INTERNATIONAL MARITIME ORGANIZATION

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REDUCTION OF GHG EMISSIONS FROM SHIPS

Comments on the report of the Correspondence Group on Carbon Intensity Reduction (TOR 3)

Submitted by ICS and INTERTANKO

SUMMARY

Executive summary:	This document provides comments on the report of the Correspondence Group on Carbon Intensity Reduction regarding its TOR 3, as set out in document MEPC 78/7/11 (China et al.). This document outlines the need to address the elements listed in this submission prior to entry into force of the GHG short-term measure.
Strategic direction, if applicable:	3
Output:	3.2
Action to be taken:	Paragraph 10
Related documents:	MEPC 76/7/52; MEPC 77/16; MEPC 78/7/11 and MEPC 78/INF.21

Introduction

1 The co-sponsors have participated to the Correspondence Group on Carbon Intensity Reduction. This submission addresses correction factors which were proposed already at MEPC 76, discussed by the Correspondence Group but not retained in the final draft of Guidelines G5 provided in document MEPC 78/7/11 (China et al.). These are fuel consumptions specific for LNG carriers and gas carriers for which the lack of corrections would lead to unfair rating of these ships.

2 Since MEPC 77 has agreed to keep the impact of the short-term measure under review after its entry into force, the co-sponsors will explain the rational for which such correction factors need to be included into the current draft guidelines and kept under review.

Discussion

3 LNG carriers and gas carriers are ships with complex operational profiles. Since CII is a rating of ships' operational profile, it is essential that the rating takes into account the complexity of these ships variable operational profiles avoiding generating perverse consequences.

4 The co-sponsors list the items predicted to generate unfairness in ships' rating and which need further consideration by the Committee. In addition, the co-sponsors propose concrete mitigations in form of additional text to the draft guidelines leading to a level playing field when rating ships in the same category.

The number of cargo transfers during the year and short voyages

5 For both LNG and gas carriers, the number of cargo operations carried out during the year will impact CII rating. Depending on the trade where the ships are employed, some ships may transport one cargo per month while others may transport one cargo per week. The difference between such operational activities brings a significant difference in the fuel consumptions for cargo loading and discharging.

6 Moreover, a more frequent cargo loading and discharging activity may mean a large number of shorter voyages, synonymous of less total sailing distance in a year. This means that LNG and gas carriers will be unequally and unfairly CII rated depending on their operational profile, with a poorer rating when engaged in short-distance trades.

7 Therefore, the co-sponsors suggest there is a justified need to apply a correction factor when calculating the attained CII value in order to keep the level playing field. This correction factor should correct CII calculation by the amount of fuel consumption of cargo transfer pumps and compressors. The Committee is invited to consider proposed additional text to the current draft of the 2022 Interim Guidelines on Correction Factors and Voyage Adjustments for CII Calculations (G5) as presented in annex 1 of this document.

The boil-off gas correction factor for LNG carriers:

8 Thermal boil-off gas consumption in Gas Combustion Unit (GCU) and boilers has been very well explained in document MEPC 76/7/52 (Greece). Despite clear justification and good suggestion on how to address this matter, the Correspondence Group suggests that the boil-off gas management issue needs further consideration and should be dealt with under the review to be completed prior 2026. The reports indicates that due to the complexity of the issue, a response cannot be given within time scale of the Correspondence Group.

9 The co-sponsors believe this matter should be addressed before entry into force of the regulations to allow for a level playing field and a better evaluation through proper reporting. Therefore, the Committee is invited to consider proposed suggested new text to the current draft of the 2022 Interim guidelines on correction factors and voyage adjustments for CII calculations (G5) as presented in annex 2 of this document.

Action requested of the Committee

10 The Committee is invited to consider the proposals set out in the paragraphs 7 and 9 of this document and annexes and take action as appropriate. Alternatively, the Committee is invited to formally include the elements listed in this submission in the review process which will take place after entry into force of the GHG short-term measure.

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ANNEX 1

ADDITIONAL TEXT TO G5

[…]

4.3 $FC_{electrical,j}$ for Corrections relating to electrical power

The parameter $FC_{electrical,j}$ is the mass (in grams) of fuel of type j, consumed for production of electrical power during the calendar year which may be deducted from the calculation of the attained CII for the following purposes:

.1 Electrical consumption of refrigerated containers […]

.2 Electrical consumption of cargo cooling/reliquefaction systems […]

.3 Electrical consumption of discharge pumps on tankers, gas and LNG carriers and vapour return compressors when relevant to cargo transfer.

