



TECHNICAL INFORMATION

36 Myeongji ocean city 9-ro,
Gangseo-gu, Busan, 618-814
Republic of Korea

Phone : +82-70-8799-8325
Fax : +82-70-8799-8319
E-mail : kimjhas@krs.co.kr
Person in charge : KIM, Joonghun

No : 2022-IMO-01
Date : 31st May, 2022

2021 EGCS GUIDELINE (Res. MEPC 340(77))

1. Background

RESOLUTION MEPC.340(77) - 2021 GUIDELINES FOR EXHAUST GAS CLEANING SYSTEMS was adopted on 26 November 2021 and it will apply to all EGCS installations considering the subject system and date of application on or after 1 June 2022.

In the case of EGCS installed before 1 June 2022, the existing guidelines (Resolution MEPC 259(68)) still can be applied. However, please be advised that if ETM-A or ETM-B is amended on or after the effective date, the new guidelines must apply.

2. Application

Subject and date of application

1) These Guidelines apply to:

(a) EGCSs installed on ships the keels of which are laid or which are at a similar stage of construction on or after 1 June 2022; or

(b) EGCSs installed on ships the keels of which are laid or which are at a similar stage of construction before 1 June 2022 which have a contractual delivery date of EGCS to the ship on or after 1 June 2022 or, in the absence of a contractual delivery date, the actual delivery of the EGCS to the ship on or after 1 June 2022; or

(c) Amendments as those specified in *4.2.2.4 or **5.6.3 to existing EGCSs undertaken on or after 1 June 2022.

* Amendments to the ETM-A which reflect EGCS changes that affect performance with respect to emissions to air and/or water should be approved by the Administration. Where additions, deletions or amendments to the ETM-A are separate to the ETM-A as initially approved, they should be retained with the ETM-A and should be considered as part of it.

** Amendments to the ETM-B which reflect EGCS changes that affect performance with respect to emissions to air and/or water should be approved by the Administration. Where additions, deletions or amendments to the ETM-B are separate from the ETM-B as initially approved, they should be retained with the ETM-B and should be considered as part of it.

2) The Appendix 3*** in new guideline that should be applied when undertaking related sampling from exhaust gas cleaning systems that have been approved in accordance with the earlier version of the EGCS Guidelines; Res. MEPC. 259(68)

*** Appendix 3 DISCHARGE WATER DATA COLLECTION

3. Content(s)

The points described below are notable changes to the revised guidelines. The contents in the square box refer to the text of the guidelines. Yellow shade is the newly revised contents.

1) Scheme A

The new guidelines state daily SO₂/CO₂ Emission checks which should be performed for EGCS installed under scheme A if a continuous exhaust gas monitoring system is not fitted.

4.4.8 Under Scheme A, if a continuous exhaust gas monitoring system is not fitted, a daily spot check of the Emission Ratio for a duration of not less than five minutes at a minimum recording frequency of 0.1 Hz at normal working condition for each outlet to the atmosphere should be undertaken to verify compliance in conjunction with the continuous monitoring of the parameters stipulated in 4.4.7. The exhaust gas readings should be allowed to stabilize before commencing recording. Readings from the calibration procedure should be automatically recorded or noted in a calibration protocol. Emission values, which are used to determine the Emission Ratio, obtained after stabilization should be recorded. If a continuous exhaust gas monitoring system is fitted, only daily spot checks of the parameters listed in paragraph 4.4.7 would be needed to verify proper operation of the EGC unit.

The revised form of the SO_x Emissions Compliance Certificate(SECC) issued to the EGCS installed as Scheme A is as follows.

APPENDIX 1

FORM OF SO_x EMISSION COMPLIANCE CERTIFICATE

This is to certify that the exhaust gas cleaning system (EGCS) listed below has been surveyed in accordance with the specifications contained under Scheme A in the 20XX Guidelines for exhaust gas cleaning systems adopted by resolution MEPC.YYY(ZZ).

