



IMO

*E*

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

GHG-WG 2/2/16  
6 February 2009  
ENGLISH ONLY

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

### Regulatory framework for mandatory application of the Energy Efficiency Design Index (EEDI) and the verification and certification procedures for the EEDI

Submitted by Japan

#### SUMMARY

<i>Executive summary:</i>	This document considers the points necessary to be discussed for the establishment of a mandatory Energy Efficiency Design Index (EEDI) scheme, focusing on the verification and certification process of the EEDI, and proposes the regulatory framework in the form of an outline for the draft amendments to the MARPOL/Annex VI and a skeleton of the draft guidelines on the verification and certification of the EEDI
<i>Strategic direction:</i>	7.3
<i>High-level action:</i>	7.3.1
<i>Planned output:</i>	7.3.1.3
<i>Action to be taken:</i>	Paragraph 32
<i>Related documents:</i>	GHG-WG 1/2/1; MEPC 58/4/1, MEPC 58/4/9 and MEPC 58/23

#### Introduction

1 This document considers the regulatory framework utilizing the Energy Efficiency Design Index (EEDI) and its verification and certification procedures as well as the associated guidelines and is thus related to items .1.2, .1.3 and .1.4 of the Terms of Reference for the second intersessional meeting of the working group on GHG emissions from ships.

2 At the fifty-eighth session of the Marine Environment Protection Committee (MEPC 58), the Draft Interim Guidelines on the Method of Calculation of the Energy Efficiency Design Index for New Ships (MEPC 58/23, annex 11) was developed and the committee approved the guidelines for calculation/trial purposes with a view to further refinement and improvement. Decisions on how to use the guidelines have not been made, however. At this stage, Japan considers that the general direction is to make the calculation of the EEDI mandatory for new ships, to establish the EEDI baselines, to determine the EEDI requirements by utilizing the baselines, and to strengthen the EEDI requirements step by step. This document considers the points necessary to be discussed

For reasons of economy, this document is printed in a limited number. Delegates are kindly asked to bring their copies to meetings and not to request additional copies.

for the establishment of such a mandatory scheme and proposes the regulatory framework in the form of an outline for the draft amendments to MARPOL Annex VI and skeleton draft Guidelines on Surveys and Certification of the EEDI.

### **Overview of the mandatory EEDI scheme**

3 As is the case with other IMO instruments, the mandatory EEDI scheme should be comprised of three components for better enforcement and compliance: requirements, verification and certification, and port State control, as described below.

#### *Requirements*

Attained EEDI: The EEDI shall be calculated for each new ship in accordance with the guidelines developed by the Organization.

Required EEDI: Attained EEDI shall be below Required EEDI, which shall be determined by utilizing the EEDI baselines to be developed by the Organization. Required EEDI shall be tightened (lowered in terms of CO<sub>2</sub> grammes per tonne mile) in a gradual manner to improve energy efficiency of new ships:

#### *Verification and certification*

Surveys: Ships to which the EEDI scheme is applied shall be subject to surveys by the Administration, or organizations recognized by it, for verification of the accuracy of the Attained EEDI and its compliance with the Required EEDI.

Certification: Certificates shall be issued after surveys by the Administration or organizations recognized by it.

#### *Port State control*

Inspection: A ship, when in a port or an offshore terminal under the jurisdiction of another Party, may be subject to inspection by officers authorized by such Party.

### **Legal instrument of the mandatory EEDI scheme**

4 Regarding the legal instrument to introduce the aforementioned mandatory EEDI scheme, adding a new part to MARPOL Annex VI, which addresses the improvement of energy efficiency of ships to reduce greenhouse emissions, should be considered as the primary option.

5 The MARPOL Convention and its Annexes, equipped with well-established and workable practices, including verification and certification and inspection, can provide a similar legal basis for the mandatory EEDI scheme. Also, considering the urgency of establishing an effective mandatory mechanism to improve the energy efficiency of ships, the amendments to MARPOL Annex VI seem not only appropriate but also desirable because it is the earliest and probably the only way to establish such a mechanism in the short term. Moreover, taking into account that the current MARPOL Annex VI addresses prevention of air pollution from ships, such as emissions of SO<sub>x</sub> and NO<sub>x</sub>, which have direct impacts on human health and the environment, it is reasonable to separate this new issue from the current Annex VI and thus to add a new part (Part 2) addressing the improvement of energy efficiency.

6 An outline for the draft text for Part 2 of MARPOL Annex VI is set out in annex 1 to this document.

## **Application of the mandatory EEDI scheme**

7 With regard to the application of the mandatory EEDI scheme, it should be ensured that any requirements can be applied in a fair and consistent manner. For this purpose, Japan proposes that three levels for application should be developed according to ship sizes and types. The first category is for small ships, which should be exempted from both requirements described in paragraph 3, namely, 1) Attained EEDI shall be calculated, and 2) Attained EEDI shall be less than Required EEDI. Such straight exemption for small ships can be seen in many other IMO instruments. The second category is for relatively small ships, which should be exempted from the 2nd Requirement to compare Attained EEDI with Required EEDI, but be subject to the requirement to calculate an Attained EEDI, as well as verification and certification. The third category is for large ships, which should be subject to all the requirements under the mandatory EEDI scheme. A detailed explanation analysis for this categorization is provided in annex 3.

