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ENERGY EFFICIENCY OF SHIPS

Review of the impact of idle time on the Carbon Intensity Indicator

Submitted by INTERCARGO

SUMMARY

Executive summary:	This document provides information on the Carbon Intensity Indicator (CII) and in particular the impact of idle time on the attained CII rating of bulk carriers. The information provided in this document is derived from studies carried out by INTERCARGO and three Classification Societies (ABS, BV and DNV) using verified IMO Data Collection System (IMO DCS) results, analysing 5,622 bulk carriers.
Strategic direction, if applicable:	3
Output:	3.2
Action to be taken:	Paragraph 24
Related documents:	MEPC 81/INF.27, MEPC 81/INF.29, MEPC 81/INF.30; MEPC 82/INF.38 and MEPC 82/INF.39

Introduction

1 MEPC 76 adopted amendments to MARPOL Annex VI that included the requirements for the short-term measure Carbon Intensity Indicator (CII) and the CII-based annual rating. The short-term measure entered into force in November 2022 and became effective from 1 January 2023.

2 MEPC 78 invited Member States and international organizations to collect relevant data in the early years of implementation of the CII rating system and to report relevant information to the Committee ahead of the review of the CII regulations and guidelines.

3 MEPC 80 approved the review plan of the short-term measure that includes a data-gathering stage from MEPC 80 to MEPC 82 which will be followed by a data analysis stage. This document is submitted to the Committee as part of the data-gathering stage and is intended to assist the Committee in its deliberations during the data-analysis stage.

4 MEPC 81 adopted amendments to the *2022 Guidelines for the development of a Ship Energy Efficiency Management Plan (SEEMP)* in order to incorporate the amendments to the IMO Data Collection System (IMO DCS) with regard to the additional data to be reported, such as fuel oil consumption per combustion system, fuel oil consumption while the ship is not under way, and the total amount of onshore power supplied. The entry-into-force date of the amendments to MARPOL Annex VI would be 1 August 2025.

Discussion

5 INTERCARGO previously collaborated with major classification societies with the purpose of assessing the impact of short voyages, port waiting times and ship loading condition (i.e. laden/ballast voyages) on the attained CII of bulk carriers and provided this information to the Committee (documents MEPC 81/INF.27 to MEPC 81/INF.32).

6 Although the above factors (short voyages, port waiting times and loading condition) affect the CII significantly, this document and accompanying information documents MEPC 82/INF.38 and MEPC 82/INF.39 (INTERCARGO) focus on the impact of idle time on the attained CII (AER).

7 The CII rating of a ship is negatively impacted by the idle time (i.e. any time when the main engine is not running, such as when the ship is in port, waiting or drifting at anchorage and carrying out maintenance and repairs at a drydocking facility) since the ship continues to produce emissions by its auxiliary engines/boiler while at the same time, there is no distance travelled. This is generally beyond the ship's control and creates a perverse incentive to run the main engine, for example when waiting at anchorage for port entry, whereby total GHG emissions will increase while the CII rating may improve due to higher distance travelled.

8 In this study, carried out by INTERCARGO, ABS, BV and DNV, the ships were divided into the six well-known bulk carrier size segments, i.e. Handysize, Supramax/Ultramax, Panamax/Kamsarmax, Minicapes/Capes, Newcastlemax and VLOC.

9 Verified IMO DCS results have been analysed by each classification society for the year 2022 and for a total of 5,622 bulk carrier ships. The total number of ships included in the study for each segment above is shown in table 1.

Table 1: Ship segments based on their ship size

Segment	**DWT Range**	**Total No. of ships**
Handysize	0 – 50,000 DWT	1,064
Supramax/Ultramax	>50,000 – 65,000 DWT	1,359
Panamax/Kamsarmax	>65,000 – 90,000 DWT	1,309
Minicapes/Capes	>90,000 – 190,000 DWT	1,317
Newcastlemax	>190,000 – 220,000 DWT	475
VLOC	> 220,000 DWT	98
Total		5,622

10 For each of the above bulk carrier segments, the following were analysed (further information on the BV and DNV studies can be found in the accompanying information documents MEPC 82/INF.37 and MEPC 82/INF.38):

.1 rating distribution and number of ships corresponding to each rating;

.2 average idle time corresponding to each rating; and

.3 average CO_2 emissions corresponding to each rating.