This Certificate is valid only for the EGCS referred to below:

System manufacturer	Model/type	Serial number	This EGCS is certified as providing following equivalency :		EGCS – Technical Manual for Scheme A (ETM-A) approval reference
			Fuel oil Sulphur limit values;	Maximum Sulphur content of fuel oils to be used:	
			0.10%	% / n/a*	
			0.50%	%	

*delete as applicable

2) Documents – OMM, ETM and SECP

- (1) Detailed procedures on how to make reports indicating *non-compliant conditions or temporary ongoing compliance in accordance with 8.2.8 should be included in ETM (4.2.2.1.9 and 5.6.1.7)

Moreover, in accordance with MEPC.1/Circ.883 Rev.1 (paragraph 10 of Annex) the limits of a short-term temporary emission exceedances should be included in ETM. Also, ETM-B should include the advised maximum fuel Sulphur content for the operational conditions the EGCS is designed for.

*non-compliant means it does not meet Regulation 14, Annex VI in MARPOL

4.2.2 EGCS Technical Manual "Scheme A" (ETM-A)

4.2.2.1 Each EGCS should be supplied with an ETM-A provided by the manufacturer. This ETM-A should, as a minimum, contain the following information:

9 detail the procedure to produce reports regarding operation in a non-compliant condition, or in a condition where the ongoing compliance would be temporary indicated in accordance with 8.2.8.

5.6 EGCS Technical Manual "Scheme B" (ETM-B)

5.6.1 Each EGCS should be supplied with an ETM-B provided by the manufacturer. This ETM-B should, as a minimum, contain the following information:

5.6.1.2.2 .2 the advised maximum fuel sulphur content for the operational conditions the EGCS is designed for (Note: higher sulphur content fuel oils may be used provided the relevant Emission Ratio value is not exceeded);

5.6.1.7 detail the procedure for producing reports regarding operation in a non-compliant condition, or in a condition where the ongoing compliance would be temporary indicated in accordance with 8.2.8.

- (2) The means to temporarily indicate ongoing compliance in the event of a failure of a single monitoring device (8.2.8) in regard to MEPC.1/Circ.883/Rev.1. should be included in the Onboard Monitoring Manual (OMM).
- (3) In accordance with paragraph 8.2.10, Guidance for the indicator that may signify a malfunction of EGCS should be included.

8.2.8 the means by which ongoing compliance would be temporarily indicated in the case of the failure of a single monitoring device, taking into account that transitory periods of emission exceedances and/or isolated spikes in the recorded output in the Emissions Ratio do not necessarily mean non-compliant exceedance of emissions and should therefore not be considered as a breach of the requirements;

8.2.10 guidance as to data or other indications which may signify a malfunction of either an analyser, an item of ancillary equipment or an operating parameter sensor together with the fault-finding and corrective actions which should be taken;

- (4) The OMM shall include a description of the operating conditions required for verification when the exhaust gas scrubber is to be operated to demonstrate the functionality of the monitoring device of the exhaust gas scrubber installed with Scheme B upon initial survey.

8.4 Under scheme B, where operation of the EGCS is required in order to demonstrate the functionality of the monitoring system during installation or initial surveys, the OMM should describe the operational condition(s) which demonstrate the operational behaviour of the monitoring system and which should be used when surveying in accordance with paragraph 5.3.1. The description of operational condition(s) may include:

- .1 the connected fuel oil combustion unit load point(s); and
- .2 the minimum operating time at a given load point.

- (5) Ship Emission Compliance Plan (SECP) maintains records of actions initiated to meet the requirements of these guidelines in the event of breakdown of an EGCS or related equipment in accordance with MEPC.1/Circ.883/Rev.1. It should also include information to be notified to the relevant flag State and port state's administrations in accordance with MEPC.1/Circ.883/Rev.1.

9.1.4 The SECP should advise that records should be kept of actions initiated to meet the requirement of these Guidelines in case of breakdown of the EGCS or associated equipment, and that the relevant flag and port State's Administration should be notified, in accordance with MEPC.1/Circ.883/Rev.1.

3) Emission testing

- The new guidelines states that extractive sample systems should be verified to be free of ingress leakage. This should be verified by the surveyor on site.