## **Verification and certification scheme**

8 The establishment of a verification and certification scheme is essential to ensure reasonable accuracy of the Attained EEDI, which is the foundation for enforcement of the scheme and the credibility of the scheme itself. Especially under a mandatory scheme, the stakes become substantive in a sense that a ship of which Attained EEDI does not meet the Required EEDI is not allowed to be put into service; Attained EEDI must be thus verified in a transparent, consistent and fair manner.

9 In order to ensure surveys and certification of Attained EEDI in a transparent and consistent manner, it is necessary to develop Guidelines for Surveys and Certification of the EEDI. The purpose of such guidelines is to assist administrations and recognized organizations in uniform application of Part 2 of MARPOL Annex VI and to assist shipowners, shipbuilders, equipment manufacturers related to the energy efficiency of the ship and other interested parties to understand the process of surveys and certification. Skeleton draft Guidelines for Surveys and Certification of the EEDI is set out in annex 2 to this document.

## **Elements to be considered in the development of the Guidelines for Surveys and Certification of the EEDI**

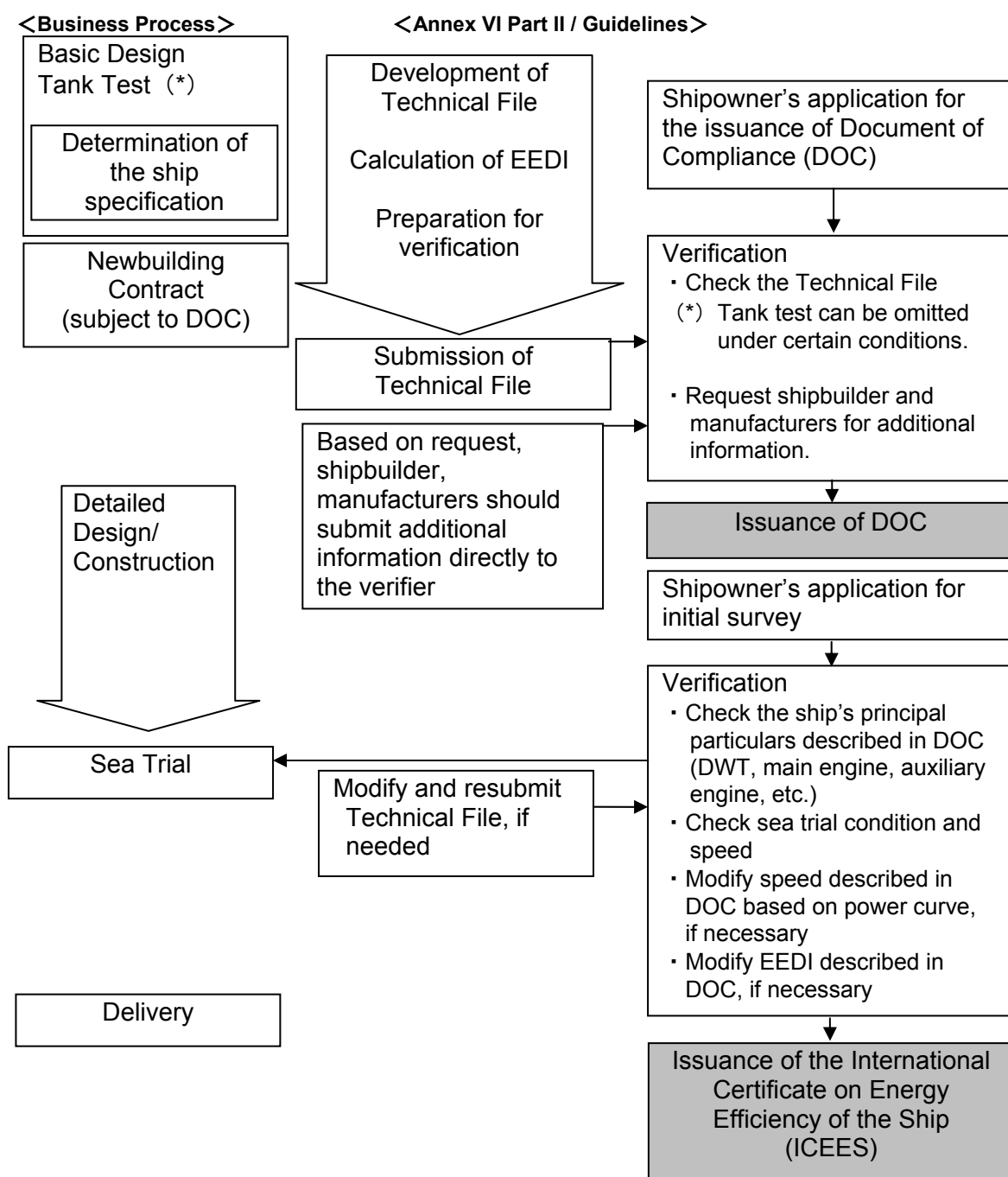
### *Identification of the cases when surveys and verification are required*

