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ENERGY EFFICIENCY OF SHIPS

The impact of port waiting time on the CII rating of ships

Submitted by ICS

SUMMARY

Executive summary:	This document highlights the impact of port waiting time on the Carbon Intensity Indicator (CII) rating of ships.
Strategic direction, if applicable:	3
Output:	3.2
Action to be taken:	Paragraph 22
Related documents:	Resolution MEPC.354(78); MEPC 76/7/19; MEPC 78/7/22, MEPC 78/17; MEPC 79/7/13, MEPC 79/INF.19; MEPC 81/INF.29, MEPC 81/INF.30; ISWG-GHG 12/2/1, ISWG-GHG 12/2/2 and ISWG-GHG 12/2/3

Introduction

1 MEPC 78 invited interested 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 (MEPC 78/17, paragraph 7.82).

2 This document provides information that is relevant to the ongoing review of the CII rating system. The review must be completed by 1 January 2026.

Acknowledgement

3 ICS wish to express its thanks to Contships Management Inc. for providing the data and information underpinning this document.

Background to the Contships Management Inc.

4 Contships Management Inc. can trace its roots back to the business founded by the N. D. Pateras family in the 1870s.

5 Contships manages 46 ships of an average age of 15.57 years and of between 900 and 1,500 twenty foot equivalent units (TEU). The ships call at 4,800 ports, carrying 1.7 million TEU annually and employing 800 seafarers and 100 shore staff.

6 Contships' strategy is published on its website, and includes the following statement:

> "To Our Social Responsibility
>
> We operate in a respectful and responsible manner towards the environment and local communities."

Operational characteristics of feeder containerships

7 Feeder containerships (feeders) are a distinct subgroup which are designed and operated differently to trans-ocean containerships. Typically small in size with a capacity of 300 to 2,000 TEU, feeders transport containers between major and minor container hubs over relatively short distances. Therefore, they are often operated on short-sea routes with disproportionately high port time, including extensive waiting periods. For example, the voyages for the Contships' feeders are typically less than three days' duration with port stays that can often exceed the three days.

8 Another aspect of this type of ship is that it incurs relatively few ballast voyages, which reflects its importance in the local supply chains and the high density of its trading patterns. This aspect is clearly illustrated when comparing the ballast distances with total distances travelled. For the Contships fleet, this data is listed in the annex to this document, and for example in the year 2023, **Contship Ace** travelled a total distance of 39,702 nm with just 2,237 nm in ballast, i.e. the ballast voyages formed just 6% of the total voyage length.

Distribution of the 2023 CII ratings for the Contships fleet

9 The A to E bandings that are defined within the *2022 Guidelines on the operational carbon intensity rating of ships (CII rating Guidelines, G4)* (resolution MEPC.354(78)), reflect expected proportions of ratings for that type of ship. However, the comparison in table 1 and figure 1 below shows that the confirmed 2023 CII ratings for the Contships feeders are distributed very differently, with a much lower proportion of A and B ratings, and a much higher proportion of D and E ratings. This is the result of low efficiency trading patterns enforced by the charterers/operators of the ships.

Table 1: 2023 CII ratings for the Contships feeders

Rating	Number of ships	Contships proportions	IMO expected proportions
A	2	4%	15%
B	1	2%	20%
C	11	24%	30%
D	15	33%	20%
E	16	36%	15%

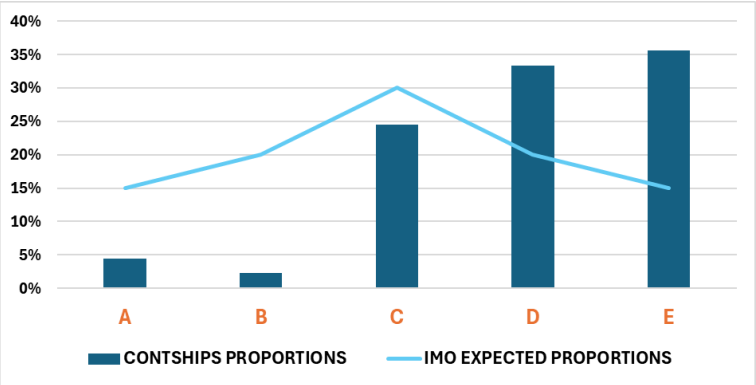

Figure 1: IMO's expected distribution of the 2023 containership CII ratings versus Contships fleet's confirmed ratings

10 This comparison suggests there are one or more factors that are unfairly influencing the CII ratings, especially for the ships engaged in the short sea shipping segment.

