
Implementation of Shipping MRV Regulation

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Issue Paper: determination of cargo carried on Reefers and ConRos

Authors:

Jasper Faber (CE Delft)

Brigitte Behrends (Marena Ltd.)



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1. Introduction

1.1. Regulatory background

The EU Regulation on the monitoring, reporting, and verification of emissions of carbon dioxide (CO₂), from maritime transport (2015/757) lays down rules for the accurate monitoring, reporting, and verification of CO₂ emissions and other relevant information from ships calling at EU ports. The other relevant information includes voyage information; distance travelled; time spent at sea; cargo carried; and transport work. This concept paper concerns the monitoring of cargo carried.

Annex II of the Regulation specifies how the amount of cargo carried shall be monitored for three ship types:

1. For passenger ships, the number of passengers shall be used to express cargo carried.
2. For ro-ro ships, cargo carried shall be defined as the number of cargo units (trucks, cars, etc.) or lane-meters multiplied by default values for their weight. Where cargo carried by ro-ro ships has been defined based on Annex B to CEN 16258 (2012), covering "Methodology for calculation and declaration of energy consumption and GHG emissions of transport services (freight and passengers)", this definition shall be deemed to comply with the Regulation.
3. For container vessels, cargo carried shall be defined as the total weight in tons of the cargo or, in absence, the amount of TEUs multiplied by default values for their weight. Where cargo carried by a container vessel is defined in accordance with applicable IMO Guidelines or instruments pursuant to the SOLAS Convention, this definition shall be deemed to comply with the Regulation.

For all other ship types, the Commission shall adopt, by means of implementing acts, technical rules specifying the applicable parameters. For each ship type, one – or if justified more than one – parameter(s) to express cargo carried need to be determined. According to Annex II part A, point 1, letter g) to the MRV Regulation, these parameters should consider, where applicable, the weight and volume of cargo carried, and the number of passengers carried.

1.2. Purpose of this paper

This paper discusses the cargo parameters for refrigerated cargo ships and for container ro-ro ships. It is intended to facilitate the discussion on the cargo parameters for these ship types at the next meeting of the European Sustainable Shipping Forum subgroup on MRV.

Disclaimer

The information and views set out in this paper are those of the author(s) and do not necessarily reflect the official opinion of the Commission.

2. Cargo parameter options

2.1. Cargo parameters for refrigerated cargo ships

2.1.1. Options

Refrigerated cargo ships carry cargo in temperature controlled holds and often containers on deck. Cargo in holds is often packaged in boxes, on pallets, et cetera. The containers on deck are often reefer containers.

Some refrigerated cargo ships have tanks for liquids. These ships typically carry fruit juices.

In principle, the following parameters could be used to monitor the amount of cargo carried:

- mass of cargo, either measured directly or calculated from the number of packaged items and the mass per item
- mass of cargo plus number of TEUs
- number of separate items
- volume of cargo

2.1.2. Brief evaluation of the options

Commercial documents and shipboard documents used for loading, draught, and stability calculations all use mass. Reefer operators usually know the gross mass of the reefer containers on board which they use for loading, draught, and stability calculations. Commercial documents for reefer tankers may be in volume or in mass. If the documents are in volume, the density is often measured and documented.

The mass of cargo, either measured directly or calculated from the number of packaged items and the mass per item, can be monitored accurately, can be verified, and is in line with industry practices (criteria A, B and C).

The mass of cargo plus the number of TEUs can also be monitored accurately, verifiably, and is in line with industry practices, but having two separate units to express cargo carried hampers the calculation of energy efficiency indicators and is therefore impractical.

The number of separate items can in many cases be monitored accurately. However, for different cargoes the items may be very dissimilar, which means that it does not allow for a fair comparison between ships (criteria D).

The volume of the cargo can be monitored accurately but is not in line with industry practices (criteria C).

2.1.3. Preliminary selection of a cargo parameter

The mass of the cargo scores better than the other parameters on accuracy, verifiability, and administrative efficiency. It can be monitored directly or calculated by multiplying the number of packaged items with the mass per item.

2.1.4. Question for discussion

- Do you agree with the proposal to express cargo carried in mass?

2.2. Cargo parameters for container/ Ro-Ro cargo ships

2.2.1. Options

Container/Ro-Ro Cargo Ships are designed to carry a wide variety of cargoes, including containers, vehicles, and general cargo. As a result, their type of cargo and therefore their payload utilisation and cargo hold volume utilisation fluctuate enormously.

Container/Ro-Ro Cargo Ships usually monitor the number of containers on board, the number of cars, trailers, and other standard units, and for non-standard units, such as heavy machinery and non-rolling cargo, the number of units and their mass. The mass of cars, trailers, trucks, etc. is not regularly monitored.

The amount of cargo can be determined by volume or mass:

- Volume: the sum of:
 - for cars, trailers, trucks and other standard units a default area multiplied by the height of the deck (the distance between the floor and the structural beam);
 - for other ro-ro cargo: the number of occupied lane metres multiplied by the height of the deck
 - for containers: the number of TEUs multiplied by 38.3 m³ (according to ISO 668:2013, ISO container type 1CC).
- Mass: either
 - the actual cargo mass; or
 - the volume calculated as above, divided by the net tonnage multiplied by the deadweight (i.e. the share of occupied cargo space times the deadweight); or
 - the amount of TEUs multiplied by default values for their mass plus the number of cargo units (trucks, cars, etc.) or lane-meters multiplied by default values for their mass.

2.2.2. Brief evaluation of the options

Container/Ro-Ro Cargo Ships create a loading plan before every departure listing the number of cars, trucks, containers, and other cargo items as well as their location in the ship. This can be used to accurately and verifiably determine the volume of the cargo as defined above (criteria A and B). The actual mass of cars, trailers, trucks, et cetera is not recorded so cannot be monitored accurately without making additional measurements. Provided that a default mass can be established, a nominal mass can be monitored as accurately and verifiably as volume.

Volume, as defined above, can be calculated on the basis of the loading plan and is therefore in line with industry practices (criteria C).

Using actual cargo mass would disadvantage ships that carry light or voluminous cargoes in a reporting period, as their efficiency appears to be worse than similar ships that carry heavy cargoes (criteria D).

2.2.3. Preliminary selection of a cargo parameter

On the basis of this evaluation, the volume of the cargo as defined in Section 2.2.1 satisfies the criteria set in Chapter 3 of the Working Paper on determination of cargo carried best.

2.2.4. Question for discussion

- Do you agree with the proposal to monitor the volume of the cargo, defined as occupied deck area multiplied by deck height for ro-ro cargo and container volume for container cargo?

A. Ship type definitions

A.1.1. Refrigerated cargo ships

Refrigerated cargo ships have StatCode A34.

StatCode Level 3	Description	StatCode Level 5	Description	Definition
A34	Refrigerated Cargo	A34A2GR	Refrigerated Cargo Ship	A multi deck cargo ship for the carriage of refrigerated cargo at various temperatures

A.1.2. Container/Ro-Ro ships

Container/Ro-Ro ships have StatCode A35C.

StatCode Level 4	Description	StatCode Level 5	Description	Definition
A35C	Ro-Ro Cargo	A35C2RC	Container/Ro- Ro Cargo Ship	A hybrid of a container ship and a ro-ro cargo ship in independent sections