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REDUCTION OF GHG EMISSIONS FROM SHIPS

Adopting a reference line for self-unloading bulk carriers

Submitted by ICS and INTERCARGO

SUMMARY

Executive summary:	This document presents a proposal to the Committee previously set out in document ISWG-GHG 12/2/5 (ICS and INTERCARGO) to establish self-unloading bulk carriers as a separate category of ship with its own reference line. This builds on the guidelines adopted by the Committee at it last meeting and does not change the method of calculating a ship's carbon intensity. Given many delegations have spoken favourably of this approach, including at the Committee's last meeting, the co-sponsors seek the Committee's consideration for adoption at this session.
Strategic direction, if applicable:	3
Output:	3.2
Action to be taken:	Paragraph 15
Related documents:	ISWG 12/2/5; MEPC 78/WP.7, MEPC 78/7/11 and MEPC.353(78)

Introduction

1 MEPC 76 adopted, in June 2021, the IMO Carbon Intensity Indicator (CII) framework that is expected to enter into effect on 1 January 2023. As this framework required substantive guidance to support its implementation, the Committee established a correspondence group to develop a package of guidelines. MEPC 78 adopted, in June 2022, a package of four resolutions setting out the supporting guidelines for CII framework, as developed by the Correspondence Group.

2 Over the course of developing these guidelines, many proposals were made for correction factors, which are critical to ensure an accurate calculation of emissions and avoid unintentional effects of seriously disadvantaging certain ships and creating perverse incentives. Correction factors also account for events that are beyond a shipowner's control, such as weather. Most of these proposals ultimately were not accepted by the Committee, as a function of the significant time pressures due to the wider complex discussions at MEPC 78 and the need for guidelines to be in place for the CII framework's implementation on 1 January 2023.

3 The co-sponsors note the support for the Committee to consider proposals at MEPC 79 which could still allow for critical adjustments to be made to guidelines before the framework's entry into force. One approach that gained a fair amount of support over the discussions in the Correspondence Group and at the Committee's last two sessions was the use of reference lines for specific classes of ships that experience challenges with the CII calculations. The use of reference lines is guided by MEPC.353(78) on *2022 Guidelines on the reference lines for use with operational carbon intensity indicators* (CII reference lines Guidelines, G2).

4 One such example would be ocean-going self-unloading bulk carriers. These are specialized ships equipped with onboard cargo-handling systems, enabling them to discharge without shore-based unloading equipment. This equipment typically comprises conveyor belt systems or pneumatic systems to move cargo from the hold to a discharge boom on deck. Because the onboard cargo-handling systems are powered by electricity generated on board from fuel, a significant share of their CO_2 emissions stem from cargo handling, resulting in a higher CII than bulk carriers of a similar size without cargo handling systems.

5 ICS and INTERCARGO, in document ISWG GHG 12/2/5, provided an analysis of 2019 DCS submissions. It showed that about 66% of the ocean-going self-unloader fleet had, on average, CII values that were 21% higher than the reference CII for bulk carriers of the same size. It noted negative impacts could be addressed by developing a dedicated reference line for ocean-going self-unloaders.

Discussion

6 During discussions in the Correspondence Group and in the Committee's consideration of the Group's interim report to MEPC 77, several Member States spoke favourably on the use of specifically developed reference lines.

7 In the sum-up of Round 4 of the Correspondence Group developing the supporting guidelines for the CII framework, the coordinators noted in the discussion on correction factors and voyage adjustments "[…] there seems to be general support to deal with issues specific to self-unloading bulk carriers, and while multiple correction factors are proposed during the course of this Correspondence Group, the proponents should consider definition of a separate ship category."[*] This proposal builds on that support, and from specific comments in the initial consideration of issues faced by self-unloaders that expressed preference to address concerns by a specific reference line.

8 While self-unloaders have more emissions compared to conventional bulk carriers, given higher energy needs, they provide a GHG emissions benefit to the wider transportation system. This benefit arises from being able to unload cargo at terminals that do not have cargo-unloading equipment. Such ships are often able to deliver cargo directly to an end user, removing the need for additional transportation.

9 As shown in the proposal, the basis of the proposal is to compare self-unloading bulk carriers to each other's performance. In addition to self-unloading equipment with its own energy requirements being built into these ships, they also require additional structural elements to support that equipment and ensure safe operation. Combined, in the context of the CII framework, these aspects put self-unloading bulk carriers at a serious disadvantage to conventionally designed bulk carriers.