11 Since the current DCS framework does not provide the necessary granularity, it is not possible to distinguish emissions related to port waiting time, anchorage and dry-dock time. It is estimated that the emissions associated with idle time include port emissions and possibly some part of anchorage emissions.

Distribution of the bulk carrier fleet with D and E ratings

12 The total distribution of ships with D and E ratings for each size segment and as provided by each classification society is available in table 2.

Table 2: Total number and percentage of ships rated D and E per size segment

Segment	Total No. of ships	Total No. of ships rated D and E	Total % of ships rated D and E
Handysize	1,064	502	47.2%
Supramax/Ultramax	1,359	711	52.3%
Panamax/Kamsarmax	1,309	287	21.9%
Minicapes/Capes	1,317	551	41.8%
Newcastlemax	475	124	26.1%
VLOC	98	32	32.7%
Total	5,622	2,207	39.3%

13 Based on the information in table 2, it can be seen that the smaller-size ships of the Handysize and especially Supramax/Ultramax segments have a higher percentage of ships rated D and E compared to ships of the larger segments. Details of the segment sizes and CII rating can be found in the accompanying information papers.

Correlation of the ship's idle time with the CII rating

14 The weighted average idle time for ships rated D and E is calculated and is provided in table 3 and figure 1 after combining the analysis from each classification society.

Table 3: Weighted average idle time (days) for ships rated D and E per ship segment

Segment	Weighted average idle time rating D (days)	Weighted average idle time rating E (days)
Handysize	198	216
Supramax/Ultramax	190	212
Panamax/Kamsarmax	160	187
Minicapes/Capes	144	162
Newcastlemax	135	145
VLOC	120	122

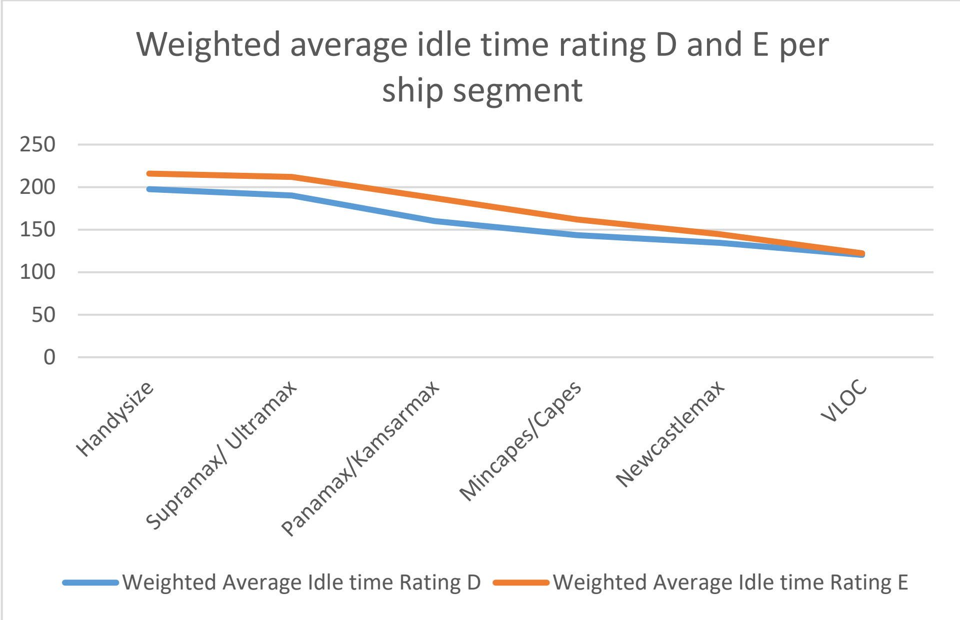

Figure 1: Average idle time for ships rated D and E per ship segment

15 From the above tables and chart it is observed that smaller-sized ships rated D and E have higher average idle time. At the same time, as a general trend, the larger ship segments have fewer average idle days and higher utilization rates.

Rating distribution, average idle time and emissions

16 Figure 2 based on data by ABS, BV and DNV shows the number of ships, the average idle time and the average CO_2 emissions within each rating band after combining the analysis from each classification society.