[…]

Appendix 1

CORRECTION FACTORS FOR USE IN CII CALCULATION

3 Electric Cargo discharge pumps on tankers, gas and LNG carriers and vapour return compressors when relevant to cargo transfer

For ~~tankers~~ vessels with directly or indirectly electrically powered discharge pumps, vapour return compressors, the correction factor $FC_{electrical}$ may be applied as follows:

.1 ~~Tankers~~ Vessels may calculate cargo ~~discharge~~ transfer kWh consumption as follows:

$$FC_{electrical\ \ transfer\ \sout{discharge},j} = \sout{discharge}\ transfer\ kWh \times SFOC$$

where:

- $FC_{electrical\ \ transfer\ \sout{discharge},j}$ (cargo discharge fuel oil consumption) represents the estimated fuel consumption attributed to use of cargo ~~discharge~~ transfer pumps and compressors during discharge or loading operations.
- ~~$Discharge$~~ $Transfer\ kWh$ is measured on the vessel by the kWh meter counter on the vessel
- $SFOC$ represents the specific fuel oil consumption in g/kWh associated with the relevant source of electrical power as per the EEDI/EEXI Technical File or NOx Technical File. In the case of ships without a Technical File, a default value of 175 g/kWh for 2 stroke engines and 200 g/kWh for 4 stroke engines and 240 g/kWh for steam turbo generators may be applied. In the case of waste heat recovery systems as defined under Category C1 in MEPC.1/Circ.896 the SFOC to be used will be at the discretion of the Administration.

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ANNEX 2

ADDITIONAL NEW TEXT G5

[…]

4 Attained Annual Operational CII (CII_{Ship}) Formula for Voyage Adjustments and Correction Factors

Use of voyage adjustments and correction factors require changes to be made to the overall attained annual operational CII (CII_{Ship}) formula as follows:

$$\frac{\sum_j C_{Fj} \cdot \left\{FC_j - \left(FC_{voyage,j} + TF_j + (0.75 - 0.03y_i) \cdot \left(FC_{electrical,j} + FC_{boiler,j} + FC_{BOG,j} + FC_{others,j}\right)\right)\right\}}{f_i \cdot f_m \cdot f_c \cdot f_{iVSE} \cdot Capacity \cdot (D_t - D_x) \cdot AF_{PT}}$$

[…]

4.[X] $FC_{BOG,j}$ for Corrections relating to Boil-off Gas (BOG) for LNG carriers

The parameter $FC_{BOG,j}$ is the total mass (in grams) of fuel of type j, consumed to manage boil-off gases during the calendar year which may be deducted from the calculation of the attained CII including:

.1 Boilers' consumption associated to steam dumping.

.2 Gas combustion Unit (GCU) consumption, which includes BOG and GCU electrical consumption.

Boil off gas management via operation of the reliquefaction plant is covered by $FC_{Electrical,j}$.

[…]

Appendix 1

Correction factors for use in CII calculation

Part [X]. $FC_{BOG,j}$ for Corrections relating to Boil-off Gas for LNG carriers

1 FC_{BOG} for Gas Combustion Unit (GCU) consumption.

For LNG carriers fitted with GCU, the consumption associated with GCU for BOG management maybe calculated as follows:

$$FC_{BOG} = FC_{GCU} + (GCU\ kWh \times SFOC)$$

where:

- FC_{GCU} represents the mass of LNG thermally oxidised in the GCU in the calendar year.
- $GCU\ kWh$ is the electrical consumption of the GCU in a calendar year and measured on the vessel by a kWh meter
- $SFOC$ represents the specific fuel consumption in g/kWh associated with the relevant source of electrical power as per the EEDI/EEXI Technical File or NOx

Technical File. In the case of ships without a Technical File, a default value of 175 g/kWh for 2 stroke engines and 200 g/kWh for 4 stroke engines may be applied. In the case of waste heat recovery systems as defined under Category C1 in MEPC.1/Circ.896 the SFOC to be used will be at the discretion of the Administration.

