CCS Classification Information

No. 181
Jan. 04, 2012

To: CCS Ship Surveyors, Auditors, Marshall Islands Ship Owners and Managers

Marine Notice No. 2-013-8 (Rev. 11/11) of the Maritime Administrator International Registries, Inc.（IRI）

———Implementation of the Revised MARPOL Annex VI, Regulations for the Prevention of Air Pollution from Ships.

Maritime Administrator of the Republic of the Marshall Islands provides Marine Notice No. 2-013-8 （Rev. 11/11） that Implementation of the Revised MARPOL Annex VI, Regulations for the Prevention of Air Pollution from Ships. This Notice should also be used by CCS Surveyors /auditors when conducting statutory/verification surveys/audits. Following is the detail of this Notice:

PURPOSE:

The Republic of the Marshall Islands (RMI) is a signatory to MARPOL Annex VI, which came into force 19 May 2005. Annex VI sets limits on ship sulphur oxide (SOx) and nitrogen oxide (NOx) emissions. It also regulates volatile organic compounds (VOCs), specifies fuel oil quality standards and prohibits deliberate emissions of ozone depleting substances and incineration of certain products on board ships. The revised MARPOL Annex VI, the text of which is provided under reference (b) of this Notice, entered into force on 1 July 2010. The purpose of this Notice is to detail these air emissions requirements, with which RMI-flagged ships must comply.

This Notice supersedes Rev. 12/08 and has been extensively revised to reflect the information contained in the additional and updated below references.

APPLICABILITY:

The revised MARPOL Annex VI applies to all ships – vessels of any type whatsoever operating in the marine environment, including hydrofoil boats, air-cushion vehicles, submersibles, floating craft, and fixed or floating platforms – with the following exceptions:

(a) Where expressly provided otherwise in Regulations 3, 5, 6, 13, 15, 16 and 18 of the revised Annex VI;

(b) Any emission necessary for securing the safety of a ship or saving life at sea;

(c) Any emission resulting from damage to a ship or its equipment, provided all reasonable precautions have been taken after the occurrence of the damage or discovery of the emission for the purpose of preventing or minimizing the emission, except if the owner/master either acted with intent to cause damage or acted recklessly and with the knowledge that damage would probably result; and

(d) Emissions directly arising from the exploration, exploitation and associated offshore processing of sea-bed mineral resources.

Please feel free to contact Classed Ship in Service Department of CCS for any inquiry:
Tel: +86-10-58112288（o）; Fax: +86-10-58112807; e-mail: cd@ccs.org.cn

REQUIREMENTS:

1.0 Requirements for Control of Emissions

The following emissions from ships must be addressed:

1.1 Ozone-Depleting Substances (Regulation 12)

1.1.1. *Ozone-depleting substances* (ODS) means controlled substances defined in paragraph 4 of article 1 of the Montreal Protocol on Substances that Deplete the Ozone Layer, 1987, listed in Annexes A, B, C or E to the said Protocol in force at the time of application or interpretation of this annex. ODS that may be found on board ship include, but are not limited to:

- Halon 1211 Bromochlorodifluoromethane
- Halon 1301 Bromotrifluoromethane
- Halon 2402 1,2-Dibromo-1,1,2,2-tetrafluoroethane (a/k/a Halon 114B2)
- CFC-11 Trichlorofluoromethane
- CFC-12 Dichlorodifluoromethane
- CFC-113 1,1,2-Trichloro-1,2,2-trifluoroethane
- CFC-114 1,2-Dichloro-1,1,2,2-tetrafluoroethane
- CFC-115 Chloropentafluoroethane

1.1.2. Any deliberate emissions of ODS, including emissions that occur in the course of maintenance, service, repair or disposal of systems or equipment, are prohibited. Minimal releases from the recapture or recycling of ozone-depleting substances are not considered deliberate releases.

1.1.3. These requirements do not apply to permanently sealed equipment where there are no refrigerant charging connections or potentially removable components that contain ODS.

1.1.4 Installations[1] containing ODS, other than hydro-chlorofluorocarbons (HCFCs) are prohibited on ships constructed on or after 19 May 2005. Furthermore, installations containing HCFCs are prohibited on ships constructed on or after 1 January 2010.

1.1.5 Use of appropriate reception facilities for disposal of ODS, and equipment containing those substances is required.

1.1.6 All ships 400 gross registered tons (GRT) and above, and drill rigs and platforms, regardless of tonnage, are to maintain a list of equipment containing ODS onboard the ship under section 2.1 of the Supplement to the International Air Pollution Prevention Certificate.

1.1.7 All ships 400 GRT and above, and drill rigs and platforms, regardless of tonnage, are to maintain an ODS record book for recording entries, in terms of mass (kg) of substance, and shall be completed without delay for the following occasions:

.1 Recharge, full or partial, of equipment containing ODS;

.2 Repair or maintenance of equipment containing ODS;

.3 Discharge of ODS to the atmosphere either deliberately or non-deliberately;

.4 Discharge of ODS to land-based reception facilities; and

.5 Supply of ODS to the ship.

Note 1: In the case of ships constructed before the relevant cut-off date, installations which have a contractual delivery date to the ship or, in the absence of a contractual delivery date, the actual delivery of the equipment to the ship, are prohibited on or after the relevant cut-off date.

1.2 NOx (Regulation 13)

1.2.1 These requirements do not apply to:

.1 Emergency diesel engines, engines installed in lifeboats and devices or equipment used solely for emergency; or

.2 Engines subject to alternative NOX control measures established by an Administration for vessels solely engaged in voyages within waters subject to the jurisdiction of the State the flag of which the ship is entitled to fly.

1.2.2 The operation of a marine diesel engine which is installed, or undergoes a major conversion on or after 1 January 2000 on any ship, irrespective of tonnage, except when the engine is an identical replacement to the engine that it is replacing, and subject to the approval of the RMI Maritime Administrator (the "Administrator"), is prohibited, unless it complies with the NOX emission limits and requirements specified in Regulation 13 of reference (b).

1.2.3 The specific limits and requirements for applicable marine diesel engines are subdivided into three "Tiers" summarized as follows:

.1 **Tier I** – marine diesel engines installed on a ship constructed on or after 1 January 2000 and prior to 1 January 2011. The NOX emission limits under this Tier form the baseline for subsequent Tiers, and can be found in paragraph 3 of Regulation 13 of reference (b).

