

Case study for onboard safety meeting

Near fatality when checking lashings of vehicles in the cargo hold of bulk carrier

Please read the below story of an incident. Keep our company's standards and procedures in mind while reading to compare with the actions of the crew below as we will discuss the factors which led to the incident occurring.

An Ultramax bulk carrier was scheduled to load a mixed cargo of tractors, new and used trucks, fibreboards, steel coils, aluminium ingots, and bagged chemicals in Rizhao, China, for discharge in Lagos, Nigeria.

During the loading process, the Master raised several concerns. These included inadequate lashings, the risk of damage to steel coils due to the weight of the fibreboards and vehicles loaded on top of them, and the uneven loading of vehicles above jumbo bags. Despite these issues, loading was completed on 14 June, and the vessel departed Rizhao.



The crew was instructed by the managers to inspect the cargo lashings daily. As the vessel holds lacked mechanical ventilation, portable blowers with ducts were used to ventilate them before entry. On 23 June, while in the Indian Ocean, a crew member felt unwell while checking lashings in Cargo Hold #3. A pungent smell was also reported. The crew exited the hold, and gas readings were taken. Results showed normal oxygen levels (20.9%), no hydrogen sulphide or explosive gases, but the presence of carbon monoxide (8 ppm). The following day, another attempt was made to enter the hold. The gas readings remained unchanged. Despite wearing half-face masks with filters, a crew member fell unconscious. He was rescued and revived.

A few days later, the vessel encountered severe weather while transiting south of South Africa. This caused vehicles in the holds to shift and collide with each other and the hold structure. The vehicles on the deck also suffered significant damage.

Investigation report highlighted the following:

Dangerous nature of the cargo

- While the vehicles were classified as non-dangerous cargo due to compliance with IMDG Code provision 961(2), they still contained fuel in their tanks as allowed under the Code. This fuel may have leaked during the voyage. The exact amount of fuel in each vehicle was not known.
- As for the pungent smell inside the hold, there were no conclusive findings, although the surveyor commented that it was possibly from the urea-formaldehyde resin applied to the cargo of fibreboards by the manufacturer.

Atmosphere in the holds

- The portable blowers were insufficient to ensure proper ventilation of the cargo holds.
- Half face masks with filters did not provide adequate protection against the hazardous atmosphere.

Lashings

- Cargo shifting occurred due to broken or loose lashings. Calculations to ensure adequate lashing were not performed.
- The cargo securing manual lacked guidance on stowing and lashing such cargoes.
- The lashings were difficult to access, posing a safety risk.

Weather routing

- The Master was not provided with weather thresholds for the voyage, including max wave height, wind force, and swell.
- No weather routing advice was obtained.

How to improve by lessons learnt

You should now perform an onboard risk assessment of the operation described. Learning from the case could be obtained by identifying the contributing factors for this specific incident to occur – and discuss whether some of the identified factors could be present onboard your ship.

Key questions for discussion:

Cargo related

- Hazards posed by the cargo of vehicles, even though it was classified as non-dangerous under the IMDG Code.
- Does the cargo securing manual address stowage and lashing of such cargoes? If 'not', then how can owners and crew ensure that securing and lashing are adequately done?
- How can you ensure that the cargo in the lower tiers can withstand the load of the cargo on top?

Ventilation

- Advantages of having mechanical ventilation installed compared to natural ventilation. Where mechanical ventilation is installed, is it preferable to have the system operate in supply mode or exhaust?
- Should the cargo hold to be treated as an enclosed space when carrying vehicles with fuel?

Personnel safety

- Types of gasses that the gas meter should be capable of measuring when carrying vehicles with fuel in the cargo holds.
- Additional precautions to be taken when carrying vehicles in the cargo holds.
- Actions to be taken when a hazardous atmosphere is detected in the cargo holds.
- Benefits and limitations of half face masks / respirators.

Weather routing

- Weather thresholds when carrying such cargoes.

A few key words to facilitate discussion: lashing, enclosed space, ventilation, commercial pressures, dangerous, IMDG, procedures, vehicles, CSM.

1 What factors contributed to the incident on board the vessel and at loading port?

**2 Risk Assessment: Could some of the risk factors be identified on board your vessel?
What is the likelihood and severity of those risk factors?**

**3 What measures would you suggest in order to mitigate the risk that could lead to such incidents?
Any additional barriers of safety that could be introduced?**