10 The cases where surveys and verification are required should be identified. In principle, an initial survey should be conducted at the stage of construction before issuing the International Certificate on the Energy Efficiency of the Ship (ICEES) and an additional survey should be conducted at the time of major conversion. “Major conversion” should be defined in Part 2 of MARPOL Annex VI (proposed regulation X-1 of annex 1 to this document). Such definition would be mostly the same as the one in MARPOL Annex I. The new sentence to be added for the EEDI scheme is a conversion “*which substantially alters the energy efficiency of the ship*”. This part needs more detailed explanation and examples on what types of conversion should be considered as one “*which substantially alters the energy efficiency of the ship*” – e.g., installation of new equipment.

### *The flow of an initial survey*

11 The proposed flow of an initial survey is presented in Figure 1 below. The two-step approach is proposed for an initial survey as a base option, i.e. the issuance of Document of Compliance (DOC) at the time of design and the issuance of the final certificate (ICEES) at the

time of delivery, by the reasons described in paragraphs 14 to 16. At the stage of the basic design of the ship, the shipowner should apply for the issuance of DOC and submit the Technical File to the Administration or organizations recognized by it. The Technical File can be developed by the shipowner, the shipbuilder or related manufacturers, it should contain information necessary for the verification, which should be determined by the guidelines. The verification should be conducted based on the submitted Technical File and additional information, if necessary, submitted directly from shipbuilders or manufacturers on request by the Administration or organization recognized by it. After the verification, the DOC is issued by the Administration or organization recognized by it. The DOC should be valid until ICEES is issued.



\* Necessary to consider a criterion for whether or not a tank test is required – e.g., in case where data of sister ship is available.

**Figure 1: The basic flow of an initial survey**

12 Then, at the stage of the sea trial of the ship, the shipowner should apply for the issuance of ICEES. According to the results of the sea trial, the shipowner can/should modify the Technical File used for the DOC verification and submit it to the Administration or organization recognized by it. After the verification, the ICEES is issued by the Administration or organization recognized by it. For the verification, the Administration or organization recognized by it should:

- .1 confirm if the constructed ship is actually constructed as planned in the basic design stage, based on the information submitted for the DOC issuance. The items to be confirmed in this process should be specified by the guidelines, including the dimensions, the type, DWT, the main engine and auxiliary engines and other specification of the ships which affect the calculation of the Attained EEDI;
- .2 confirm if the difference between the speed used for the Attained EEDI calculation and the observed speed at the sea trial can be technically justified, taking into consideration the sea conditions when the sea trial was conducted;
- .3 adjust, if necessary, the speed used for the calculation of the Attained EEDI by utilizing the power curves contained in DOC Technical File, taking into account the results of the sea trial; and
- .4 review the value of Attained EEDI in the DOC, if necessary, and change the value as appropriate.

13 Although the proposed flow in Figure 1 assumes a two-step approach, the first of which is issuance of DOC at the design stage and the second is issuance of ICEES before the delivery, there might be other options for the flow of an initial survey:

*Base Option: Both DOC and ICEES are issued with respective verifications. Verification for, and issuance of, DOC is mandatory.*

*Option 1: Both DOC and ICEES are issued with respective verifications. Verification for, and issuance of, DOC is on a voluntary basis.*

*Option 2: Only ICEES is issued with one-time verification before delivery.*

14 In the Base Option, verification of Attained EEDI at the design stage is mandatory and shipowners must apply for the issuance of DOC. The flow presented in Figure 1 assumes the Base Option because it ensures the most reliable verification of Attained EEDI and because it does not put unnecessary risk on both shipowners and shipbuilders – a risk that shipowners may find that the contracted ship does not comply with the EEDI requirements at the time of delivery and that shipbuilders may face contract penalties for non-compliance.

15 In Option 1, it is the shipowners' discretion to apply for issuance of DOC. There is no mandatory verification for the issuance of DOC. Therefore, shipowners may choose to apply for DOC issuance if they think the risk of non-compliance of the EEDI requirements is too large because of lack of data. Instead, shipowners can choose not to apply if there are sufficient reliable data from sister ships, or if they fully trust the shipbuilder in view of good history of business deals with that particular shipbuilder.

16 Option 2 is the simplest one, under which there is no DOC issuance, neither is there any related verification during the time of construction of the ship. This option does not seem appropriate because it is not possible for shipowners to know the values of Attained EEDI of the ships they contracted before delivery, which imposes risks on shipowners and shipbuilders as explained in paragraph 14 above.