.2 **Tier II** – marine diesel engines installed on a ship constructed on or after 1 January 2011. The NOX emission limits under this Tier represent a modest reduction of about 20% from the baseline limits under Tier I, and can be found in paragraph 4 of Regulation 13 of reference (b).

.3 **Tier III** – marine diesel engines installed on a ship constructed on or after 1 January 2016, when the ship is operating within a designated NOX Emission Control Area (ECA). The NOX emission limits under this Tier represent an aggressive reduction of about 80% from the baseline limits under Tier I, and can be found in paragraph 5.1.1 of Regulation 13 of reference (b).

a) Tier III requirements do not apply to marine diesel engines installed on a ship of less than 24 meters when it has been specifically designed, and is used solely, for recreational purposes.

b) Tier III requirements also do not apply when a marine diesel engine is installed on a ship with combined nameplate propulsion horsepower of less than 750 kW, or for replacement engines only after 1 January 2016, when it is not possible for the engine to meet the Tier III requirements due to specific design or construction limitations. Such exemption shall be approved by the Administrator.

c) In those cases where the Tier III requirements cannot be applied, and when applicable Tier III marine diesel engines are operated outside of a designated NOX ECA, the engine shall meet the NOX emission limits set forth under Tier II.

1.2.4 A major conversion means a modification of a marine diesel engine not already certified compliant with the NOX emission limits and requirements specified in Regulation 13 of reference (b) where:

.1 The engine is replaced by a non-identical marine diesel engine or an additional marine diesel engine is installed;

.2 Any substantial modification, as defined in reference (c), is made to the engine, or

.3 The maximum continuous rating of the engine is increased by more than 10% compared to the maximum continuous rating of the original certification of the engine.

1.2.5 Existing engines installed on a ship constructed on or after 1 January 1990, but before 1 January 2000, may be subject to comply with the NOX emission limits under Tier I when the following criteria apply:

.1 The engine has a power output of more than 5,000 kW;

.2 The engine has a per-cylinder displacement at or above 90 litres; and

.3 An Approved Method exists for that engine.

1.2.6 An Approved Method is a method for a particular engine, or range of engines, that when applied will ensure the engine complies with the NOX emission limits as applicable. This method is to be certified by a Party to MARPOL Annex VI and submitted to the International Maritime Organization (IMO) for circulation before it becomes applicable. Refer to Appendix 3 of this notice for a summary of Approved Methods circulated by the IMO as of the revision date of this notice.

1.2.7 When an Approved Method has been established for a particular type or class of engine subject to paragraph 1.2.5 above, it is required to be applied to the relevant engine no later than the first Renewal Survey beginning 12 months after the effective date of notification.

1.2.8 Ships with an engine subject to paragraph 1.2.5 above shall indicate on the International Air Pollution Prevention (IAPP) certificate either that an Approved Method is available for the relevant engine, that an Approved Method has been applied (when available), or that an Approved Method does not exist or is not yet available for the subject engines. Issuance of an Engine International Air Pollution Prevention (EIAPP) certificate is not required for engines to which an Approved Method has been applied. However, an "Approved Method File" containing information describing the Approved Method, means of survey and onboard verification procedure shall be required to accompany the engine throughout its life onboard the ship.

1.3 SOx (Regulation 14)

1.3.1 The sulphur content of any fuel oil used on board a ship, when operating outside of a designated SOX ECA, shall not exceed the following limits:

.1 4.50% m/m prior to 1 January 2012;

.2 3.50% m/m on and after 1 January 2012; and

.3 0.50% m/m on and after 1 January 2020.

1.3.2 The sulphur content of any fuel oil used on board a ship, when operating within a designated SOX ECA, shall not exceed the following limits:

.1 1.50% m/m prior to 1 July 2010;

.2 1.00% m/m on and after 1 July 2010; and

.3 0.10% m/m on and after 1 January 2015.

1.3.3 All ships using separate fuel oils when operating within an ECA are to carry a written fuel oil changeover procedure, developed specifically for that ship, detailing:

.1 A step-by-step process for carrying out the fuel oil changeover; and

.2 Methods for calculating the time necessary to ensure the fuel oil service system is fully flushed of all fuel oils exceeding the applicable sulphur content limit prior to entering into the ECA.

1.3.4 All ships using separate fuel oils when operating within an ECA are to also maintain a log book for recording entries[2] of any fuel oil changeover operation, and shall record, without delay, the following information upon completion of every operation:

.1 The date, time and position of the ship; and

.2 The volume of low sulphur fuel oils in each tank.

1.4 ECAs (Regulations 13 and 14)

1.4.1 For the purposes of Regulations 13 and 14 of reference (b), ECAs are special sea areas designated by the IMO, in which more stringent emission limits are established. Such ECAs can be designated for either NOX controls, SOX and Particulate Matter (PM) controls, or all three emission controls (NOX, SOX and PM).

1.4.2 The currently designated ECAs for SOX emissions only are set forth under Regulation 14.3 of reference (b):

Baltic Sea Area (SOx) – as defined in Regulation 1.11.2 of MARPOL Annex I

North Sea (SOx) – as defined in Regulation 5(1)(f) of MARPOL Annex V

1.4.3 Future ECAs shall be designated by means of an amendment to MARPOL Annex VI. The following MEPC Resolutions contain text of amendments through which ECAs for SOX and NOX emissions are to be established:

.1 Resolution MEPC.190(60) – North American Emission Control Area (NOx and SOx), reference (d):
Entry into Force – 1 August 2011
In Full Effect – 1 August 2012

.2 Resolution MEPC.202(62) – United States Caribbean Sea Emission Control Area (NOx and SOx), reference (e):
Entry into Force – 1 January 2013
In Full Effect – 1 January 2014

1.5 VOCs (Regulation 15)

1.5.1 The emissions of VOCs from tankers are to be regulated in those ports or terminals that have notified the IMO of their intent to do so. In accordance with reference (f), the IMO shall provide, through MEPC circulars, a listing of ports and terminals where VOCs are controlled, along with information regarding the size of tankers to be controlled, the cargoes requiring vapour emission control systems, and the effective date of such controls.

Note 2: A sample changeover recording form, *Low Sulphur Fuel Oil Changeover Completion Form*, is provided in Appendix 2 of this Notice.

