

MARINE ENVIRONMENT PROTECTION  
COMMITTEE  
67th session  
Agenda item 4

MEPC 67/INF.22  
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## AIR POLLUTION AND ENERGY EFFICIENCY

### Japanese activity on "Minimum propulsion power to maintain the manoeuvrability of ships in adverse conditions"

Submitted by Japan

#### SUMMARY

*Executive summary:* This document provides information about Japanese activity on "Minimum propulsion power to maintain the manoeuvrability of ships in adverse conditions"

*Strategic direction:* 7.3

*High-level action:* 7.3.2

*Planned output:* 7.3.2.1

*Action to be taken:* Paragraph 7

*Related documents:* MEPC 64/4/13, MEPC 64/INF.7, MEPC 64/4/42, MEPC 64/23; MEPC 65/4; MEPC.232(65); MEPC 66/4/10, MEPC 66/INF.25; MSC 93/21/5, MSC 93/INF.13; MEPC 67/4/16 and MEPC 67/INF.14

#### Introduction

1 With regard to propulsion power needed to maintain the manoeuvrability under adverse conditions, provided in regulation 21.5 of MARPOL Annex VI, a number of proposals and comments were submitted or expressed by various Member States and observers. After intensive discussions, the *2013 Interim Guidelines for determining minimum propulsion power to maintain the manoeuvrability of ship in adverse conditions* (hereinafter referred to as the 2013 Interim Guidelines), were adopted at MEPC 65.

2 In the 2013 Interim Guidelines, a ship which fulfils one of two assessment levels (i.e. minimum power lines assessment and simplified assessment) is considered to have sufficient power to maintain manoeuvrability in adverse conditions. This assessment procedure is basically derived from a concept proposed by IACS in documents MEPC 64/4/13 and MEPC 64/INF.7. Though there was originally one more assessment level in addition to these two assessment levels (i.e. comprehensive assessment level), the Committee concluded that it was premature to be included in the Guidelines, at that time.

3 In order to establish a "comprehensive" assessment method, the Japan Society of Naval Architects and Ocean Engineers (JASNAOE) established a Strategy Research Committee on the Minimum Propulsion Power in 2014, chaired by Professor Yasukawa from Hiroshima University and launched an R&D project in cooperation with Class NK and stakeholders of Japanese maritime industry. Most of the relevant experts in Japanese universities, classification societies, industries and research institutions such as National Maritime Research Institute (NMRI) and National Research Institute of the Fisheries Engineering, participated in the R&D project.

### **Outline of the R&D project**

4 The purpose of the R&D project is to develop technically rational methods to determine minimum propulsion power to maintain ship manoeuvrability under adverse conditions. The R&D project consists of the following research:

- .1 to develop and improve hydrodynamic and aerodynamic simulation tools (or numerical calculation methods of equilibria and their stability), including the low-speed manoeuvring simulation models, steady wave force model in waves and an estimation of fluctuating propeller torque;
- .2 to develop model test procedure, including free-running model test, operation scenario etc.;
- .3 to validate the developed tools mentioned in .1 above and their applicability to other ship types; and
- .4 to establish a rigorous methodology for the determination of minimum propulsion power.

5 The process and final results of the R&D project will be provided to stakeholders in both Japanese and English languages. The results of the R&D project are expected to contribute to the further consideration of minimum propulsion power during discussions in IMO, and also to be utilized for ship design, such as optimization of main engine output and ship speed, taking both efficiency and safety into consideration.

6 Taking into account recent worldwide increasing requests for the development of comprehensive guidelines, Japan believes that it would be desirable that organizations and groups concerned in this issue, including academic societies, classification societies and other organizations of maritime stakeholders, work collaboratively. Japan is willing, therefore, to exchange views on this issue and to provide the results of Japanese R&D projects in a timely manner for that collaborative action. It would be highly appreciated if outputs of other similar projects would also be submitted to MEPC. It would be expected to develop comprehensive guidelines for determining minimum propulsion power to maintain the manoeuvrability of ship in adverse conditions, utilizing and/or integrating the results of these projects on this issue.

### **Action requested of the Committee**

7 The Committee is invited to note this information.

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