INTERNATIONAL MARITIME ORGANIZATION

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FURTHER TECHNICAL AND OPERATIONAL MEASURES FOR ENHANCING THE ENERGY EFFICIENCY OF INTERNATIONAL SHIPPING

Comments on MEPC 74/6

Submitted by the Russian Federation

SUMMARY

Executive summary:	This document gives further explanations to document MEPC 74/6 for a more aware approach to the development of criteria and indexes for energy efficiency of ships not carrying cargo and/or passengers for commercial purposes ("transport work")
Strategic direction, if applicable:	3
Output:	3.7
Action to be taken:	Paragraph 19
Related documents:	MEPC 74/6; MEPC 70/18, MEPC 70/WP.8; MEPC 71/6/2; MEPC 72/6/1, MEPC 72/6/4 and MEPC 74/INF.35

Introduction

1 This document is submitted in accordance with the provisions of paragraph 6.12.5 of the document on *Organization and method of work of the Maritime Safety Committee and the Marine Environment Protection Committee and their subsidiary bodies* (MSC-MEPC.1/Circ.5/Rev.1) and provides comments on document MEPC 74/6 proposing the development of a criterion for the energy efficiency for ships that do not carry out transport work.

2 MEPC 73 requested all interested Member States and/or international organizations to submit proposals for the development of an all-embracing and uniform approach to the identification of vessels not engaged in "transport work".

3 Document MEPC 74/6, co-sponsored by the Russian Federation, proposes two options for the energy efficiency criterion for vessels that do not perform transport work. The Russian Federation has compiled this document in order to explain the advantages of each of the two proposed criteria in further detail and to present an overall approach for their assessment.

Basis for discussion

4 The fundamental document in the energy efficiency regulation and development of any standards in this respect is ISO 50001:2018 Energy management systems – Requirements with guidance for use. In compliance with ISO 50001:2018, *energy efficiency* is a ratio or other quantitative relationship between the characteristics related to the performed work, the received service, consumer goods or received energy, and the characteristics of the amount of spent energy.

5 Therefore, in general, the ratio of two quantitative criteria is taken as an index for the energy efficiency of any object of human activity:

.1 in the denominator, the criterion shall reflect the usefulness of this object, that is, assess the amount of benefit or benefit produced by this object, let's call it "USEFULNESS", or U; and

.2 in the numerator, the criterion shall evaluate the energy consumed by the object to fulfil its purpose and obtain the benefit or benefit that is taken into account in the denominator, let's call it "ENERGY EFFICIENCY" (energy consumption) or E.

6 Thus, any energy efficiency index shall always meet the formula $R=\frac{E}{U}$, where:

R – the energy efficiency index;
E – quantitative criterion of energy consumption; and
U – quantitative criterion of usefulness.

7 The Russian Federation considers that the main purpose of developing energy efficiency criteria in accordance with ISO 50001:2018 is the possibility of benchmarking, meaning the process of collecting, analysing and determining the relation between the data characterizing energy performance, comparable activities for the purpose of assessing, comparing and developing improvement proposals. In general terms, the "criterion" concept means that general characteristics of the process can be expressed in quantitative form. The criterion should be versatile and reflecting the system properties interesting for regulation. Thus, a criterion is a characteristic based on which the quality assessment of an object or process is formed, and those qualities that we are interested in, so different criteria are necessary to assess different qualities of the same object.

8 For example, during EEDI development, transport work was selected as U criterion characterizing the usefulness of a transport vessel, which the vessel can perform under full load at operational speed. CO_2 amount emitted by the vessel during the transport work was selected as the E criterion of energy consumption. Selection of CO_2 amount as a criterion of energy consumption of the vessel was made due to the fact of the purpose set to take into account the possibility of using various fuel types and thus creating preferences for liquefied natural gas (LNG) as fuel on ships.

9 Selection of transport work as U usefulness criterion for any vessel has its deficiencies. In this case, the ship operations (including largely energy-consuming ones) in which the ship does not perform transport work are not taken into account. For example, energy consumption is not taken into account when unloading a tanker, or operation of an inert gas generator during cargo operations, operation of cargo cranes during unloading and ballast treatment are not taken into account either. In addition, the ballast passage is not taken into account when the transport vessel does not carry out any transport work.

