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PREVENTION OF AIR POLLUTION FROM SHIPS

Proposal for an Energy Efficiency Design Index Verification Process

Submitted by International Towing Tank Conference (ITTC)

SUMMARY

Executive summary:	This document provides comments on the proposal in document MEPC 60/4/35 to make the Energy Efficiency Design Index for new ships mandatory and proposes a verification and approval process. This document also invites the Committee to consider involving ITTC Member Organizations in this process.
Strategic direction:	7.3
High-level action:	7.3.1
Planned output:	7.3.1.3
Action to be taken:	Paragraph 17
Related documents:	GHG-WG 2/2/1, GHG-WG 2/2/7, GHG-WG 2/2/14, GHG-WG 2/2/16; MEPC 59/4/2, MEPC 59/24 and MEPC 60/4/35

Introduction

1 This document is submitted in accordance with paragraph 4.10.5 of the Guidelines on the organization and method of work of the Committees and their subsidiary bodies (MSC-MEPC.1/Circ.2) and paragraph 3 of document MEPC 60/1//Add.1, and comments on document MEPC 60/4/35 (Japan).

2 To establish a mandatory instrument at IMO, it is of vital importance that the EEDI needs to be verified in order to issue a corresponding EEDI-Certificate. As verifiers, the report of MEPC 59 mentions administrations, classification societies and any other recognized organization (RO). This document provides the view of the International Towing Tank Conference ITTC on the issue of verification and approval of the energy efficiency design index (EEDI). ITTC strongly supports the EEDI, but notes that it is not a substitute for taking action in reducing emissions from the existing fleet. ITTC looks forward to making progress on both the EEDI and on actions to address GHG emissions from existing ships. This document does not mention ITTC's view on the calculation of the EEDI itself.

Objective

3 At the fifty-eighth session of the MEPC, the Draft Interim Guidelines on the Method of Calculation of the EEDI for New Ships were developed but with a view to further refining and improving them. The objective of this document is to further improve and bring forward the discussion on the EEDI by proposing a verification and approval process for the EEDI for new ships during trials.

4 ITTC strongly supports an EEDI framework that includes a mandatory sea trial verification of a ship's EEDI. Each ship is normally required to undergo a sea trial to verify its performance-related characteristics, safety issues and, similarly, a verification of all measures taken to improve GHG emissions is needed. Concerning the EEDI, a sea trial should be required to verify it. This verification process via sea trial should provide information whether or not a ship, as it is actually built and operated, meets its required EEDI and if so, that this will result in meaningful and verifiable greenhouse gas reductions to address global climate change. Furthermore, an EEDI sea trial verification requirement will be analogous to the IMO testing requirement for engine certification, as specified by MARPOL Annex VI, for meeting the NO_x emissions requirements.

5 The assessment of the trial speed (and the recalculation of design speed at deeper draughts) is of fundamental contractual importance and thus dealt with between owners and yards by well established methods. Different commonly accepted procedures are in place, taking into consideration common practice and experiences from model basins and shipyards. Based on the feedback of full scale results, ITTC member organizations (mainly the large model basins) typically enhance and update their data base information and improve the quality of their prediction methods (1), (2) continuously.

6 Example from ITTC – Recommended Procedures and Guidelines:

.1 (1) 7.5-02-03-01.4 1978 ITTC Performance Prediction Method, 2008.

.2 (2) 7.5-02-07-02.2 Predicting Power Increase in Irregular Waves Based on Model Experiments in Regular Waves, 2002.

7 ITTC strongly recommends that:

.1 ITTC member organizations should be authorized by the Administration to perform model tests;

.2 ISO 15016 should not be the only possibility to assess speed;

.3 the ITTC quality standards for speed trials evaluation should be part of the EEDI verification process, the ITTC member organizations should adjust their evaluation methods to ensure full verification of all EEDI related aspects;

.4 any speed trial assessment procedure, fulfilling these quality standards should be accepted; and

.5 IMO should also authorize the ITTC member organizations to act as verifiers along qualified procedures under the condition of the acceptance of the involved parties, e.g., shipowner, shipyard, and national authorities, etc.

8 EEDI verification should be conducted in two steps. A preliminary verification should be made at the design stage and a final verification during sea trials:

.1 The preliminary verification is mainly based on tank test results (speed power relation for full loaded and sea trial conditions) taking into account the methodology of deriving full scale ship speed from outcomes of tank tests. For ensuring the quality of tank tests, ITTC has developed procedures and guidelines for their member organizations. It is necessary that the ITTC member organization performing the tank tests are authorized by the Administration too.

.2 The final verification should be done during the sea trial. The verifier should attend the sea trial and confirm the requirements settled in a "Guideline on Verification of the EEDI". This verification should take into account the ITTC recommendations and procedures for full scale trials (3), (4), (5) and the requirements coming from the calculation procedure of the EEDI.

9 Example from ITTC – Recommended Procedures and Guidelines:

.1 (3) 7.5-04-01-01.1. Preparation and Conduct of Speed/Power Trials, 2005;

.2 (4) 7.5-04-01-01.2 / 4.3.3.1. Analysis of Speed/Power Trial Data/Correction of the ship's performance due to the effects of wind, 2005; and

.3 (5) 7.5-04-01-01.2 / 4.3.3.2. Analysis of Speed/Power Trial Data/Correction of the ship's performance due to the effects of waves, 2005.

10 Information should be given among others on:

.1 Propulsion system;

.2 Power supply system;

.3 How are the measurements performed;

.4 What methodology of taking sea conditions into account was used;

.5 Draught and trim;

.6 Ship speed;

.7 Shaft power;

.8 Power Consumption;

.9 Shaft revolutions; and

.10 Main emphasis should be given to the sea conditions (measurements should be performed according to ITTC, ISO or equivalent recommendations).

11 Finally, the verifier should issue a report on the achieved EEDI value.

12 If a ship's attained EEDI, as verified by sea trial, is lower than its required EEDI value, the ship may then be certified by the Administration as meeting its EEDI requirement.

13 If a ship's attained EEDI, as verified by sea trial, is higher than its required EEDI, then remedial action must be taken. ITTC believes there are several options available for a shipbuilder and/or ship purchaser to address such a deficiency. Remedial action might involve the modification of the ship itself or improvements of some existing parts. ITTC member organizations are well trained to suggest modifications and improvements. If such action is taken, then another sea trial should be required to verify the result.

14 Other options beyond modifying the ship design to improve the EEDI could be:

.1 increased usage of power saving systems;

.2 improved specific fuel consumption of the engines (main and auxiliary);

.3 increased ship speed at a given power output by trim optimization and advanced propeller designs;

.4 additional power saving devices (Ducts, fins et).

These are only some options; each of them requires further development. During such development it might become apparent that some of these options are ultimately unfeasible due to their complexity or due to competitive issues. Nevertheless, ITTC mentions these options to encourage further dialogue regarding the implications of a ship failing to attain its required EEDI at sea trial.

Conclusions

15 A ship's attained EEDI should be verified via a sea trial in order to ensure meaningful greenhouse gas reductions. It is necessary to ensure that such verification trials need to be advised by experienced organizations, mainly model basins which are all represented by ITTC and strongly recommended to do their work according to detailed ITTC procedures and guidelines ensuring consistency between the IMO requirements for the EEDI and ITTC practice.

16 Furthermore, it is important to carefully consider the implications of a ship not attaining its required EEDI during sea trial. If so, it is evident that there is need for several remedial design modifications which can be recommended by ITTC member organizations based on detailed knowledge from many different sea trials.

Action requested of the Committee

17 The Committee is invited to consider the above comments and take action as appropriate.