

Investigation Report No. 03/19

Date: 25.06.20

Serious marine casualty

Loss of containers overboard from MSC ZOE from 01. – 02. January 2019

The Merchant Marine General Directorate, Panama, the Dutch Safety Board, Netherlands, and the Bundesstelle für Seeunfalluntersuchung, Germany make the following recommendation to their responsible administrations in their capacity as representative of the flag states in the various committees of the IMO:

1 Safety Recommendations

The following safety recommendations do not attribute a presumption of blame or liability in respect of type, number or sequence.

1.1. Revise the existing technical and legal regulations for container ships regarding the design limits of cargo securing equipment, approved loading and stability conditions and the consideration of shallow water effects and speed on ship motions and resulting accelerations and forces. In doing so, especially the following provisions and aspects are to be taken into account:

- IS-Code (Off-design stability conditions for very large containerships and Second Generation Intact Stability started in May 2020)
- Code of Safe Practice for Cargo Stowage and Securing for very large containerships
- Container safety convention (CSC) and ISO 1496-1 Freight containers - Specification and testing respectively
- IMO Circular MSC.1/Circ. 1228 dated 11 January 2007, Revised guidance to the master for avoiding dangerous situations in adverse weather and sea conditions whether it works at all sea conditions.
- Stability booklet, include that all loading conditions should be checked on high accelerations/forces.
- Cargo securing manual, include design limits of the cargo securing equipment in accordance to the design accelerations.

In doing so, the aforementioned authorities should act in such a way that results attained by existing international working groups are incorporated.

1.2. Generate an obligation on all container ships

- 1.2.1. to install electronic inclinometers or similar (inertia) systems to measure and display this information in real-time to the captain/crew, and
- 1.2.2. to install sensors on critical locations on the ship in order to measure accelerations and to provide this information in real-time to the captain/crew in order to allow them to monitor these;
- 1.2.3. and for ships with mandatory equipped VDR to record actual roll angle, roll period and accelerations for the purpose of safety investigations.

1.3. Evaluate and assess possible technical solutions that can assist the captain/crew in the detection of the loss of containers and propose international standards for implementation of such solutions.

2. The Merchant Marine General Directorate, Panama, the Dutch Safety Board, the Netherlands, and the Bundesstelle für Seeunfalluntersuchung, Germany make the following recommendation to **the responsible administrations of The Netherlands and Germany**, in their capacity as responsible authorities for the conservation and protection of the Wadden Sea to, in cooperation with the Trilateral Wadden Sea Cooperation:

Ascertain whether the existing tracks of the German Bight Traffic Separation Schemes north of the Wadden Sea have to be adapted, or measures have to be taken particularly for large containerships to maximize the safety of the voyage on the sailing routes. In doing so, the following aspects and hydrodynamic phenomena have to be taken into account:

- Extreme ship motions and accelerations;
- Ships speed;
- Green water effects;
- Slamming;
- Possibility of contact with the seabed;
- Status of the Wadden Sea as Particularly Sensitive Sea Area (PSSA).

If determined that adaptation is necessary or measures have to be taken, the responsible administrations in their capacity as representative of the flag states in the various committees of the IMO, should propose an amendment and/or measures for the above mentioned existing tracks.

3. The Merchant Marine General Directorate, Panama, the Dutch Safety Board, Netherlands, and the Bundesstelle für Seeunfalluntersuchung, Germany make the following recommendation to **the shipowning company MSC**:

- In the construction and operation of ships, reduce high acceleration forces, which can cause damage to crew, passengers and cargo, by installing eg. bilge keels or anti-roll tanks or stabilizers or setting operational stability limits eg by limiting the operational GM.

- Raise awareness and develop guidelines to the Masters and Navigational Officers on sailing with a high stability and the hydrodynamic phenomena that may be encountered in the sailing routes north of the Wadden Sea.
4. The Merchant Marine General Directorate, Panama, the Dutch Safety Board, Netherlands, and the Bundesstelle für Seeunfalluntersuchung, Germany make the following recommendation to **the World Shipping Council** and **the International Chamber of Shipping**:
- Communicate actively the lessons from this safety investigation;
 - Propagate industry standards and principles that will increase the safety of container transport;
 - Start an initiative for innovation in ship design, to work towards hull and/or lashing system designs that are better suited for the conditions as described in this report.