



Air Emission Compliance Options SOx Scrubber as an alternative

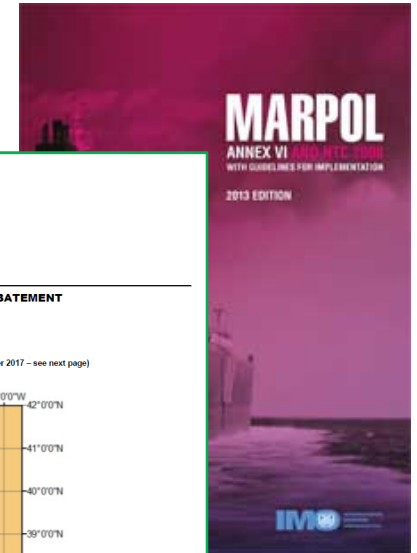
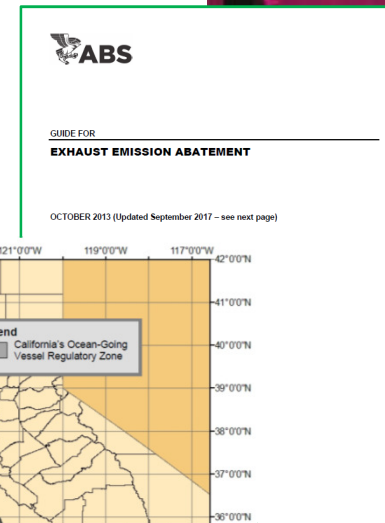
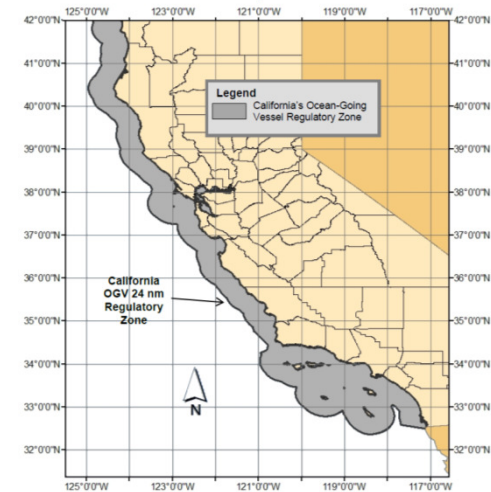
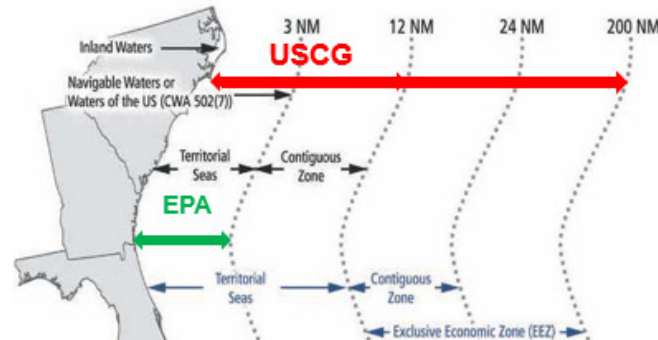
Stamatis Fradelos September 2018



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EGCS (Scrubber): Requirements and Acceptability

- Statutory Requirements
 - MEPC.259(68) – 2015 Guidelines for Exhaust Gas Cleaning Systems
 - MARPOL Annex VI
 - U.S. EPA 2013 Vessel General Permit
- Class Requirements
 - ABS Guide for Exhaust Emission Abatement Guide, 2018
- Acceptability:
 - IMO
 - EU
 - USCG
 - U.S. EPA
 - CARB



SOx Scrubber: IMO Requirements

- MEPC.259(68) – 2015 Guidelines for Exhaust Gas Cleaning Systems
- IMO accept EGCS through Reg. 4 of MARPOL Annex VI as an equivalent compliance for Ref. 14
- Subject to approval by flag to MEPC. 259 (68)
- ABS can approve on behalf of flag when authorized by the flag. Flag is requested to notify IMO their acceptance.
- IMO Global Integrated Shipping Information System (GISIS) for the available notification

<https://gisis.imo.org/Public/Default.aspx>

MEPC 68/2/Annex 1
Annex 1, page 1

ANNEX 1
RESOLUTION MEPC.259(68)
(adopted on 15 May 2015)
2015 GUIDELINES FOR EXHAUST GAS CLEANING SYSTEMS

THE MARINE ENVIRONMENT PROTECTION COMMITTEE

International Maritime Organization
Committee (the Committee)
vention and control of marine
Committee adopted, by
significantly strengthens the
Committee adopted, by
clearing systems (hereafter
on 1 July 2010,
es the use of an alternative
reactions as that required by
in regulation 14, taking into
accordingly,
ndments to the 2009 EGCS
vention and Response, at its
g systems, as set out in the
to account when allowing the
in regulation 4 of MARPOL.
Member Governments to bring
in, shiploaders, marine diesel
as described in appendix 3
the light of experience gained
resolution MEPC 194(59).