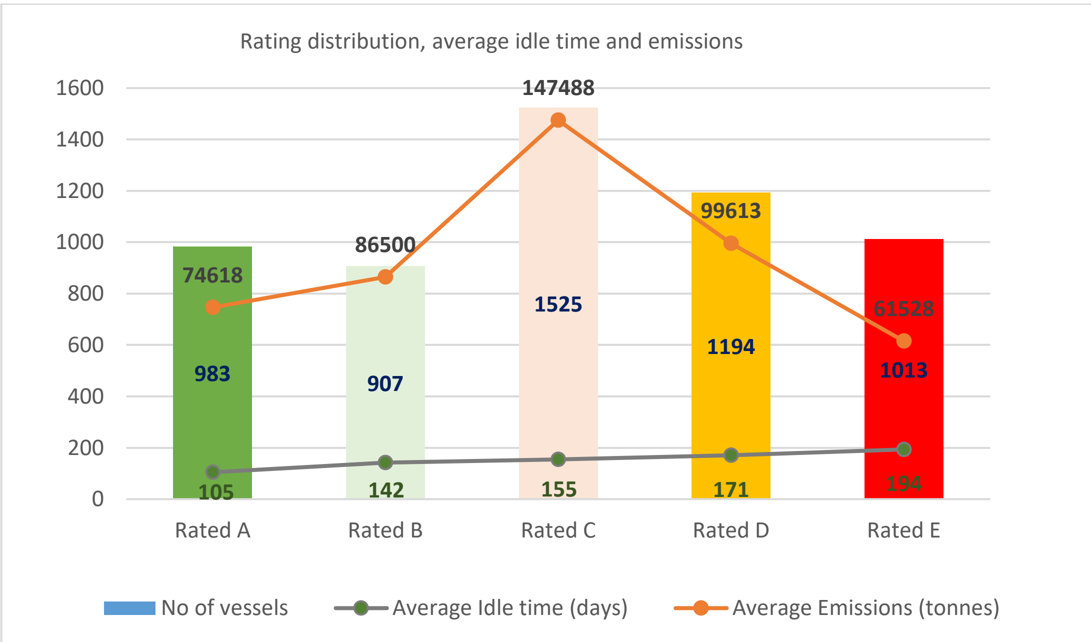

Figure 2: Rating distribution, average idle time and emissions

Impact of idle time on the CII rating

17 The data contained within paragraphs 12 to 16 clearly shows there is a correlation between idle time and the CII rating, with D and E ratings generally attributed to increased idle time.

18 In most cases, A- and E-rated ships have the lowest average CO_2 emissions, while C- and D-rated ships have the highest average CO_2 emissions in each segment in general. Further information on the impact of idle time on the CII rating with regard to the specific bulk carrier segments can be found in the accompanying information papers.

Conclusion

19 The CII rating system does not unambiguously provide an indication of a ship's efficiency, with a ship's rating being influenced by the amount of time the ship is not performing transport work, which is generally out of the control of the ship.

20 The CII in its current format does not provide an incentive to reduce overall CO_2 emissions as ships rated E have on average lower overall CO_2 emissions compared to the ships in bands A to D and ships in D have lower CO_2 emissions than those in C.

21 In order to achieve the Organization's goals of decarbonizing global shipping, the CII must be adjusted in a manner that reflects the true energy efficiency of a ship rather than reflecting the efficiency of a port or other factors outside the control of a ship. Furthermore, the CII should also provide an incentive to reduce overall emissions rather than operate in a way that would increase total emissions but provide a more favourable rating.

Proposal

22 The Committee is invited to instruct the Working Group on Air Pollution and Energy Efficiency to take note of the information in this document and examine how the CII can be adjusted in order to achieve the Organization's goals.

23 Noting the information in paragraphs 4 and 11 in relation to amendments to the SEEMP and the current lack of granularity with the IMO DCS, a multi-phased approach may be needed, with the first phase having a solution based on current data, followed by further refined solutions as more data becomes available.

Action requested of the Committee

24 The Committee is invited to note the information contained in this document, in particular the proposals in paragraphs 22 and 23, and take action as appropriate.

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