*Information to be included in the Technical File*

17 Information to be provided in the Technical File should be prescribed in the guidelines. In the verification application, the Technical File is submitted by the shipowner to the Administration or organizations recognized by it. Therefore, if all information necessary for the verification is required to be included in the Technical File, this means that shipbuilders have to provide all the information, including confidential ones, to shipowners. This is not desirable in terms of the protection of confidential information of shipbuilders. On the other hand, the protection of confidential information should not be abused in order not to unreasonably limit the scope of the verification. As a possible way out, the proposed flow allows the Administration or organization recognized by it to request shipbuilders or manufacturers for additional information which is not contained in the Technical File, if needed. Then shipbuilders or manufacturers can directly submit it to the Administration or organization recognized by it without revealing confidential information to others.

18 As discussed above, the information to be included in the Technical File should be the requisite minimum, which is:

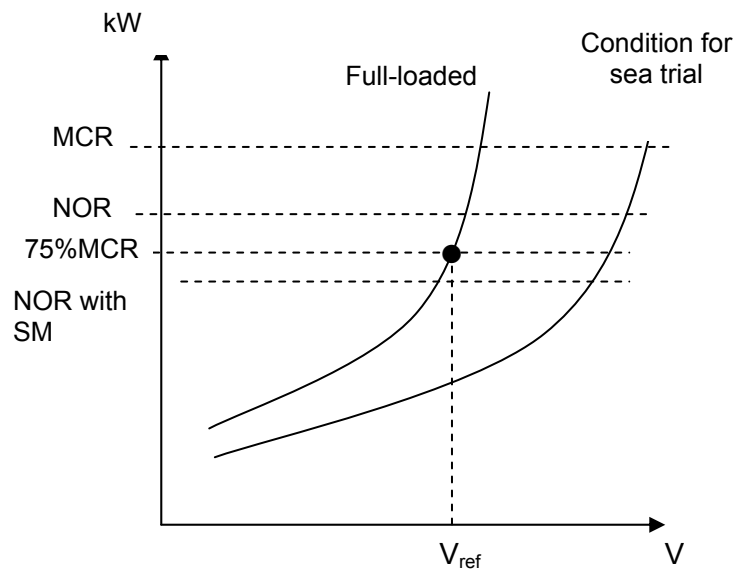
- .1 values of each parameter used for the calculation of the Attained EEDI and the source of the values or the basis of the calculation: i.e. DWT, types and output of main and auxiliary engines, particulars of energy saving equipment, Specific Fuel Consumption (based on the NO<sub>x</sub> Technical File or the manufacturer's test report), etc.;
- .2 principal particulars and other information necessary for the calculation of EEDI: the dimensions, the overview of the propulsion system and of the electricity supply system on board, etc.; and
- .3 basis of speed estimation and its process (at the design stage).

19 For verification of the Attained EEDI after the sea trial, International Air Pollution Prevention Certificate and survey report for D/W, as attachment to the Technical File, and the results of speed tests should be submitted to the Administration or organizations recognized by it.

*Verification of speed*

20 Considering the magnitude of impact on the Attained EEDI, the three parameters of DWT, P<sub>ME</sub> (power of main engine) and V<sub>ref</sub> (ship speed) are particularly important for the verification of the EEDI. Compared with the verification of DWT and P<sub>ME</sub>, the verification of V<sub>ref</sub> is technically complex and difficult. Especially, the verification of V<sub>ref</sub> by conducting sea trial at full-loaded condition is almost impossible, except for certain ship types such as tankers, because a ship usually cannot carry maximum cargoes at the sea trial. Therefore, particular attention should be paid to the methodology of effective verification of V<sub>ref</sub>.

21 Normally, shipbuilders can develop power curves to estimate ship speed for full-loaded condition and sea trial condition (partially-loaded) (Figure 2-1). For verification of  $V_{ref}$ , it would be necessary to check the speed in full-loaded condition (used in Attained EEDI) based on the deviation of the calibrated speed at sea trial and the corresponding speed on the power curve for sea trial condition.

