



All respectful ICS surveyors/customers

With gratitude,

According to enter into force of MRV-EU on 1 July 2015 and begin monitoring of CO2 emission report of ships above 5000 gross tonnage on 1 January 2018, and with considering that all the ships are traveling across the international shipping lines, due to not detaining the ships, ICS decide to inform respectful surveyors\customers of necessary information about taking steps in a form of technical information.

The technical information related to the above mentioned subject and also the supplementary attachments are accessible through the following address on ICS Network (ICS-WAN):

<\\server\ICS Organization\Convention and LegislationDepartment\Publication\tech\2015\06>

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ICS

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کلیه بازرسان و مشتریان محترم ICS

با سلام و احترام

با توجه به لازم الاجرا شدن MRV – EU از اول جولای ۲۰۱۵ و آغاز نظارت بر گزارش نشر CO2 برای کشتی های GT > ۵۰۰۰ از اول ژانویه ۲۰۱۸ و با توجه به اینکه کشتی ها در خطوط کشتیرانی بین المللی در حال تردد می باشند، به جهت ممانعت از بازداشت شدن کشتی ها، موسسه بر آن شد که اطلاعات لازم جهت گام های اجرایی را در قالب یک اطلاعیه فنی در اختیار بازرسان و مشتریان محترم بگذارد.

این اطلاعیه فنی به انضمام پیوست های تکمیلی آن در بخش CLD از شبکه داخلی مؤسسه با آدرس ذیل قابل دسترسی می باشد:

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رضوان پناه

مدیر واحد کنوانسیون ها و مقررات دریایی

موسسه رده بندی ایرانیان

ترک دعوی : اگرچه در گردآوری کلیه راهنماهای فنی ارائه شده توسط موسسه رده بندی ایرانیان، تا حد ممکن تلاش در دقت و صحت محتوا صورت گرفته است، این موسسه متحمل مسئولیتی در قبال هرگونه اشتباهات، خسارت های احتمالی و جرانی که ممکن است در ارتباط با بکارگیری مفاهیم و مطالب ارائه شده رخ دهد، نمی باشد.

موسسه رده بندی ایرانیان

تهران- خیابان قائم مقام فراهانی- بالاتر از میدان شعاع-کوچه شبنم-پلاک ۵

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CHAPTER 1: GENERAL

1. BACKGROUND

1.1) Maritime transport has an impact on the global climate and on air quality, as a result of the carbon dioxide (CO₂) emissions and other emissions that it generates, such as nitrogen oxides (NO_x), Sulphur oxides (SO_x), methane (CH₄), particulate matter (PM) and black carbon (BC). In July 2011, the IMO adopted technical and operational measures, in particular the Energy Efficiency Design Index (EEDI) for new ships and the Ship Energy Efficiency Management Plan (SEEMP), which will bring improvement in terms of reducing the expected increase in greenhouse gas emissions, but alone cannot lead to the necessary absolute reductions of greenhouse gas emissions from international shipping to keep efforts in line with the global objective of limiting increases in global temperatures to 2 °C.

International maritime shipping remains the only means of transportation not included in the Union's commitment to reduce greenhouse gas

emissions. According to the impact assessment accompanying the proposal for this Regulation, Union-related CO₂ emissions from international shipping increased by 48 % between 1990 and 2007. The European Parliament's Resolution of 5 February 2014 on a 2030 framework for climate and energy policies called on the Commission and the Member States to set a binding EU 2030 target of reducing domestic greenhouse gas emissions by at least 40 % compared to 1990 levels.

In order to reduce CO₂ emissions from shipping at Union level, the best possible option remains setting up a system for monitoring, reporting and verification (MRV system) of CO₂ emissions based on the fuel consumption of ships as a first step of a staged approach for the inclusion of maritime transport emissions in the Union's greenhouse gas reduction commitment, alongside emissions from other sectors that are already contributing to that commitment.

2. SCOPE

1.2.1) Enter into force

This Regulation should enter into force on 1 July 2015 to ensure that the Member States and relevant stakeholders have sufficient time to take the necessary measures for the effective application of this Regulation before the first reporting period starting on 1 January 2018.

