INTERNATIONAL MARITIME ORGANIZATION

IMO

E

INTERSESSIONAL MEETING OF THE
GREENHOUSE GAS WORKING GROUP
2nd session
Agenda item 2

GHG-WG 2/2/19
6 February 2009
ENGLISH ONLY

CONSIDERATION OF THE ENERGY EFFICIENCY DESIGN INDEX FOR NEW SHIPS

Application of EEDI to ships other than those operating with conventional machinery and power distribution arrangements

Submitted by ICS, CLIA, INTERFERRY and the Marshall Islands

SUMMARY

Executive summary:	This document provides some observations on issues associated with applying the EEDI developed at MEPC 58 to ships with machinery installations that do not conform to the "conventional" arrangement of prime movers (e.g., diesel engines) directly coupled or geared to the propulsion shaft and with electrical power supplied by auxiliary engines. Such ships could include passenger ships; some dynamically positioned ships, and electrically propelled ships
Strategic direction:	7.3
High-level action:	7.3.1
Planned output:	7.3.1.1 and 7.3.1.3
Action to be taken:	Paragraph 17
Related documents:	MEPC 58/23, annex 11; MEPC 58/4/24 and MEPC 58/WP.8

Introduction

1 MEPC 58 approved the use of the draft Interim Guidelines on the method of calculation of the Energy Efficiency Design Index for new ships, for calculation and trial purposes with a view to further refinement and improvement, as set out in annex 11 of the report MEPC 58/23. However, as noted in the report of the Working Group on GHG Emissions from Ships (MEPC 58/WP.8), there remains a number of significant issues related to the application of the EEDI, in particular to electrically propelled ships and passenger ships. It was noted, for example, that the benchmarking undertaken to date has specifically excluded electrically propelled ships, as the database does not provide adequate distinction for the installed machinery.

2 In noting the problems with applying the current formulation of the EEDI to ships with non-conventional power trains and power demands, such as passenger ships, some dynamically positioned ships, electrically propelled ships and others; this document provides some observations on the difficulties.

Background

3 The co-sponsors have closely followed the debate in IMO and have actively participated in the development so far of the EEDI and have consistently maintained that the current formulation has a number of limitations with respect to unrestricted application to all ships.

4 These limitations were recognized by the working group at MEPC 58. However, given the time available and the fact that the majority of ships in the world fleet use what can best be described as "conventional" machinery arrangements, it was decided to concentrate on the majority. In this context "conventional" may be taken to describe machinery installations where prime movers (such as single or multiple diesel engines) are directly linked to the propulsion shafting and electrical power is separately supplied by additional auxiliary engines (typically an installation of multiple medium speed diesel engines) whose output is a very small percentage of the total installed power.

5 It is to be recognized that where the auxiliary power demands are a small percentage of the total installed power, the present EEDI formulation provides a simple and effective method to address electrical generation power consumption. However, when the percentage contribution of the power available for the generation of electricity becomes more significant, the present formulation may not be appropriate. Power redundancy is also an important safety factor and this aspect needs addressing to avoid penalizing ship safety.

6 The introduction of new safety requirements, such as the new SOLAS Safe Return to Port regulations for passenger ships that enter into force in July 2010, are additionally driving the need for more redundancy in available power. This is in addition to shipowners' commercial considerations. If the total installed power is used as the benchmark for the EEDI then some designs will be penalized or ship designers will be forced to reduce the safety level.

7 The ever increasing environmental regulatory regime – both international and local – requires the fitting of more and more equipment, all of which consume more power. While these requirements may apply to all ship types, many are directly linked to the number of persons onboard. The effect is significantly larger on certain ships such as passenger ships and ferries as well as some other "non-conventional" ships. The current EEDI proposal takes no account of these aspects.

8 Modern passengers ships, and in particular cruise ships have extremely complex multiple engine and machinery installations for flexibility. The vast majority of all new cruise ships are electrically propelled with sophisticated power management systems using diesels, gas turbines and waste heat steam turbines to generate the power for propulsion and hotel load. They have installations that are segregated and distributed to allow for optimal efficiency of operation and redundancy in case of unit failure.

9 Similarly, many modern passenger ferries have multi engine installations that directly drive the main propulsion shafts. A typical example is *a father and son arrangement* where two engines are connected to a propulsion shaft via a gearbox. Such arrangements allow operators to choose the amount of power that they devote to propulsion based upon itinerary requirements.

10 As both these ship types are very much designed on the basis of meeting specific itinerary requirements their hull forms are already highly optimized. The basis for competition is significantly based upon this operating profile – ferries might compete with land-based routes and cruises would not be cruises if a number of separate destinations were not included.

11 In view of the recent fluctuations in fuel prices most ship operators have been concentrating on ways to reduce fuel consumption. For example, some cruise ship operators have determined that their best opportunity for reducing power consumption exist within the hotel element of the overall load profile. The current EEDI formulation indicates that auxiliary power is taken as a simple fraction of the available power and if this is applied universally to all ships it would provide no encouragement to designers to develop new and more efficient designs for significant reductions in auxiliary power consumption.

12 The co-sponsors are aware that various industry working groups have been active in the months since MEPC 58 trying to find a suitable solution for the more complex ship types. The co-sponsors note that the cruise industry and the Ro-pax sector, have separately been trying to come up with a straightforward and simple adaptation to the EEDI given in the draft guidelines that may address this issue, so far without success.

13 The co-sponsors believe that it will be necessary to develop additional EEDI formulations that will deliver the environmental benefit desired while still allowing designers, builders and operators the opportunity to develop commercial designs that meet market needs for complex ships that are not conventionally powered.

Conclusion

14 The currently developed EEDI appears not to be applicable to all ships, especially to those with complex and sophisticated machinery installations that are not "conventional" in nature.

15 The co-sponsors believe that the current formula does not provide the necessary encouragement for innovation that is essential if the EEDI is to have a real and meaningful effect on the reduction of GHG. It does not appear to be the right formulation for application to all ships irrespective of machinery and propulsion configuration.

16 The co-sponsors consider that the EEDI developed at MEPC 58 is more suitable for application to "conventional" powered and propelled ships that comprise the majority of the world fleet. Therefore, it is suggested that the preliminary efforts be concentrated on finalizing the development of the EEDI for "conventional" ship types, thus allowing for the development of robust and appropriate EEDI's for other more complex ship types. By adopting this approach the vast majority of the world fleet would be addressed initially and the development of appropriate indexing tools for more complex ship types would also be facilitated.

Action requested of the Intersessional Meeting

17 The Intersessional Meeting is invited to take note of the above and most particularly to the conclusions and proposals in paragraphs 14 to16 and to decide as appropriate.

_____