11 Within the Contships fleet, there is a group of sister ships, all of the same design and with almost identical attained EEXI. By considering this group of ships, it is possible to eliminate potential factors relating to the design of the ships and focus in on operational factors that are influencing the CII ratings.

Contships sister ships

12 The Contships feeders **Contship Pax**, **Contship Ten**, **Contship Vie**, **Contship Way** and **Contship Zoe** are all close sister ships with the following particulars:

Table 2: Particulars of the Contships sister ships

Name	Built	Length overall (metres)	TEU	Gross Tonnage	EEXI
Contship Pax	2008	147.83	1,100	9,948	21.85
Contship Ten	2007	147.83	1,100	9,948	21.88
Contship Vie	2007	147.83	1,100	9,948	21.88
Contship Way	2008	147.81	1,100	9,948	21.85
Contship Zoe	2007	147.78	1,100	9,948	21.8

Figure 2: Contship Way

13 EEXI is a design index which provides a measure of efficiency. The close similarity of the EEXI figures for this group of sister ships confirms that in terms of their design, they should have very similar energy efficiency. Therefore, any differences in the CII rating must be solely attributable to operational factors.

Port time

14 By inspection of the data in the annex to this document, it is apparent that for this group of sister ships, there has been significant variation in the amount of time spent in port, against total time. For these durations, generators and boilers may continue to produce CO_2 emissions (which appear in the numerator of the CII equation), but no distance is travelled (which appears in the denominator of the CII equation). Therefore, such port time can adversely impact on the CII ratings.

15 Table 3 and figure 3 below summarize the port time and the CII ratings and a close correlation is apparent, with about a 40% increase in port time resulting in an increase in the CII value of about 5 gCO_2/DWT-miles. Noting that the difference between the B and E thresholds is 4.5 gCO_2/DWT-miles, just the influence of port stay can change the CII rating by two grades. Thus, one can safely conclude that the port time represents a very substantial impact on the CII rating which is outside of the control of the shipowner and it can cancel the attempts to improve the ship's efficiency in the underway part of the voyages.

Table 3: Contships sister ships – Port time versus CII

Ship Name	IMO Number	Ratio of time at port to total time (%)	CII Final	CII Rating Final
Contship Ten	9347982	42%	21.081	D
Contship Way	9435533	42%	20.974	D
Contship Zoe	9434797	49%	18.666	C
Contship Pax	9435521	65%	22.186	E
Contship Vie	9434802	80%	26.861	E

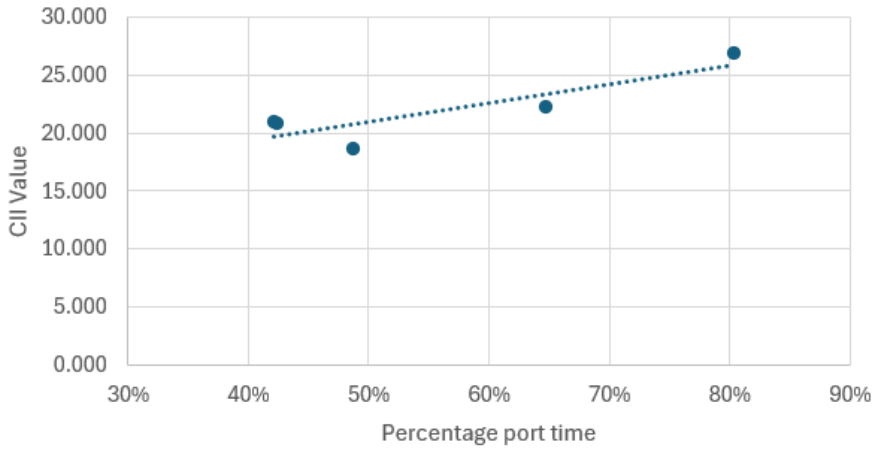

Figure 3: Contships sister ships – port time percentage versus the attained CII

Discussion

16 Although this study has focused on a fleet of feeder containerships, it is acknowledged that port time is a factor that can also influence the CII rating of other types of ships. Indeed, earlier submissions such as documents ISWG-GHG 12/2/1 (BIMCO et al), ISWG-GHG 12/2/2 (IPTA et al.), ISWG-GHG 12/2/3 (Malaysia et al), MEPC 78/7/22 (India), MEPC 79/7/13 (Bahamas et al.), MEPC 79/INF.19, MEPC 81/INF.29 and MEPC 81/INF.30 (INTERCARGO) have included assessments of the impact of port time on other ship types, including other types of containerships.

