South African Maritime Safety Authority

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Marine Notice No. 42 of 2020

The use of Exhaust Gas Cleaning System (EGCS) in South African waters and Ports

TO ALL SHIP OWNERS, SHIP OPERATORS, MASTERS, BUNKER SUPPLIERS AND PRINCIPAL OFFICERS

This is supplementary to Marine Notice 8 of 2019 (Effective implementation of IMO 2020 0.50% sulphur cap. To be read in conjunction with Marine Notice 8 of 2019.

Summary

This Marine Notice serves to update on the country's transitional position regarding the use of Exhaust Gas Cleaning System (EGCS) in South African waters, in line with the global implementation of the International Convention for the Prevention of Pollution from Ships (MARPOL) Annex VI limit of 0.50 mass per cent concentration (0.50% m/m) sulphur content in fuel oil, for all ships, effective 1 January 2020.

This Marine Notice was drafted in consultation with the Transnet National Port Authority (TNPA) and the Department of Environment, Fisheries and Forestry (DEFF).

a) Introduction

As the custodian of the 1954 International Convention for the prevention of pollution of the sea by oil (OILPOL Convention), the International Maritime Organization, soon after it began functioning in 1959, assumed responsibility for pollution issues and subsequently has, over many years, adopted a wide range of measures to prevent and control pollution caused by ships and to mitigate the effects of any damage that may occur as a result of maritime operations and accidents.

The original focus of its work was the prevention of marine pollution by oil, resulting in the adoption of the first ever comprehensive antipollution convention, the International Convention for the Prevention of Pollution from Ships (MARPOL) in 1973. This has changed over the last few decades to include a much wider range of measures to prevent marine pollution, and the original MARPOL Convention was amended many times to also include requirements addressing pollution from chemicals, other harmful substances, garbage, sewage and, under an Annex VI adopted in 1997, air pollution and emissions from ships.

In recent years IMO has identified shipping as a growing source of greenhouse gases. This led to IMO sanctioning studies over the years to quantify shipping contribution to greenhouse gases. This culminated in IMO publishing the First Greenhouse Gas Emissions Study in 2000 and the Second Study in 2009.

The Third Study was published in 2014 with the Fourth Study expected to be published later in 2020. These studies are part of the 3-step approach evidence based decision making in progressing shipping's response to climate change.

From 1 January 2020, the limit for sulphur in fuel oil used on board ships operating outside designated emission control areas was reduced to 0.50% m/m (mass by mass).

There are various options that are presented and adopted by the International Maritime Organisation (IMO) to ensure that ship owners and operators can comply with these requirements, chief of which is the use of the compliant 0.50% fuel oil.

This include amongst other options, usage of distillates, blended fuel oil, other cleaner fuels, and installation of exhaust gas cleaning technology.

Reports from vessels calling at their first port of call in South Africa, between the period April 2020 and July 2020, have shown the following statistics in terms of the use of Exhaust Gas Cleaning Systems:

EGCS	APR	MAY	JUN	JUL
CLOSED	1	5	5	4
EGCS NOT FITTED	2	0	0	0
HYBRID	9	7	9	10
OPEN	70	107	99	110
OPEN/CLOSED	2	1	0	1
OPEN/HYBRID	1	0	0	0
CLOSED OR HYBRID	0	0	0	1
OPEN LOOP ONLY FOR DDGG-BOILER	0	0	0	2
OTHER (i.e. Compliant Fuel or other means)	546	603	514	515
MONTH TOTAL	**632**	**723**	**627**	**643**

b) The use of Exhaust Gas Cleaning System (EGCS)

The use of exhaust gas cleaning systems, also known as scrubbers, is a commercially available option for the shipping industry. Ships installed with scrubbers mean they can continue to burn high-sulphur bunker fuel from 2020 and comply with the 0.5% sulphur limit. The abatement technology works by spraying alkaline water into a vessel's exhaust to remove sulphur and other unwanted chemicals, either via open-loop system, closed-loop system, or hybrid (open-and-closed loop) system.

The acceptance of exhaust gas cleaning systems (scrubbers) as an equivalent arrangement under Regulation 4 of MARPOL Annex VI for compliance with the sulphur limit is currently based on the criteria stipulated in the 2015 Guidelines for Exhaust Gas Cleaning Systems (resolution MEPC.259(68)). 2015 Guidelines for Exhaust Gas Cleaning Systems (resolution MEPC.259(68)

2015 Guidelines for Exhaust Gas Cleaning Systems (resolution MEPC.259(68)

Extract from the Guidelines:

10 WASHWATER

10.1 Washwater discharge criteria [1]

[1] The washwater discharge criteria should be revised in the future as more data becomes available on the contents of the discharge and its effects, taking into account any advice given by GESAMP.

10.1.1 When the EGC system is operated in ports, harbours, or estuaries, the washwater monitoring and recording should be continuous. The values monitored and recorded should include pH, PAH, turbidity and temperature. In other areas the continuous monitoring and recording equipment should also be in operation, whenever the EGC system is in operation, except for short periods of maintenance and cleaning of the equipment. The discharge water should comply with the following limits.