[*] See document MEPC 78/7/11 (China et al.), annex 5, page 13.

Proposal

10 Work was contracted to CE Delft to develop a reference line from data on existing international self-unloading bulk carriers. The CII reference lines Guidelines (MEPC.353(78), in paragraph 3.2, stipulates for a defined group of ships, the reference line is formulated as follows:

$$CII_{ref} = a Capacity^{-c}$$

where CII_{ref} is the reference value of year 2019, *Capacity* is identical with the one defined in the specific carbon intensity indicator (CII) for a ship type, as shown in table 1; *a* and *c* are parameters estimated through median regression fits, taking the attained CII and the Capacity of individual ships collected through IMO DCS in year 2019 as the sample.

11 As the CII reference lines Guidelines stipulate that the reference line is for “a defined group of ships”, the first step is to propose a definition for this group of ships. The definitions for the other “defined groups of ships” are those set out in MARPOL Annex VI, which the Guidelines recognize as applicable. However, the *CII Reference Lines Guidelines* do not suggest that a group of ships needs to be defined by MARPOL Annex VI, only that they should be defined. As such the co-sponsors propose the following be added to the definitions in the Guidelines:

> "2.5 *Self-unloading bulk carrier* means a bulk carrier with an onboard cargo handling system that is utilized to discharge dry bulk cargo via a boom conveyor or shipboard cargo pipeline equipment, as defined in paragraph 2.10 of resolution MEPC.355(78)."

12 Following the Guidelines set out in resolution MEPC.353(78), and as derived in document ISWG-GHG 12/2/5, the formula for a reference line for self-unloading bulk carriers is proposed as follows:

$$CII_{ref} = 5498 \cdot dwt^{-0.621}$$

13 The co-sponsors further propose to amend table 1 in resolution MEPC.353(78) to append an additional sub-category of "self-unloading bulk carrier". As the report from CE Delft set out in the annex to document ISWG 12/2/5 found all such ships were under 120,000 DWT, no separate categories based on size are proposed. Such a revision would look like:

Table 1: Parameters for determining the 2019 ship type specific reference lines

Ship type		**Capacity**	***a***	***c***
Bulk carrier	279,000 DWT and above	279,000	4745	0.622
	less than 279,000 DWT	DWT	4745	0.622
Self-unloading bulk carrier		DWT	5498	0.621
Gas carrier	65,000 and above	DWT	14405E7	2.071
	less than 65,000 DWT	DWT	8104	0.639
Tanker *[table continues unchanged] …*		…	…	…

14 The co-sponsors have provided a draft resolution in the annex to this document to facilitate the Committee's consideration and possible adoption.

Action requested of the Committee

15 The Committee is invited to consider the proposal contained in paragraphs 10 to 13 of this document and in the annex, and to take action as appropriate so that the reference line may be available for self-unloading bulk carriers on entry into effect of the amendments on 1 January 2023.

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ANNEX

DRAFT MEPC RESOLUTION

REVISED 2022 GUIDELINES ON THE REFERENCE LINES FOR USE WITH OPERATIONAL CARBON INTENSITY INDICATORS (CII REFERENCE LINES GUIDELINES, G2)

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

RECALLING Article 38(a) of the Convention on the International Maritime Organization concerning the functions of the Marine Environment Protection Committee (the Committee) conferred upon it by international conventions for the prevention and control of marine pollution from ships,

NOTING that the Committee adopted, at its seventy-sixth session, by resolution MEPC.328(76), the *2021 Revised MARPOL Annex VI*, which entered into force on 1 November 2022,

NOTING IN PARTICULAR that the *2021 Revised MARPOL Annex VI* (MARPOL Annex VI) contains amendments concerning mandatory goal-based technical and operational measures to reduce carbon intensity of international shipping,

NOTING FURTHER that regulation 28.4 of MARPOL Annex VI requires reference lines to be established for each ship type to which regulation 28 is applicable,

NOTING that the Committee, at its seventy-eighth session, adopted, by resolution MEPC.353(78), the *2022 Guidelines on the reference lines for use with operational carbon intensity indicators (CII reference lines guidelines, G2),*

HAVING CONSIDERED, at its seventy-ninth session, the draft *Revised 2022 Guidelines on the reference lines for use with operational carbon intensity indicators (CII reference lines guidelines, G2)*,

1 ADOPTS the *Revised 2022 Guidelines on the reference lines for use with operational carbon intensity indicators (CII reference lines Guidelines, G2)*, as set out in the annex to the present resolution;