1.5.2 Tankers subject to vapor emissions control must be fitted with a vapor collection system approved by a Recognized Organization (RO) on behalf of the Administrator taking into account reference (g), within three (3) years after a port/terminal has notified IMO of its regulation of tanker VOC emissions.

1.5.3 Gas carriers must comply with the requirements of this section only if their loading and containment systems allow safe retention of non-methane VOCs on board, or their safe return ashore.

1.5.4 Notwithstanding the above requirements, effective 1 July 2010, all tankers carrying crude oil are to maintain a VOC management plan onboard, specific to each ship, approved by an RO on behalf of the Administrator.

1.5.5 Guidance on the development of a VOC management plan and additional information on VOC requirements are provided within Section 5 of RMI Marine Guideline 2-13-4, reference (h).

1.6 Shipboard Incineration (Regulation 16)

1.6.1 Shipboard incineration is allowed only in a shipboard incinerator.

1.6.2 Incineration of the following substances is prohibited:

.1 Annexes I, II and III cargo residues of the present MARPOL Convention and related contaminated packing materials;

.2 Polychlorinated biphenyls (PCBs);

.3 Garbage, as defined in Annex V of the present MARPOL Convention containing more than traces of heavy metals;

.4 Refined petroleum products containing halogen compounds;

.5 Sewage sludge and sludge oil either of which is not generated onboard the ship;

.6 Exhaust gas cleaning system residues; and

.7 Polyvinyl Chlorides (PVCs) unless incinerated in shipboard incinerators certified under reference (i) or reference (j).

1.6.3 Shipboard incineration of sewage sludge and sludge oil generated during normal operations of a ship is allowed in the main or auxiliary power plant or boilers, but in those cases shall not take place inside ports, harbors and estuaries.

1.6.4 An incinerator on a ship constructed on or after 1 January 2000, or installed on or after 1 January 2000 must meet the requirements of Appendix IV to reference (b), Type Approval and Operating Limits for Shipboard Incinerators, and must be approved by an RO on behalf of the Administrator taking into account reference (j).

1.6.5 All ships with an incinerator to which paragraph 1.6.4 above applies must possess a manufacturer‟s operating manual that provides guidance on incinerator operations within the prescribed limits. Personnel with responsibilities for incinerator operations must be trained and capable of implementing the guidance provided in the manual.

1.6.6 Monitoring flue gas temperature for incinerators to which paragraph 1.6.4 above applies is required at all times when the unit is in operation.

- For a continuous-feed incinerator[3]: waste shall not be fed when the flue gas temperature is below 850°C.
- For a batch-loaded incinerator: the unit shall be designed so that the temperature in the combustion chamber reaches 600°C within five (5) minutes of start-up, and

thereafter stabilize at a temperature not less than 850°C.

1.6.7 Development, installation and operation of alternative thermal waste treatment devices that meet or exceed the requirements of this regulation are allowable.

2.0 Fuel Oil Quality (Regulation 18)

2.1 Fuel oil delivered to and used onboard any ship to which reference (b) applies must meet the standards of Regulation 18 which address the composition of hydrocarbons to be used for combustion purposes.

2.2 Fuel oil for combustion purposes derived from methods other than petroleum refining must meet the standards of Regulation 18 regarding their composition, must not exceed the sulphur content requirements set forth in Regulation 14, and must not cause an engine to exceed the NOX emission limits set forth in Regulation 13.

2.3 The fuel oil quality standards do not apply to coal in its solid form or nuclear fuels or to the use of hydrocarbons for platforms and drilling rigs which are produced and subsequently used on site as fuel, when approved by the Administrator.

3.0 Bunker Delivery Notes and Fuel Oil Samples

3.1 For every ship of 400 GRT and above and every fixed and floating drilling rig and other platform, details of fuel delivered for combustion purposes shall be recorded by means of a Bunker Delivery Note. The Bunker Deliver Note must include (per Appendix V of reference (b)), at a minimum, the following information:

- Name and IMO number of receiving ship:
- Port;
- Date of commencement of delivery;
- Name, address, and telephone number of marine bunker supplier;
- Product name(s);
- Quantity (metric tons);
- Density at 15º C (kg/m3) -- tested in accordance with ISO 3675;
- Sulphur content (% m/m) -- tested in accordance with ISO 8754; and

A declaration signed and certified by the fuel oil supplier’s representative that the fuel oil supplied is in conformity with the applicable requirements of revised MARPOL Annex VI.

Note 3: *Continuous feeding* is defined as the process whereby waste is fed into a combustion chamber without human assistance while the incinerator is in normal operating conditions with the combustion chamber operative temperature between 850°C and 1200°C.

3.2 The requirements of this section do not apply to gas fuels such as liquefied natural gas, compressed natural gas, or liquefied petroleum gas. However, the sulphur content of gas fuels delivered to a ship specifically for combustion purposes on board that ship shall be documented by the supplier.

3.3 Bunker Delivery Notes:

- Shall be kept on board in the MARPOL Annex VI Record Book and be readily available for inspection;
- Shall be retained for a period of three (3) years after the fuel has been delivered on board; and
- Are subject to inspection by port State control authorities as well as the Administrator.

3.4 Upon completion of the bunkering operations, a representative sample of the fuel oil delivered shall accompany the Bunker Delivery Note. Representative samples under this requirement shall be obtained in accordance with reference (k). The sample shall be:

- Sealed and signed by the bunker supplier's representative;
- Sealed and signed by the master or officer in charge of bunker operations;
- Retained under ship's control until the fuel oil is substantially consumed, but not less than 12 months from time of delivery; and
- Analyzed in accordance with the verification procedure set forth in Appendix VI of reference (b), *Fuel verification procedure for MARPOL Annex VI fuel oil samples*, should the Administrator require such an analysis.

3.5 For every ship of 400 GRT and above, on scheduled services with frequent and regular port calls which would render compliance with the requirements of this section impracticable, an alternative documentation and sampling storage plan may be accepted by the Administration, after consideration of the circumstances involved and consultation with the affected States concerned.

