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PREVENTION OF AIR POLLUTION FROM SHIPS

The need for refinement of the Energy Efficiency Design Index (EEDI)

Submitted by the International Chamber of Shipping (ICS)

SUMMARY

Executive summary:	This document provides comments on issues related to the technical application of the EEDI to a wide range of vessel types. Proposals to refine the present formulation are then presented to address the issues which have been raised
Strategic direction:	7.3
High-level action:	7.3.1
Planned output:	7.3.1.2 and 7.3.1.3
Action to be taken:	Paragraph 14
Related document:	MEPC 59/4/2

Introduction

1 GHG-WG 2 further developed the draft Interim Guidelines on the method of calculation of the EEDI for new ships. The current formulation of the EEDI is widely recognized as being appropriate for vessels equipped with "traditional" machinery layouts with one or two large diesel prime movers mechanically linked to the propeller(s) along with (a) much smaller engine(s) installed to provide auxiliary power.

2 However, in order for the formulation to be applicable to all vessels it will need to be refined. Much clearer guidance on practical application will be needed in order to preserve the transparency of the EEDI and its effectiveness in driving efficiency improvements with respect to Greenhouse Gas (GHG) emissions.

3 In particular, as was discussed during GHG-WG 2, there remain issues related to the application of the EEDI to passenger ships and electrically propelled ships.

Technical issues relating to application of the EEDI

4 During discussions within the working group on this topic at MEPC 58 and also during the intersessional meeting of the working group in March 2009, it was widely agreed that there were specific difficulties in applying the EEDI to the following ship types:

- ro-ro vessels;
- high speed craft;
- smaller vessels (less than 20,000 dwt);
- passenger vessels;
- general cargo ships; and
- steam turbine ships.

In addition to clearly identifiable ship types, there will also be many individual vessels whose design is significantly constrained by parameters other than optimization of open water performance. For example, many of the vessels engaged in short sea trades will have hull forms which are constrained by; channel width and depth, length and width of port entrance locks, height of quayside, etc. Although these aspects will not affect the basic approach to the calculation of the Design Index, provision will need to be made in the application guidelines so that due acknowledgement of such constraints can be made alongside the formal record of attained EEDI.

5 When considering the effect of the introduction of the EEDI in terms of its application to the world fleet it may be noted that the significant ships with a "traditional" machinery layout (in effect bulk carriers and tankers) represent approximately 44% of vessels when measured in terms of numbers of vessels but around 70% when measured by DWT which is more relevant when considering the transport work done. This figure increases to around 85% if container ships are included.

6 The current guidance bases the calculation of CO_2 emissions on empirical expressions based on statistical analysis of data for ships built in the past. Much of this data shows a wide scatter.

7 For vessels other than those of 'traditional' machinery layout, Guidelines for technical application of the EEDI should include the option of using direct calculation of CO_2 emissions based on the design power balance for the vessel as was provisionally agreed at the intersessional meeting of the GHG Working Group. The use of this approach would then provide real reductions of CO_2 emission on individual vessels when future requirements for the attained EEDI are tightened.

8 For vessels with 'traditional' machinery layouts, an option to use the design power balance when calculating the contribution from auxiliary engines should be available to give a more accurate figure for the EEDI of the vessel concerned (which could very well be higher than the nominal EEDI obtained using the empirical recipe) whilst at the same time avoiding the safety and environmental problems noted below.

9 During the intersessional meeting of the GHG working group there was some discussion as to the perceived need to calculate the EEDI using the same empirical assumptions as had been used to develop the regression lines for the data for existing vessels. However, ICS believes that there is no imperative to do this. It is quite obvious that various assumptions and simplifications

need to be made when deriving statistical trends from data that is widely scattered and taken from databases that were not developed with EEDI in mind. This does not mean that calculations for new vessels should be required to be subject to the same limitations.

10 The opportunity should be taken at the beginning of the application of the EEDI to require data recording and subsequent calculations to be carried out much more logically, consistently and transparently than may have been the case in the past. The detailed calculation of the EEDI should then be held on board as part of the statutory documentation of the vessel and should be endorsed by the classification society and flag administration.

Safety and Environmental Concerns

11 In addition to concerns with the technical applicability of the present formulation to the specific ship types noted above, there is also a significant safety concern for all ship types. This is related to the inclusion within the EEDI of all installed propulsion and auxiliary power on board irrespective of whether or not the operating profile for the vessel utilizes that power on a day-to-day basis.

12 The current proposals, in making no reference to the design power balance for the vessel, will result in a disincentive to provide for optimized efficiency and flexibility in power generation systems. As a particular example, this could result in conflict with safety requirements for passenger vessels attempting to meet "return to port criteria". It may also result, for example, in proactive cargo ship operators being penalized for installing more flexible electrical generation systems for emergency use (if not identified solely for emergency use); to provide flexibility for maintenance; or to provide opportunities for modal optimization of power generation (i.e. switching to a smaller generator running at its optimum setting rather than a large generator running inefficiently at low power).

Proposals

13 In order to address the issues raised above in a pragmatic and technically appropriate manner, the following proposals are submitted for consideration by the Committee:

.1 the initial phase of application for the EEDI should be for bulkers, tankers, and possibly container ships "with" traditional' machinery layout. Thereby ensuring that the greater part of the shipping CO_2 inventory will be addressed in the first phase;

.2 for vessels other than those of "traditional" machinery layout Guidelines for technical application of the EEDI should utilize direct calculation of CO_2 emissions based on the design power balance for the vessel;

.3 for vessels with traditional machinery layouts, the use of the design power balance when calculating the contribution from auxiliary engines should be available as an option; and

.4 the detailed calculation of the EEDI should be held on board as part of the statutory documentation of the vessel and should be endorsed by the flag Administration at the time of commissioning.

14 **Action requested of the Committee**

The Committee is invited to consider the information provided and the proposals made in paragraph 13 above, and to take action as appropriate.