

MARINE ENVIRONMENT PROTECTION  
COMMITTEE  
77th session  
Agenda item 11

MEPC 77/INF.6  
16 September 2021  
ENGLISH ONLY  
Pre-session public release:

## WORK PROGRAMME OF THE COMMITTEE AND SUBSIDIARY BODIES

### Assessment on certification of SCR systems and application of IACS Unified Interpretation MPC112 Rev.1

Submitted by EUROMOT

#### SUMMARY

*Executive summary:* EUROMOT took note of the proposed revision of the *2017 Guidelines addressing additional aspects of the NO<sub>x</sub> Technical Code 2008 with regard to particular requirements related to marine diesel engines fitted with Selective Catalytic Reduction (SCR) systems* (resolution MEPC.291(71) as amended by resolution MEPC.313(74)) (the 2017 SCR Guidelines, as amended). In order to facilitate the ongoing discussion on the certification of engine-SCR systems, EUROMOT would like to inform on a position paper which describes proven alternative ways to detect the deterioration rate of SCR performance with the use of currently available technology of NO<sub>x</sub> measurement devices

*Strategic directions, if applicable:* 1 and 6

*Output:* Not applicable

*Action to be taken:* Paragraph 4

*Related documents:* MEPC 77/11/2 and resolution MEPC.291(71) as amended by resolution MEPC.313(74)

#### Introduction

1 EUROMOT has noted the request for a new output on revising the *2017 Guidelines addressing additional aspects of the NO<sub>x</sub> Technical Code 2008 with regard to particular requirements related to marine diesel engines fitted with Selective Catalytic Reduction (SCR) systems* (resolution MEPC.291(71), as amended by resolution MEPC.313(74)) (the 2017 SCR Guidelines, as amended), as proposed in document MEPC 77/11/2 (Marshall Islands et al.). In that document, specific changes to the 2017 SCR Guidelines, as amended, are presented, which are based on recently published IACS Unified Interpretations (UIs).

### **EUROMOT assessment**

2 EUROMOT would like to draw the attention of the Committee to a proposal in document MEPC 77/11/2 on further requirements on the application of paragraph 3.2.8.1 of the 2017 SCR Guidelines, as amended. These are based on IACS UI MPC112 Rev.1 and require a NO<sub>x</sub> measurement device to be within a specified margin compared to the analyser used during the parent engine test, in order to be accepted for monitoring of degradation of the SCR catalyst. This requirement on NO<sub>x</sub> measurement devices, which are used to detect the deterioration rate of SCR performance, is in EUROMOT's view disproportionate and not in line with today's available technology for NO<sub>x</sub> sensors.

3 NO<sub>x</sub> sensors are already used in marine and many land-based on- and off-highway engine applications. In the annexed position paper, EUROMOT provides further details on how to assure the emission-compliant operation and introduces proven ways to use NO<sub>x</sub> measurement devices for monitoring SCR catalyst condition/degradation as required in paragraph 3.2.8.1 of resolution MEPC.291(71).

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

4 The Committee is invited to note the information contained in this document.

\*\*\*

## ANNEX

### EUROMOT ASSESSMENT ON CERTIFICATION OF SCR SYSTEMS AND APPLICATION OF IACS UNIFIED INTERPRETATION MPC112 REV. 1

#### Position Paper as of 26 July 2021

EUROMOT members have already introduced a broad range of engine/SCR systems which comply with IMO Tier III requirements. Details on the certification of these systems are defined in the NO<sub>x</sub> Technical Code 2008 and resolution MEPC.291(71) (the 2017 SCR Guidelines).

Depending on the size of the system, its intended use in the ship and the requirements of the customer, there is a broad variation of technical solutions on the market. Certification and the definition of system-specific details have always been carried out jointly in cooperation between applicants and IACS member associations.

In that regard, EUROMOT is concerned that the interpretation of requirements on paragraph 3.2.8.1 of the 2017 SCR Guidelines as stated in IACS UI MPC112 Rev.1 of November 2019\* may lead to obstacles during the certification of upcoming engine-SCR systems and resulting unsolved questions regarding the use of NO<sub>x</sub> sensors. EUROMOT would like to provide feedback, based on its members' experiences, to facilitate the certification of engine-SCR systems:

NO<sub>x</sub> sensors are used in many land-based on- and off-highway engine applications in manifold ways with good experiences.

In marine use, NO<sub>x</sub> sensors are widely used in engine-SCR systems, (feed forward and feedback control systems). They can either be a part of the engine control or self-diagnostic system or the readings of a NO<sub>x</sub> sensor can be used for example as the primary method for catalyst condition monitoring.

Currently available NO<sub>x</sub> sensors provide, depending on environmental conditions and concentration level, an accuracy in the range of 10-15%, whereas IACS UI MPC112 Rev.1 requires a 5% accuracy compared to the readings of the analyser during the parent engine test. That requirement is not in line with today's technical solutions; however, manufacturers carry out sufficient compensation measures to assure the emission-compliant operation.

In addition to other mounting- and operating-instruction of the manufacturer of the sensors, that technology-specific accuracy is an important parameter for all applicants. Manufacturers of engine-SCR systems consider that parameter already today responsibly during the layout of their systems.

It is EUROMOT's view that the use of current NO<sub>x</sub> sensor technology should be possible by the individual applicant demonstrating that the system achieves emissions control within the limit. Technical flexibility should be maintained to provide the optimal clean and efficient solution to the marine sector.

Regarding the application of IACS interpretation on paragraph 3.2.8.1 of the 2017 SCR Guidelines, EUROMOT proposes to accept the use of currently available NO<sub>x</sub> sensor technology.

---

\* UI MPC112 2017 Guidelines Addressing Additional Aspects of the NO<sub>x</sub> Technical Code 2008 with regard to Particular Requirements related to Marine Diesel Engines fitted with Selective Catalytic Reduction (SCR) Systems (Resolution MEPC.291(71), Section 3.2.8) – Rev.1 Nov 2019 Clean.

That could be achieved by adapting the accuracy range to the current level of technology (+/-15%), using the sensors for calculation the NO<sub>x</sub> reduction (resulting +/-5% accuracy for reduction percentage) or accepting alternative concepts where the accuracy of the sensors and related components are reflected in the design margin of the system layout.

### **EUROMOT proposal**

**1 For the application of paragraph 3.2.8.1 of the 2017 SCR Guidelines:**

A NO<sub>x</sub> measurement device, incorporated in an SCR feedback or feed forward reductant control system, is not required to be in compliance with appendix III of the NO<sub>x</sub> Technical Code 2008 if the suitability of this NO<sub>x</sub> measurement device had been proven by the applicant.

**2 The suitability shall be verified by one of the following:**

- .1 Comparing the emission data of the NO<sub>x</sub> measurement device with the results of an analyser complying with paragraph 3.4 of appendix III of the NO<sub>x</sub> Technical Code 2008. The values of the engine-out emissions obtained by the NO<sub>x</sub> measurement device shall not differ by more than ±15% from the readings of the analyser.
- .2 As above, except that the NO<sub>x</sub> reduction values shall not differ by more than ±5%-points from the readings of the analyser, where NO<sub>x</sub> reduction is directly used as a means of monitoring catalyst condition/degradation.
- .3 Alternative concepts where the accuracy of the sensors and related components are reflected in the design margin of the system layout.

**3** The applicant shall specify the accuracy of the NO<sub>x</sub> measurement device based on a defined calibration procedure and/or exchange requirements for the device.

---