The time diagram is as following:



1.2.2) Application

1.2.2.1) This Regulation applies to ships above 5000 gross tonnage regardless of their flag in respect of CO₂ emissions released during their voyages from their last port of call to a port of call under the jurisdiction of a Member State and from a port of call under the jurisdiction of a Member State to their next port of call, as well as

within ports of call under the jurisdiction of a Member State.

1.2.2.2) This Regulation does not apply to warships, naval auxiliaries, fish-catching or fish-processing ships, wooden ships of a primitive build, ships not propelled by mechanical means, or government ships used for non-commercial purposes.

CHAPTER 2: MONITORING PLAN

1. CONTENT AND SUBMISSION OF THE MONITORING PLAN

2.1.1) Time of submit monitoring plan

by 31 August 2017, companies shall submit to the verifiers a monitoring plan for each of their ships indicating the method chosen to monitor and report CO₂ emissions and other relevant information.

2.1.2) Content of monitoring plan

The monitoring plan shall consist of a complete and transparent documentation of the monitoring method for the ship concerned and shall contain at least the following elements:

- (a) the identification and type of the ship, including its name, its IMO identification number, its port of registry or home port, and the name of the shipowner;
- (b) the name of the company and the address, telephone and e-mail details of a contact person;
- (c) a description of the following CO₂ emission sources on board the ship: main engines, auxiliary engines, gas turbines, boilers and inert gas generators, and the fuel types used;
- (d) a description of the procedures, systems and responsibilities used to update the list of CO₂ emission sources over the reporting period;

- (e) a description of the procedures used to monitor the completeness of the list of voyages;
- (f) a description of the procedures for monitoring the fuel consumption of the ship, including:
 - (i) the method chosen from among those set out in Annex I for calculating the fuel consumption of each CO₂ emission source, including, where applicable, a description of the measuring equipment used,
 - (ii) the procedures for the measurement of fuel uplifts and fuel in tanks, a description of the measuring equipment used and the procedures for recording, retrieving, transmitting and storing information regarding measurements, as applicable,
 - (iii) the method chosen for the determination of density, where applicable,
 - (iv) a procedure to ensure that the total uncertainty of fuel measurements is consistent with the requirements of this Regulation, where possible referring to national laws, clauses in customer contracts or fuel supplier accuracy standards;
- (g) single emission factors used for each fuel type, or in the case of alternative fuels, the methodologies for determining the emission factors, including the methodology for sampling, methods of analysis and a description of the laboratories used, with the ISO 17025 accreditation of those laboratories, if any;
- (h) a description of the procedures used for determining activity data per voyage, including:
 - (i) the procedures, responsibilities and data sources for determining and recording the distance,

- (ii) the procedures, responsibilities, formulae and data sources for determining and recording the cargo carried and the number of passengers, as applicable,
- (iii) the procedures, responsibilities, formulae and data sources for determining and recording the time spent at sea between the port of departure and the port of arrival;
- (i) a description of the method to be used to determine surrogate data for closing data gaps;
- (j) a revision record sheet to record all the details of the revision history.

2. MONITORING OF CO₂ EMISSIONS AND OTHER RELEVANT INFORMATION

2.2.1) Time of monitoring CO₂ emission

From 1 January 2018, companies shall, based on the monitoring plan assessed monitor CO₂ emissions for each ship on a per-voyage and an annual basis by applying the appropriate method for determining CO₂ emissions.

2.2.2) Calculation of CO₂ emission

2.2.2.1) For the purposes of calculating CO₂ emissions companies shall apply the following formula:

$$\text{Fuel consumption} \times \text{emission factor}$$

2.2.2.2) Fuel consumption shall include fuel consumed by main engines, auxiliary engines, gas turbines, boilers and inert gas generators.

2.2.2.3) Fuel consumption within ports at berth shall be calculated separately.

