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Bulk carrier safety, efficiency reshaped by new rules, tools

YEAR'S END A TIME TO REFLECT

Cargo securing of containers

THIS article is drawn from *Maritime Safety Awareness Bulletin: Shaping Shipping for People,* Issue #22, September 2025: "Cargo securing of containers".

1. Cargo securing

Inadequately stowed and secured cargoes cause significant harm to people, the environment, other cargoes and vessels, not only at sea but also during loading and discharge.

These safety issues may result in serious incidents, environmental pollution and reputational damage to the shipping industry and can also cost tens of millions of dollars to clean up[1].

Safety of Life at Sea (SOLAS) Convention and Marine Order 42 (Carriage, stowage and securing of cargoes and containers) stipulates that cargo shall be loaded, stowed and secured to prevent damage or hazard to the ship, persons and loss of cargo overboard.

1 Kinley, M. 2020 "A time of reminders", Shipping Australia, Spring/Summer. p. 52.

During ships inspections, the Australian Maritime Safety Authority (AMSA) identified the following stowage and securing issues involving cargo containers:

- exceeded maximum permissible container stack weights;
- exceeded maximum permissible weight distributions within stacks; and
- cargo was not appropriately secured throughout the voyage to prevent loss of cargo overboard.

2. Case study 12 – 50 containers overboard[2]

The vessel underwent a series of heavy rolls that resulted in the loss of 50 containers overboard.

The investigation found that the vessel's fixed container securing arrangements on deck were inadequately maintained and the strength of the securing fixtures were severely reduced by corrosion, which compromised the effective securing of cargo.

For extended periods, shipboard inspections failed to detect deteriorating condition of the vessel's deck structure and fittings.

2 Australian Transport Safety Bureau (2022) Marine Occurrence Investigation Report – Loss of containers overboard from APL England. 16 December 2022.

3. Case study 2 – 81 containers overboard[3]

Approximately 81 containers were lost overboard and a further 62 were damaged due to heavy rolling while the vessel was enroute to Sydney.

The investigation found that (amongst other factors):

- the calculated resultant forces on the weights and distribution of containers in two bays exceeded the allowable force limits specified in the ship's cargo securing manual;
- the cargo planning process ashore did not ensure that the proposed container stowage

3 Australian Transport Safety Bureau (2022) Marine Occurrence Investigation Report – Loss of containers overboard YM Efficiency. 13 February 2020.

Figure 1. *Thinned, heavily wasted and failed lashing eyes (top) and wasted and failed container support structure (bottom)*

Figure 2: *Damaged containers*

plan complied with the stowage and lashing forces requirements of the ship's cargo securing manual;

- the master and chief mate did not check that the proposed container stowage plan complied with the cargo securing manual; and apart from on-the-job training and mentoring, there was no evidence to indicate that the officers had been trained in the use of the loading computer system or the lashing calculation program.

4. Strategies to prevent container loss

The requirements for ensuring the proper stowage and securing of cargo containers are set out in the International Convention for the Safety of Life at Sea (SOLAS), 1974 Chapter VI, Regulation 5. SOLAS requires cargo to be appropriately secured "throughout the voyage" to prevent loss of cargo overboard.

The ship's approved cargo securing manual includes requirements on cargo securing, including the types and correct application of cargo securing devices provided on board the ship. The following are some practical strategies for improving container securing and preventing container loss.

5. Maintaining and monitoring cargo securing arrangements

Operators must ensure that securing devices are in good condition, compatible with the ship and maintained in accordance with the inspection and maintenance schedule contained in the cargo securing manual.

This includes establishing maintenance schedules to ensure cargo securing equipment and fittings are regularly inspected and maintained.

Maintenance processes and procedures should be regularly reviewed for continued effectiveness. Crew need to monitor cargo securing arrangements throughout the voyage to ensure the lashing arrangements have not become loose.

6. Procedures and training

Operators should provide training to ensure crew are appropriately trained and familiar with the contents of the approved cargo securing manual, in accordance with their respective roles on board.

Exceeding the mass limits defined in the cargo securing manual may result in the destruction of lashings and fittings or the collapse of individual containers.

The approved cargo securing manual should be comprehensive and understandable. Poorly written procedures will likely result in poor practices or non-compliance. It is important to ensure the manual is developed to align with the way tasks are actually conducted onboard for safety and practicality.

Operators should regularly review the procedures and manual to ensure they are up-to-date and effective to enable the crew to implement the requirements of the manual appropriately

7. Preparing for weather and sea conditions

Severe weather conditions may be experienced at any time of the year off the Australian coast. Most container loss incidents in Australian waters have occurred during severe weather conditions.

Strong southerly winds, when combined with an easterly swell, can create extreme wave conditions where container ships are at risk of losing cargo overboard. In such incidents, swell size and interval may lead to excessive or even parametric rolling resulting in extreme acceleration forces on container stacks.

Cargo shall be stowed and secured in accordance with the Code of Safe Practice for Cargo Stowage and Securing (CSS Code). The CSS Code General Principles state:

"Decisions taken for measures of stowage and securing cargo should be based on the most severe weather conditions which may be expected by experience for the intended voyage."

Additionally, due to the construction of container ships, the effects of parametric rolling are pronounced and can cause stress on securing systems leading to container loss[4]. As such, vessel dynamics should be considered in evaluating sea states and applying weather routing during voyage to minimise effects of parametric rolling.

Guidance for avoidance of parametric rolling is provided in MSC.1/Circ.1228 Revised guidance to the master for avoiding dangerous situations in adverse weather and sea conditions. While the vessel's safety management system will contain procedures relating to heavy weather, early avoidance is better than proceeding through heavy weather[5].

Effective weather routing procedures should be in place. The master should always consult the latest available weather information and vessel operators should ensure the master always has access to this information[6].

In Australia, the Bureau of Meteorology (BoM) provides weather forecasts and high seas warnings to GMDSS equipped ships; these are received by appropriate terminals configured to NAVAREA XI.

4 Dutch Safety Board (2020) Investigation Report - Safe container transport north of the Wadden Islands Lessons learned following the loss of containers from MSC Zoe. June 2020.

5 Code of Safe Practice for Cargo Stowage and Securing (CSS Code).

6 MSC.1/Circ.1228 Revised guidance to the Master for avoiding dangerous situations in adverse weather and sea conditions

8. Concentrated Inspection Campaign

Australia, along with member Authorities of the Tokyo and Indian Ocean MOUs continue to identify issues relating to improper cargo securing and stowage. A concentrated inspection campaign is planned to be conducted by both MOUs in relation to cargo securing and stowage in 2026, in collaboration with the Paris MOU.

9. Key messages[7]

Safety management systems should capture, and address risks associated with cargo.

Introduce specific measures and controls to mitigate risks effectively.

The risk assessment should capture risks involving heavy weather navigation, including precautions to prevent the loss of cargo, and ensure appropriate checklists are available.

Effective weather routing, based on the latest available weather information, should be undertaken.

Regularly review the risks and control measures to ensure the controls remain effective and up to date, in light of new information or a change in operational condition.

The ship's crew must be familiar with the approved cargo securing manual.

Cargo securing equipment and fittings should be regularly inspected and maintained.

Containers must be stowed and secured in accordance with the approved cargo securing manual and the crew should check this before signing off on cargo load.

Australian Maritime Safety Authority

7 Australian Maritime Safety Authority (2002) Marine Notice 2022/02 – Proper stowage and securing of cargo containers.