3.6 If a Bunker Delivery Note or representative sample is not provided by the bunker supplier or fuel oil is found not to be in compliance with that stated on the Bunker Delivery Note, details shall be recorded in the ship's log, and the Administrator shall be notified at the following address:

Investigations
Republic of the Marshall Islands
Office of the Maritime Administrator
11495 Commerce Park Drive
Reston, Virginia 20191-1506 USA
Tel: +1-703-620-4880
Fax: +1-703-476-8522
Email: investigations@register-iri.com

3.7 Due to reports of difficulties experienced in some areas in obtaining compliant fuel oil for operation within a SOX ECA, the IMO has adopted the early implementation of certain principles of Regulation 18.2 of the revised MARPOL Annex VI. Although the revised Regulation 18 will not enter into force until 1 July 2010, if a ship, despite all best efforts, is unable to obtain the required fuel oil to meet SOX ECA emission requirements, then the principles of the revised Regulation 18.2 may be applied early, in accordance with

MEPC.1/Circ.637, effective from 16 October 2008. As application of MEPC.1/Circ.637 may not be recognized or uniformly implemented early by all Parties, prompt notification, as required to the Administrator and the relevant port State authorities is strongly recommended in order to determine the most appropriate course of action.

4.0 Fuel Oil Availability

4.1 If a ship, despite all best efforts, is unable to obtain the required fuel oil to meet the applicable SOX ECA emission requirements, the Competent Authority of the relevant port of destination and the Administrator shall be promptly notified and provided with the following information:

.1 A record of actions taken to attempt to achieve compliance; and

.2 Evidence that the ship attempted to purchase compliant fuel oil in accordance with its voyage plan and, if it was not made available where planned, that attempts were made to locate alternative sources for such fuel oil and that despite best efforts to obtain compliant fuel oil, no such fuel oil was made available for purchase.

4.2 Providing the above information does not indemnify the ship from port State control (PSC) action in the event compliant fuel oil could not be obtained, the relevant authorities for the port of destination, if Party to MARPOL Annex VI, are to take into account all relevant circumstances in addition to the evidence provided when determining the appropriate action to take. Therefore, prompt notification is required well in advance of entering the ECA, when requesting any deviation from the standards in section 1.3 of this Notice.

5.0 Surveys and Certificates

5.1 Every ship of 400 GRT and above and every fixed and floating drilling rig and other platform are subject to initial, annual, intermediate, renewal and additional surveys to establish compliance with the revised MARPOL Annex VI air emissions requirements. Upon successful completion of the appropriate survey, an IAPPC shall be issued by the RO.

5.2 Each engine installed on a ship, irrespective of tonnage, to which section 1.2 of this Notice applies shall be subject to survey and certified with an EIAPPC, in accordance with the NOx Technical Code.

5.3 A new IAPPC is required upon transfer of the ship to the RMI flag. A new IAPPC shall be issued only when the RO or a representative acting on behalf of the Administrator is fully satisfied that the ship is in compliance with the requirements of revised MARPOL Annex VI.

5.4 Whenever an accident occurs or a defect is discovered that affects the efficiency or completeness of equipment, the master or ship owner, must:

- Report this information, at the earliest opportunity, to the Administrator or RO responsible for issuing the relevant certificate; and
- Establish a corrective action plan acceptable to the Administrator or RO.

6.0 Recordkeeping

6.1 A MARPOL Annex VI Record Book, to be retained in the custody of the chief engineer, shall be established and maintained for the purpose of filing:

- The Engine Technical Files;
- The Record Book of Engine Parameters, when the Engine Parametric Check Method is employed;
- The Approved Method File, if applicable;
- Bunker Delivery Notes; and
- Tracking/control system for fuel oil samples.

6.2 The ODS record book required under section 1.1.7 of this Notice, and the fuel oil changeover log book required under section 1.3.4 of this Notice may be incorporated into the MARPOL Annex VI Record Book, provided such entries are differentiated as separate and independent sections of the MARPOL Annex VI Record Book.

7.0 Equivalents

7.1 Express approval by the Administrator is needed for any changes/alternatives in the equipment, systems, fittings, arrangements or material covered by a survey. Approval for a change/alternative will be granted, provided that the ship's RO confirms to the Administrator that the change/alternative is at least as effective as that required by MARPOL Annex VI. The Administrator will subsequently notify IMO of any such approvals. Direct replacement of such equipment and fittings that conform with the revised MARPOL Annex VI is permitted.

7.2 Ships which intend to apply an Exhaust Gas Cleaning System (EGCS) as a means for compliance with Regulation 14 and/or Regulation 13 of reference (b) shall be subject to the approval process for an equivalent arrangement. If utilized, an EGCS shall be installed and approved in accordance with reference (l).

This Classification Information is published on CCS website (www.ccs.org.cn) and is to be forwarded by CCS branches to relevant shipping companies in relevance to their business area.

Attachment 1: Marine Notice No. 2-013-8 (Rev. 11/11)

Attachment 2: Appendix of Marine Notice No. 2-013-8 (Rev. 11/11)

Appendix 1: GENERAL RMI MARITIME ADMINISTRATOR GUIDANCE ON CHANGING FROM HIGH-SULPHUR FUEL OIL TO LOW SULPHUR FUEL OIL

Appendix 2: LOW SULPHUR FUEL OIL CHANGEOVER COMPLETION RECORD

Appendix 3: COMMUNICATIONS OF INFORMATION ON AN APPROVED METHOD UNDER MARPOL ANNEX VI

References:

(a) International Convention for the Prevention of Pollution from Ships, 1973, As Modified by the Protocol of 1978 (MARPOL)

(b) Resolution MEPC.176(58) - Amendments to the Regulations for the Prevention of Air Pollution from Ships (MARPOL Annex VI)

(c) Resolution MEPC.177(58) – Amendments to the Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines (NOx Technical Code 2008)

(d) Resolution MEPC.190(60) – North American Emission Control Area

(e) Resolution MEPC.202(62) – United States Caribbean Sea Emission Control Area

(f) MEPC.1/Circ.509 – Notification to the Organization on Ports or Terminals where Volatile Organic Compounds (VOCs) Emissions are to be Regulated

(g) MSC/Circ.585 – Standards for Vapour Emission Control Systems

(h) Republic of the Marshall Islands Marine Guideline 2-13-4 – Revised MARPOL Annex VI

(i) Resolution MEPC.59(33) as amended by Resolution MEPC.92(45) – Revised Guidelines for the Implementation of Annex V

(j) Resolution MEPC.76(40) as amended by Resolution MEPC.93(45) – Standard Specification for Shipboard Incinerators

(k) Resolution MEPC.182(59) – Guidelines for the Sampling of Fuel Oil for Determination of Compliance with the Revised MARPOL Annex VI

(l) Resolution MEPC.184(59) – Exhaust Gas Cleaning System (EGCS) Guidelines

REPUBLIC OF THE MARSHALL ISLANDS

OFFICE OF THE MARITIME ADMINISTRATOR

Marine Notice

No. 2-013-8

Rev. 11/11

TO: **ALL SHIPOWNERS, OPERATORS, MASTERS AND OFFICERS OF MERCHANT SHIPS, AND RECOGNIZED ORGANIZATIONS**

SUBJECT: **Implementation of the Revised MARPOL Annex VI, Regulations for the Prevention of Air Pollution from Ships.**

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Inquiries concerning the subject of this Notice should be directed to the Office of the Maritime Administrator, Republic of the Marshall Islands, c/o Marshall Islands Maritime and Corporate Administrators, Inc., 11495 Commerce Park Drive, Reston, VA 20191-1506 USA.

