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MARINE GUIDANCE

MG-4/2012/1

12/2012

FOR: Ship Owners, Ship Managers, Ship Operators, Ship Masters, Ship Officers, Classification Societies

SUBJECT: REVISED MARPOL ANNEX VI

PURPOSE:

This document serves to provide clarifications to the substantive changes to the revised MARPOL Annex VI and relevant requirements for compliance, which have been incorporated into Tuvalu Marine Circular MC-1/2010/12/2. MARPOL Annex VI first came into force 19 May 2005. Thereafter, draft amendments to MARPOL Annex VI were adopted 10 October 2008 at the 58th meeting of the IMO MEPC, as set forth under IMO Resolution MEPC.176(58), which entered into force as of 1 July 2010.

An Appendix I (can be downloaded at www.tvship.com from this Marine Guidance) to this document is a diagram summarizing the existing and new emission requirements, including their effective dates of application.

APPLICATION:

This marine guidance applies to all Tuvalu flagged vessels unless expressly provided otherwise in revised Regulations 3, 5, 6, 13, 15, 16 and 18 of MARPOL Annex VI. For example, under the revised Regulation 15, only tankers carrying crude oil are required to implement a VOC Management Pla. This requirement is therefore not applicable to any other vessel type.

DEFINITIONS:

The following abbreviations stand for:

- “CNG” – Containerized Natural Gas
- “ECAs” – Emission Control Areas
- “EGCS” – Exhaust Gas Cleaning System
- “EIAPPC” – Engine International Air Pollution Prevention Certificate
- “EU” – European Union
- “GT” – Gross Tonnage in accordance to ITC 69
- “HCFCs” – Hydro-chlorofluorocarbons
- “IAPPC” – International Air Pollution Prevention Certificate
- “IMO” – International Maritime Organization
- “ITC 69” – International Convention on the Tonnage Measurement of Ships, 1969
- “LNG” – Liquid Natural Gas
- “LPG” – Liquid Petroleum Gas
- “MARPOL” – International Convention for the Prevention of Pollution from Ships 1973, as modified by the Protocol of 1978
- “MEPC” – Marine Environment Protection Committee (IMO)
- “NO_x” – Nitrogen Oxide
- “ODS” – Ozone-depleting Substances
- “PM” – Particulate Matter
- “RO” – Recognized Organization as defined by IMO Resolution A.789(19).
- “SECA” – SO_x Emission Control Area
- “SCR” – Selective Catalytic Reduction

- “SO_x” – Sulphur Oxide
- “VOC” – Volatile Organic Compounds

The following terms shall mean:

- “Administration” or “TSR” – Tuvalu Ship Registry
- “Ships” – are defined in Article 2 of MARPOL as a vessel of any type whatsoever operating in the marine environment and includes hydrofoil boats, air-cushion vehicles, submersibles, floating craft and fixed or floating platforms.

REFERENCES:

- (a) International Convention for the Prevention of Pollution from Ships, 1973, As Modified by the Protocol of 1978 (MARPOL)
- (b) IMO Resolution MEPC.176(58) - Amendments to the Regulations for the Prevention of Air Pollution from Ships (MARPOL Annex VI)
- (c) Tuvalu Marine Circular MC-1/2010/12/2
- (d) IMO Resolution MEPC.190(60) – North American Emission Control Area
- (e) IMO Resolution MEPC.202(62) – United States Caribbean Sea Emission Control Area
- (f) IMO Resolution MEPC.184(59) – Exhaust Gas Cleaning System (EGCS) Guidelines
- (g) IMO Resolution MEPC.185(59) – Guidelines for the Development of a VOC Management Plan
- (h) IMO MEPC.1/Circ.680 – Technical Information on Systems and Operation to Assist Development of VOC Management Plans
- (i) IMO MEPC.1/Circ.719 – Technical Information on a Vapour Pressure Control System to Facilitate the Development and the Update of VOC Management Plans
- (j) IMO MEPC.1/Circ.735 – Unified Interpretation to MARPOL Annex VI (VOC Management Plan)
- (k) Directive 2005/33/EC of the European Parliament
- (l) IMO MEPC.1/Circ.774 – Information on Designated Ports at which VOC emissions are regulated

