IMO 2020

CONSISTENT IMPLEMENTATION OF MARPOL ANNEX VI

IMO INTERNATIONAL MARITIME ORGANIZATION

IMO 2020

CONSISTENT IMPLEMENTATION OF

MARPOL ANNEX VI

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Foreword

In October 2008, the Marine Environment Protection Committee (MEPC) of the International Maritime Organization adopted revisions to the international regulations for the prevention of air pollution from ships (MARPOL Annex VI). The revised regulations included a requirement that, from 1 January 2020, the sulphur content of fuel oil used by ships operating outside designated emission control areas shall not exceed the 0.50% by mass, known as "IMO 2020". Reducing emissions of sulphur oxides will bring significant global benefits for human health and environment.

A review provision was included in MARPOL Annex VI that required MEPC to assess the availability of compliant fuel oil to meet the 2020 requirement by 2018. In October 2016, following the review, MEPC 70 decided that, from 1 January 2020, the sulphur content of fuel oil used by ships operating outside designated emission control areas shall not exceed 0.50% by mass. Since this decision, and having agreed a new output at MEPC 71 in July 2017 on consistent implementation of the 0.50% sulphur limit, the Organization has been working diligently and determinably to prepare the sector for this change.

This significant effort has led to relevant amendments to MARPOL Annex VI, including the ban on the carriage of non-compliant fuel oil that will enter into force on 1 March 2020. Since IMO 2020 will have a major impact worldwide, the shipping industry, oil industry and the fuel oil suppliers also have been making their preparations.

Furthermore, comprehensive guidelines on consistent implementation and port State control of chapter 3 of MARPOL Annex VI have been adopted by MEPC 74 in May 2019. A package of guidance documents, including for ship implementation planning, provide important information to support the enforcement of this global rule by stakeholders across the sector.

This publication is part of the awareness raising action taken by the Organization and brings together all the instruments and guidance prepared into one document for reference. As such it will help support the international shipping sector to successfully implement IMO 2020.

List of abbreviations and acronyms

ASA	Asian Shipowners' Association
BDN	bunker delivery note
CFPP	cold filter plugging points
CIMAC	International Council on Combustion Engines
COQ	certificate of quality
CP	cloud points
cSt	centistoke
DM	distillate marine fuels
ECA	emission control area
ECSA	European Community Shipowners' Associations
EGCS	exhaust gas cleaning system
EIAPP Certificate	Engine International Air Pollution Prevention Certificate
ETM	EGC System Technical Manual
FAME	fatty acid methyl ester
FONAR	fuel oil non-availability report
GISIS	Global Integrated Shipping Information System
HFO	heavy fuel oil
HSFO	high sulphur fuel oil
HSHFO	high sulphur heavy fuel oil
IAPP Certificate	International Air Pollution Prevention Certificate
ICS	International Chamber of Shipping
ISGOTT	International Safety Guide for Oil Tankers and Terminals
ISO	International Organization for Standardization
MDO	marine diesel oil
MGO	marine gas oil
MSDS	material safety data sheet
OEM	original equipment manufacturer
OMM	onboard monitoring manual
PP	pour point
PSC	port State control
PSCO	port State control officer
QMS	quality management system
RM	residual marine fuels
S	sulphur
SDS	safety data sheet
SECC	SO_x Emissions Compliance Certificate

SECP	SO_x emissions compliance plan
SMS	safety management system
ULSFO	ultra-low sulphur fuel oil
VLSFO	very low sulphur fuel oil
VOC	volatile organic compounds

IMO resolutions

Resolution MEPC.305(73)

adopted on 26 October 2018

Amendments to the Annex of the Protocol of 1997 to amend the International Convention for the prevention of pollution from ships, 1973, as modified by the Protocol of 1978 relating thereto

Amendments to MARPOL Annex VI

(Prohibition on the carriage of non-compliant fuel oil for combustion purposes for propulsion or operation on board a ship)

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

RECALLING Article 38(a) of the *Convention on the International Maritime Organization* concerning the functions of the Marine Environment Protection Committee conferred upon it by international conventions for the prevention and control of marine pollution from ships,