17 Disproportionately lengthy port time can be incurred due to the nature of a ship's operation and trading pattern. For example, where a ship is routinely operating on short sea routes, a high proportion of time in port is incurred for cargo loading/discharging operations and extended waiting times before berthing. In this scenario, the CII can be impacted due to emissions that are generated while not incurring distance travelled. However, other factors can also come into play, such as increased emissions attributable to manoeuvring/drifting and increased hull resistance in shallow water.

18 Additionally, port time can be incurred due to inefficiencies in port operations, which may necessitate a ship going to anchor for an extended period before a loading berth becomes available.

19 Nevertheless, regardless of whether the disproportionately high port time is due to the route length or inefficiencies in the port operation, neither are factors that are attributable to the design or operation of ships, under the control of the shipowner. Therefore, it is inappropriate for the CII ratings to be adversely influenced by these factors, and it is important that this anomaly is fully addressed during the ongoing review of the CII rating system. Possible solutions could include, inter alia, one or more of the following:

.1 omit fuel consumption that results from factors outside of the control of the ship e.g., port congestion, inefficient ports, slow operation, strikes, etc.;

.2 omit fuel used at anchorage, waiting time for berth availability (where it is normally the case that shore power is unavailable) and cargo operation at berth;

.3 revise the CII calculation methodology and the reference lines to exclude port and manoeuvring emissions; and

.4 for voyages of less than 72 hours, allow a reduction in the recorded fuel consumed for the manoeuvring and port time phases of the voyage, including the waiting time.

20 For the Contships sister ships, there is also the issue of the onboard cranes which are used for self-loading/discharging. As previously demonstrated in document MEPC 76/7/19 (Netherlands (Kingdom of the)), such equipment increases a ship's fuel consumption due to the additional weight and windage, and owing to the energy for the loading operation being incurred by the ship rather than the port. Possible solutions to this anomaly could include:

.1 a correction factor for the heavy loading gear (cranes) that takes into account the extra weight and wind resistance (drag); and

.2 for ports where shore power is unavailable, emissions related to the cargo handling should be excluded from the CII calculation.

21 The feeder containerships are also equipped with bow thrusters that allow them to easily manoeuvre in ports with the need of fewer tugboats. While this is reducing the overall emissions generated for the operation of these ships and thus their environmental footprint, the power required for the bow thruster will increase the ship's fuel consumption and degrade the attained CII. This effect on the CII is an anomaly and could be resolved with the exclusion of power consumed by bow thrusters, similarly with the reefer containers.

Action requested of the Committee

22 The Committee is invited to take note of the information provided, and to ensure that all such anomalies are fully addressed during the ongoing review of the CII rating system, and to take action as appropriate.

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ANNEX

BACKGROUND INFORMATION ON THE STUDY

The following data was provided by the Contships Management Inc. and includes their fleet's 2023 CII ratings as confirmed by the ROs.

The sister ships which are the focus of this document are highlighted in red. The ship **Contship Don** is not an exact sister ship as it does not have loading cranes, whereas the other sister ships do. Therefore, **Contship Don** has been excluded from the analysis within the main body of this document.

