Interim Guidelines for determining minimum propulsion power to maintain the manoeuvrability of ships in adverse conditions

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Interim Guidelines for determining minimum propulsion power to maintain the manoeuvrability of ships in adverse conditions

1. International Maritime Organization (IMO)
2. Regulatory framework – MARPOL Annex VI –
3. 2013 Interim Guidelines, as amended
4. Future work plan
International Maritime Organization (IMO)

- A specialized agency of the UN
- The IMO Convention adopted in 1948 and IMO first met in 1959
- 171 Member States
- Develop and maintain a comprehensive regulatory framework for shipping
- Safety, environment, legal matters, technical co-operation, security and the efficiency of shipping

Safe, secure and efficient shipping on cleaner oceans
Regulatory framework

– MARPOL Annex VI –
MARPOL Annex VI:
- Entered into force on 19 May 2005

Revisions of Annex VI:
- Adopted in October 2008
- Entered into force on 1 July 2010

Chapter 4 on Energy Efficiency
- Adopted in July 2011
- Entered into force on 1 January 2013

Number of Contracting States: 86 (as of 30 Sept. 2015)
The combined merchant fleets of which constitute approximately 95.34% of the gross tonnage of the world’s merchant fleet
MARPOL Annex VI - Overview

- Ozone Depleting Substances
- Volatile Organic Compounds
- Nitrogen Oxides (NOx)
- Shipboard Incineration
- Sulphur Oxides (SOx)
- Energy Efficiency

New
MARPOL Annex VI – Regulations –

Chapter 1 – General
Applications, Definitions, Exceptions, Equivalents, etc.

Chapter 2 – Survey, certification and means of control
Surveys, Certificate, Port State Control, etc.

Chapter 3 – Requirements for control of emissions from ships
NOx, SOx, Ozone-depleting Substances (ODS), Volatile Organic Compounds (VOC), Shipboard Incineration, etc.
IMO Work to address GHG Emissions from Ships

IMO MEPC 62 (July 2011)

Regulations for reduction of GHG (Greenhouse Gas) from maritime sector were adopted as Amendments to MARPOL Annex VI

Entered into force on 1 Jan. 2013

- EEDI Energy Efficiency Design Index
- SEEMP Ship Energy Efficiency Management Plan
MARPOL Annex VI – Regulations –

Chapter 4 – Regulations on energy efficiency for ships

Application Reg.19
Attained Energy Efficiency Design Index (EEDI) Reg.20
Required EEDI Reg.21
Ship Energy Efficiency Management Plan (SEEMP) Reg.22
Technical co-operation and technology transfer Reg.23

Source: NYK Super Eco Ship 2030
Energy Efficiency Design Index (EEDI) - Outline

\[
\text{EEDI} = \frac{\text{Impact to environment}}{\text{Benefit to society}} = \frac{\text{Power} \times \text{fuel consumption} \times \text{CO}_2 \text{ emission factor}}{\text{Capacity} \times \text{ship speed}}
\]

- **Attained EEDI**
  For new ships, attained EEDI value shall be calculated.

- **Required EEDI**
  For new ships with more than a certain size, attained EEDI value shall satisfy the required EEDI value.

\[
\text{Attained EEDI} \leq \text{Required EEDI}
\]
Required EEDI = (1-X/100) \cdot \text{Reference line value}

X: Reduction factor

\textbf{Reference line}: Average EEDI of past 10 years ships

\[
\text{Reduction factor} : X = a \cdot b^{-c}
\]

\text{Regulatory framework} – MARPOL Annex VI –

\text{Phase 0} 2013-2014
\text{Phase 1} 2015-2019
\text{Phase 2} 2020-2024
\text{Phase 3} 2025-

IMO shall review

10% 15/20% 30%

\text{Below Y} \quad \text{Y \sim Z} \quad \text{Above Z}
2013 Interim Guidelines

for determining minimum propulsion power to maintain the manoeuvrability of ships in adverse conditions, as amended
Regulation 21 – Required EEDI

Regulation 21.5

➢ …., the installed propulsion power shall not be less than the propulsion power needed to maintain the manoeuvrability of the ship under adverse conditions as defined in the guidelines to be developed by the Organization*.

