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FURTHER CONSIDERATION OF THE REVISION OF THE IMO SHIP FUEL OIL CONSUMPTION DATA COLLECTION SYSTEM (DCS)

Appropriate metrics to quantify cargo carried when amending the IMO DCS

Submitted by WSC

SUMMARY

Executive summary:	This document comments on proposals to amend the IMO DCS, and recommends support for disaggregating reporting of fuel use when ships are underway and at rest, for different fuel consumers (main propulsion engines, auxiliary engines and boilers) and to index emissions to cargo carried in preference to nominal capacity. It is also critical that the metrics used to quantify cargo carried must recognize that different ship types are designed for different cargo parameters, at a high level this can be divided into those ships which carry volume and those which carry weight. There are also ship types which do not carry cargo. For container ships use of "TEU-miles" is recommended as the most appropriate measure of cargo carried.
Strategic direction, if applicable:	3
Output:	3.2
Action to be taken:	Paragraph 25
Related documents:	ISWG-GHG 12/2/2; ISWG-GHG 13/7; MEPC 79/7/13; resolutions MEPC.338(76) and MEPC.304(72)

Introduction

1 ISWG-GHG 13 considered document ISWG-GHG 13/7 (Austria et al.) which proposed amending the current IMO Data Collection System (DCS).

2 In general, WSC welcomes and supports the proposals and recommendations made in document ISWG-GHG 13/7, including disaggregating data to provide greater granularity, indexing emissions to cargo carried and improving transparency. In addition, WSC believes that moving to a data system that is based on cargo carried, also requires using a cargo-unit appropriate to a given ship type. In this context, this document recommends the use of TEU-miles for containerships, recognizing that when quantifying cargo carried it is essential to

recognize the fundamental differences between ship types and, by extension, the vital importance of using appropriate cargo-units for each ship type. Moreover, a standard volumetric unit (measured in TEU) is clearly the cargo metric used across the world's economy for measuring cargo carried and delivered in the container trades.

3 As such, WSC recommends that "TEU-miles" be used to quantify cargo carried by container ships. Supporting rationale for this recommendation and for the recommendations made in document ISWG-GHG 13/7 in general is provided in the following paragraphs.

Background

4 The IMO DCS collects rounded data, which is anonymized. Nominal capacity is reported as DWT or GT (as appropriate) and fuel use is total fuel use, meaning there is no granularity for the amount of fuel consumed by propulsion engines, auxiliary engines, and boilers.

5 When the DCS quantified aggregate fuel use by the industry, and by sector, this was adequate. However, DCS data is now used to verify ship carbon intensity indicators (CIIs) and the associated rating mechanism. The data is also expected to support future GHG reduction measures and decision making by the Organization. As such it is appropriate to review the DCS so that it is fit for these purposes.

6 Document ISWG-GHG 13/7 provides several positive proposals which are supported by WSC, including, inter alia:

.1 disaggregating data for propulsion engines, auxiliary engines, and boilers, and for when the ship is underway and at rest (ISWG-GHG 13/7, paragraph 18);

.2 improving transparency by providing greater access to data and reporting of non-rounded data (ISWG-GHG 13/7, paragraphs 20 to 24); and

.3 inclusion of data for transport work and indexing of emissions to cargo carried (ISWG-GHG 13/7, paragraphs 6 to 14).

7 The increased granularity which would be provided by disaggregating data would facilitate detailed analysis of fuel use according to operational conditions (underway, at rest) and for propulsion and non-propulsion purposes. Such analysis using verified data should offer more accurate insight into shipboard fuel consumption, and facilitate informed decision making.

8 Including transport work data in the DCS and indexing emissions to cargo carried would provide increased insight when reviewing fuel consumption data and the CII. The current CII regulation uses nominal capacity (DWT or GT, depending on ship type) because currently the DCS data can only be used to verify CIIs which index emissions to nominal capacity.

9 A review of the CII regulation is to be completed by 1 January 2026. For this review to be meaningful and effective, data will be needed to support detailed analysis and the DCS will need to provide appropriate data to verify proposed improvements. If the DCS is kept as-is, the absence of data for cargo carried and lack of granularity will limit the scope of the review since imprecise and inappropriate data will preclude alternatives and otherwise undermine the forthcoming review.