2.2.2.4) In principle, default values for emission factors of fuels shall be used unless the company decides to use data on fuel quality set out in the Bunker Fuel Delivery Notes (BDN) and used for demonstrating compliance with applicable regulations of sulphur emissions.

2.2.2.5) Those default values for emission factors shall be based on the latest available values of the Intergovernmental Panel for Climate Change (IPCC). Those values can be derived from Annex VI to Commission Regulation (EU) No 601/2012 (1).

2.2.2.6) Appropriate emission factors shall be applied in respect of biofuels and alternative non-fossil fuels.

2.2.3) Methods for determining CO₂ emissions

2.2.3.1) The company shall define in the monitoring plan which monitoring method is to be used to calculate fuel consumption for each ship under its responsibility and ensure that once the method has been chosen, it is consistently applied.

2.2.3.2) Actual fuel consumption for each voyage shall be used and be calculated using one of the following methods:

- (a) Bunker Fuel Delivery Note (BDN) and periodic stocktakes of fuel tanks;
- (b) Bunker fuel tank monitoring on board;
- (c) Flow meters for applicable combustion processes;
- (d) Direct CO₂ emissions measurements.

Any combination of these methods, once assessed by the verifier, may be used if it enhances the overall accuracy of the measurement.

2.2.4) Explanation of each method

2.2.4.1) Method A: BDN and periodic stocktakes of fuel tanks

2.2.4.1.1) This method is based on the quantity and type of fuel as defined on the BDN combined with periodic stocktakes of fuel tanks based on tank readings. The fuel at the beginning of the period, plus deliveries, minus fuel available at the end of the period and de-bunkered fuel

between the beginning of the period and the end of the period together constitute the fuel consumed over the period.

2.2.4.1.2) The period means the time between two port calls or time within a port. For the fuel used during a period, the fuel type and the sulphur content need to be specified.

2.2.4.1.3) This method shall not be used when BDN are not available on board ships, especially when cargo is used as a fuel, for example, liquefied natural gas (LNG) boil-off.

2.2.4.1.4) Under existing MARPOL Annex VI regulations, the BDN is mandatory, is to be retained on board for three years after the delivery of the bunker fuel and is to be readily available. The periodic stocktake of fuel tanks on-board is based on fuel tank readings. It uses tank tables relevant to each fuel tank to determine the volume at the time of the fuel tank reading. The uncertainty associated with the BDN shall be specified in the monitoring plan. Fuel tank readings shall be carried out by appropriate methods such as automated systems, soundings and dip tapes. The method for tank sounding and uncertainty associated shall be specified in the monitoring plan.

2.2.4.1.5) Where the amount of fuel uplift or the amount of fuel remaining in the tanks is determined in units of volume, expressed in litres, the company shall convert that amount from volume to mass by using actual density values. The company shall determine the actual density by using one of the following:

- (a) on-board measurement systems;
- (b) the density measured by the fuel supplier at fuel uplift and recorded on the fuel invoice or BDN.

2.2.4.1.6) The actual density shall be expressed in kg/l and determined for the applicable temperature for a specific measurement. In cases for which actual density values are not available, a standard density factor for the relevant fuel

type shall be applied once assessed by the verifier.

2.2.4.2) Method B: Bunker fuel tank monitoring on-board

2.2.4.2.1) This method is based on fuel tank readings for all fuel tanks on-board. The tank readings shall occur daily when the ship is at sea and each time the ship is bunkering or de-bunkering.

2.2.4.2.2) The cumulative variations of the fuel tank level between two readings constitute the fuel consumed over the period.

2.2.4.2.3) The period means the time between two port calls or time within a port. For the fuel used during a period, the fuel type and the sulphur content need to be specified.

2.2.4.2.4) Fuel tank readings shall be carried out by appropriate methods such as automated systems, soundings and dip tapes.

2.2.4.2.5) The method for tank sounding and uncertainty associated shall be specified in the monitoring plan.