CONTENTS:

1. Ozone-Depleting Substances (Regulation 12)

- 1.1. The fundamental requirements of the pre-existing Regulation 12 that prohibit new installations containing certain ODS on specific dates remain unchanged. Even though the term “New Installation” as was defined in the pre-existing MARPOL Annex VI has been removed, the principles of that term are now incorporated directly into the revised MARPOL Annex VI. Therefore, the revised Regulation 12 expressly states the parameters by which installations containing ODS (other than HCFCs), and installations containing HCFCs, are prohibited.
- 1.2. New requirements under the revised Regulation 12 introduced two (2) record-keeping requirements to ships 400 GT and above, and drill rigs and platforms, regardless of tonnage. These ships are required to:
 - 1.2.1. maintain a list of equipment onboard containing ODS, to be provided under section 2.1 in the Supplement to the IAPPC, and;
 - 1.2.2. maintain an ODS Record Book, only if the ship has rechargeable systems onboard containing ODS. The ODS Record Book is to be used to record when such equipment is recharged, repaired, or maintained, and when ODS are discharged to the atmosphere (deliberately or accidentally), ashore, or received onboard. As prescribed in Tuvalu Marine Circular MC-1/2010/12/2, the ODS Record Book can be maintained independently, or as a part of an existing log book.

2. Emission Control Areas (ECAs)

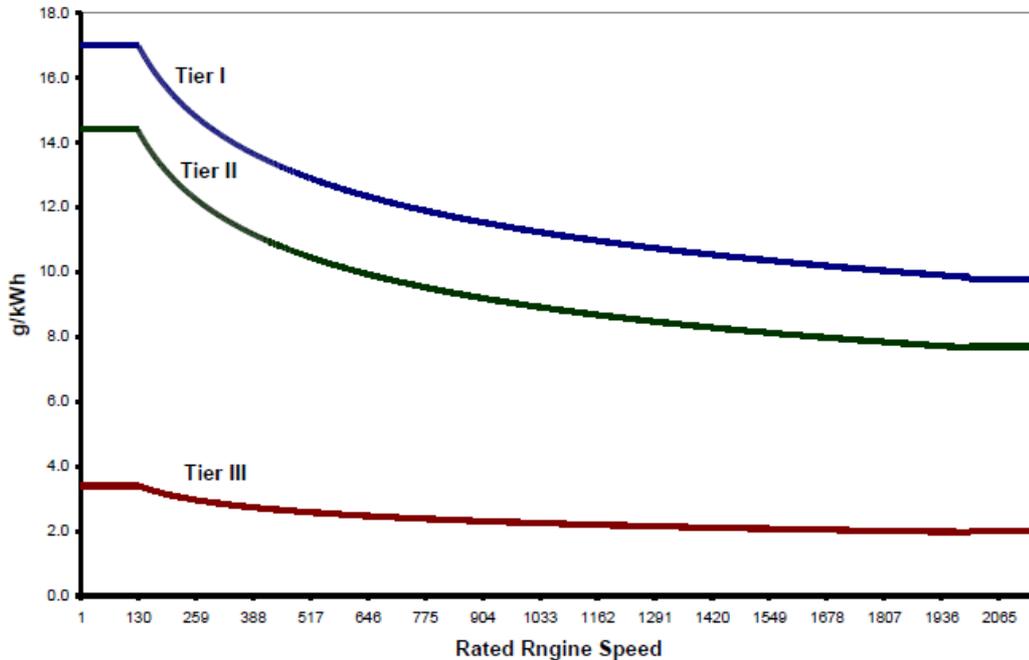
- 2.1. The pre-existing Regulation 14 of MARPOL Annex VI defined a SECA as a designated area where special measures are mandated for the control of SOX emissions. The amended text eliminates the definition of a SECA and replaces it with a broader term, Emissions Control Area (ECA), to provide for future regulation of other air emission types in special designated areas, such as NOX under Tier III (see section 3 below).
- 2.2. Accordingly, two (2) new ECAs regulating both SOX and NOX emissions have been adopted through amendments to the revised Regulations 13 and 14 – the North American ECA with an entry into force date of 1 August 2011, set forth under IMO Resolution MEPC.190(60), and the United States Caribbean Sea Emission Control Area with an entry into force date of 1 January 2013, set forth under IMO Resolution MEPC.202(62).
- 2.3. The SECAs established under the pre-existing Regulation 14 of MARPOL Annex VI (Baltic Sea Area and North Sea) continue to remain in effect, designated as SOx ECAs.