* 2013 Interim guidelines for determining minimum propulsion power to maintain the manoeuvrability of ships in adverse conditions, as amended.
Interim Guidelines – Overview

- **Application**
  - Apply to ships required to comply with EEDI regulation during Phase 0 and Phase 1
  - Bulk Carriers, Tankers and Combination Carriers (20,000 DWT or above)

- **Assessment procedure**
  - **Level 1:**
    - Minimum power lines assessment
  - **Level 2:**
    - Simplified assessment
2013 Interim Guidelines, as amended

2012
- Interim Guidelines
- MSC-MEPC.2/Circ.11

Amend definition of “Adverse conditions”

2013
- 2013 Interim Guidelines
- Resolution MEPC.232(65)

Extend the scope of application: Phase 0 to Phase 1

2014
- Amendments to the 2013 Interim Guidelines
- Resolution MEPC.255(67)

Amend criteria line for Level 1 assessment

2015
- Amendments to the 2013 Interim Guidelines, as amended
- Resolution MEPC.262(68)
MEPC 68 (May 2015)

- No support to amend the Level 2 assessment until related international research projects are completed
  - Thorough review on the Level 2 assessment would be conducted after receiving the results of ongoing projects of SHOPERA and JASNAOE in the autumn of 2016 (as agreed at MEPC 67)

- Some support for consideration and evaluation of possible amendments to the Level 1 assessment parameters
  - A proposal of new criteria lines for minimum propulsion power (by Greece and Japan)
2013 Interim Guidelines, as amended

MEPC 68 (May 2015)

- Adopted amendments to the 2013 Interim Guidelines (MEPC.262(68))

Table 1: Parameters a and b for determination of the minimum power line values for the different ship types

<table>
<thead>
<tr>
<th>Ship type</th>
<th>a</th>
<th>b</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulk carrier which DWT is less than 145,000</td>
<td>0.0763</td>
<td>3374.3</td>
</tr>
<tr>
<td>Bulk carrier which DWT is 145,000 and over</td>
<td>0.0490</td>
<td>7329.0</td>
</tr>
<tr>
<td>Tanker</td>
<td>0.0652</td>
<td>5960.2</td>
</tr>
<tr>
<td>Combination Carrier</td>
<td>see tanker above</td>
<td></td>
</tr>
</tbody>
</table>

- A phase-in period of six months for the application of the amendments
- A consolidate text: MEPC.1/Circ.850/Rev.1
Future work plan
MEPC 68 (May 2015)

- MEPC 68 endorsed the updated plan for the work on EEDI related issues.

### UPDATED PLAN FOR THE WORK ON EEDI RELATED ISSUES

<table>
<thead>
<tr>
<th>Year</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEPC sessions</td>
<td>MEPC 68</td>
<td>MEPC 69</td>
<td>MEPC 70</td>
<td>MEPC 71</td>
</tr>
<tr>
<td>Regulatory framework (reference lines and reduction factors) for:</td>
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<tr>
<td>- cruise passenger ships (conventional propulsion)</td>
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<tr>
<td>- passenger ships other than cruise passenger ships (conventional/non-conventional propulsion)</td>
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<tr>
<td>- ships having non-conventional propulsion other than LNG carriers and cruise passenger ships</td>
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<tr>
<td>Consideration of EEDI calculation method for ships having non-conventional propulsion other than LNG carriers and cruise passenger ships</td>
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<tr>
<td>Consideration of Guidelines for determining minimum propulsion power needed to maintain the manoeuvrability of the ship under adverse conditions</td>
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</tbody>
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All up-to-date information available from:

Thank you for your attention

For more information please see:

www.imo.org