



## 1. EEDI Verification

The comments and recommendations given below on the EEDI verification have been prepared by ECMAR, the European Council for Maritime Applied R&D.

### 1.1 Summary

ECMAR members want to share their unprecedented experience on the issues of measurement of trial performance and verification with the MEPC working group. Furthermore, ECMAR offers recommendations to the proposed framework of verification procedures.

ECMAR Recommendations:

- I. **Independent verifiers:** do not change guideline 2.1 of MEPC.1/Circ.682 in this respect. The changes as proposed in the EE-WG/WP.1 are supported by ECMAR.
- II. **Preliminary verification of the EEDI:**
  - Use the ITTC tank test methods and the ITTC quality system as the base methods for prediction of power curve.
  - Do not standardise the extrapolation methods
  - Use a general empirical method to predict the powering curves in case of missing tank test data based on the extended data of the model basins.
- III. **Sea trial procedures:** Force the sector to develop more accurate sea trial procedures and correction and replace the request for a lot of information for ballast-load conversion by the use of a general prediction method based on specific model tests.

### 1.2 Background

ECMAR, the European Council of Maritime Applied Research, was founded in 2007 by a core group of 15 partners to develop a common strategy for European Research in the European maritime industry, and to support the adoption of the relevant research priorities within the scope of the EU Framework Programmes for Research and Technology Development. Amongst these 15 partners, 14 either operate their own towing tanks or are active players in the field of maritime hydrodynamics. ECMAR membership is currently 27 European organisations of which, 13 operate towing tanks and 19 are active in the field of applied hydrodynamic research and customer services. ECMAR can therefore rightfully claim to represent the majority of EU towing tank operation.

## 2. ECMAR's Comments and Recommendations

ECMAR, which represents the European Maritime Applied Research Organisations, strongly supports the introduction of the EEDI framework. The maritime sector is obliged to contribute to the reduction of the Green House Gas emissions and the EEDI framework provides a direction to quantify and improve the performance of ships in this respect.

At MEPC 60 verification procedures of the EEDI were discussed and there was agreement on a number of issues. ECMAR members now want to share their unprecedented experience on the issues of measurement of trial performance and verification with the MEPC working group. Furthermore, ECMAR offers recommendations to the proposed framework of verification procedures as presented in the MEPC.1/Circ.682, the minutes of the MEPC 60 and the draft guidelines on survey and certification of the EEDI as developed during the intersessional meeting of the WG.

### 2.1 Independency of verifiers

In paragraph 2.1 of the interim guidelines and in 7.6 of the minutes the independent verifiers of EEDI are discussed. Firstly, according to ECMAR, the verification of the performance of a ship during sea trials is a process between two parties, the owner and the builder/designer, governed by different interests and well embedded in legal procedures. These parties agree on the verification of the trial performance in a procedure and a party to perform the verification. The latter is normally the ship yard, but could be an independent third party. The latter is also used in case of a conflict between the two parties.

This process ensures an independent outcome of the sea trial performance and this process is bound by legal procedures.

According to the minutes of the MEPC meeting the conductors of tank tests and sea trials are not regarded as independent. This reasoning is not considered consistent. Other parties involved, e.g. the shipyard, the Classification Society or the designer are not independent either, and should be excluded as well. However, this might result in a difficult situation which does not lead to in a 'low entrance barrier' for adapting the voluntary EEDI verification.

ECMAR recommends a more balanced commercial procedure to verify the ship trial performance. Certain involved parties should not be excluded a priori as they might be in a position to stimulate a faster introduction of the voluntary verification of the EEDI. The main objective for the short-term is to gain as much experience as possible with the EEDI verification.

- *ECMAR recommendation for independent verifiers: do not change guideline 2.1 of MEPC.1/Circ.682 in this respect. The changes as proposed in the EE-WG/WP.1 are supported by ECMAR.*

### 2.2 Preliminary verification of the EEDI

In paragraph 4.2.5 and 4.2.6 of the MEPC.1/Circ.682 the verification of the design EEDI is discussed and suggestions are made to improve the quality of the power curves in the design phase. ECMAR members find this discussion hard to understand:

- The interest of tank test organisations is to predict the performance of a vessel as accurate as possible. This provides them a competitive position to the shipbuilders, designers and owners; it is not of interest to predict a too high speed or too low EEDI. The prediction is always balanced by verification during sea trials.
- The ITTC, the international towing tank conference, has already developed standard methods to correctly measure the powering performance of a ship and extrapolate this to sea trial values. There is therefore no need to develop further procedures or methods to replace them.
- However prediction of ship powering performance is not a numerical procedure which can be derived from tank dimensions, equipment used and standard corrections directly. It is always based on standard procedures related to the correlation between model and full scale data. In these procedures there is a correction factor which allows the correlation experience of an institute. Tank test institutes have translated their years of correlation, for some of them in more than thousands predictions, into experience factors accounting for ship specific details, shipyard differences, differences in building procedures and in the finishing of the ship. These experience based correlation factors are not published or available, as they are the "business secret" of the tank institute.
- The development of a standard correlation factor method would therefore harm the competitive edge of designers and or builders and would reduce the motivation for further developments in energy saving. As argued previously, there should also be more trust in the "commercial" process between customer and shipyard.
- The experience base of tank test institutes is often translated into an empirical prediction method, based on a number of ship parameters. A general prediction method could support the verification of EEDI in the case of missing tank test data, uncertainty on "similar ships" or a check on the design EEDI. The typical accuracy of such a prediction method is around 3%. ECMAR is willing to support IMO in providing such a method.

***ECMAR recommendations for the preliminary verification of the EEDI:***

- *Use the ITTC tank test methods and the ITTC quality system as the base methods for prediction of power curve.*
- *Do not standardise the extrapolation methods*
- *Use a general empirical method to predict the powering curves in case of missing tank test data based on the extended data of the model basins.*

### **2.3 Sea trial procedures**

In the verification framework it is mandatory to use the ISO or comparable methods for performing or correcting the sea trial measurements to a standardised condition. However, methods such as the ISO 15016 or the ITTC procedures, allow for different interpretations of trial procedures and corrections, often not using state of the art correction methods. This can lead to differences of 5 to 10% in the derived power curves. ECMAR recommends that IMO should insist on the development of more accurate correction methods to avoid the large difference in the power curves obtained.

In the verification guideline framework additional information is required by the verifier. This is to check on the calculated design EEDI and the conversion from ballast to laden trials. The objectives of the guidelines will be hard to achieve. The data requested is Intellectual Property of the shipbuilder, designer or tank institute and it will be difficult to make this information available to the verifier on a voluntary basis. To reduce the barrier of the use of this voluntary verification more practical solution should be defined. The general

empirical methods will probably offer a low barrier method to allow for the verification and the ballast-laden conversion.

- *ECMAR recommendation for Sea trial procedures: Force the sector to develop more accurate sea trial procedures and correction and replace the request for a lot of information for ballast-load conversion by the use of a general prediction method based on specific model tests.*

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