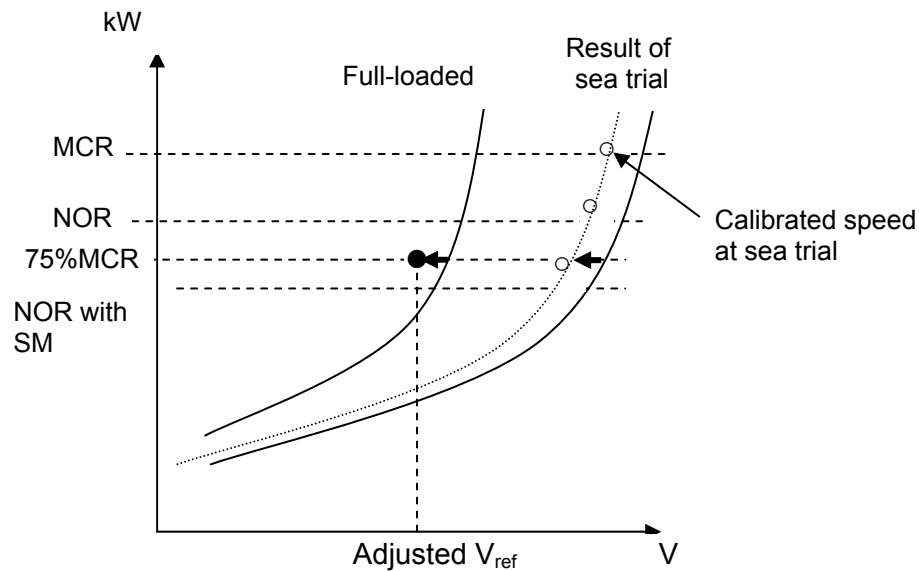


**Figure 2-1: Power curve at the design stage  
(For DOC)**

22 The power curves used for verification should be accurate and supported with evidence. In this sense, model tests should be required as a reliable basis for developing a power curve. Nonetheless, with the existence of power curves of sister ships, it should be considered whether model tests can be exempted. To ensure the quality of model test, test organizations should be required to acquire an international standard (ISO17025) or the equivalent. Wind-tunnel test needs not to be made mandatory, and test organizations can use their standard method for calculation of wind forces and indicate such method and calculation process for correlation of model-ship.

23 Test organizations are also required to present a report to demonstrate that a model ship and an actual ship are considered reasonably identical. For better compliance and also for convenience, the format of a test report should be standardized. Furthermore, in cases where the types of propellers used are different between a model test and an actual ship, test organizations should provide explanation on the method for adjustment calculation.

24 If the deviation of the observed speed at sea trial turns out to be considerable, the standard method of calibration, which is to adjust the speed used for Attained EEDI based on the two power curves, should be developed (Figure 2-2).



\* Taking into account the results of sea trial,  $V_{ref}$  in full-loaded condition should be adjusted with the standardized method to be developed by the Organization.

**Figure 2-2: Power curve adjusted based on the sea trial results  
(For ICEES)**

25 Moreover, sea trial conditions should be determined as close as possible to the conditions that model tests assumed, e.g., draft and trim at sea trial should be close to those used in the power curve developed at the design stage. It is probable that conditions for sea trials do not correspond to those of model tests, and the method of calibration may have to be stipulated in the guidelines.

#### *Requirements for sea trial*

26 Considering the importance of the results of sea trials, the attendance of an officer of the Administration or organizations recognized by it should be required. When calibration based on sea conditions – wind, tide and wave – is needed, it should be implemented in accordance with ISO15016. In addition, the requirements for sea trial should be considered and described in the guidelines. In considering the requirements, it may be necessary to consider alleviation of the requirements in case the data for sister ships are available, e.g., the number of data points to be monitored/measured can be reduced.

#### *Further issues to be considered for the 2nd step verification through sea trial*

27 The verification and certification process explained above is based on the two-step approach – the first is the issuance of DOC at the design stage and the second is the issuance of ICEES before delivery. Also, it assumes that the results of sea trials should/can be utilized in the second step of the verification. However, the reliable verification of the Attained EEDI through proper utilization of the sea trial results would necessitate standardization of various matters, including:



- .1 method of measuring the main engine power at sea trial;
- .2 calibration of sea conditions including wave, wind and tide (an ISO standard exists); and
- .3 adjustment of the ship speed at full-loaded condition used in the Attained EEDI, based on the deviation between the calibrated speed at sea trial and the corresponding speed on the power curve for sea trial conditions.

28 If such standardization cannot be developed before the entry into force of the mandatory EEDI scheme, the second step of the verification would have to be conducted in a simplistic way without considering the results of sea trials until the necessary standardization is completed. In such a case, the second verification would only be the document and ship visual check on whether or not the condition of the ship or its equipment corresponds with those described in the DOC.

#### *Verification and certification of an additional survey*

29 After a major conversion as defined in proposed regulation X-1 in Part 2 of MARPOL Annex VI, the verification of the Attained EEDI should be conducted. Information to be provided to the Administration or recognized organizations should be determined by the guidelines. Although sea trials should be required for an initial survey, sea trials may not be necessary for an additional survey because it is difficult to assess the effect of a major conversion on the Attained EEDI independently from that of aging degradation. Thus, the method of verification for additional surveys should be considered.

#### *Renewal survey*

30 Attained EEDI is ship-specific and determined solely by the ship design. Because of this nature of the Attained EEDI, the Attained EEDI should be considered as the same throughout the operating life of the ship unless the ship goes through a major conversion. ICEES should be regarded valid until the additional survey is conducted at the time of a major conversion that may change the energy efficiency of the ship. Therefore, renewal surveys are not necessary as part of the mandatory EEDI scheme.

#### **Port state control (PSC)**

31 Based on Article 5 of the MARPOL Convention, a ship to which Part 2 of Annex VI applies may, in any port or offshore terminal of another Party, be subject to inspection by officers for the purpose of determining whether the ship is in compliance with Part 2. A port State control (PSC) should only confirm whether or not a ship has a valid certificate including attachments in accordance with the associated requirements. Also, it should be checked whether or not the condition of the ship or its equipment corresponds with the particulars of the certificate and technical specification provided in the Technical File. In any case, PSC should not intend to confirm the contents of the certificate such as the calculation process of the Attained EEDI.