IMO
GISIS: MARPOL Annex VI

Public Area > MARPOL Annex VI
Reg. 4.2 | Reg. 11.4 | Reg. 13.7.1 | Reg. 15.2 | Regs. 17.2 | Regs. 17.3 | Reg. 18.1 | Regs.

MARPOL Annex VI

In 1997 a new annex was added to the International Convention for the Prevention of Pollution from Ships (Annex VI) seek to minimize airborne emissions from ships (SOx, NOx, O₃) environmental problems. Annex VI entered into force on 19 May 2005 and a revised Annex VI was adopted on 15 May 2015.

Notifications required by Parties to MARPOL Annex VI

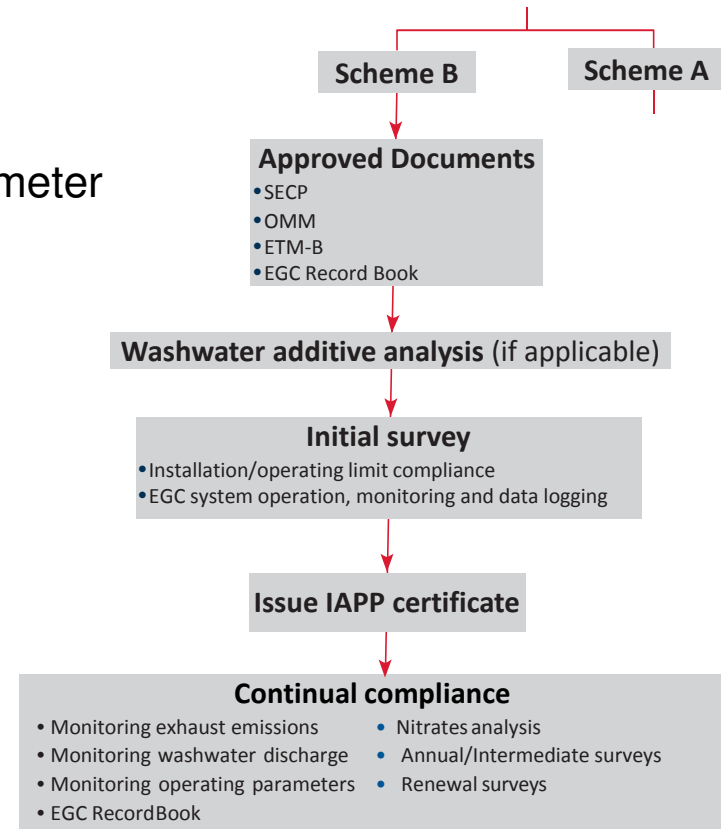
Administrations are required to make notifications to the Organization under the following regulations:

- [Regulation 4.2](#): equivalent compliance method;
- [Regulation 11.4](#): detection of violations and enforcement;
- [Regulation 13.7.1](#): approved methods for certain marine diesel engines installed on a ship as of 1 January 2020;
- [Regulation 15.2](#): ports or terminals regulating the emissions of Volatile Organic Compounds;
- [Regulations 17.2](#): ports, terminals or ship-breaking facilities where reception facilities are provided;
- [Regulations 17.3](#): ports, terminals or ship-breaking facilities where reception facilities are provided;
- [Regulation 18.1](#): fuel oil availability;
- [Regulation 18.2.5](#): evidence of non-availability of compliant fuel oil;
- [Regulation 18.9.6](#): failure of fuel oil suppliers to meet the requirements specified in regulation 18.9.6;
- [Regulation 19.6](#): allowance, suspension, withdrawal or declination of application of regulations;
- [Specimens](#): specimens of certificates.

[EEDI database Information](#)

Demonstration of Compliance: Scrubber System Approval

- MEPC. 259(68) Scheme B:
 - Continuous Monitoring of SOx emissions
 - continuous water discharge checks and spot parameter checks
- Approved documents
- Initial Survey Onboard
- Approval Letter and IAPP Certificate
- Flag and IMO Notification



SOx Scrubber: U.S. Requirements

- Statutory Bodies – USCG and EPA
- Acceptance through USCG CG-CVC Policy Letter No. 12-04 dated 25 July 2012
- EPA issued Frequently Asked Questions addresses MARPOL Annex VI compliance issues
- California Air Resource Board (CARB) does not allow the use of Scrubber in Regulated California Waters
- Discharge of washwater governed by U.S. EPA 2013 Vessel General Permit
- Some individual States impose additional requirements

Vessel General Permit for Discharges Incidental to the Normal Operation of Vessels (VGP)
Final 2013 FGP
AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
as amended (33 USC 1251 et seq.) as a means of transportation and accurate Notice of Intent (NOI) of Inspection (PARI) form and of this permit.
2. Further vessel class or type apply in addition to any general individual states and Indian Country used in this permit are provided in right December 19, 2018.