10 At first glance it may seem that this is not a deficiency since if the vessel's main purpose is shipping (e.g. transport work), such neglected energy costs can be considered unavoidable and therefore not taken into account. But in case any energy costs in any inevitable production process are not taken into account in the energy efficiency index, the energy-saving impetus disappears therein, the task of boosting implementation of new energy efficiency solutions will be limited only to energy costs directly associated with transport work.

11 It can become even more relevant for ships for which usefulness is not determined by shipping, but by some other functions, for example, supply of drilling platforms with fuel and consumables. Even though such vessels carry goods regularly, most of the time they are on standby, ensuring safety, since in addition to supply, their function is the task of extinguishing fire if necessary, removing an iceberg as far as possible or picking people off if necessary.

12 CO_2 amount for such vessels is quite suitable as an E criterion of energy consumption by analogy with EEDI, the only difference being that CO_2 shall be taken into account from all fuel consumers (including auxiliary boilers) on board that are involved in the operation according to its main assignment. In both criteria proposed in document MEPC 74/6, as a characteristic of energy consumption E, the numerator uses CO_2 total amount calculated on the basis of consumed fuel, taking into account the possibility to use various fuel types and impetus to use environmentally friendly fuels.

13 The selection of the usefulness criterion U cannot be made without taking into account the purpose of the vessel and the benefit for which the vessel is operated; therefore, this criterion cannot be universal for any type of vessel.

14 Separately, one should pay attention to the fact that there is a large group of vessels for which the purpose of operation is not to obtain direct benefit, but to prevent harmful impact to the marine environment. Namely the mere presence of such a vessel in the area of operations is necessary to reduce the risk during the operation of the object, and its usefulness is determined by the usefulness of the object that the vessel serves. These vessels include as follows: salvage, fire-fighting ships, oil recovery vessels, boom-laying boats, etc. For such ships their rescue work performed cannot be a criterion of usefulness, since the scope of the work performed depends on the accident occurrence or absence of such, and this event is random. The usefulness criterion for such vessels is not related to the distance travelled and the power utilized by the main engines. For such vessels, we propose to use the number of days in a year as a quantitative criterion of usefulness, during which the vessel was ready to perform its basic functions of salvage/rescue or supporting any work of its kind. That is, the index formula can be written:

$$R = \frac{E}{U} = \frac{\textit{Total kg } CO_2 \textit{ emitted /year}}{\textit{Total hours underway/year}}$$

15 So, the above proposed index, referred to as Proposal B in document MEPC 74/6, gives an impetus to reduce fuel consumption mainly due to saving hours of operation of engines and boilers, as well as to increase the ship's readiness time to operate for its intended purpose, that is, by reducing energy consumption.

16 Index A proposed in document MEPC 74/6, referred to as Proposal A in that document, relates to the amount of CO_2 produced to the engine operating time:

$$R = \frac{E}{Pg} = \frac{\textit{Total kg } CO_2 \textit{ emitted /year}}{\textit{Total gross power output generated/year}}$$

17 As the total operating time is put in the denominator, this characteristic performs the usefulness criterion function, this criterion does not give an impetus to save engine operation time, and it should be assumed as an axiom. Any energy generated on board is useful and necessary to fulfil a vessel's assignment (it does not seem quite correct). However, index A provides a significant impetus to enhance the ship propulsion plant and increase its efficiency at fractional loads.

18 Having compared the two proposed indexes, we consider it necessary to mention that each of them can perform its specific function:

.1 index **A**, associated with the engine operating time, characterizes the ship structural perfection and its propulsion plant; and

.2 index **B** is related more to the operation and rational use of the propulsion plant. For example, for a ship in route when using index A, the shipowner shall mandatorily select the ship's speed corresponding to the minimum specific fuel consumption of the engine, of approximately 0.85 times the maximum power. If being guided by index B, it will be more useful to select the speed efficient for fuel consumption per mile of distance travelled and the total amount of CO_2 emissions during the passage will be less.

Action requested of the Committee

19 The Committee is invited to consider the general approach to the principles for developing energy efficiency criteria, outlined in paragraphs 5 to 7 as well as the alternative proposed as a means of assessing CO_2 emissions from offshore ship-contractors, and take action as appropriate.