3. NOx (Regulation 13)

- 3.1. The pre-existing Regulation 13 has been substantially changed by introducing the possibility of regulating NOx emissions from **existing** (pre-2000) engines, and taking a multi-tiered approach towards regulating **new** engines. As a whole, the amended regulation applies to each marine diesel engine with a power output of more than 130 kW installed on any ship, irrespective of tonnage, constructed within the timeframes specified for each Tier, and for each marine diesel engine greater than 130 kW which undergoes a major conversion on or after 1 January 2000.
- 3.2. The amended regulation has incorporated the interpretation regarding replacement engines into the definition of major conversion. The concept of a replacement engine has also been broadened to include an additional engine, which may not necessarily be a direct replacement to an existing engine. It is also specified that engines which are substantially modified or have the maximum continuous rating increased by more than 10% shall meet the NOx emission standards of Tier I when the ship is constructed before 1 January 2000, or shall meet the NOx emission standards in force at the time the ship was constructed for ships constructed after 1 January 2000.
- 3.3. Tiered NOx Emission Requirements:
 - 3.3.1. The Tier I standard is identical to the pre-existing Regulation 13 standard for NOx emissions, and remains applicable to engines installed on ships constructed between 1 January 2000 and 1 January 2011. Engines that meet Tier I standards may continue to comply with Tier I requirements after the entry into force of Tier II and Tier III, provided they do not undergo a major conversion.
 - 3.3.2. The Tier II standard is a modest reduction of the NOx emission limits from Tier I by about 20%, depending on the rated speed of the engine, and applies to engines installed on ships constructed on or after 1 January 2011.
 - 3.3.3. The Tier III standard is an aggressive 80% reduction of the NOx emission limits of the Tier I standard and applies to engines installed on ships constructed on or after 1 January 2016, and only when that ship is operating within a NOx ECA (see section 2 above). Otherwise, the standards provided under Tier II need only be met while the ship is operating outside of a NOx ECA.
 - 3.3.4. The Tier III requirement is expected to be achieved through after-engine technologies (e.g. SCR of the exhaust stream). However, the IMO is required to complete a review by 2013 of technological developments for the purpose of determining if the Tier III standards will be reasonably achievable by the 1 January 2016 effective date, or if postponement is warranted. Also, recreational vessels under 24 meters in length, or vessels with a combined nameplate propulsion power of less than 750 kW with design or construction limitations that would prohibit compliance, may be exempted by the Administration from compliance with the Tier III standards.