10.1.2 pH criteria

10.1.2.1 The washwater pH should comply with one of the following requirements which should be recorded in the ETM-A or ETM-B as applicable:

.1 The discharge washwater should have a pH of no less than 6.5 measured at the ship's overboard discharge with the exception that during manoeuvring and transit, the maximum difference between inlet and outlet of 2 pH units is allowed measured at the ship's inlet and overboard discharge.

.2 The pH discharge limit, at the overboard monitoring position, is the value that will achieve as a minimum pH 6.5 at 4 m from the overboard discharge point with the ship stationary, and which is to be recorded as the overboard pH discharge limit in the ETM-A or ETM-B. The overboard pH discharge limit can be determined either by means of

direct measurement, or by using a calculation-based methodology (computational fluid dynamics or other equally scientifically established empirical formulae) to be left to the approval by the Administration, and in accordance with the following conditions to be recorded in the ETM-A or ETM-B:

.1 all EGC units connected to the same outlets are operating at their full loads (or highest practicable load) and with the fuel oil of a maximum sulphur content for which the units are to be certified (Scheme A) or used with (Scheme B);

.2 if a test fuel with lower sulphur content, and/or test load lower than maximum, sufficient for demonstrating the behaviour of the washwater plume is used, the plume's mixing ratio must be established based on the titration curve of seawater. The mixing ratio would be used to demonstrate the behaviour of the washwater plume and that the overboard pH discharge limit has been met if the EGC system is operated at the highest fuel sulphur content and load for which the EGC system is certified (Scheme A) or used with (Scheme B);

.3 where the washwater flow rate is varied in accordance with the EGC system gas flow rate, the implications of this for the part load performance should also be evaluated to ensure that the overboard pH discharge limit is met under any load;

.4 reference should be made to a sea-water alkalinity of 2,200 µmol/litre and pH 8.2 [2]; an amended titration curve should be applied where the testing conditions differ from the reference seawater, as agreed by the Administration; and

[2] These values could be revised within two years for new installations following the adoption of these amended guidelines upon further inputs on the physical state of the seas resulting from the use of exhaust gas cleaning systems.

.5 if a calculation-based methodology is to be used, details to allow its verification such as but not limited to supporting scientific formulae, discharge point specification, washwater discharge flow rates, designed pH values at both the discharge and 4 m location, titration and dilution data should be submitted.

10.1.3 PAHs (Polycyclic Aromatic Hydrocarbons)

10.1.3.1 The washwater PAH should comply with the following requirements. The appropriate limit should be specified in the ETM-A or ETM-B.

10.1.3.2 The maximum continuous PAH concentration in the washwater should not be greater than 50 µg/L PAH_{phe} (phenanthrene equivalence) above the inlet water PAH concentration. For the purposes of this criteria, the PAH concentration in the washwater should be measured downstream of the water treatment equipment, but upstream of any washwater dilution or other reactant dosing unit, if used, prior to discharge.

10.1.3.3 The 50 µg/L limit described above is normalized for a washwater flow rate through the EGC unit of 45 t/MWh where the MW refers to the MCR or 80% of the power rating of the fuel oil combustion unit. This limit would have to be adjusted upward for lower washwater flow rates per MWh, and vice-versa, according to the table below.

Flow rate (t/MWh)	**Discharge concentration limit (µg/L PAHphe equivalents)**	**Measurement technology**
0 - 1	2250	Ultraviolet light
2.5	900	– ” –
5	450	Fluorescence [3]
11.25	200	– ” –
22.5	100	– ” –
45	50	– ” –
90	25	– ” –

[3] For any Flow Rate > 2.5 t/MWh Fluorescence technology should be used.

10.1.3.4 For a 15-minute period in any 12-hour period, the continuous PAH_{phe} concentration limit may exceed the limit described above by up to 100%. This would allow for an abnormal start up of the EGC unit.

10.1.4 Turbidity/Suspended Particle Matter

10.1.4.1 The washwater turbidity should comply with the following requirements. The limit should be recorded in the ETM-A or ETM-B.

10.1.4.2 The washwater treatment system should be designed to minimize suspended particulate matter, including heavy metals and ash.

10.1.4.3 The maximum continuous turbidity in washwater should not be greater than 25 FNU (formazin nephlometric units) or 25 NTU (nephlometric turbidity units) or equivalent units, above the inlet water turbidity. However, during periods of high inlet turbidity, the precision of the measurement device and the time lapse between inlet measurement and outlet measurement are such that the use of a difference limit is unreliable. Therefore all turbidity difference readings should be a rolling average over a 15-minute period to a maximum of 25 FNU. For the purposes of this criteria the turbidity in the washwater should be measured downstream of the water treatment equipment but upstream of washwater dilution (or other reactant dosing) prior to discharge.