NOTING article 16 of the *International Convention for the Prevention of Pollution from Ships, 1973,* as modified by the Protocols of 1978 and 1997 relating thereto (MARPOL), which specifies the amendment procedure and confers upon the appropriate body of the Organization the function of considering amendments thereto for adoption by the Parties,

HAVING CONSIDERED, at its seventy-third session, proposed amendments to MARPOL Annex VI concerning the prohibition on the carriage of non-compliant fuel oil for combustion purposes for propulsion or operation on board a ship,

1 ADOPTS, in accordance with article 16(2)(d) of MARPOL, amendments to MARPOL Annex VI, the text of which is set out in the annex to the present resolution;

2 DETERMINES, in accordance with article 16(2)(f)(iii) of MARPOL, that the amendments shall be deemed to have been accepted on 1 September 2019 unless, prior to that date, not less than one third of the Parties or Parties the combined merchant fleets of which constitute not less than 50% of the gross tonnage of the world's merchant fleet, have communicated to the Organization their objection to the amendments;

3 INVITES the Parties to note that, in accordance with article 16(2)(g)(ii) of MARPOL, the said amendments shall enter into force on 1 March 2020 upon their acceptance in accordance with paragraph 2 above;

4 REQUESTS the Secretary-General, for the purposes of article 16(2)(e) of MARPOL, to transmit certified copies of the present resolution and the text of the amendments contained in the annex to all Parties to MARPOL;

5 REQUESTS FURTHER the Secretary-General to transmit copies of the present resolution and its annex to Members of the Organization which are not Parties to MARPOL.

Annex

Amendments to MARPOL Annex VI
(Prohibition on the carriage of non-compliant fuel oil for combustion purposes for propulsion or operation on board a ship)

Chapter 3 – *Requirements for control of emissions from ships*

Regulation 14
Sulphur oxides (SO_x) and particulate matter

General requirements

1 *Paragraph 1 is replaced by the following:*

"**1** The sulphur content of fuel oil used or carried for use on board a ship shall not exceed 0.50% m/m."

Requirements within emission control areas

2 *Paragraph 3 is replaced by the following:*

"**3** For the purpose of this regulation, an emission control area shall be any sea area, including any port area, designated by the Organization in accordance with the criteria and procedures set forth in appendix III to this Annex. The emission control areas under this regulation are:

.1 the Baltic Sea area as defined in regulation 1.11.2 of Annex I of the present Convention;

.2 the North Sea area as defined in regulation 1.14.6 of Annex V of the present Convention;

.3 the North American emission control area, which means the area described by the coordinates provided in appendix VII to this Annex; and

.4 the United States Caribbean Sea emission control area, which means the area described by the coordinates provided in appendix VII to this Annex."

3 *Paragraph 4 is replaced by the following:*

"**4** While a ship is operating within an emission control area, the sulphur content of fuel oil used on board that ship shall not exceed 0.10% m/m."

4 *The subtitle "***Review provision***" and paragraphs 8, 9 and 10 are deleted.*

Appendix I

Form of International Air Pollution Prevention (IAPP) Certificate (regulation 8)

SUPPLEMENT TO INTERNATIONAL AIR POLLUTION PREVENTION CERTIFICATE (IAPP CERTIFICATE)

RECORD OF CONSTRUCTION AND EQUIPMENT

2 Control of emissions from ships

2.3 *Sulphur oxides (SO_x) and particulate matter* (regulation 14)

5 *Paragraphs 2.3.1 and 2.3.2 are replaced by the following and a new paragraph 2.3.3 is added as follows:*

"2.3.1 When the ship operates outside of an emission control area specified in regulation 14.3, the ship uses:

.1 fuel oil with a sulphur content as documented by bunker delivery notes that does not exceed the limit value of 0.50% m/m, and/or ..... ☐

.2 an equivalent arrangement approved in accordance with regulation 4.1 as listed in paragraph 2.6 that is at least as effective in terms of SO_x emission reductions as compared to using a fuel oil with a sulphur content limit value of 0.50% m/m..... ☐

2.3.2 When the ship operates inside an emission control area specified in regulation 14.3, the ship uses:

.1 fuel oil with a sulphur content as documented by bunker delivery notes that does not exceed the limit value of 0.10% m/m, and/or ..... ☐