**U.S. Department of Homeland Security
United States Coast Guard**
Commandant
United States Coast Guard
2100 2nd Street, S.W.
Washington, DC 20543-0001
Staff Office: CG-CVC
Phone: (202) 372-1911
Fax: (202) 372-1911
cgCVC@uscg.mil
18711
CG-CVC Policy Letter
12-04
July 25, 2012
From: K. P. McAVOY, CAPT
COMDT - Commercial Vessel Compliance (CVC)
To: Distribution
Subject: GUIDELINES FOR COMPLIANCE AND ENFORCEMENT OF THE EMISSIONS CONTROL AREAS ESTABLISHED WITHIN THE UNITED STATES JURISDICTION AS DESIGNATED IN MARPOL ANNEX VI REGULATION 14

Frequently Asked Questions
North American and U.S. Caribbean Sea ECA - Understanding Compliance Issues
This document addresses Annex VI compliance issues for a range of circumstances. Please note that this discussion is not meant to address every possible circumstance for the topics covered. Vessel operators are encouraged to contact EPA or U.S. Coast Guard before applying these responses for a particular set of circumstances.
Exhaust Gas Cleaning Systems (EGCS)
Keeping in mind application of the International Maritime Organization's (IMO) Resolution MEPC.259(68) 2015 Guidelines for Exhaust Gas Cleaning Systems (EGCS), what are U.S. EPA requirements for the disposal of sludge from an EGCS?
Sludge or residues generated in treating exhaust gas scrubber wastewater discharge must not be discharged in waters subject to the VGP (i.e., including waters of the territorial sea up to a distance of three miles) and should be delivered ashore to an adequate reception facilities, VGP 2.2.26. The United States further expects MARPOL Annex VI Regulation 4 equivalency approvals to be conditioned upon compliance with IMO guidelines, including IMO's 2015 Guidelines for Exhaust Gas Cleaning Systems. See Regulation 4.3. The 2015 Guidelines at 4.3 explain that EGCS residues should not be discharged to the sea, and Annex VI prohibits incineration on board.
For open loop EGCS, will EPA consider the effluent pH value based on a calculation (i.e., computational fluid dynamics) as described in IMO Resolution MEPC.259(68) 2015 Guidelines for Exhaust Gas Cleaning Systems?
EPA clarified in the response to comments for the 2013 VGP that a computational calculation is not an approved method for demonstrating compliance with Vessel General Permit (VGP) pH requirements. (BTC, p.98)

EPA United States Environmental Protection Agency
Office of Transportation and Air Quality
EPA-420-F-16-005
December 2016



SOx Scrubber: EU Requirements

- Emission Abatement Methods (Scrubber)
 - Accept for ships of all flags through Article 8
 - Scrubber to comply with IMO Guidelines MEPC. 259 (68) for EGCS
 - Washwater discharge subject to local requirements
- EU member countries prohibit discharge
 - **Germany:** inland waters rivers, certain ports, Kiel Canal
 - **Belgium:** within three nautical miles off its coast
 - **Lithuania:** National authorities are of the position that open-loop scrubber wash water discharge should be prohibited in territorial waters and ports.
 - **Latvia:** Discharges of polluted water not allowed in Port Water



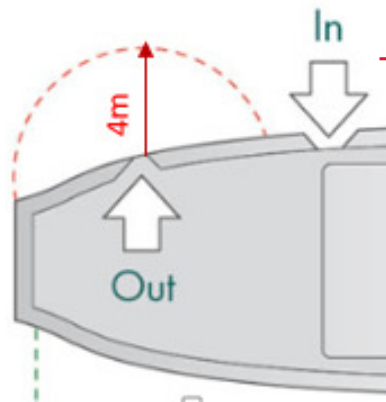
EU Water Framework Directive (WFD) puts an obligation for compliance with water quality standards on the member states. Many member states have this responsibility passed down to local ports and areas. It is advisable to contact the intended ports of operation for any potential adoption of additional requirements or change of their current position if the vessel intend to call those ports.

Demonstration of Compliance: Emission and Discharge

- Emission based on SO₂(ppm)/CO₂(% v/v) ratio values
- Continuous in service emission and discharge monitoring
- Spot check of operational parameters

- IMO:
 - pH
 - PAH, Turbidity and Nitrates
- US EPA – VGP: 3 nm territorial sea
 - pH, differ from IMO
 - PAH, Turbidity and Nitrates – Same as IMO
 - Additional sampling, analyzing and reporting requirements

Fuel Oil Sulfur Content (% m/m)	Ratio Emission SO ₂ (ppm)/CO ₂ (v/v)
0.5	21.7
0.1	4.3



Exemptions and Contingency Measures

- IMO MARPOL Annex VI
 - Reg. 3 allows exemptions for compliance “...for any emissions resulting from **damage** to a ship...”
 - Collision
 - Heavy weather
 - Accidental
 - Breakdowns
- MEPC. 259(68) has not specific contingency measures
- USCG expect certain degree of redundancy
- UK issued guidance under MGN 510

PPR 5/11/1:

Proposed Amendments to MEPC. 259(68) to include requirements for contingency measures



Thank You

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