2.2.4.2.6) Where the amount of fuel uplift or the amount of fuel remaining in the tanks is determined in units of volume, expressed in litres, the company shall convert that amount from volume to mass by using actual density values. The company shall determine the actual density by using one of the following:

- (a) on-board measurement systems;
- (b) the density measured by the fuel supplier at fuel uplift and recorded on the fuel invoice or BDN;
- (c) the density measured in a test analysis conducted in an accredited fuel test laboratory, where available.

2.2.4.2.7) The actual density shall be expressed in kg/l and determined for the applicable temperature for a specific measurement. In cases for which actual density values are not available,

a standard density factor for the relevant fuel type shall be applied once assessed by the verifier.

2.2.4.3) Method C: Flow meters for applicable combustion processes

2.2.4.3.1) This method is based on measured fuel flows on-board. The data from all flow meters linked to relevant CO₂ emission sources shall be combined to determine all fuel consumption for a specific period.

2.2.4.3.2) The period means the time between two port calls or time within a port. For the fuel used during a period, the fuel type and the sulphur content need to be monitored.

2.2.4.3.3) The calibration methods applied and the uncertainty associated with flow meters used shall be specified in the monitoring plan.

2.2.4.3.4) Where the amount of fuel consumed is determined in units of volume, expressed in litres, the company shall convert that amount from volume to mass by using actual density values. The company shall determine the actual density by using one of the following:

- (a) on-board measurement systems;
- (b) the density measured by the fuel supplier at fuel uplift and recorded on the fuel invoice or BDN.

2.2.4.3.5) The actual density shall be expressed in kg/l and determined for the applicable temperature for a specific measurement. In cases for which actual density values are not available, a standard density factor for the relevant fuel type shall be applied once assessed by the verifier.

2.2.4.4) Method D: Direct CO₂ emissions measurement

2.2.4.4.1) The direct CO₂ emissions measurements may be used for voyages and for CO₂ emissions occurring in ports located in a Member State's jurisdiction. CO₂ emitted shall include CO₂ emitted by main engines, auxiliary

engines, gas turbines, boilers and inert gas generators. For ships for which reporting is based on this method, the fuel consumption shall be calculated using the measured CO₂ emissions and the applicable emission factor of the relevant fuels.

2.2.4.4.2) This method is based on the determination of CO₂ emission flows in exhaust gas stacks (funnels) by multiplying the CO₂ concentration of the exhaust gas with the exhaust gas flow.

2.2.4.4.3) The calibration methods applied and the uncertainty associated with the devices used shall be specified in the monitoring plan.

2.2.5) Monitoring of other relevant information

2.2.5.1) Monitoring on pre voyage basis

2.2.5.1.1) For the purposes of monitoring other relevant information on a per-voyage basis (Article 9(1)), companies shall respect the following rules:

- (a) the date and hour of departure and arrival shall be considered using Greenwich Mean Time (GMT). The time spent at sea shall be calculated based on port departure and arrival information and shall exclude anchoring;
- (b) the distance travelled may be either the distance of the most direct route between the port of departure and the port of arrival or the real distance travelled. In the event of the use of the distance of the most direct route between the port of departure and the port of arrival, a conservative correction factor should be taken into account to ensure that the distance travelled is not significantly underestimated. The monitoring plan shall specify which distance calculation is used and, if necessary, the correction factor used. The distance travelled shall be expressed in nautical miles;