3.3.5. The NOx emission requirements under the revised Regulation 13 are represented in diagram 1 below:

Diagram 1: NOx Emission Value Requirements



3.4. Existing (pre-2000) Engines

- 3.4.1. Certain pre-2000 engines may now be subject to compliance with the standards of Tier I when an “Approved Method” exists for that engine. The Approved Method is any process, adjustment, retrofit, etc., that is certified by any administration that is a Party to MARPOL Annex VI, to bring a particular pre-2000 engine into compliance with Tier I standards, provided certain conditions are met. The revised Regulation 13.7.1 applies to such potentially regulated engines as those that have a power output of more than 5000 kW, and a per cylinder displacement at or above 90 litres, which are installed on a ship constructed on or after 1 January 1990, but prior to 1 January 2000. As an Approved Method becomes available for a type or class of engine, and the certifying administration notifies the IMO of the approval, the Approved Method is then required to be applied to the relevant engine no later than the first Renewal Survey beginning 12 months after the effective date of notification.
- 3.4.2. Issuance of an EIAPPC 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 will be required to accompany the engine throughout its life onboard the ship.
- 3.4.3. The Approved Method shall not de-rate the engine by more than 1%, increase fuel consumption by more than 2%, or adversely affect engine durability or reliability. The Approved Method shall also not be excessively costly, as determined through the “Cost-Effectiveness” formulation provided in the Revised MARPOL Annex VI Regulation 13.

4. SO_x & PM (Regulation 14)

4.1. The revised Regulation 14 is structured to provide a stepped approach, resulting in gradual reductions of fuel oil sulphur content limits according to the following schedule:

4.1.1. 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:

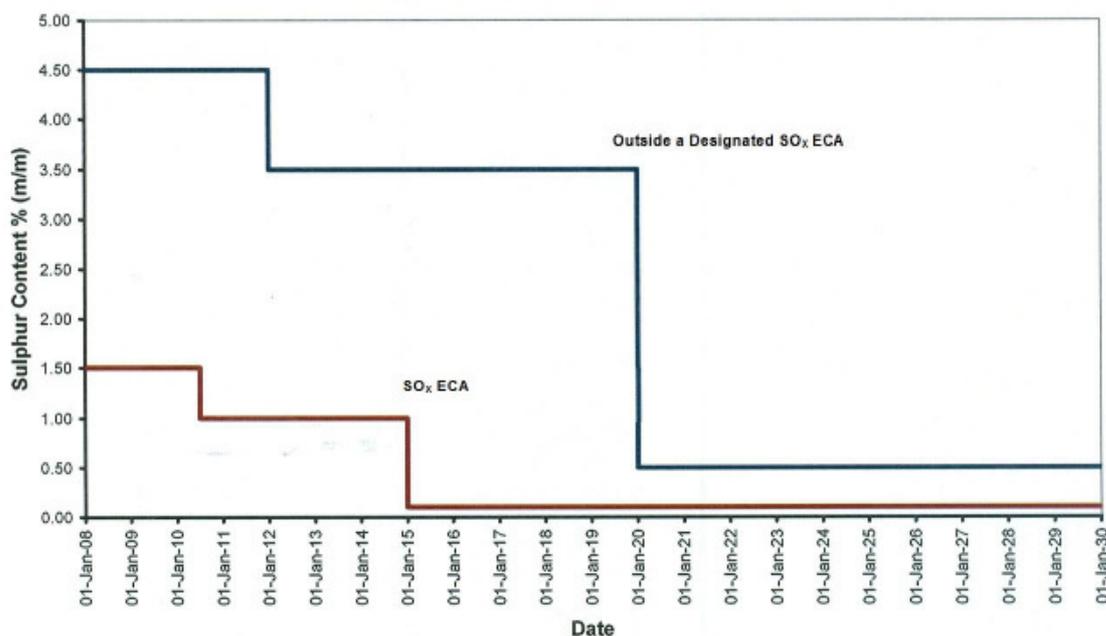
- 4.50% m/m prior to 1 January 2012;
- 3.50% m/m on and after 1 January 2012; and
- 0.50% m/m on and after 1 January 2020 (see section 4.2 below).

4.1.2. 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:

- 1.50% m/m prior to 1 July 2010;
- 1.00% m/m on and after 1 July 2010;
- 0.10% m/m on and after 1 January 2015.

