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PREVENTION OF AIR POLLUTION FROM SHIPS

Proposal for Improving MEPC/Circ.471 – Interim Guidelines for Voluntary Ship CO_2 Emission Indexing for use in Trials

Submitted by the Marshall Islands

SUMMARY	
Executive summary:	This submission proposes amendments to paragraph 3.5 of the annex to MEPC/Circ.471 to reflect discussions at GHG-WG 1 and experience gained by the Marshall Islands Administration during CO_2 indexing trials concerning the measure of cargo mass for various ship types
Strategic direction:	7.3
High-level action:	7.3.1
Planned output:	7.3.1.3
Action to be taken:	Paragraph 9
Related documents:	MEPC/Circ.471; MEPC 58/4 and MEPC 57/4/22

Introduction

1 The first session of the MEPC Intersessional Working Group on Greenhouse Gas Emissions from Ships was tasked with reviewing the Interim Guidelines for Voluntary CO_2 mission Indexing for use in Trials (MEPC/Circ.471) with a view to finalization at MEPC 58. Following the summing-up by the Chairman, the group agreed that in order to approve the review of MEPC/Circ.471 at MEPC 58, documents submitted to previous sessions of the Committee, which contain concrete proposals for amendments, can be used to prepare draft text of amendments for approval. Accordingly, this submission proposes amendments to paragraph 3.5 of the annex to MEPC/Circ.471, Interim Guidelines for Voluntary Ship CO_2 Emission Indexing for use in Trials, based upon discussions during the GHG-WG 1 meeting in Oslo, Norway and trials conducted by the Marshall Islands Administration and reported previously in document MEPC 57/4/22. The proposed amendments concern the measure of cargo mass for various ship types.

Background

GHG-WG 1

2 The GHG-WG 1, after consideration of the proposal by Germany (GHG-WG 1/3/2), and a thorough debate on the merits of using TEU *vs.* DWT for calculating the operational index for container ships, the group agreed that both parameters should continue to be allowed (as in the interim guidelines contained in MEPC/Circ.471) to gain further experience. Additionally, it was noted that a cautious approach to the use of TEU should be taken for the time being as currently there is no mandatory requirement to declare the total cargo capacity of a container ship in TEUs, and it is a well-known fact that some companies do not disclose these data for commercial reasons.

3 Cargo mass for other ship types such as gas carriers and passenger ships was discussed in more detail during the consideration of the proposed design index.

Marshall Islands Indexing Trials

4 Marshall Islands conducted CO_2 indexing trails as documented in MEPC 57/4/22. The data collection included historical and real-time operational data collected from seven container ships of varying TEU capacity, spanning a period of about four to nine months, depending on the vessel. The data involved a variety of voyages and voyage legs, ranging in time from hours to 33 days, involving both short-sea and trans-ocean voyages with a wide variety of loading conditions. In addition to distance sailed, fuel data and numbers of full and empty TEUs, data concerning total ship DWT (including light ship, cargo, fuel, water, store, etc.) and cargo DWT based upon the ship's capacity plan, using draught readings at the beginning of a voyage or voyage leg, were recorded. Accordingly, three different calculations of CO_2 index were performed for each voyage and voyage leg using cargo mass as:

.1 first, cargo weight in tonnes based upon assuming 10 tonnes per loaded container and 2 tonnes per empty container;

.2 second, actual cargo weight in tonnes calculated by taking the total DWT in tonnes and subtracting the tonnes of ballast, fresh water, fuel oil, lube oil and other consumables on board; and

.3 third, total DWT in tonnes based upon the ship's draught determined by taking the vessel's draught readings at departure and using the Capacity Plan Deadweight Scale to note total deadweight on board corresponding to the departure draught, to include cargo, fresh water, ballast, fuel oil, lube oil and other consumables.

5 Calculated CO_2 indexes varied considerably as experienced in past efforts at container ship CO_2 indexing trials. Examination of the data from these trials would indicate that this reflects the following:

.1 cargo mass, by definition, is a critical factor and part of the index calculation. The number of full containers carried by any ship during the trial period varied considerably and never approached maximum capacity. The index calculation uses the total fuel consumed for the trial period so the fuel consumed during the voyage where less cargo was carried was apportioned to a lower tonnage of cargo mass with consequent higher resulting index. While a ship with less cargo may require less fuel, there is a point of diminishing returns as cargo is reduced;

.2 voyage length is also a critical factor where long trans-ocean voyages with the ship operating at design speed experiencing a lower index as compared to ships on short voyages where a greater proportion of time is spent at a less efficient lower transit or manoeuvring speed;

.3 the combination of low cargo mass, combined with short duration voyages, is significant resulting in high index extremes; and

.4 generally, larger ships with higher TEU/DWT capacity had a lower index, depending on voyage length and cargo loading.

6 With regard to the most appropriate approach to the issue of cargo mass to be used in trials, generally, on a voyage-by-voyage basis, use of the container estimate of 10 tonnes for full containers and 2 tonnes for empty containers resulted in a higher calculated index than using actual cargo tonnes to calculate the index. Additionally, the use of total DWT resulted in an even lower index. Accordingly, use of the actual cargo tonnes or total DWT, based on calculations using a ship's capacity plan and draught readings at sailing, probably provides a more accurate assessment of the CO_2 index.

7 The wide variation observed in these trials between container ships compared with previous tanker trials support the concept that separate CO_2 index baselines must be developed for different classes of ships. However, use of a common measure of actual cargo mass such as cargo DWT might provide a useful means of comparison between some ship classes.

Proposal

8 Proposed amendments to the annex to MEPC/Circ.471 are found at annex to this submission. The proposed amendments address various ship types and reflect both the discussions during the GHG-WG 1, as well as the results of the Marshall Islands indexing trials. With regard to the GHG-WG 1, discussions about the concepts of the design and operational index, while it is agreed that the operational and design indexes serve a different purpose, the Marshall Islands believes that the use of common measures of cargo mass should be considered and the proposed amendments address this.

Action requested of the Committee

9 The Committee is invited to consider the foregoing and take action as appropriate.

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ANNEX

PROPOSED AMENDMENTS TO THE ANNEX TO MEPC/Circ.471
INTERIM GUIDELINES FOR VOLUNTARY SHIP CO_2 EMISSION INDEXING FOR USE IN TRIALS

3.5 Cargo

Generally, cargo could be defined in terms of cargo mass.

For dry and wet bulk and general cargo ships, the mass of transported cargo should be defined in metric tonnes (t), derived from the ship's draught and capacity plan.

For ships carrying a combination of containers and other cargoes, two calculations should be made: first, a TEU mass of 10 t should be applied for loaded TEUs and 2 t for empty TEUs; and, second, a calculation based upon total cargo weight in tonnes derived from the ship's draught and capacity plan.

For other types of ship, the following units could be applied:

- For liquefied gas carriers: cargo capacity in cubic metres (m^3)
- For passenger vessels: two separate calculations based upon number of passengers and GT
- For car ferries and car carriers: two separate calculations based upon number of car units ~~or~~ and occupied lane metres
- For container ships: two separate calculations based upon cargo capacity in TEUs and actual cargo weight in tonnes (t), derived from the ship's draught and capacity plan.
- ~~number of TEUs (empty or full)~~
- For railway and ro-ro vessels: two separate calculations based upon number of railway cars and freight vehicles, and, ~~or~~ occupied lane metres.