crane no. 1 structure during the night. This may have further misguided the stevedore, as he walked away from the interrupted cargo operations.

Since the stevedore had been previously working inside crane no. 1, it was also not excluded that he may have been disorientated after descending and exiting the crane's structure. Combined with the heavy rain, he may have taken a wrong turn and fell into the open cargo hold.

Considering also that the deck was wet with rainwater, it was not excluded that the stevedore slipped and fell into the cargo hold.

No swell was recorded in the port area of Bata on the morning of the occurrence. Therefore, sudden vessel movements / motions were not considered to be contributory to the stevedore's loss of balance, footing and / or holding.

Physical barrier systems

There were no physical barrier systems, say, in the form of stanchions and ropes, installed at the time of the occurrence. Crew members had not been notified that the stevedores intended to open the centre hatch cover of bay 06. Then, the operation of crane no. 1 (to lift the centre hatch cover of bay 06) may

⁷ The MSIU sought to clarify this with the Equatorial Guinean Authorities, however, no response was received on the matter prior to the closure of the safety investigation.

⁸ Climate of Equatorial Guinea. (n.d.) Retrieved from:
<https://www.britannica.com/place/Equatorial-Guinea/Climate>

have either gone unnoticed by the crew members, or else it did not raise any concerns. Furthermore, the centre hatch cover was placed on the port side hatch cover of the same bay, making its opening less noticeable for the crew members⁹. Unaware of the opening, the crew members did not install the stanchions around the perimeter of the opened hatch cover, as a protection against a fall from the crossbay, next to the crane's structure.

The starboard side of the hatch cover was also considered by the safety investigation as another possible location from where the stevedore may have fallen. The sides of the hatch covers were not normally provided with stanchions surrounding the borders; effectively, it was hazardous to stand on a hatch cover next to an adjacent open hatch cover.

One may argue that it would have been up to the individual to assess the risk and act accordingly, even in the light of missing physical barrier systems. However, it was acknowledged that an *ad hoc* assessment exercise would have been subjective at best and incomplete at worst, not least because of the unknown variables, which would need to be considered at the time.

Control over risk – further considerations

The absence of witnesses imposed a challenge for the safety investigation in its attempts to understand the stevedore's perception of risk and what role it had played in his decision-making process. That was critical because it would have enabled the safety investigators to analyse and perhaps understand how the stevedore made sense of the contextual situation, minutes before the accident happened.

Moreover, the safety investigation had no insight of the organisational culture and sub-

cultures, which the stevedore formed part of. Thus, as much as group behaviour may have also influenced one's approach towards work-related risk, it was not possible to analyse risk from a socio-cultural paradigm. In this respect, the effect of group / organisational culture on the stevedore, and how this culture may have influenced the risk acceptance / mitigation aspects, remained unknown variables to the safety investigation.

The absence of accident data on the subject matter was further compounded by additional lack of information on the stevedore's final actions, just before the fatal fall into the empty cargo hold. As much as it was an undisputable conclusion that the fall into the cargo hold meant that the stevedore somehow stepped beyond the safe perimeter of the cargo hold opening, it was not possible to determine whether this was a matter of:

- not anticipating the hazard;
- not understanding the risk;
- an illusion on the control of risk; and
- judgment made prior to his action.

The safety investigation was of the view that although critical accident data was not available for analysis, it may be safely stated that there existed a gap between (what are known as) distal cues (*e.g.*, the environment), and proximal cues (*i.e.*, the stevedore's perception of the environment).

Whilst the local conditions of rain and the hour of the day may have influenced the 'dimensions' of this gap, the absence of accident data did not make it possible for the safety investigation to identify a more detailed account of the distal and proximal cues, and how these correlated and influenced the decision-making process of the stevedore.

⁹ Landing it ashore, it would have been seen by the crew members positioned on the starboard side of the vessel and the bridge.