4.2. The sulphur content requirements under the revised Regulation 14 are represented in diagram 2 below:

Diagram 2: Fuel Oil Sulphur Content Requirements



4.3. Ships which utilize separate fuel oils to comply with the revised Regulation 14 while operating within a SO_x ECA are now required to carry and implement a written fuel oil change-over procedure, prescribing the method for properly executing the fuel oil change-over prior to entry into, and after departure from, the SO_x ECA. Refer to Appendix I of Tuvalu Marine Circular MC-1/2010/12/2 for additional information on change-over procedures.

4.4. A review will be conducted by the IMO, targeted for completion in 2018, for the purpose of evaluating the availability of Low Sulphur Fuel Oils for the 2020 global cap reduction. If the result of the study concludes that availability of such fuels will not be possible by 2020, an extension of the effective date until 2025 will be considered.

4.5. A change of particular note was the removal of specific reference to EGCS from the pre-existing Regulation 14 as a specific alternative measure to achieve compliance within a SECA. Instead,

application of an EGCS now falls more generally under alternative arrangements within revised Regulation 4. This now means alternative arrangements (such as EGCS) would not be limited to only meet SOx ECA requirements, but they can also be applied to meet global sulphur emission requirements. However, it also means that any installation of an EGCS shall be subject to evaluation and approval by the administration, and subsequently communicated to the IMO by the approving administration as applying an alternative arrangement in each instance where an EGCS is installed.

- 4.6. EGCS Guidelines have been considerably re-developed and issued under IMO Resolution MEPC.184(59). An important addition to the guidelines was to provide equivalent SOx emission values corresponding to each of the fuel oil sulphur caps as required.

5. VOC (Regulation 15)

- 5.1. Pre-existing Regulation 15 requirements remain unchanged through the revised text. However, a substantive addition now requires tankers carrying crude oil to have on board and implement a VOC Management Plan. This new requirement applies to all tankers carrying crude oil, irrespective of tonnage and regardless if the tanker is fitted with an approved vapour collection system. The VOC Management Plan is required to be approved by a RO on behalf of the Administration, on the basis of the guidance provided in the following MEPC documents:

- 5.1.1. IMO Resolution MEPC.185(59) – Guidelines for the Development of a VOC Management Plan
- 5.1.2. IMO MEPC.1/Circ.680 – Technical Information on Systems and Operation to Assist Development of VOC Management Plans
- 5.1.3. IMO MEPC.1/Circ.719 – Technical Information on a Vapour Pressure Control System to Facilitate the Development and the Update of VOC Management Plans
- 5.1.4. IMO MEPC.1/Circ.735 – Unified Interpretation to MARPOL Annex VI (VOC Management Plan)

- 5.2. It should be noted, the IMO will provide a listing of ports or terminals where VOC emission controls are required, through MEPC Circulars, and an approved vapour collection system will then be required to be installed onboard such tankers calling at that port or terminal within three (3) years after the effective date of the notification to the IMO. Please see IMO MEPC.1/Circ.774.

6. Shipboard Incineration (Regulation 16)

- 6.1. The fundamental requirements of pre-existing Regulation 16 remain unchanged. There are two (2) new additions to the list of substances prohibited from incineration. The revised Regulation 16 prohibits the incineration of sewage sludge and sludge oil, either of which is not generated onboard the ship, and the residues from EGCS.
- 6.2. The revisions also clarify the application of Regulation 16 to indicate that it covers incinerators installed on a ship constructed on or after 1 January 2000, in addition to incinerators installed on or after 1 January 2000 on any ship, regardless of the date of construction of the ship. Also clarified is the minimum operating temperature of 850 °C for batch-loaded type incinerators.