2 FC_{BOG} for Boilers' consumption associated to steam dumping.

For steam driven LNG carriers, the consumption associated with steam dumping for BOG management maybe calculated as follows:

$$FC_{BOG} = \frac{Sd}{St} \cdot \{FC_{LNG} + \left[\frac{C_{lng}}{C_{HFO}} . FC_{HFO}\right] + \left[\frac{C_{lng}}{C_{MDO}} . FC_{MDO}\right]\}$$

Which can be simplified as follows to fit in the CII calculation formulas

$$FC_{BOG,j} = \frac{Sd}{St} \cdot \Sigma_j \left[\frac{C_{lng}}{C_{F_j}} . FC_{BSD,j}\right]$$

where:

- Sd or steam dump represents the metered flow of steam in a calendar year, directly flowing into the condenser without providing useful work.
- St or total steam represents the metered flow of steam in a calendar year generated by the boilers.
- FC_{LNG} represents the total LNG mass consumption of boilers in the calendar year
- FC_{HFO} represents the total HFO mass consumption of boilers in the calendar year
- FC_{MDO} represents the total MDO mass consumption of boilers in the calendar year
- $FC_{BSD,j}$ represents the total mass of fuel type *j* consumed in boilers in the calendar year
- C_{lng} , C_{HFO} and C_{MDO} represent the fuel mass to CO_2 mass conversion factor for fuel type, LNG, HFO and MDO respectively, as specified in the *2018 Guidelines on the method of calculation of the attained EEDI for new ships* (resolution MEPC.308(73)), *as may be further amended*.

The CII calculation formulas becomes

$$\frac{\sum_j C_{Fj} \cdot \left\{FC_j - \left(FC_{voyage,j} + TF_j + (0.75 - 0.03y_i) \cdot \left(FC_{electrical,j} + FC_{boiler,j} + \frac{Sd}{St} \cdot \left[\frac{C_{lng}}{C_{F_j}} . FC_{BSD,J}\right] + FC_{others,j}\right)\right)\right\}}{f_i \cdot f_m \cdot f_c \cdot f_{iVSE} \cdot Capacity \cdot (D_t - D_x) \cdot AF_{PT}}$$

The method to be used for steam metering will be at the discretion of the Administration.

Below illustration represents a generic and simplified marine steam plant

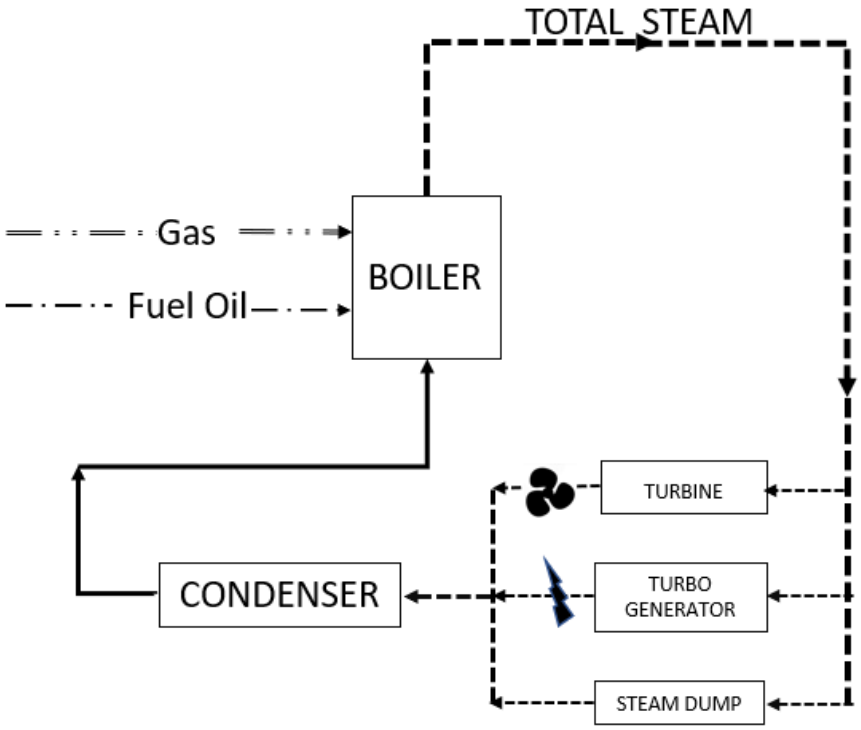

Figure [X]: Generic and simplified marine steam plant