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

32 The Intersessional Meeting is invited to consider the regulatory framework, the outline of the draft text of Part 2 of MARPOL Annex VI, the skeleton draft Guidelines for Surveys and Certification of EEDI as well as relevant related matters, and take action as appropriate.

\*\*\*



## ANNEX 1

## OUTLINE FOR DRAFT TEXT OF PART 2 OF MARPOL ANNEX VI

**PART 2****Regulation X-1 – Definition**

- 1 “Existing ship” means a ship which is not a new ship.
- 2 “New ship” means a ship:
  - .1 for which the building contract is placed on or after the entry into force of this Part of the Annex; or
  - .2 in the absence of a building contract, the keel of which is laid or which is at a similar stage of construction on or after six months after the entry into force of this Part of the Annex; or
  - .3 the delivery of which is on or after [30] months after the entry into force of this Part of the Annex.
- 3 “Major Conversion” means a conversion of a ship:
  - .1 which substantially alters the dimensions or carrying capacity of the ship; or
  - .2 which changes the type of the ship; or
  - .3 the intent of which in the opinion of the Administration is substantially to prolong its life; or
  - .4 which otherwise so alters the ship that, if it were a new ship, it would become subject to relevant provisions of the present Convention not applicable to it as an existing ship; or
  - .5 which substantially alters the energy efficiency of the ship

*Definitions of “Existing ships,” “New ships,” and “Major Conversion” should be added.*

**Regulation X-2 – Application**

- 1 The provisions of this Part of the Annex shall apply to all ships of [400] gross tonnage and above, except where expressly provided otherwise in regulation X-xx, X-yy of this Part of the Annex.
- 2 The provisions of this Part of the Annex shall not apply to ships operating in waters subject to the sovereignty or jurisdiction of the State whose flag the ship is entitled to fly. However, each Party shall ensure, by the adoption of appropriate measures, that such ships act in a manner consistent with this Convention, so far as is reasonable and practicable.
- [3 Except for certain ship types]

*The provisions of the MARPOL Convention and its Annexes are, in general, applied to all ships of the contracted governments. Then, for the practicability, only certain ships, usually above the certain gross tonnage, are subject to surveys.*

*In the case of the new part of the mandatory EEDI scheme, it seems reasonable and practicable to establish three levels for application of the provisions. Ships belonging to the category I are exempted from all the provisions of Part 2. Ships in category II are subject to all the provisions of Part II except for those of Required EEDI. Ships in category III are subject to all the provisions. For details, refer to Annex 3 of this document.*

### **Regulation X-3 – Attained Energy Efficiency Design Index (Attained EEDI)**

- 1 The EEDI shall be calculated for each new ship. The EEDI shall be specific to each ship and shall indicate the estimated performance of the ship in terms of energy efficiency, and be accompanied by the technical file that contains the information necessary for the calculation of the EEDI and that shows the process of calculation. The EEDI shall be verified, based on the technical file, either by the Administration or by any person or organization authorized by it taking into account guidelines developed by the Organization.

*For ships in category II and III, Attained EEDI shall be calculated in accordance with the guidelines developed by the Organization. Currently, the Interim Guidelines on the Method of Calculation of the Energy Efficiency Design Index for New Ships are used on a trial basis and to be reviewed for the further improvement.*

*Attained EEDI of ships in category II and III shall be verified, based on the technical file, either by the Administration or by any person or organization authorized by it taking into account the guidelines for verification and certification to be developed by the Organization. Technical file should include necessary information to verify Attained EEDI. For the consistent and transparent verification, the detailed requirements of the technical file should be described in the guidelines.*

### **Regulation X-4 – Required EEDI**

- 1 For new ships of [10,000] gross tonnage and above, the attained EEDI shall be as follows:  

$$\text{Attained EEDI} \leq (1-X/100) \times \text{EEDI Baseline (Required EEDI)}$$
 where X is the reduction factor of the EEDI, in percentage, compared to the EEDI baseline, to be determined as follows:  
 For ships of which contract is placed on or after [ ] and before [ ]  $X = [ ]$   
 For ships of which contract is placed on or after [ ] and before [ ]  $X = [ ]$
- 2 The EEDI Baseline shall be calculated as follows  

$$\text{The EEDI Baseline} = a \times b^{-c}$$
 where a, b and c are the parameters determined by the following table:

Ship Type	A	B	C
Tanker		DWT of the ship	

*For ships in category III, their Attained EEDI shall be below their Required EEDI, which should be determined by the baselines developed by the Organization and the reduction factor (X). Required EEDI should be strengthened in a gradual manner to ensure the constant energy improvement of new ships.*

**Regulation X-5 – Ship Efficiency Management Plan (SEMP)**

- 1 The Company and the Ship to which this Part of the Annex applies shall establish the Energy Efficiency Management System (EEMS) and the ship shall carry on board a SEMP approved by the Administration. Such a management system and SEMP shall be based on the Guidelines developed by the Organization.
- 2 The SEMP shall consist, at least, of:
  - .1 operational and technical measures to be taken by, and the procedures to be followed by in implementing such measures, the company and the ship in order to minimize the GHG emission from the ship;
  - .2