7. Regulation 18 - Fuel Oil Availability and Quality

- 7.1. The provisions of pre-existing Regulation 18, which principally addressed fuel oil quality, remain unchanged. The amended regulation incorporates four (4) new provisions as follows:
 - 7.1.1. As indicated in the new title for the revised Regulation 18, the availability of compliant fuel oil is now addressed. The revisions specifically promote and require notification by the Administration to the IMO of availability of compliant fuel oil and addresses circumstances and measures to be taken in such instances when compliant fuel oil is not available. Ships are required to provide detailed records and evidence of actions taken to attempt to achieve compliance with the relevant requirements of Regulation 14, so that Port State authorities may determine the most appropriate course of action. A notification to the Administration

and the relevant Port State authority regarding the inability to obtain compliant fuel oil is required;

- 7.1.2. Gas fuels (such as LNG, LPG, CNG etc.) are now added to the exclusion provision for revised Regulation 18. The intent is to address situations where some ships which run on gas fuels only (not dual-fuel engines), such as using boil-off gas in boilers on LNG vessels, do not have to demonstrate compliance with the bunkering provisions of revised Regulation 18, e.g. retention of representative fuel samples. All other applicable provisions of the revised MARPOL Annex VI apply to gas fuels and gas fueled engines, with the exception of the definition of a marine diesel engine as it applies to Regulation 13 and the NOx Technical Code;
- 7.1.3. A fuel oil verification procedure is now introduced, which is contained in Appendix VI to the revised MARPOL Annex VI, and outlines the steps to be followed in the event an Administration requires the representative fuel-oil sample to be tested; and
- 7.1.4. An alternative record keeping method is allowed for Bunker Delivery Notes on ships 400 GT and above, which are on frequent or regularly scheduled services, subject to approval by the Administration and consultation with other affected member States.

8. Certification

- 8.1. The form for the IAPPC is substantially altered from the pre-existing version of the form. The EIAPPC is also amended, but mainly consists of consequential changes to references, with minor alterations to the supplement / record of construction.
- 8.2. Existing engines certified under the existing NOx Technical Code need not have the EIAPPC reissued unless the engine undergoes a major conversion as defined by the revised MARPOL Annex VI, Regulation 13.

9. Requirements for Platforms and Drilling Rigs

- 9.1. The pre-existing provisions of Regulation 19(2) and 19(3) remain unchanged, except for having been re-located to and incorporated as a new section under the revised Regulation 3, Exceptions and Exemptions, as Regulations 13.1 and 13.2. The pre-existing Regulation 19(1) was considered superfluous due to the definition of "all ships" under MARPOL 73, Article 2(4), and subsequently deleted.

10. EU Directive

- 10.1. As from 1 January 2010, under the requirements of Directive 2005/33/EC of the European Parliament, the maximum allowable sulphur content of fuel oil to be used by all ships (irrespective of Flag) at berth in EU ports will be 0.10%. "At berth" is intended to include ships at anchor or moored within port limits, as well as alongside. The rules provide for a time period to complete any necessary fuel change-over, which is stated to be "as soon as possible after arrival and as late as possible before departure." Time limits may be specified in some ports or may not be defined other than as provided within the directive.
- 10.2. Exceptions to the requirements are limited except for specific instances. For example, the requirement does not apply for ships due to be at berth for less than two (2) hours according to published timetables, or if approved abatement technologies are utilized, such as EGCS. However, continuous emission monitoring must be employed when abatement technologies are used.
- 10.3. When using separate fuels to comply with the EU Directive, the time of the fuel change-over operation shall be recorded in a ship's logbook. The EU Directive does not specify a logbook into which such entries are to be made, however it is recommended to utilize the same logbooks as required by the Administration as contained in Tuvalu Marine Circular MC-1/2010/12/2 for compliance with revised Regulation 14. Further, although the directive does not mandate instituting an approved fuel change-over procedure for compliance, all safety precautions are to

be considered and adhered to when undertaking fuel change-over for compliance with the EU Directive.

Yours sincerely,

Deputy Registrar
Tuvalu Ship Registry