10 Improving transparency will facilitate use of DCS data for research and analysis by interested stakeholders, further aiding informed decision making. A further benefit will be to allow interested stakeholders to identify potential errors which might escape the attention of data verifiers, and to promote confidence in the DCS database. The preference of WSC is full transparency of DCS data (i.e., public access to non-anonymized data). However, recognizing the concerns expressed by some Member States at ISWG-GHG 13, WSC can support the compromise proposal provided in paragraph 23 of document ISWG-GHG 13/7 proposing controlled access as part of a pathway to make data available to the public at a future date.

11 Having confirmed support for improving granularity, transparency and indexing emissions to cargo carried, this document will discuss how cargo carried should be reported and provide proposals for consideration by the Group and the Committee.

Quantifying cargo carried

12 If data for cargo carried is to be reported to the DCS, it will be essential:

.1 to identify the relevant cargo parameter (in basic terms, weight or volume); and

.2 that the selected metric is accurate and verifiable.

13 The following sections consider each of these aspects in turn to demonstrate that the appropriate cargo carried metric for containerships is "TEU-miles".

Cargo parameters

14 Ships are designed and optimized to carry different types of cargo or passengers, as evidenced by the diversity of ship types which make up the global fleet. Additionally, a significant part of the fleet carries neither cargo nor passengers but undertakes unique work activities.

15 Cargo carrying ships can be divided between ship types designed and optimized to carry weight (such as dry bulk carriers, oil tankers), and those designed and optimized to carry volume (such as container ships and LNG carriers). Whether a ship is designed to carry weight or volume, and the nature of cargo to be carried, determines hull form, hull dimensions and machinery, financial considerations, and ship operation. No single metric for cargo carried is suitable for all ship types.

16 A single "one size fits all" metric, such as weight, would result in distortion and erroneous indicators. Comparing efficiency of a volume carrier such as a container ship or gas carrier with other ship types using weight carried would be misleading, lead to deeply flawed conclusions and distort decision making. It should be noted that the issue is not unique to containerships but would be equally applicable to other ship types which carry volume (or passengers).

17 Although weight may seem an appropriate common metric because the laws of physics generally require more energy to move a heavier laden ship through the water, the reality is much more complicated. Hull immersion is only one element to determine energy needed to move a ship through the water, other key factors include inter alia, hull form, whether the ship is at its design draft, trim, environmental conditions, machinery configuration, and to what unit of cargo a given ship type is optimized for in both design and operation.

18 Positively, document ISWG-GHG 13/7 has already recognized this essential reality, table 1 of that document provides several different metrics for different ship types. Therefore, the discussion is not whether the metrics for cargo carried should reflect the unique properties of different ships, but which metrics are most appropriate.

19 There are different types of standard ISO shipping container, including 20- and 40-foot containers, but the universal standard unit to indicate ship capacity and load is the twenty-foot equivalent unit, or TEU. Ship operation and commercial transactions are also based on TEU.

20 Containerized cargo is especially varied, almost anything which can physically fit inside a standard shipping container is carried as cargo. Some cargoes are "heavy", container weight limits are reached before the volume limit. Much more commonly, however, the volume limit of the container is reached first because cargo is "light". Further, it is necessary to reposition containers due to the asymmetric nature of some trades. Empty containers are also cargo, consuming cargo hold or above deck stowage volume. The ship is fully loaded when the TEU limit is reached, this is invariably significantly below the DWT capacity. As such the industry uses volume as the key metric for cargo, capacity, and commercial operations, not weight. Unlike most ship types, container ships do not operate unladen except for initial delivery from the building yard, occasional voyages to/from drydock, and rare repositioning voyages. Even where trade flows are highly asymmetric the need to reposition containers balances TEU loads, however, weight varies greatly by voyage segment according to the nature of container contents with optimum draft, stability and trim being maintained using water ballast.

21 Weight represents neither container ship capacity nor cargo carried. Hull forms and dimensions of container ships are determined by the need to accommodate a specified number of TEU, and the TEU is the commercial unit of the industry and is the appropriate reporting metric for the DCS. However, this further needs to be refined to "TEU-miles" for the reasons explained in the following section.