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(a) Where expressly provided otherwise in Regulations 3, 5, 6, 13, 15, 16 and 18 of the revised Annex VI;

(b) Any emission necessary for securing the safety of a ship or saving life at sea;

(c) Any emission resulting from damage to a ship or its equipment, provided all reasonable precautions have been taken after the occurrence of the damage or discovery of the emission for the purpose of preventing or minimizing the emission, except if the owner/master either acted with intent to cause damage or acted recklessly and with the knowledge that damage would probably result; and

(d) Emissions directly arising from the exploration, exploitation and associated offshore processing of sea-bed mineral resources.

REQUIREMENTS:

1.0 Requirements for Control of Emissions

The following emissions from ships must be addressed:

1.1 Ozone-Depleting Substances (Regulation 12)

1.1.1. *Ozone-depleting substances* (ODS) means controlled substances defined in paragraph 4 of article 1 of the Montreal Protocol on Substances that Deplete the Ozone Layer, 1987, listed in Annexes A, B, C or E to the said Protocol in force at the time of application or interpretation of this annex. ODS that may be found on board ship include, but are not limited to:

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- Halon 1301 Bromotrifluoromethane
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- CFC-11 Trichlorofluoromethane

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- CFC-113 1,1,2-Trichloro-1,2,2-trifluoroethane
- CFC-114 1,2-Dichloro-1,1,2,2-tetrafluoroethane
- CFC-115 Chloropentafluoroethane

1.1.2. Any deliberate emissions of ODS, including emissions that occur in the course of maintenance, service, repair or disposal of systems or equipment, are prohibited. Minimal releases from the recapture or recycling of ozone-depleting substances are not considered deliberate releases.

1.1.3. These requirements do not apply to permanently sealed equipment where there are no refrigerant charging connections or potentially removable components that contain ODS.

1.1.4 Installations[1] containing ODS, other than hydro-chlorofluorocarbons (HCFCs) are prohibited on ships constructed on or after 19 May 2005. Furthermore, installations containing HCFCs are prohibited on ships constructed on or after 1 January 2010.

1.1.5 Use of appropriate reception facilities for disposal of ODS, and equipment containing those substances is required.

1.1.6 All ships 400 gross registered tons (GRT) and above, and drill rigs and platforms, regardless of tonnage, are to maintain a list of equipment containing ODS onboard the ship under section 2.1 of the Supplement to the International Air Pollution Prevention Certificate.

1.1.7 All ships 400 GRT and above, and drill rigs and platforms, regardless of tonnage, are to maintain an ODS record book for recording entries, in terms of mass (kg) of substance, and shall be completed without delay for the following occasions:

.1 Recharge, full or partial, of equipment containing ODS;

.2 Repair or maintenance of equipment containing ODS;

.3 Discharge of ODS to the atmosphere either deliberately or non-deliberately;

.4 Discharge of ODS to land-based reception facilities; and

.5 Supply of ODS to the ship.

[1] In the case of ships constructed before the relevant cut-off date, installations which have a contractual delivery date to the ship or, in the absence of a contractual delivery date, the actual delivery of the equipment to the ship, are prohibited on or after the relevant cut-off date.

1.2 NO_X (Regulation 13)

1.2.1 These requirements do not apply to:

.1 Emergency diesel engines, engines installed in lifeboats and devices or equipment used solely for emergency; or

.2 Engines subject to alternative NO_X control measures established by an Administration for vessels solely engaged in voyages within waters subject to the jurisdiction of the State the flag of which the ship is entitled to fly.

1.2.2 The operation of a marine diesel engine which is installed, or undergoes a major conversion on or after 1 January 2000 on any ship, irrespective of tonnage, except when the engine is an identical replacement to the engine that it is replacing, and subject to the approval of the RMI Maritime Administrator (the "Administrator"), is prohibited, unless it complies with the NO_X emission limits and requirements specified in Regulation 13 of reference (b) above.

1.2.3 The specific limits and requirements for applicable marine diesel engines are subdivided into three 'Tiers' summarized as follows:

.1 **Tier I** – marine diesel engines installed on a ship constructed on or after 1 January 2000 and prior to 1 January 2011. The NO_X emission limits under this Tier form the baseline for subsequent Tiers, and can be found in paragraph 3 of Regulation 13 of reference (b) above.

.2 **Tier II** – marine diesel engines installed on a ship constructed on or after 1 January 2011. The NO_X emission limits under this Tier represent a modest reduction of about 20% from the baseline limits under Tier I, and can be found in paragraph 4 of Regulation 13 of reference (b) above.

.3 **Tier III** – marine diesel engines installed on a ship constructed on or after 1 January 2016, when the ship is operating within a designated NO_X Emission Control Area (ECA). The NO_X emission limits under this Tier represent an aggressive reduction of about 80% from the baseline limits under Tier I, and can be found in paragraph 5.1.1 of Regulation 13 of reference (b) above.

a) Tier III requirements do not apply to marine diesel engines installed on a ship of less than 24 meters when it has been specifically designed, and is used solely, for recreational purposes.

b) Tier III requirements also do not apply when a marine diesel engine is installed on a ship with combined nameplate propulsion horsepower of less than 750 kW, or for replacement engines only after 1 January 2016, when it is not possible for the engine to meet the Tier III requirements due to specific

design or construction limitations. Such exemption shall be approved by the Administrator.

c) In those cases where the Tier III requirements cannot be applied, and when applicable Tier III marine diesel engines are operated outside of a designated NO_X ECA, the engine shall meet the NO_X emission limits set forth under Tier II.