6.10 Extractive sample systems should be verified to be free of ingress leakage in accordance with the analysing equipment manufacturers' recommendations at intervals as defined in the OMM. It should be verified that the system is free of ingress on initial start-up and as given in the OMM with the findings from those checks recorded in the EGCS Record Book.

4) Data recording and processing device

- The new guideline requires data recording and reporting devices to record and report not only the required measured values regard to paragraph 4.4.7, 5.4.2 and 10.3 but also applicable limit values for all operating and emission-related parameters. It is essential that the data processing device have an ability to identify whether a vessel is sailing inside or outside an Emission Control Area (ECA) to be able to report applicable emission rate limit values.

7 DATA RECORDING AND PROCESSING DEVICE

7.2 The recording and processing device should record, whenever the EGCS is in operation, the data described in 4.4.7, 5.4.2, and 10.3 as applicable, including overboard discharges from any associated tanks within the system, against UTC and ship's position as given by a Global Navigational Satellite System (GNSS) and whether the ship was inside or outside an Emission Control Area as given by regulation 14.3 at that time. The device should also be capable of:

<p>.1 (Scheme B only) being automatically set, or pre-set, with the Emission Ratio limit value as appropriate to the sea area, in relation to regulation 14.3, where the ship is operating;</p> <p>.2 being automatically set, or pre-set, with the applicable overboard pH limit value;</p> <p>.3 being automatically set with the applicable PAH limit value;</p> <p>.4 recording the aggregated time in excess of 15 minutes over any rolling 12-hour period that the differential PAH value is above the set limit value by more than 100%;</p> <p>.5 being pre-set with the applicable turbidity limit value;</p> <p>.6 recording the aggregated time in excess of 15 minutes over any rolling 12-hour period that the rolling average differential turbidity value is above the set limit value by more than 20%; and</p> <p>.7 recording preset and set limit values.</p> <p>7.5 The device should be capable of downloading a copy of the recorded data and reports in a readily useable format clearly indicating periods of non-compliance. Such copy of the data and reports should be available to the Administration or port State control as requested.</p>

5) Discharge monitoring

(1) A new limit has been established for the discharge water from the temporary storage tank, and the limit value should be applied only to the case of direct discharge to the sea. And it could be discharged together with discharge water during open loop mode of EGCS provided that each emission limit is satisfied.

<p>10.1.7 Discharge water from temporary storage</p>	
<p>10.1.7.1 Any discharge water originating from the EGCS and discharged overboard following temporary storage within any tank designed for that purpose and featured in the ETM-A or ETM-B should be monitored/recorded in accordance with 10.2.1, and meet, independent of any flow rate, the following discharge water criteria:</p>	
pH	See paragraph 10.1.2
PAH	Maximum of 50 µg/L PAH _{phe} (phenanthrene equivalence) before any dilution for control of pH
Turbidity	Not greater than 25 FNU (formazin nephelometric units) or 25 NTU (nephelometric turbidity units) or equivalent units, before any dilution for pH control
<p>10.1.7.2 When demonstration of compliance with the provisions contained within this section is not possible, the water intended for discharge should be considered EGCS residue.</p>	

(2) Nitrate

(a) Nitrate discharge data can now also be presented as the difference between concentrations in the inlet water and in the discharge water.

<p>10.1.5.2 Within the first three months of operation after installation/initial survey and three months prior to each renewal survey a sample of the discharge water from each EGCS should be drawn and analysed for nitrate content and results should be made available to the Administration. However, the Administration may require an additional sample to be drawn and analysed at its discretion. The nitrate discharge data and analysis certificate is to be retained on board the ship as part of the EGCS Record Book and to be available for inspection as required by port State control or other parties. Criteria in respect of sampling, storage, handling and analysis should be detailed in the ETM-A or ETM-B as</p>
--

applicable. To assure comparable nitrate discharge rate assessment, the sampling procedures should take into account 10.1.5.1, which specifies the need for discharge water flow normalization. Nitrates discharge data is to be presented as the difference between concentrations in the inlet water and in the discharge water. The test method for nitrate should be ISO 13395:1996, ISO 10304-1:2007, US EPA 353.2 or other internationally accepted equivalent test standard (suitable for seawater).