2 INVITES Administrations to take the annexed Guidelines into account when developing and enacting national laws which give force to and implement requirements set forth in regulation 28.4 of MARPOL Annex VI;

3 REQUESTS the Parties to MARPOL Annex VI and other Member Governments to bring the annexed Guidelines to the attention of masters, seafarers, shipowners, ship operators and any other interested parties;

4 AGREES to keep the Guidelines under review in light of experience gained with their implementation, also taking into consideration that in accordance with regulation 28.11 of MARPOL Annex VI a review of the operational measures to reduce carbon intensity of international shipping shall be completed by 1 January 2026,

5 REVOKES the *2022 Guidelines on the reference lines for use with Operational Carbon Intensity Indicators (CII Reference Lines Guidelines, G2).*

ANNEX

REVISED 2022 GUIDELINES ON THE REFERENCE LINES FOR USE WITH OPERATIONAL CARBON INTENSITY INDICATORS (CII REFERENCE LINES GUIDELINES, G2)

1 Introduction

1.1 These Guidelines provide the methods to calculate the reference lines for use with operational carbon intensity indicators, and the ship type specific carbon intensity reference lines as referred to in regulation 28 of MARPOL Annex VI.

1.2 One reference line is developed for each ship type to which regulation 28 of MARPOL Annex VI applies, based on the specific indicators stipulated in *2022 Guidelines on operational carbon intensity indicators and the calculation methods* (G1) developed by the Organization, ensuring that only data from comparable ships are included in the calculation of each reference line.

2 Definition

2.1 *MARPOL* means the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocols of 1978 and 1997 relating thereto, as amended.

2.2 *IMO DCS* means the data collection system for fuel oil consumption of ships referred to in regulation 27 and related provisions of MARPOL Annex VI.

2.3 For the purpose of these Guidelines, the definitions in MARPOL Annex VI, as amended, apply.

2.4 An operational carbon intensity indicator (CII) reference line is defined as a curve representing the median attained operational carbon intensity performance, as a function of Capacity, of a defined group of ships in year of 2019.

2.5 *Self-unloading bulk carrier* means a bulk carrier with an onboard cargo handling system that is utilized to discharge dry bulk cargo via a boom conveyor or shipboard cargo pipeline equipment, as defined in paragraph 2.10 of resolution MEPC.355(78).

3 Method to develop the CII reference lines

3.1 Given the limited data available for the year of 2008, the operational carbon intensity performance of ship types in year 2019 is taken as the reference.

3.2 For a defined group of ships, the reference line is formulated as follows:

$$CII_{ref} = a Capacity^{-c} \quad (1)$$

where CII_{ref} is the reference value of year 2019, *Capacity* is identical with the one defined in the specific carbon intensity indicator (CII) for a ship type, as shown in table 1; *a* and *c* are parameters estimated through median regression fits, taking the attained CII and the Capacity of individual ships collected through IMO DCS in year 2019 as the sample.

4 Ship type specific operational carbon intensity reference lines

The parameters for determining the ship type specific reference lines, for use in Eq.(1), are specified as follows:

Table 1: Parameters for determining the 2019 ship type specific reference lines

Ship type		Capacity	*a*	*c*
Bulk carrier	279,000 DWT and above	279,000	4745	0.622
	less than 279,000 DWT	DWT	4745	0.622
Self-unloading bulk carrier		DWT	5498	0.621
Gas carrier	65,000 and above	DWT	14405E7	2.071
	less than 65,000 DWT	DWT	8104	0.639
Tanker		DWT	5247	0.610
Container ship		DWT	1984	0.489
General cargo ship	20,000 DWT and above	DWT	31948	0.792
	less than 20,000 DWT	DWT	588	0.3885
Refrigerated cargo carrier		DWT	4600	0.557
Combination carrier		DWT	5119	0.622
LNG Carrier	100,000 DWT and above	DWT	9.827	0.000
	65,000 DWT and above, but less than 100,000 DWT	DWT	14479E10	2.673
	less than 65,000 DWT	65,000	14779E10	2.673
Ro-ro cargo ship (vehicle carrier)	57,700 GT and above	57,700	3627	0.590
	30,000 GT and above, but less than 57,700 GT	GT	3627	0.590
	Less than 30,000 GT	GT	330	0.329
Ro-ro cargo ship		GT	1967	0.485
Ro-ro passenger ship	Ro-ro passenger ship	GT	2023	0.460
	High Speed Craft designed to SOLAS chapter X	GT	4196	0.460
Cruise passenger ship		GT	930	0.383