



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

GHG-WG 2/2/14  
9 February 2009  
ENGLISH ONLY

## CONSIDERATION OF THE ENERGY EFFICIENCY DESIGN INDEX FOR NEW SHIPS

### Verification of the Energy Efficiency Design Index (EEDI)

Submitted by Norway

#### SUMMARY

<i>Executive summary:</i>	This document discusses the need for verification based on sea trials of ships and proposes that developing guidelines for this should be a priority for IMO
<i>Strategic direction:</i>	7.3
<i>High-level action:</i>	7.3.1
<i>Planned output:</i>	7.3.1.1 and 7.3.1.3
<i>Action to be taken:</i>	Paragraph 9
<i>Related document:</i>	MEPC 58/23

#### Introduction

1 MEPC 58 developed draft interim guidelines on the method of calculation of the energy efficiency design index (EEDI) for new ships. The issue of approval and/or verification of the design index has been discussed by MEPC and by the Intersessional Meeting.

2 Three main options are under consideration:

- .1 Plan approval: The index is calculated and approved at the design stage;
- .2 Verification based on sea trial measurement data without prior approval; and
- .3 Plan approval of design with subsequent verification by sea trial measurement.

## Discussion

3 Each of these options may have advantages and disadvantages. A summary of these are shown in Table 1.

**Table 1: Comparison of verification options**

	<b>Advantages</b>	<b>Disadvantages</b>
Option1:  Plan approval	Simple and low cost in application	Existing speed prediction tools are based on empirical towing tank data. Limitations to accuracy of speed calculation with non-standard designs and features (asymmetric hulls, air lubrication, contra rotating propellers, etc.).  Need to define what calculation tools/algorithms/should be allowed to be used for different ships.  May be necessary to define what assumptions and parameters are reasonable for different models (e.g., friction coefficients ...)  Limited verification that as built corresponds to approved drawings (e.g., weight estimate, hull friction assumptions).
Option 2:  Verification based on sea trial measurement without prior approval	The performance of the design as built is assessed, thus eliminating possible errors from wrong (false) assumptions.  This is particularly important when special non-standard designs and features are used. (asymmetric hulls, air lubrication, contra rotating propellers, etc.).	Demanding in terms of effort required to verify efficiency of the design.
Option 3:  Plan approval with verification based on sea trial measurement	Some ship builders/buyers may find it beneficial to have an early approval from an official body.	The measurement from sea trial final verification will be the decisive in case of difference in result (in the reverse case, sea trial verification would not be needed). In case of an approved design failing on sea trial, the approving body will presumably not accept responsibility. Some ship builders/buyers may want to build ships without mandatory verification.

4 In the view of Norway, plan approval alone (option 1) is not sufficient since plan approval cannot verify necessary input assumptions, and because special ships design features that may be used to increase efficiency are typically not well covered in the empirical data that is the basis of speed prediction models.

5 Option 3, which requires plan approval with verification based on sea trial measurement, adds little benefit to the ship builder/buyer that cannot be provided by a specialist consultant on a voluntary basis. Therefore, it is the view of Norway that verification based on sea trial measurement without mandatory plan approval (option 2) is a reasonable solution.

6 Norway therefore proposes that IMO starts to develop a framework for which ship performance can be verified based on sea trial measurement. Due to the complex nature of this topic, a code not dissimilar in size and complexity from the NO<sub>x</sub> Technical Code may be required.

7 Significant time and resources will be needed to develop what may be termed IMO “EEDI Technical Code”. This work should preferably start as soon as possible.

8 Two international standards exist that may be a starting point for the development of a EEDI verification procedure. These are:

- .1 ISO 19019:2005 Sea-going vessels and marine technology – Instructions for planning, carrying out and reporting sea trials
- .2 ISO 15016:2002 Ships and marine technology – Guidelines for the assessment of Speed and power performance by analysis of speed trial data

#### **Action requested of the Intersessional Meeting**

9 The Intersessional Meeting is invited to consider the proposals when developing recommendations for MEPC 59 on verification of the EEDI.

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