- (b) Under scheme B, the sampling and reporting of nitrate analysis results which is gathered from similar design could be used as an alternative to the sampling, analysis and quantification requirements of 10.5.2 with the agreement of the Administration.

For this, Manufacturer should submit technical review or relevant document to this society to check an engineering analysis which demonstrates the design similarities in respect of nitrate concentrations in the discharge water.

10.1.5.3 Data on discharge water nitrate concentrations gathered from EGCSs of similar design could be used as an alternative to the sampling, analysis and quantification requirements of 10.1.5.2 with the agreement of the Administration based on an engineering analysis which demonstrates the design similarities in respect of nitrate concentrations in the discharge water.

- (3) These guidelines newly requires approval of discharge water monitoring with the minimum logging frequency is 0.0111 Hz. And, Calibration and instrument drift data should, as given in the OMM, be either recorded by the data recording system or manually entered in the EGCS Record Book as appropriate to the means used.

10.4.1 The data recording system should comply with the requirements of sections 7 and 8 and should continuously record pH, PAH and turbidity in accordance with 10.2.1 at a frequency of not less than 0.0111 Hz.

10.4.2 Calibration and instrument drift data should, as given in the OMM, be either recorded by the data recording system or manually entered in the EGCS Record Book as appropriate to the means used.

- (4) In the new guidelines, it stated Design guidance for water sampling points/valves.

10.7.1 Each sampling point should be installed at a location that is representative of the main washwater or discharge water stream and accessible to personnel. The sampling extraction point should be open in the direction of the water flow.

- 6) Phenanthrene equivalent

The terminology "Phenanthrene equivalent" is defined. Definitions can be found in Table 3 of this guidelines. This is related to Discharge water monitoring unit.

Phenanthrene equivalent

It corresponds to the signal produced by a PAH monitor with excitation wavelengths between 244 nm and 264 nm (254±10 nm) and detection wavelengths between 310 nm and 410 nm (360±50 nm) calibrated against a known set of phenanthrene concentrations within the expected measurement range when exposed to EGCS discharge water containing a range of different PAH species.

7) Appendices

-Appendix 3 DISCHARGE WATER DATA COLLECTION

The appendix 3 is fully amended, now which include Recommended procedure for sampling, 3 Recommended template for submitting sampling data and so on.

-Appendix 4 STANDARD SEAWATER TITRATION CURVE

This appendix can use be used in calculated-base methodologies to calculate that the discharge water meet the PH criteria (10.1.2) in the new guideline.

-Appendix 5 ANALYSER INFORMATION TEMPLATES

This template can be used to meet the requirements of subsection 8.2 of these guidelines which certain information, as a minimum, should be included in the OMM in order to facilitate surveys and inspections.

This technical information was published by Convention& legislation team (Convention@krs.co.kr) to give information about the new EGCS guideline, Res. MEPC 340(77).

- If you have any technical questions regarding plan and document approval for EGCS, please contact the Environment & Piping Team. (piping@krs.co.kr, 070-8799-8460).

- If you have any technical questions regarding Type approval of the monitoring system, or equipment inspection, please contact the Marine & Ocean Equipment Team. (equipment@krs.co.kr, 070-8799-8267)

Reference

- Res. MEPC.259(68) - 2015 Guidelines for Exhaust Gas Cleaning Systems
- Res. MEPC.340(77) - 2021 Guidelines for Exhaust Gas Cleaning Systems
- MEPC.1/Circ.883/Rev.1 - Guidance on indication of ongoing compliance in the case of the failure of a single monitoring instrument, and recommended actions to take if the exhaust gas cleaning system (EGCS) fails to meet the provisions of the EGCS guidelines.

(Distributions : KR surveyors, Ship owners, Manufacturers, Other relevant parties)

Disclaimer :

Although all possible efforts have been made to ensure correctness and completeness of the contents contained in this information service, the Korean Register is not responsible for any errors or omissions made herein, nor held liable for any actions taken by any party as a result of information retrieved from this information service.