Vessel Name	IMO Number	Ratio of time at port to total time (%)	CII Final	CII Rating Final	EEXI (g CO2/t·nm)	Distance Ballast Total (nm)	Distance Ladden Total (nm)	Total Distance Travelled (nm)	Berth Time Total (hours)	Steaming Time Total (hours)	Days At Port (days)
CONTSHIP ACE	9348637	66%	18.105	D	19.42	2237	37465	39702	3155.9	2966.5	241.4
CONTSHIP AIR	9364356	59%	20.134	D	21.86	4196	42311	46507	3561.2	3585.5	213.8
CONTSHIP ANA	9308596	72%	28.629	E	24,58	7	33861	33868	3305.4	2481.1	261.2
CONTSHIP ART	9664275	35%	15.232	B	N/A	1795	70024	71819	1737.0	5634.7	128.8
CONTSHIP BEE	9364344	46%	17.087	C	21.89	0	60518	60518	2424.8	4763.6	166.6
CONTSHIP BOX	9449845	60%	16.173	D	18.79	0	46019	46019	-	-	-
CONTSHIP CUB	9683477	67%	25.606	E	22.05	107	34038	34145	3963.1	2930.8	242.9
CONTSHIP DON	9347956	42%	20.166	D	21,75	3675	63446	67121	1255.6	5079.1	153.8
CONTSHIP ECO	9492751	58%	16.545	A	N/A	25	47280	47305	2347.4	3668.6	211.2
CONTSHIP ERA	9507702	29%	17.824	C	21,62	36	78914	78950	1475.5	6167.9	104.9
CONTSHIP EVE	9449699	49%	25.455	E	24.55	5196	45285	50481	1756.1	4295.0	177.5
CONTSHIP FOX	9507714	44%	17.979	C	21,65	1152	62899	64051	2390.4	4933.8	159.4
CONTSHIP FUN	9308613	58%	24.95	E	24.5	1744	42848	44592	2982.1	3651.5	211.5
CONTSHIP GIN	9517434	57%	18.844	D	19.63	683	57299	57982	1879.9	3747.6	208.2
CONTSHIP ICE	9517422	54%	16.54	C	19.63	12546	48349	60895	2348.5	4078.9	195.0
CONTSHIP IVY	9371402	49%	21.937	D	23.53	124	57544	57668	3075.5	4439.1	178.6
CONTSHIP JET	9348625	57%	19.928	E	19.42	212	49886	50098	2084.9	3800.4	206.6
CONTSHIP JOY	9349174	65%	22.936	E	23.38	489	42513	43002	1744.8	3084.0	235.1
CONTSHIP KEY	9338278	35%	17.46	C	21.61	10770	56844	67614	2386.7	5184.4	128.1
CONTSHIP LEO	9403451	31%	21.622	E	21.74	49	75786	75835	1853.2	5840.2	112.0
CONTSHIP LEX	9346562	48%	19.728	D	21,80	1129	54925	56055	1898.7	4563.6	173.8
CONTSHIP LUV	9406934	42%	19.091	C	21.83	57	57908	57965	1600.3	4975.5	154.4
CONTSHIP MAX	9347786	58%	25.6	E	24,55	3124	45144	48268	3289.1	3597.8	212.3
CONTSHIP MED	9306249	51%	20.965	D	21,65	452	47686	48138	1898.7	4253.3	185.5
CONTSHIP NEW	9373905	78%	22.669	E	21.8	1767	22184	23951	4550.2	1917.6	284.7
CONTSHIP OAK	9373917	57%	20.712	D	21.77	3821	41370	45191	2862.6	3766.6	207.5
CONTSHIP ONO	9324978	44%	17.81	C	21.75	2245	59145	61391	631.8	4746.0	158.5
CONTSHIP PAX	9435521	65%	22.186	E	21.85	1468	37122	38590	4316.6	3084.8	235.7
CONTSHIP PEP	9319595	38%	22.142	D	24.5	37	71189	71226	1531.5	5447.6	136.9
CONTSHIP QUO	9437206	52%	23.606	E	24,55	4594	51447	56040	1583.8	4138.8	189.3
CONTSHIP RAY	9388338	67%	23.541	E	21.8	8	37848	37856	3760.2	2865.3	244.7
CONTSHIP RUN	9306237	63%	14.201	C	18.86	0	46930	46930	2479.7	3225.5	230.0
CONTSHIP SEA	9306213	64%	14.369	C	18.86	0	45292	45292	2605.6	3138.5	234.0
CONTSHIP SKY	9403449	59%	21.85	E	21,74	859	47139	47998	2709.5	3603.0	214.9
CONTSHIP SUN	9347815	51%	25.178	E	24.52	821	55561	56382	2005.1	4271.0	187.1
CONTSHIP TEN	9347982	42%	21.081	D	21.88	338	60895	61232	2231.1	5097.2	153.2
CONTSHIP TOP	9395616	62%	19.973	D	21.67	1368	40536	41903	3826.4	3302.4	225.8
CONTSHIP UNO	9379026	57%	20.024	D	21.73	2081	52541	54622	2473.6	3751.8	207.7
CONTSHIP VIE	9434802	80%	26.861	E	21.88	2785	21483	24268	3630.0	1715.4	292.8
CONTSHIP VOW	9395599	59%	20.262	D	21.81	0	46144	46144	1840.6	3541.7	216.3
CONTSHIP WAY	9435533	42%	20.974	D	21.85	1788	66952	68740	2126.8	5054.1	154.6
CONTSHIP WIN	9395604	35%	18.75	C	21.73	76	73238	73314	1302.0	5689.9	126.9
CONTSHIP YEN	9664263	35%	14.955	A	N/A	20	77530	77550	1488.5	5742.0	126.7
CONTSHIP ZEN	9683491	66%	23.575	E	22.07	0	34870	34870	3615.4	2992.0	239.6
CONTSHIP ZOE	9434797	49%	18.666	C	21.8	19	61313	61332	1971.4	4485.2	177.5