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## ENERGY EFFICIENCY OF SHIPS

**Proposed amendment to paragraph 2.2.5.2 of the 2018 Guidelines on the method of calculation of the attained Energy Efficiency Design Index (EEDI) for new ships**

**Submitted by ICS and RINA**

### SUMMARY

*Executive summary:* The equation within paragraph 2.2.5.2 of the *2018 Guidelines on the method of calculation of the attained Energy Efficiency Design Index (EEDI) for new ships* (resolution MEPC.308(73), as amended) is ambiguous and for those not familiar with the intent of the guidelines has caused confusion. To provide greater clarity, the co-sponsors propose a minor change to the format of the equation.

*Strategic direction, if applicable:* 3

*Output:* 3.6

*Action to be taken:* Paragraph 6

*Related documents:* Resolution MEPC.308(73), resolution MEPC.322(74) and resolution MEPC.332(76)

### Background

1 Within paragraph 2.2.5.2 of the *2018 Guidelines on the method of calculation of the attained Energy Efficiency Design Index (EEDI) for new ships* (resolution MEPC.308(73), as amended), the following defines the power of the main engine,  $P_{ME(i)}$ :

The maximum allowable deduction for the calculation of  $\sum P_{ME(i)}$  is to be no more than  $P_{AE}$  as defined in paragraph 2.2.5.6. For this case,  $\sum P_{ME(i)}$  is calculated as:

$$\sum_{i=1}^{n_{ME}} P_{ME(i)} = 0.75 \times \left( \sum MCR_{ME(i)} - \sum P_{PTO(i)} \right) \quad \text{with } 0.75 \times \sum P_{PTO(i)} \leq P_{AE}$$

2 At first glance, the following circled parts appear inconsistent, i.e. the first statement appears to limit the maximum  $P_{PTO(i)}$  deduction to the auxiliary engine power,  $P_{AE}$ , whereas the circled equation suggests the  $P_{PTO(i)}$  deduction is limited to no more than  $P_{AE}/0.75$ .

The maximum allowable deduction for the calculation of  $\sum P_{ME(i)}$  is to be no more than  $P_{AE}$  as defined in paragraph 2.2.5.6. For this case,  $\sum P_{ME(i)}$  is calculated as:

$$\sum_{i=1}^{n,ME} P_{ME(i)} = 0.75 \times \left( \sum MCR_{ME(i)} - \sum P_{PTO(i)} \right) \quad \text{with } 0.75 \times \sum P_{PTO(i)} \leq P_{AE}$$

3 Several shipowners that are members of ICS national associations have reported confusion over this aspect of the guidelines. A representative of another NGO has also experienced the same ambiguity.

4 Having discussed this issue with IACS and others that were involved with the drafting of the guidelines, the co-sponsors understand that the intent of the regulation is to limit the  $P_{PTO(i)}$  deduction to no more than  $P_{AE}/0.75$ . Paragraph 6.5.4 of IACS procedure PR 38 provides a correct interpretation of this aspect which is reproduced below:

#### 6.5.4 One main engine with shaft generator, $0.75 \times P_{PTO} > P_{AE}$ , option 1

$$MCR_{PTO} = 2,000kW$$

$$0.75 \times P_{PTO} = 0.75 \times 2,000kW \times 0.75 = 1,125kW > P_{AE} \Rightarrow P_{PTO} = P_{AE} / 0.75 = 1,000kW$$

$$MCR_{ME} = 20,000kW$$

$$P_{ME} = 0.75 \times (MCR_{ME} - P_{PTO}) = 0.75 \times (20,000kW - 1,000kW) = 14,250kW$$

$$P_{AE} = (0.025 \times MCR_{ME}) + 250kW = 750kW$$

5 To provide greater clarity, the annex to this submission proposes an amendment to paragraph 2.2.5.2 of the guidelines.

#### Action requested of the Committee

6 The Committee is invited to consider the draft amendments to the *2018 Guidelines on the method of calculation of the attained Energy Efficiency Design Index (EEDI) for new ships* (resolution MEPC.308(73), as amended), as set out in the annex to this document and take action as appropriate.

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ANNEX

**DRAFT AMENDMENT TO 2018 GUIDELINES ON THE METHOD OF CALCULATION OF THE ATTAINED ENERGY EFFICIENCY DESIGN INDEX (EEDI) FOR NEW SHIPS (RESOLUTION MEPC.308(73), AS AMENDED BY RESOLUTIONS MEPC.322(74) AND MEPC.332(76))**

Paragraph 2.2.5.2 of the resolution MEPC.308(73), as amended, currently reads as follows:

**"2.2.5.2 P<sub>PTO(i)</sub>; Shaft generator**

In case where shaft generator(s) are installed, PPTO(i) is 75% of the rated electrical output power of each shaft generator. In case that shaft generator(s) are installed to steam turbine, PPTO(i) is 83% of the rated electrical output power and the factor of 0.75 should be replaced to 0.83.

For calculation of the effect of shaft generators two options are available:

**Option 1:**

The maximum allowable deduction for the calculation of  $\sum P_{ME(i)}$  is to be no more than  $P_{AE}$  as defined in paragraph 2.2.5.6. For this case,  $\sum P_{ME(i)}$  is calculated as:

$$\sum_{i=1}^{nME} P_{ME(i)} = 0.75 \times \left( \sum MCR_{ME(i)} - \sum P_{PTO(i)} \right) \quad \text{with } 0.75 \times \sum P_{PTO(i)} \leq P_{AE}$$

"

The co-sponsors propose to replace this text with the following:

**"2.2.5.2 P<sub>PTO(i)</sub>; Shaft generator**

In case where shaft generator(s) are installed, PPTO(i) is 75% of the rated electrical output power of each shaft generator. In case that shaft generator(s) are installed to steam turbine, PPTO(i) is 83% of the rated electrical output power and the factor of 0.75 should be replaced to 0.83.

For calculation of the effect of shaft generators two options are available:

**Option 1:**

The maximum allowable P<sub>PTO(i)</sub> deduction is to be no more than  $P_{AE}/0.75$  with  $P_{AE}$  defined in paragraph 2.2.5.6. For this case  $\sum P_{ME(i)}$  is calculated as:

$$\sum_{i=1}^{nME} P_{ME(i)} = 0.75 \times \sum MCR_{ME(i)} - 0.75 \times \sum P_{PTO(i)} \quad \text{with } \sum P_{PTO(i)} \leq \frac{P_{AE}}{0.75}$$

"