10.1.4.4 For a 15-minute period in any 12-hour period, the continuous turbidity discharge limit may be exceeded by 20%.

10.1.5 Nitrates

10.1.5.1 The washwater treatment system should prevent the discharge of nitrates beyond that associated with a 12% removal of NO_X from the exhaust, or beyond 60 mg/l normalized for washwater discharge rate of 45 tons/MWh whichever is greater.

10.1.5.2 At each renewal survey nitrate discharge data is to be available in respect of sample overboard discharge drawn from each EGC system with the previous three months prior to the survey. However, the Administration may require an additional sample to be drawn and analysed at their discretion. The nitrate discharge data and analysis certificate is to be retained on board the ship as part of the EGC Record Book and be available for inspection as required by port State control or other parties. Requirements in respect of sampling, storage, handling and analysis should be detailed in the ETM-A or ETM-B as applicable. To assure comparable nitrate discharge rate assessment, the sampling procedures should take into account paragraph 10.1.5.1, which specifies the need for washwater flow normalization. The test method for the analysis of nitrates should be according to standard seawater analysis as described in Grasshoff *et al*.

10.1.5.3 All systems should be tested for nitrates in the discharge water. If typical nitrate amounts are above 80% of the upper limit, it should be recorded in the ETM-A or ETM-B.

10.1.6 Washwater additives and other substances

An assessment of the washwater is required for those EGC technologies which make use of chemicals, additives, preparations or create relevant chemicals in situ. The assessment could take into account relevant guidelines such as the *Procedure for approval of ballast water management systems that make use of active substances (G9)* (resolution MEPC.169(57)), and, if necessary, additional washwater discharge criteria should be established.

10.2 Washwater monitoring

10.2.1 pH, oil content (as measured by PAH levels), and turbidity should be continuously monitored and recorded as recommended in section 7 of these Guidelines. The monitoring equipment should also meet the performance criteria described below:

pH

10.2.2 The pH electrode and pH meter should have a resolution of 0.1 pH units and temperature compensation. The electrode should comply with the requirements defined in BS 2586 or of equivalent or better performance and the meter should meet or exceed BS EN ISO 60746-2:2003.

PAH

10.2.3 The PAH monitoring equipment should be capable to monitor PAH in water in a range to at least twice the discharge concentration limit given in the table above. The equipment should be demonstrated to operate correctly and not deviate more than 5% in washwater with turbidity within the working range of the application.

10.2.4 For those applications discharging at lower flow rates and higher PAH concentrations, ultraviolet light monitoring technology or equivalent, should be used due to its reliable operating range.

Turbidity

10.2.5 The turbidity monitoring equipment should meet requirements defined in ISO 7027:1999 or USEPA 180.1.

10.3 Washwater monitoring data recording

The data recording system should comply with the requirements of sections 7 and 8 and should continuously record pH, PAH and Turbidity as specified in the washwater criteria.

10.4 Washwater residue

10.4.1 Residues generated by the EGC unit should be delivered ashore to adequate reception facilities. Such residues should not be discharged to the sea or incinerated on board.

10.4.2 Each ship fitted with an EGC unit should record the storage and disposal of washwater residues in an EGC log, including the date, time and location of such storage and disposal. The EGC log may form a part of an existing logbook or electronic recording system as approved by the Administration.

c) The Study on the impact of open loop system wash water discharge on the marine environment

Resolution 2 of the South African National MARPOL workshop on implementation of MARPOL Annex VI on 0.50% sulphur limit, held on 24-25 July 2019 and aimed at establishing the state of the country readiness, and the implementation roadmap to respond to the IMO regulation of low Sulphur fuel for shipping, required South Africa to commission and complete a study on the impact of open loop system wash water discharge on the marine environment.

In the first quarter of 2020, the study was commissioned with the local South African University with the expectation to have it completed by the end of the second quarter of 2020. The imposed lockdown due to COVID-19, has negatively affected the delivery timeline of the study. This resulted in South Africa not being

able to finalise its policy on the use of open loop scrubbers, based on scientific analysis. With the current restrictions, it is estimated that the study should be finalised by December 2020.

South Africa will review its position no later than December 2020 and should there be any amendments, an updated Marine Notice will be issued.

d) Current Position

In line with Marine Notice 8 of 2019, South Africa continues to accept all type approved scrubbers and will re-evaluate its position in December 2020.

SCRUBBER USAGE	
AREA	**USAGE**
Exclusive Economic Zone	☒Permitted ☐Not Permitted
Territorial Waters	☒Permitted ☐Not Permitted
Port Limits	☒Permitted ☐Not Permitted
In Port	☒Permitted ☐Not Permitted
Non-compliant Scrubbers	☐Permitted ☒Not Permitted

The following considerations to be adhered to:

a) Masters should immediately inform the Authorities should there be a breakdown of the EGCS.
b) Masters are reminded to adhere to the requirements of Marine Notice 9 of 2019 in terms of Fuel Oil Non-Availability Reports (FONAR).
c) All records to be made available during Port State Control Inspections.
d) The National Port Authority may require the master to provide evidence that a complaint EGCS is onboard.

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