.2 an equivalent arrangement approved in accordance with regulation 4.1 as listed in paragraph 2.6 that is at least as effective in terms of SO_x emission reductions as compared to using a fuel oil with a sulphur content limit value of 0.10% m/m ..... ☐

2.3.3 For a ship without an equivalent arrangement approved in accordance with regulation 4.1 as listed in paragraph 2.6, the sulphur content of fuel oil carried for use on board the ship shall not exceed 0.50% m/m as documented by bunker delivery notes ..... ☐"

Resolution MEPC.320(74)
adopted on 17 May 2019

2019 Guidelines for consistent implementation of the 0.50% sulphur limit under MARPOL Annex VI

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

RECALLING Article 38(a) of the *Convention on the International Maritime Organization* concerning the functions of the Marine Environment Protection Committee (the Committee) conferred upon it by international conventions for the prevention and control of marine pollution from ships,

RECALLING ALSO that, at its fifty-eighth session, the Committee adopted, by resolution MEPC.176(58), a revised MARPOL Annex VI which significantly strengthens the emission limits for sulphur oxides (SO_x),

RECALLING FURTHER that, at its seventieth session, the Committee adopted, resolution MEPC.280(70), Effective date of implementation of the fuel oil standard in regulation 14.1.3 of MARPOL Annex VI, confirming "1 January 2020" as the effective date of implementation for ships to comply with global 0.50% m/m sulphur content of fuel oil requirement,

NOTING ALSO that, at its seventy-third session, the Committee approved circular MEPC.1/Circ.878* on the Guidance on the development of a ship implementation plan for the consistent implementation of the 0.50% sulphur limit under MARPOL Annex VI,

HAVING CONSIDERED, at its seventy-fourth session, draft 2019 Guidelines for consistent implementation of the 0.50% sulphur limit under MARPOL Annex VI, prepared by the Sub-Committee on Pollution Prevention and Response, at its sixth session,

1 ADOPTS the 2019 Guidelines for consistent implementation of the 0.50% sulphur limit under MARPOL Annex VI, as set out in the annex to the present resolution;

2 REQUESTS Parties to MARPOL Annex VI and other Member Governments to bring these Guidelines to the attention of shipowners, ship operators, fuel oil suppliers and any other interested groups;

3 AGREES to keep these Guidelines under review in the light of experience gained with their application.

* See page 63 of this publication.

Annex

2019 Guidelines for consistent implementation of the 0.50% sulphur limit under MARPOL Annex VI

1 Introduction

1.1 Objective

1.1.1 The purpose of these Guidelines is to ensure consistent implementation of the 0.50% sulphur limit under MARPOL Annex VI. These Guidelines are intended for use by Administrations, port States, shipowners, shipbuilders and fuel oil suppliers, as appropriate.

1.2 Definitions

1.2.1 For the purpose of these Guidelines, the definitions in MARPOL Annex VI apply.

1.2.2 The following definitions of fuel oils are used, as applicable:

.1 Distillate marine fuels (DM) are as specified in ISO 8217:2017* (e.g. DMA, DMB, DMX, DMZ);

.2 Residual marine fuels (RM) are as specified in ISO 8217:2017* (e.g. RMD 80, RMG 380);

.3 Ultra-low sulphur fuel oil (ULSFO) are as specified in ISO 8217:2017* (e.g. maximum 0.10% S ULSFO-DM, maximum 0.10% S ULSFO-RM);

.4 Very low sulphur fuel oil (VLSFO) (e.g. maximum 0.50% S VLSFO-DM, maximum 0.50% S VLSFO-RM); and

.5 High sulphur heavy fuel oil (HSHFO) exceeding 0.50% S.

2 Ship implementation planning for 2020

2.1 MEPC 70 agreed to "1 January 2020" as the effective date of implementation for ships to comply with the 0.50% m/m fuel oil sulphur content limit requirement and adopted resolution MEPC.280(70) on the Effective date of implementation of the fuel oil standard in regulation 14.1.3 of MARPOL Annex VI†.

2.2 In this context, MEPC 73 agreed that Administrations should encourage ships flying their flag to develop implementation plans, outlining how the ship may prepare in order to comply with the required sulphur content limit of 0.50% by 1 January 2020. The plan should be complemented with a record of actions taken by the ships in order to be compliant by the applicable date.

