

Container Ship Safety

Our Position

IACS shares the concerns raised by marine insurers (IUMI) and the industry regarding the number of incidents/accidents on board container ships, such as cargo fires, fires in engine room, loss of containers at sea and the influence of whipping on structural design of the container ships.

IACS has set Container Ship Safety as a new work area and will work with industry stakeholders to investigate the relevant cases for possible improvement of the regulatory framework to mitigate the risks of such incidents/accidents in the future.

BACKGROUND

The rapid increase in the growth of container shipping by sea stimulates the global business to increase the fleet of container ships both in quantitative and dimensional terms. Despite the improvement in the design of modern container ships and implementation of new statutory instruments aimed at ensuring the safe operation of these ships, statistics show that the consequences of incidents/accidents aboard container ships related to fires and loss of cargo is not decreasing, but even growing.

According to IUMI (source: Cefor, the Nordic Association of Marine Insurers), “while the years 2020 and 2021 were heavily impacted by engine room fires, fires in the cargo area of container vessels have also shown a steady increase in recent years”. Therefore, it has been suggested that the existing fire detection and fire-fighting systems required by the regulatory framework should be reviewed. There is another big issue related to safe container shipping that remains actual to date, which is the loss of cargo at sea.

As claimed by World Shipping Council (WSC) for the combined nine-year period from 2008 to 2016, on average, there were 2150 containers lost at sea each year, which includes 1,582 containers lost due to catastrophic events. Recent incidents suggest that the existing cargo stowage and securing approach does not sufficiently cover the relevant aspects for the newest classes of ultra large container ships.

The last but not the least issue related to container ship safety is whipping structural response which is regularly observed when ships are sailing in rough seas. Recent accidents suggest that global ship hydroelastic loading may be a contributing factor for the structural failures.

SUMMARY OF KEY ISSUES

1. Fires in cargo area

To tackle the events of the fires onboard of container ships, a road map for amending SOLAS chapter II-2 to address fire-fighting capabilities on board container vessels was agreed by SSE 8 in February 2022 (Identification of hazards, Risk analysis, Risk control options, Cost-benefit assessment, Recommendations for decision-making). With that, IACS could contribute to addressing the issue of timely detection and extinction of fires. IACS is working with IUMI etc to explore the possibility of appropriate initiatives in this regard.

The factors which may contribute to fire incidents may be also related to inadequate training and familiarisation of crew members with installed fire fighting systems and fire fighting procedures onboard as well as maintenance of fire fighting systems and equipment. More frequent fire drills and proper crew familiarisation based on fire incident contributing factors may reduce the possibility and frequency of fire incidents in cargo areas. Factors contributing to fires in cargo areas identified during incident investigation

should be brought to the attention of companies managing container vessels for integration of additional measures for reducing risks of fire in Safety Management Systems documentation. Implementation of such additional measures, once integrated, could be verified during ISM audits onboard.

2. Fires in engine room

The main and common cause of fires in the engine room of cargo ships are poorly maintained engines/ dirty engine room/associated fuel supply equipment and leakage from the low-pressure fuel and lubricating oil pipes.

Factors contributing to fires in engine room areas identified during incident investigation should be brought to the attention of companies managing container vessels for integration of additional measures for reducing risks of fire in Safety Management Systems documentation. Implementation of such additional measures, once integrated, could be verified during ISM audits onboard.

3. Loss of containers at sea

One of the root causes of loss of containers at sea is the deviation of actual loading conditions of the ship from the sample loading conditions mentioned in the stowage and securing plans. Therefore, evaluation of actual loading conditions for compliance with container lashing rules by only using the stowage and securing plans in the approved CSM is cumbersome.

4. Influence of whipping on structural design of the container ships

Up to now within the Class Rules, if considered, most often the whipping is addressed by simplified empirical factors. As noted in background, global ship hydroelastic loading/response may be a contributing factor to structural failures. It is therefore essential to gain deeper insight into the physics of whipping.

IACS POSITION

Based on the information available, the following areas can be identified for IACS to address container ship safety issues:

1. Fires on Container Ships (cargo area and engine room)

In order to solve the fire safety issues on container ships more effectively, accurate and adequate accident data (including details and causes) are prerequisite

and essential. To this end, IACS is in discussion with industry partners to collect and analyse fire accident data covering both cargo areas and engine rooms, with root causes being either failures of systems/equipment or human element/management.

Furthermore, IACS will consider the risk aspects making use of the outcome of the "CARGOSAFE" project. Based on the outcome, further analysis may be carried out to identify appropriate measures to mitigate the fire risks, which could include the development/revision of new/existing requirements/provisions, enhanced training, etc.

In addition, focus campaigns on container ship fire safety during ISM Audits may be considered to identify possibilities for improvement.

IACS will support and proactively contribute to the IMO output on the development of amendments to SOLAS chapter II-2 and the FSS Code concerning detection and control of fires in cargo holds and on the cargo deck of container ships.

2. Loss of containers at sea

With the view to providing a means to efficiently evaluate actual stowage and securing of cargo containers, IACS considers that lashing software, currently available, can be used by the crew as a supplement to the stowage and securing plans included in the approved CSM (Cargo Securing Manual contained in MSC.1/Circ.1353/Rev.2, Ch.4).

Consideration will also be given to planned development of new instrument on Container Lashing Equipment.

3. Influence of whipping on structural design of the container ships

IACS has identified two items, review the existing publications on global hydroelastic response of ships with focus on whipping and derive minimum functional requirements for the whipping phenomena. This work is scheduled to be carried out as part of IACS ongoing project on wave loads. This project is a follow up of the finalised project on North Atlantic wave environment which has delivered updated wave scatter diagram in Rev. 2 of IACS Rec.34.

SUMMARY OF WORK CARRIED OUT BY IACS ON THIS ISSUE TO DATE

1. Fires in cargo area

IACS has assisted IUMI with the drafting of its submissions to the IMO to progress work in this area. The assessment of the hazards and possible risk mitigation measures is a first step in developing new requirements and this work is currently underway.

2. Fires in engine room

IACS-IUMI Correspondence Work Group on Fire Risks in Engine Room due to Leakage from Low-Pressure Fuel & Oil Pipes was established in 2020. The Group aims to suggest changes to the MSC.1/Circ.1321 Guidelines for measures to prevent fires in engine rooms.

3. Loss of containers at sea

IACS submitted a paper “Lashing software as a supplement to container stowage and securing plan” to CCC 8 (CCC 8/12) in September 2022 proposing that lashing software should be acceptable as a supplement to the stowing and securing plan included

in the approved CSM and lashing software should be approved by the Administration or RO. IACS’ proposal received support in principle from CCC 8. Noting the response received at CCC 8, IACS has decided to make a new output proposal to MSC 107 (June 2023) introducing the supplementary use of lashing software together with the development of “harmonized” performance standards for the software to allow uniform approvals by the Administrations and recognised organisations.

A new Project Team on container securing / lashing is being set up under Hull Panel to further consider the development of new instrument on Container Lashing Equipment.

4. Influence of whipping on structural design of the container ships

A project team has been established under IACS Hull Panel. This team carried out a comprehensive review of literature and current industry practice and evaluated the whipping influence on hull girder strength on several ships of different size. The results have been transferred to a new project team on wave loads, which will finalise this work based on new wave scatter diagram for the North Atlantic.

This position paper was first published in January 2023. Please note if you’re reading this paper in hard copy the most recent version is available at www.iacs.org.uk/about/iacs-position-papers/.

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