Accuracy and verification

22 Data reported to the DCS must be accurate and verifiable. Additionally, minimizing verification burden for all stakeholders, including the Administration and their Recognized Organizations, is desirable. As already demonstrated, weight is not a meaningful metric for containerized cargo. There are significant accuracy and verification reasons against its use for container ships, including, inter alia:

.1 despite the Verified Gross Mass (VGM) requirements of the SOLAS Convention, some container weights are still wrongly declared;

.2 use of total weight would still require verification requirements. The short duration of some voyage segments and intensity of rotations for many containerships means this would still be burdensome and it would not address inaccuracy arising from issues with declared weight; and

.3 average container weights introduce distortions and inaccuracy because trade routes have different cargo profiles and average cargo weights vary significantly. Any average container weight would be based on assumptions, favouring some routes and discriminating against others as well as being inherently inaccurate.

23 In short, weight is an inherently inaccurate measure when applied to containers. Moreover, a standard volumetric measure (TEU) is the universal cargo metric used by governments, commercial clients, and society when measuring the transport work of a container ship. Therefore, there are compelling reasons to favour volume for container ships in order to assure accuracy and ease of verification.

24 TEU is accurate, and simple to verify with low burden, including for the Administration. TEU does not have the inherent weaknesses arising from a reliance on assumptions, average values or from known issues with container declared weights.

25 If a ship has multiple port calls, aggregating TEU (or weight) at the end of the reporting period will indicate higher transport work value than an identical ship operating the same route but with fewer (or no) intermediate port calls, making some ships appear more efficient than others despite their actual transport work being similar. This is illustrated using a simple example in the annex of this document. To assist with verification of "TEU-miles", it is recommended that the DCS reporting form include TEU for each port pair. However, the TEU value would only be a verification aid, and transport work would be based on "TEU-miles".

Carbon Intensity Indicators

26 As referenced in paragraphs 5, 6.2 and 6.3 of this document, there is an interaction between the DCS and CII. The *2021 Guidelines on the operational carbon intensity reduction factors relative to reference lines (CII reduction factors guidelines, G3)* (MEPC.338(76)) use representative ship types and weight to establish reduction rates and quantify overall transport work performance of the fleet. This will then facilitate analysis to demonstrate the trajectory of emissions reduction relative to the levels of ambition of the *Initial IMO Strategy on reduction of GHG emissions from ships* (resolution MEPC.304(72)) (referred to as Initial IMO GHG Strategy). Ordinarily this might make revising cargo metrics, such as introducing "TEU-miles" for containerships, difficult. It is necessary to maintain alignment between several different instruments. However, the Organization has a unique opportunity to introduce revisions to the DCS, without prejudice to levels of ambition, CII reduction rates and whilst avoiding inconsistencies between the DCS and emissions reduction monitoring for the global fleet, as explained in the following paragraphs.

27 When considering issues related to the G3 guidelines and introducing new cargo metrics it should be noted that:

.1 the Initial IMO GHG Strategy does not provide a definition for transport work;

.2 the Initial IMO GHG Strategy is currently in the process of being revised, and a review of the CII regulation is to be completed by 1 January 2026;

.3 since the only verified data collected by IMO DCS for cargo is nominal capacity, mandatory CIIs used by the Organization (AER and cgDIST) index emissions to nominal capacity (DWT or GT, respectively);

.4 CII reduction rates are only defined up to 2026; and

.5 there is no verified data or baseline for demand-based transport work.

28 Therefore, the existing position with respect to transport work, emissions tracking and reporting of cargo carried is far from clear or agreed. There is nothing preventing the Organization considering further metrics and supporting "TEU-miles" for containerships.

29 Further, it must be considered that:

.1 the Initial IMO GHG Strategy is already under review and that significant amendments to the levels of ambition are expected; and

.2 the CII regulation will be reviewed before 1 January 2026, which is expected to include agreeing further CII reduction rates beyond 2026.

30 These reviews will almost certainly mean that a comprehensive review and update of the G3 Guidelines (MEPC.338(76)) will be necessary.