1.2.4 A **major conversion** means a modification of a marine diesel engine not already certified compliant with the NO_X emission limits and requirements specified in Regulation 13 of reference (b) above where:

.1 The engine is replaced by a non-identical marine diesel engine or an additional marine diesel engine is installed;

.2 Any substantial modification, as defined in reference (c) above, is made to the engine, or

.3 The maximum continuous rating of the engine is increased by more than 10% compared to the maximum continuous rating of the original certification of the engine.

1.2.5 Existing engines installed on a ship constructed on or after 1 January 1990, but before 1 January 2000, may be subject to comply with the NO_X emission limits under Tier I when the following criteria apply:

.1 The engine has a power output of more than 5,000 kW;

.2 The engine has a per-cylinder displacement at or above 90 litres; and

.3 An **Approved Method** exists for that engine.

1.2.6 An **Approved Method** is a method for a particular engine, or range of engines, that when applied will ensure the engine complies with the NO_X emission limits as applicable. This method is to be certified by a Party to MARPOL Annex VI and submitted to the International Maritime Organization (IMO) for circulation before it becomes applicable. Refer to Appendix 3 of this notice for a summary of Approved Methods circulated by the IMO as of the revision date of this notice.

1.2.7 When an Approved Method has been established for a particular type or class of engine subject to paragraph 1.2.5 above, it is required to be applied to the relevant engine no later than the first Renewal Survey beginning 12 months after the effective date of notification.

1.2.8 Ships with an engine subject to paragraph 1.2.5 above shall indicate on the International Air Pollution Prevention (IAPP) certificate either that an Approved Method is available for the relevant engine, that an Approved Method has been applied (when available), or that an

Approved Method does not exist or is not yet available for the subject engines. Issuance of an Engine International Air Pollution Prevention (EIAPP) certificate is not required for engines to which an Approved Method has been applied. However, an 'Approved Method File' containing information describing the Approved Method, means of survey and onboard verification procedure shall be required to accompany the engine throughout its life onboard the ship.

1.3 SO_X (Regulation 14)

1.3.1 The sulphur content of any fuel oil used on board a ship, when operating outside of a designated SO_X ECA, shall not exceed the following limits:

.1 4.50% m/m prior to 1 January 2012;

.2 3.50% m/m on and after 1 January 2012; and

.3 0.50% m/m on and after 1 January 2020.

1.3.2 The sulphur content of any fuel oil used on board a ship, when operating within a designated SO_X ECA, shall not exceed the following limits:

.1 1.50% m/m prior to 1 July 2010;

.2 1.00% m/m on and after 1 July 2010; and

.3 0.10% m/m on and after 1 January 2015.

1.3.3 All ships using separate fuel oils when operating within an ECA are to carry a written fuel oil changeover procedure, developed specifically for that ship, detailing:

.1 A step-by-step process for carrying out the fuel oil changeover; and

.2 Methods for calculating the time necessary to ensure the fuel oil service system is fully flushed of all fuel oils exceeding the applicable sulphur content limit prior to entering into the ECA.

1.3.4 All ships using separate fuel oils when operating within an ECA are to also maintain a log book for recording entries[2] of any fuel oil changeover operation, and shall record, without delay, the following information upon completion of every operation:

.1 The date, time and position of the ship; and

.2 The volume of low sulphur fuel oils in each tank.

[2] A sample changeover recording form, *Low Sulphur Fuel Oil Changeover Completion Form*, is provided in Appendix 2 of this Notice.

1.4 ECAs (Regulations 13 and 14)

1.4.1 For the purposes of Regulations 13 and 14 of reference (b) above, ECAs are special sea areas designated by the IMO, in which more stringent emission limits are established. Such ECAs can be designated for either NO_X controls, SO_X and Particulate Matter (PM) controls, or all three emission controls (NO_X, SO_X and PM).

1.4.2 The currently designated ECAs for SO_X emissions only are set forth under Regulation 14.3 of reference (b) above:

- Baltic Sea Area (SO_X) – as defined in Regulation 1.11.2 of MARPOL Annex I
- North Sea (SO_X) – as defined in Regulation 5(1)(f) of MARPOL Annex V

1.4.3 Future ECAs shall be designated by means of an amendment to MARPOL Annex VI. The following MEPC Resolutions contain text of amendments through which ECAs for SO_X and NO_X emissions are to be established:

.1 Resolution MEPC.190(60) – North American Emission Control Area (NO_X and SO_X), reference (d) above:

- Entry into Force – 1 August 2011
- In Full Effect – 1 August 2012

.2 Resolution MEPC.202(62) – United States Caribbean Sea Emission Control Area (NO_X and SO_X), reference (e) above:

- Entry into Force – 1 January 2013
- In Full Effect – 1 January 2014

1.5 VOCs (Regulation 15)

1.5.1 The emissions of VOCs from tankers are to be regulated in those ports or terminals that have notified the IMO of their intent to do so. In accordance with reference (f) above, the IMO shall provide, through MEPC circulars, a listing of ports and terminals where VOCs are controlled, along with information regarding the size of tankers to be controlled, the cargoes requiring vapour emission control systems, and the effective date of such controls.

1.5.2 Tankers subject to vapor emissions control must be fitted with a vapor collection system approved by a Recognized Organization (RO) on behalf of the Administrator taking into account reference (g) above, within three (3) years after a port/terminal has notified IMO of its regulation of tanker VOC emissions.

1.5.3 Gas carriers must comply with the requirements of this section only if their loading and containment systems allow safe retention of non-methane VOCs on board, or their safe return ashore.

1.5.4 Notwithstanding the above requirements, effective 1 July 2010, all tankers carrying crude oil are to maintain a VOC management plan onboard, specific to each ship, approved by an RO on behalf of the Administrator.

1.5.5 Guidance on the development of a VOC management plan and additional information on VOC requirements are provided within Section 5 of RMI Marine Guideline 2-13-4, reference (h) above.

1.6 Shipboard Incineration (Regulation 16)

1.6.1 Shipboard incineration is allowed only in a shipboard incinerator.

1.6.2 Incineration of the following substances is prohibited:

- Annexes I, II and III cargo residues of the present MARPOL Convention and related contaminated packing materials;
- Polychlorinated biphenyls (PCBs);
- Garbage, as defined in Annex V of the present MARPOL Convention containing more than traces of heavy metals;
- Refined petroleum products containing halogen compounds;
- Sewage sludge and sludge oil either of which is not generated onboard the ship;
- Exhaust gas cleaning system residues; and
- Polyvinyl Chlorides (PVCs) unless incinerated in shipboard incinerators certified under reference (i) or reference (j) above.