*SEMP is discussed in another Japanese submission (GHG-WG2 XXX).*

**Regulation X-6 – Surveys**

- 1 Ships to which this Part of the Annex applies shall be subject to the surveys specified below:
  - .1 an initial survey before the ship is put in service, or before the International Certificate on the Energy Efficiency of the Ship is issued. This survey shall verify that the EEDI required by regulation X-3 and X-4 as well as the SEMP required by regulation X-5 is in accordance with the requirements of this Part of the Annex.
  - .2 a renewal survey at intervals specified by the Administration, but not exceeding five years. This survey shall verify that the SEMP required by regulation X-5 complies with the requirements of this Part of the Annex.
  - .3 an additional survey, either general or partial, according to the circumstances, after a major conversion of the ship or significant change in the SEMP. The survey shall be such as to ensure that any such change and major conversion has been made in the way that the ship continues complying with the requirements of this Part of the Annex and that the EEDI is recalculated as necessary.

*To ensure compliance to the requirements relating to the EEDI, ships in category II and III shall be subject to an initial survey and an additional survey. A renewal survey is applicable only to SEMP requirements.*

**Regulation X-7 – Issue or endorsement of certificate**

- 1 An International Certificate on the Energy Efficiency of the Ship shall be issued, after an initial or renewal survey in accordance with the provisions of regulation X-6 of this Annex, to any ship of [ ] gross tonnage and above engaged in voyages to ports or offshore terminals under jurisdiction of other Parties.
- 2 Such certificate shall be issued or endorsed either by the Administration or by any person or organization duly authorized by it. In every case, the Administration assumes full responsibility for the certificate.
- 3 .....(followed by the standard clauses as the other IMO Conventions)

**Regulation X-8 Inspection of ships**

- 1 A ship to which this Part of the Annex VI of MAPROL applies may, in any port or offshore terminal of another Party, be subject to inspection by officers dully authorized by that Party for the purpose of determining whether the ship is in compliance with this Annex. Except as provided in paragraph X of this article, any such inspection is limited to:

\*\*\*

## ANNEX 2

### SKELETON DRAFT GUIDELINES FOR SURVEYS AND CERTIFICATION OF ENERGY EFFICIENCY DESIGN INDEX

#### 1 GENERAL

1.1 The purpose of this document is to provide the Guidelines for Surveys and Certification of Energy Efficiency Design Index (EEDI) that will assist the Administration and organizations recognized by it in the uniform application of the provisions of the Part 2 of the Annex VI of MARPOL, and assist shipowners, shipbuilders, manufacturers being related to the energy efficiency of the ship and other interested parties to understand the process of the surveys and the certification.

1.2 These Guidelines provides the procedures for the survey to verify that the EEDI of the ship complies with the requirements of the Part 2 of Annex VI, and those necessary for the issuance of a Document of Compliance (DOC) and an International Certificate on the Energy Efficiency of the Ship (ICEES).

#### 2 DEFINITIONS

*(Definitions of words that are not defined by the MARPOL ANNEX VI should be provided here, if necessary.)*

#### 3 SCOPE AND APPLICATION

*(This section is to describe the cases when verification and certification is necessary.)*

#### 4 APPLICATION

*(This section is to describe the application of the guidelines.)*

#### 5 IMPLEMENTATION OF SURVEY

*(This section is to describe the process of survey and verification.)*

- *Information to be included in Technical File;*
- *Information, other than those included in Technical File, that the Administration/Recognized Organization can request to obtain;*
- *Verification of speed: use of power curve, standard calibration method, requirements for test organizations, standard report format for test organizations, requirements for sea trial; and*
- *How to conduct an additional survey and the information to be provided to the Administration or organizations recognized by it for an additional survey.*

**6 ISSUANCE AND ENDORSEMENT OF CERTIFICATES**

*(This section is to describe the procedures of issuance and endorsement of certificates.)*

**7 INSPECTION OF SHIPS**

*(This section is to describe the procedures of inspection of ships.)*

\*\*\*



## ANNEX 3

## ANALYSIS ON THE DIFFERENT CATEGORIES OF APPLICATION

*As mentioned in Regulation X-2 of annex 2, it should be considered to establish three levels for application of the provisions. Ships belonging to the category I are exempted from all the provisions of Part 2. Ships in category II are subject to all the provisions of Part II except for those of Required EEDI. Ships in category III are subject to all the provisions.*

**Table1 – Quick reference of the proposed application of the requirements**

	GT	Calculation of Attained EEDI	Attained EEDI < Required EEDI	Verification and certification
<i>Category I</i>	<i>- [400]</i>	<i>X</i>	<i>X</i>	<i>X</i>
<i>Category II</i>	<i>[400] – [10,000]</i>	<i>O</i>	<i>X</i>	<i>O</i>
<i>Category III</i>	<i>[10,000] -</i>	<i>O</i>	<i>O</i>	<i>O</i>
<i>Not international ships</i>		<i>X</i>	<i>X</i>	<i>X</i>