PPE

The safety investigation did not come across accident data, which would have confirmed that the stevedore was wearing a safety helmet. Nonetheless, the MSIU believes that a safety helmet would not have prevented the fatal injuries which the stevedore had sustained because of his fall into the cargo hold.

Fatigue / Drugs & Alcohol

No data on the stevedore's quality and period of rest was available to the safety investigation. Neither were toxicological test results available to confirm, or otherwise, the presence of illicit / medical drugs and / or alcohol.

As such, the safety investigation was unable to determine whether fatigue, drugs and / or alcohol were contributing factors to this occurrence.

Dangerous practices

The safety investigation did not have data indicating how the stevedores' dangerous actions were addressed, if any. The reported behaviour *per se*, as much as noticeable was accepted – at least to a degree that it did not necessitate the suspension of the cargo operations. The safety investigation believes that this was suggestive of similar behaviour patterns which crew members may have observed in other ports, in other areas around the world and therefore, not necessarily endemic to the port where this accident has happened.

CONCLUSIONS

1. The stevedore's external injuries suggested that they were caused by a fall from a height.
2. Before the stevedore fell into the cargo hold, he was either standing on the starboard side hatch cover, or on the cross bay between bay 06 and bay 10 near the vessel's crane structure.
3. It was not excluded that the reduced visibility may have contributed to the stevedore unknowingly stepping inside the perimeter of the open cargo hold.
4. Artificial lighting in the area, coupled with the heavy rain, may have cast shadows around bay 06 and the vessel's crane no. 1 structure during the night.
5. Walking out of crane no. 1, the stevedore may have taken a wrong turn and fell into the open cargo hold.
6. Considering that the deck was wet with rainwater, the stevedore may have slipped and fell into the cargo hold.
7. Sudden vessel movements / motions were not considered to be contributory to the fatally injured stevedore's loss of balance, footing and / or holding.
8. Physical barrier systems had not been installed around the perimeter of the opened hatch cover at the time of the occurrence because crew members had not been notified that the stevedores had opened the centre hatch cover of bay 06.
9. An *ad hoc* risk assessment exercise by the stevedore would have been subjective at best and incomplete at worst, not least because of the unknown variables which would need to be considered at the time.
10. A gap existed between distal cues and proximal cues.

RECOMMENDATIONS¹⁰

Polskie Linie Oceaniczne S.A. is recommended to:

16/2023_R1 Disseminate the findings of the safety investigation to the fleet.

¹⁰ **Recommendations shall not create a presumption of blame and / or liability.**

SHIP PARTICULARS

Vessel Name:	<i>Port Gdynia</i>
Flag:	Malta
Classification Society:	Polish Register of Shipping (PRS)
IMO Number:	9334387
Type:	Container vessel
Registered Owner:	Aranda S.P. Z.O.O.
Managers:	Polskie Linie Oceaniczne S.A.
Construction:	Steel
Length Overall:	220.00 m
Registered Length:	220.23 m
Gross Tonnage:	34642
Minimum Safe Manning:	15
Authorised Cargo:	General cargo in containers

VOYAGE PARTICULARS

Port of Departure:	Lomé, Togo
Port of Arrival:	Kribi, Cameroon
Type of Voyage:	Short international voyage
Cargo Information:	Cargo operation was in progress
Manning:	18

MARINE OCCURRENCE INFORMATION

Date and Time:	07 October 2022 at 0725 (LT)
Classification of Occurrence:	Very Serious Marine Casualty
Location of Occurrence:	01° 49.5' N 009° 44.1' E
Place on Board	Cargo hold
Injuries / Fatalities:	One fatality
Damage / Environmental Impact:	None reported
Ship Operation:	Cargo operations, loading shore-to-ship
Voyage Segment:	Alongside, moored
External & Internal Environment:	Twilight time, raining, with good visibility. Sea state negligible as vessel was in a port area. Air temperature was recorded at 25 °C.
Persons on board:	18 crew members and undetermined number of stevedores