1.6.3 Shipboard incineration of sewage sludge and sludge oil generated during normal operations of a ship is allowed in the main or auxiliary power plant or boilers, but in those cases shall not take place inside ports, harbors and estuaries.

1.6.4 An incinerator on a ship constructed on or after 1 January 2000, or installed on or after 1 January 2000 must meet the requirements of Appendix IV to reference (b) above, *Type Approval and Operating Limits for Shipboard Incinerators*, and must be approved by an RO on behalf of the Administrator taking into account reference (j) above.

1.6.5 All ships with an incinerator to which paragraph 1.6.4 above applies must possess a manufacturer's operating manual that provides guidance on incinerator operations within the prescribed limits. Personnel with responsibilities for incinerator operations must be trained and capable of implementing the guidance provided in the manual.

1.6.6 Monitoring flue gas temperature for incinerators to which paragraph 1.6.4 above applies is required at all times when the unit is in operation.

- For a continuous-feed incinerator[3]: waste shall not be fed when the flue gas temperature is below 850°C.
- For a batch-loaded incinerator: the unit shall be designed so that the temperature in the combustion chamber reaches 600°C within five (5) minutes of start-up, and thereafter stabilize at a temperature not less than 850°C.

1.6.7 Development, installation and operation of alternative thermal waste treatment devices that meet or exceed the requirements of this regulation are allowable.

2.0 Fuel Oil Quality (Regulation 18)

2.1 Fuel oil delivered to and used onboard any ship to which reference (b) above applies must meet the standards of Regulation 18 which address the composition of hydrocarbons to be used for combustion purposes.

2.2 Fuel oil for combustion purposes derived from methods other than petroleum refining must meet the standards of Regulation 18 regarding their composition, must not exceed the sulphur content requirements set forth in Regulation 14, and must not cause an engine to exceed the NO_X emission limits set forth in Regulation 13.

2.3 The fuel oil quality standards do not apply to coal in its solid form or nuclear fuels or to the use of hydrocarbons for platforms and drilling rigs which are produced and subsequently used on site as fuel, when approved by the Administrator.

3.0 Bunker Delivery Notes and Fuel Oil Samples

3.1 For every ship of 400 GRT and above and every fixed and floating drilling rig and other platform, details of fuel delivered for combustion purposes shall be recorded by means of a Bunker Delivery Note. The Bunker Deliver Note must include (per Appendix V of reference (b) above), at a minimum, the following information:

- Name and IMO number of receiving ship:
- Port;
- Date of commencement of delivery;
- Name, address, and telephone number of marine bunker supplier;
- Product name(s);
- Quantity (metric tons);
- Density at 15° C (kg/m^3) -- tested in accordance with ISO 3675;
- Sulphur content (% m/m) -- tested in accordance with ISO 8754; and
- A declaration signed and certified by the fuel oil supplier's representative that the fuel oil supplied is in conformity with the applicable requirements of revised MARPOL Annex VI.

[3] *Continuous feeding* is defined as the process whereby waste is fed into a combustion chamber without human assistance while the incinerator is in normal operating conditions with the combustion chamber operative temperature between 850°C and 1200°C.

3.2 The requirements of this section do not apply to gas fuels such as liquefied natural gas, compressed natural gas, or liquefied petroleum gas. However, the sulphur content of gas fuels delivered to a ship specifically for combustion purposes on board that ship shall be documented by the supplier.

3.3 Bunker Delivery Notes:

- Shall be kept on board in the MARPOL Annex VI Record Book and be readily available for inspection;
- Shall be retained for a period of three (3) years after the fuel has been delivered on board; and
- Are subject to inspection by port State control authorities as well as the Administrator.

3.4 Upon completion of the bunkering operations, a representative sample of the fuel oil delivered shall accompany the Bunker Delivery Note. Representative samples under this requirement shall be obtained in accordance with reference (k) above. The sample shall be:

- Sealed and signed by the bunker supplier's representative;
- Sealed and signed by the master or officer in charge of bunker operations;
- Retained under ship's control until the fuel oil is substantially consumed, but not less than 12 months from time of delivery; and
- Analyzed in accordance with the verification procedure set forth in Appendix VI of reference (b) above, *Fuel verification procedure for MARPOL Annex VI fuel oil samples*, should the Administrator require such an analysis.

3.5 For every ship of 400 GRT and above, on scheduled services with frequent and regular port calls which would render compliance with the requirements of this section impracticable, an alternative documentation and sampling storage plan may be accepted by the Administration, after consideration of the circumstances involved and consultation with the affected States concerned.

3.6 If a Bunker Delivery Note or representative sample is not provided by the bunker supplier or fuel oil is found not to be in compliance with that stated on the Bunker Delivery Note, details shall be recorded in the ship's log, and the Administrator shall be notified at the following address:

Investigations
Republic of the Marshall Islands
Office of the Maritime Administrator
11495 Commerce Park Drive
Reston, Virginia 20191-1506 USA
Tel: +1-703-620-4880
Fax: +1-703-476-8522
Email: investigations@register-iri.com

3.5 Due to reports of difficulties experienced in some areas in obtaining compliant fuel oil for operation within a SO_X ECA, the IMO has adopted the early implementation of certain principles of Regulation 18.2 of the revised MARPOL Annex VI. Although the revised Regulation 18 will not enter into force until 1 July 2010, if a ship, despite all best efforts, is unable to obtain the required fuel oil to meet SO_X ECA emission requirements, then the principles of the revised Regulation 18.2 may be applied early, in accordance with MEPC.1/Circ.637, effective from 16 October 2008. As application of MEPC.1/Circ.637 may not be recognized or uniformly implemented early by all Parties, prompt notification, as required to the Administrator and the relevant port State authorities is strongly recommended in order to determine the most appropriate course of action.