*O: applied*

*X: not applied*

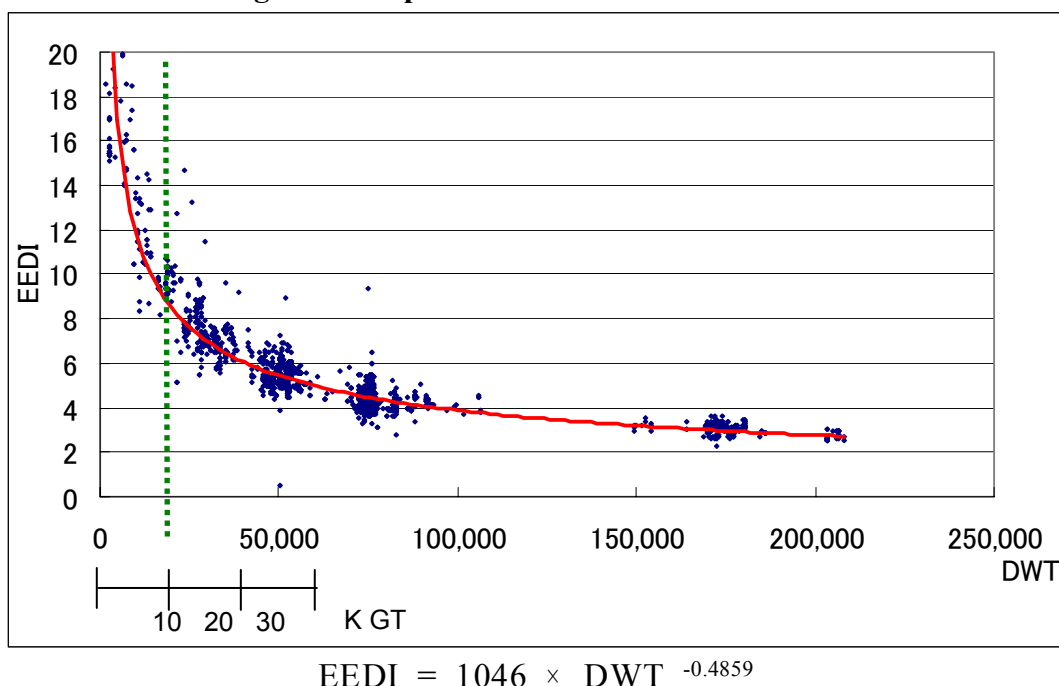
*Category I is the group of very small ships and boats (less than [400] gross tonnage), of which contribution to CO<sub>2</sub> emissions is very small. Category II is the group of relatively small ships (between [400] and [10,000] gross tonnage), of which Attained EEDIs should be calculated as an indicator of ship energy efficiency performance, which can be used for shipowners to compare ship performance and choose more energy efficient ships. However, those Attained EEDIs are not suitable for application of the requirements of Required EEDI because of the following reasons:*

- .1 As indicated in Figure 1 of this annex, the baselines of the Required EEDIs take a form of a long-tailed curve. The slope of the long-tailed curve for ships of less than 20,000 DWT is very steep. The deviation of EEDI values of existing ships, which is used to develop the baselines, is very large. Such considerable deviation of EEDI values of existing ships would reduce the reliability of the baseline; for some ships it would be very easy to clear the Required EEDI based on the baseline, while for other ships it would be impossible to clear the requirement. (Reference is made to another submission by Japan (GHG-WG XX); and*
- .2 According to the Updated Study on Greenhouse Gas Emissions from Ships Phase I Report (MEPC 58/INF.6), the contribution of CO<sub>2</sub> emissions from bulk carriers less than 10,000 DWT is 2.4% of the total CO<sub>2</sub> emissions from bulk carriers of all sizes, and bulk carriers between 10,000 DWT and 20,000 DWT accounts for 3.6% of the total (Figure 2). Therefore, bulk carriers of less than 20,000DWT are responsible for approximately as small as 6% of the total CO<sub>2</sub> emissions from all the bulk carriers. Considering that the number of ships belonging to Category II is large, that the works associated with the application of the requirement of Required EEDI and the enforcement are enormous, and that the CO<sub>2</sub> emissions from ships in Category II are small, it is reasonable to exempt ships in Category II from the application of the Required EEDI requirements.*

*Also, there is a possibility that baselines for certain ship types cannot be developed because of some reasons such as the lack of enough data for establishing baselines and the excessive deviation of existing ships' data from the baselines. Ships of these types should be also exempted from mandatory compliance for Required EEDI.*

*In addition, it is considered necessary to exempt the ships operating only in waters subject to the sovereignty or jurisdiction of the State whose flag the ship is entitled to fly, as they are already covered by the existing across-sector regime. However, encouraging each Party to ensure that such ships act in a manner consistent with the provisions of the Part II is beneficial. Similar provisions are included in the Ballast Waste Management Convention and the draft Ship Recycling Convention.*

**Figure 1: Expected baseline for bulk carriers**



**Figure 2: Percentage share of CO<sub>2</sub> emissions from bulk carriers, categorized by DWT**