31 When considering CII reduction rates, it must be understood that both demand and supply transport work levels of ambition are relative reductions indexed to 2008 baselines, and are separate and distinct from absolute reductions. Providing there is a baseline and an appropriate metric, then a reduction rate can be defined, remaining fully consistent with both the letter and intent of the Initial IMO GHG Strategy.

32 After considering that the Initial IMO GHG Strategy will be revised and that the CII regulation will be reviewed, it is clear that the Organization can carry out a comprehensive review of the DCS, including metrics to be used, without prejudice to either the Revised Strategy, tracking overall emissions reduction of the fleet or CII reduction rates. This can support the consequential review of the G3 Guidelines which will be necessary regardless of what is decided for the DCS. With respect to the G3 Guidelines and emissions reduction tracking and defining CII reduction rates for container ships, WCS offers two possible ways forward:

.1 Option 1: define baselines for containership types using "TEU-miles". The agreed reduction rates would be applied to this baseline, and this would be used to track emissions reduction of the segment in line with the levels of ambition of the Initial Strategy, and the Revised Strategy when this is agreed; or

.2 Option 2: define baselines and reduction rates for containership types using "TEU-miles". When the Organization assesses performance of the global fleet, the aggregated ‘TEU-mile’ value would be multiplied by an agreed representative figure for weight to allow development of a single consolidated value for fleet transport work performance.

33 WSC recommends Option 1.

Proposals

34 WSC supports document ISWG-GHG 13/7 in general subject to amending table 1, row 2 of that document as shown below:

Table 1: Suggested variable to be reported for each ship type category (part only shown)

Ship Type	Cargo related data
Containerships	~~metric tonnes of total mass of cargo and containers~~ TEU-miles

Deletion shown in ~~strikethrough~~, addition shown underlined.

Action Requested of the Working Group

35 The Group is requested to consider the information provided in this document and the proposal made in paragraph 34 and take action as appropriate.

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ANNEX

EXAMPLE OF INFLUENCE OF AGGREGATING TEU VS. TEU-MILES IN THE DCS

1 The below worked, simplified example, illustrates the effects of aggregating TEU carried versus use of aggregated TEU-miles calculated. For simplicity it is assumed the same number of TEU is onboard for all voyage segments, although this unlikely in reality. Ship A makes a voyage from Shanghai to Rotterdam with four intermediate port calls. Ship B is the same ship operating from Shanghai to Rotterdam with no intermediate port calls. Fuel used is estimated at 3.3T/hr for both ships.

2 This worked example is provided to assist the working group to understand the effects of aggregating TEU at the end of a reporting period, as opposed to aggregating TEU-Miles for each port pair.

Table 1: Ship A

Port Pair	Distance (NM)	Fuel used (T)	TEU	TEU-miles
Shanghai – Hong Kong	845	166.5	15,000	12,675,000
Hong Kong - Singapore	1,460	286	15,000	21,900,000
Singapore – Jebel Ali	3,430	673	15,000	51,450,000
Jebel Ali - Jeddah	2,198	429	15,000	32,970,000
Jeddah - Rotterdam	3,997	782	15,000	59,995,000
Total	11,930	2,366.5	75,000	178,950,000

3 If total distance is multiplied by aggregate TEU (75,000) the resulting "transport work" value would be 894,750,000, five times higher than the "TEU-mile" value.

Table 2: Ship B

Port Pair	Distance (NM)	Fuel used	TEU	TEU-miles
Shanghai - Rotterdam	10,525	2,061	15,000	157,875,000
Total	10,525	2,061	15,000	157,875,000

4 In this case, the figure for total distance is multiplied by aggregate TEU is the same as the "TEU-mile" value.

Conclusion

5 For ship A, using aggregated TEU with total distance travelled would indicate transport work five times higher than for ship B. However, if "TEU-miles" is aggregated for each ship then transport work will be broadly similar, with the differences for both fuel and transport work reflecting the shorter voyage distance for Ship B. As such, it will be essential to avoid multiple counting of containers which would inflate indicated transport work of ships making multiple port calls relative to other ships which carry the same quantity of cargo over similar distances but which make fewer port calls. Consequently, it is TEU-miles that represents a clean, fully accurate, and easily verifiable measure of container ship transport work.