- (c) transport work shall be determined by multiplying the distance travelled with the amount of cargo carried;
- (d) for passenger ships, the number of passengers shall be used to express cargo carried. For all other categories of ships, the amount of cargo carried shall be expressed either as metric tonnes or as standard cubic metres of cargo, as appropriate;
- (e) for ro-ro ships, cargo carried shall be defined as the number of cargo units (trucks, cars, etc.) or lane-metres multiplied by default values for their weight. Where cargo carried by ro-ro ships has been defined based on Annex B to the CEN standard EN 16258 (2012), covering ‘Methodology for calculation and declaration of energy consumption and GHG emissions of transport services (freight and passengers)’, that definition shall be deemed to comply with this Regulation. For the purposes of this Regulation, ‘ro-ro ship’ means a ship designed for the carriage of roll-on-roll-off cargo transportation units or with roll-on-roll-off cargo spaces;
- (f) for container ships, cargo carried shall be defined as the total weight in metric tonnes of the cargo or, failing that, the amount of 20-foot equivalent units (TEU) multiplied by default values for their weight. Where cargo carried by a container ship is defined in accordance with applicable IMO Guidelines or instruments pursuant to the Convention for the Safety of Life at Sea (SOLAS Convention), that definition shall be deemed to comply with this Regulation. For the purposes of this Regulation, ‘container ship’ means a ship designed exclusively for the carriage of containers in holds and on deck;
- (g) the determination of cargo carried for categories of ships other than passenger ships, ro-ro ships and container ships shall enable the taking into account, where applicable, of the weight and volume of cargo carried and the number of passengers

carried. Those categories shall include, inter alia, tankers, bulk carriers, general cargo ships, refrigerated cargo ships, vehicle carriers and combination carriers.

2.2.5.1.2) In order to ensure uniform conditions for the application of point (g) of paragraph 1, the Commission shall adopt, by means of implementing acts, technical rules specifying the parameters applicable to each of the other categories of ships referred to under that point.

Those implementing acts shall be adopted not later than 31 December 2016 in accordance with the examination procedure referred to in Article 24(2).

The Commission, by means of implementing acts, may revise, where appropriate, the applicable parameters referred to in point (g) of paragraph 1. Where relevant, the Commission shall also revise those parameters to take account of amendments to this Annex pursuant to Article 5(2). Those implementing acts shall be adopted in accordance with the examination procedure referred to in Article 24(2).

2.2.5.1.3) In complying with the rules referred to in paragraphs 1 and 2, companies may also choose to include specific information relating to the ship's ice class and to navigation through ice.

2.2.5.2) Monitoring on an annual basis

2.2.5.2.1) For the purposes of monitoring other relevant information on an annual basis, companies shall respect the following rules:

The values to be monitored under Article 10 shall be determined by aggregation of the respective per voyage data.

Average energy efficiency shall be monitored by using at least four indicators: fuel consumption per distance, fuel consumption per transport work, CO₂ emissions per distance and CO₂ emissions per transport work, which shall be calculated as follows:

Fuel consumption per distance = total annual fuel consumption/total distance travelled

Fuel consumption per transport work = total annual fuel consumption/total transport work
CO2

emissions per distance = total annual CO2 emissions/total distance travelled

CO2 emissions per transport work = total annual CO2 emissions/total transport work.

In complying with these rules, companies may also choose to include specific information relating to the ship's ice class and to navigation through ice, as well as other information related to the fuel consumed and CO2 emitted, differentiating on the basis of other criteria defined in the monitoring plan.

3. REPORTING

3.1) Content of the emissions report

3.1.1) From 2019, by 30 April of each year, companies shall submit to the Commission and to the authorities of the flag States concerned, an emissions report concerning the CO2 emissions and other relevant information for the entire reporting period for each ship under their responsibility, which has been verified as satisfactory by a verifier in accordance with Article 13.

3.1.2) Companies shall include in the emissions report the following information:

- (a) data identifying the ship and the company, including:
 - (i) name of the ship,
 - (ii) IMO identification number,
 - (iii) port of registry or home port,
 - (iv) ice class of the ship, if included in the monitoring plan,
 - (v) technical efficiency of the ship (the Energy Efficiency Design Index (EEDI) or the Estimated Index Value (EIV) in accordance with IMO Resolution MEPC.215 (63), where applicable),
 - (vi) name of the shipowner,
 - (vii) address of the shipowner and its principal place of business, 19.5.2015

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(viii) name of the company (if not the shipowner),

(ix) address of the company (if not the shipowner) and its principal place of business,

(x) address, telephone and e-mail details of a contact person;

(b) the identity of the verifier that assessed the emissions report;

(c) information on the monitoring method used and the related level of uncertainty;

(d) the results from annual monitoring of the parameters in accordance with Article 10.