4.0 Fuel Oil Availability

4.1 If a ship, despite all best efforts, is unable to obtain the required fuel oil to meet the applicable SO_X ECA emission requirements, the Competent Authority of the relevant port of destination and the Administrator shall be promptly notified and provided with the following information:

.1 A record of actions taken to attempt to achieve compliance; and

.2 Evidence that the ship attempted to purchase compliant fuel oil in accordance with its voyage plan and, if it was not made available where planned, that attempts were made to locate alternative sources for such fuel oil and that despite best efforts to obtain compliant fuel oil, no such fuel oil was made available for purchase.

4.2 Providing the above information does not indemnify the ship from port State control (PSC) action in the event compliant fuel oil could not be obtained, the relevant authorities for the port of destination, if Party to MARPOL Annex VI, are to take into account all relevant circumstances in addition to the evidence provided when determining the appropriate action to take. Therefore, prompt notification is required well in advance of entering the ECA, when requesting any deviation from the standards in section 1.3 of this Notice.

5.0 Surveys and Certificates

5.1 Every ship of **400 GRT and above** and every fixed and floating drilling rig and other platform are subject to initial, annual, intermediate, renewal and additional surveys to establish compliance with the revised MARPOL Annex VI air emissions requirements. Upon successful completion of the appropriate survey, an IAPPC shall be issued by the RO.

5.2 Each engine installed on a ship, irrespective of tonnage, to which section 1.2 of this Notice applies shall be subject to survey and certified with an EIAPPC, in accordance with the NO_X Technical Code.

5.3 A new IAPPC is required upon transfer of the ship to the RMI flag. A new IAPPC shall be issued only when the RO or a representative acting on behalf of the Administrator is fully satisfied that the ship is in compliance with the requirements of revised MARPOL Annex VI.

5.4 Whenever an accident occurs or a defect is discovered that affects the efficiency or completeness of equipment, the master or shipowner, must:

- Report this information, at the earliest opportunity, to the Administrator or RO responsible for issuing the relevant certificate; and
- Establish a corrective action plan acceptable to the Administrator or RO.

6.0 Recordkeeping

6.1 A MARPOL Annex VI Record Book, to be retained in the custody of the chief engineer, shall be established and maintained for the purpose of filing:

- The Engine Technical Files;
- The Record Book of Engine Parameters, when the Engine Parametric Check Method is employed;
- The Approved Method File, if applicable;
- Bunker Delivery Notes; and
- Tracking/control system for fuel oil samples.

6.2 The ODS record book required under section 1.1.7 of this Notice, and the fuel oil changeover log book required under section 1.3.4 of this Notice may be incorporated into the MARPOL Annex VI Record Book, provided such entries are differentiated as separate and independent sections of the MARPOL Annex VI Record Book.

7.0 Equivalents

7.1 Express approval by the Administrator is needed for any changes/alternatives in the equipment, systems, fittings, arrangements or material covered by a survey. Approval for a change/alternative will be granted, provided that the ship's RO confirms to the Administrator that the change/alternative is at least as effective as that required by MARPOL Annex VI. The Administrator will subsequently notify IMO of any such approvals. Direct replacement of such equipment and fittings that conform with the revised MARPOL Annex VI is permitted.

7.2 Ships which intend to apply an Exhaust Gas Cleaning System (EGCS) as a means for compliance with Regulation 14 and/or Regulation 13 of reference (b) above shall be subject to the approval process for an equivalent arrangement. If utilized, an EGCS shall be installed and approved in accordance with reference (l) above.

Appendix 1

GENERAL RMI MARITIME ADMINISTRATOR GUIDANCE ON CHANGING FROM HIGH-SULPHUR FUEL OIL TO LOW SULPHUR FUEL OIL

Procedures for changing from a High Sulphur Fuel Oil (HSFO) to a Low Sulphur Fuel Oil (LSFO) should, in addition to the processes required under section 1.3.3 of this Notice, address the issues raised below and include arrangement drawings. A number of practical issues relating to the development of plans have been identified. These include the need to:

- Address safety issues, including whether it is appropriate to change to LSFO with the engine room unmanned (if applicable).

- Ensure that adequate quantities of ready-to-use fuel oil for engines and boilers used for propulsion and generating plant remain continuously available during any changeover procedures from HSFO to LSFO.

- Confirm with engine and equipment manufacturers that main and auxiliary engines and associated fuel treatment equipment are suitable for use of LSFO and implement any recommendations made by the manufacturers.

- Implement a procedure onboard the ship to check the compatibility of the different fuels to be used for the changeover dilution process. This may be by using a compatibility spot test kit onboard or, preferably, by sending samples of the two (2) fuels to an independent testing service.

    - Seek approval from the vessel's RO for any proposed changes to piping systems or fuel storage arrangements that are planned to accommodate the use of LSFO onboard.

    A number of organizations and ROs have developed LSFO changeover calculators, which provide an estimate of the time required to dilute or flush out HSFO in the fuel oil service system to meet the applicable ECA limit. It should be noted that these calculations are an estimate for guidance purposes only and that spot samples to check actual sulphur content at various stages of the process are recommended to account for any operations not considered.

Appendix 2

LOW SULPHUR FUEL OIL CHANGEOVER COMPLETION RECORD

Date	Time	Ship's Position		Volume of Low Sulphur Fuel Oils in Each Tank		Fuel Oil Consignment	Chief Engineer Signature
		Latitude	Longitude	Location	Quantity		

Appendix 3

COMMUNICATIONS OF INFORMATION ON AN APPROVED METHOD UNDER MARPOL ANNEX VI

IMO Circular	Date of Notification	Effective Date*	Submitting Party	Detail
MEPC.1/Circ.765	12 August 2011	12 August 2012	Denmark	MAN B&W S50MC
MEPC.1/Circ.764/Add.1	15 September 2011	12 August 2012	Denmark	MAN B&W S70MC, AM 29484-11
MEPC.1/Circ.764	12 August 2011	12 August 2012	Denmark	MAN B&W S70MC, AM 29484-11
MEPC.1/Circ.743	17 February 2011	5 February 2012	Germany	Wartsila RTA(52, 52U, 58T, 62, 62U, 72, 72U, 84C, 84CU, 84M, 84T-B, 96C
MEPC.1/Circ.738/Add.1	10 August 2011	6 October 2011	Denmark	MAN B&W S70MC, AM 13235-10
MEPC.1/Circ.738	19 October 2010	6 October 2011	Denmark	MAN B&W S70MC, AM 13235-10

*Installation is mandatory no later than the first Renewal Survey for the IAPP Certificate on or after the Effective Date (subject to commercial availability)