2.3 MEPC 73, recognizing the need for guidance to support the consistent implementation of the 0.50% sulphur limit under MARPOL Annex VI, approved MEPC.1/Circ.878‡ on the Guidance on the development of a ship implementation plan for the consistent implementation of the 0.50% sulphur limit under MARPOL Annex VI.

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* The latest edition of the ISO standard is recommended.

† Regulation 14.1.3 of MARPOL Annex VI, was amended by resolution MEPC.305(73) (see page 3 of this publication).

‡ See page 63 of this publication.

3 Impact on fuel and machinery systems

3.0.1 The experiences and lessons learned from the transition to the 0.10% m/m SO_x-ECA limit indicated that current ship machinery operations should be sufficiently capable of addressing the concerns regarding combustion of the new 0.50% m/m limit fuel oils.

3.0.2 Currently most of the marine diesel engines and boilers on ships operating outside emission control areas (ECAs) are optimized to operate on heavy fuel oil. From 2020, ships are required to use fuel oils with a sulphur content of 0.50% m/m or lower, unless fitted with an approved equivalent means of compliance.

3.1 Distillate fuels

3.1.1 A major challenge with distillate fuels is low viscosity. Low viscosity may cause internal leakages in diesel engines, boilers and pumps. Internal leakages in fuel injection system may result in reduced fuel pressure to the engine, which may have consequences for the engine performance (e.g. starting of the engine). Equipment makers recommendations should be taken into account, and adequate testing, maintenance and possible installation of coolers, etc., may be performed.

3.1.2 Cold filter plugging points (CFPP) and cloud points (CP) as well as the pour point (PP) for distillate fuels need to be considered in light of the ship's intended operating area and ambient temperatures.

3.1.3 These issues are critical concerns as they can result in the formation and accumulation of wax sediment, which can cause costly and avoidable maintenance. In the worst-case scenario, sediment can cause engine fuel starvation and power loss.

3.1.4 ISO 8217:2017* limits the cold flow properties of a fuel through setting a limit on the PP. However, given that wax crystals form at temperatures above the PP, fuels that meet the specification in terms of PP can still be challenging to operations in colder operating regions, as the wax particles can rapidly block filters, potentially plugging them completely. For cold weather, additional cold flow properties, CFPP and CP, should be reported by the supplier when the receiving ship has ordered distillate fuel for cold weather operations, a requirement that is specified in ISO 8217:2017*.

3.1.5 Since the residual fuels are usually heated and distillate fuels are not heated, particular attention needs to be given to the cold flow properties of distillates. Cold flow property challenges can be managed by heating the fuel. CIMAC has issued "01 2015 CIMAC Guideline Cold flow properties of marine fuel oils"†.

3.1.6 Fuel temperature should be kept approximately 10°C above the PP in order to avoid any risk of solidification, however this may not reduce the risk of filter blocking in case of high CFPP and CP.

3.1.7 It is good practice to review the possibilities of heating arrangements for distillate fuels on board. This is usually very limited, as it is not standard practice to have heating arrangements in distillate storage, settling or service tanks. Transfer arrangements may be adapted to pass through a residual fuel oil heat exchanger should the need arise.

3.1.8 Knowing the fuel properties before bunkering will assist in taking the necessary precautions where and when necessary. If the ship is heading towards colder climates and the cold flow properties are inferior, the fuel may be:

.1 either used before entering cold regions; or

.2 used with suitable heating arrangement, as mentioned above.

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* The latest edition of the ISO standard is recommended.

† https://www.cimac.com/cms/upload/workinggroups/WG7/CIMAC_WG7_2015_01_Guideline_Cold__Flow_Properties_Marine_Fuel_Oils_final.pdf

3.1.9 If the approach of applying heat is being followed it should be ensured that the fuel is not overheated resulting in the viscosity dropping below the minimum recommendation of 2 cSt at any point in the fuel system, including the engine inlet. In order to reduce this risk, heating should be limited to max 40°C.

3.2 Distillate fuel with FAME content

3.2.1 Increased demand for Distillate fuels may result in more land based products making their way into the marine supply pool, some of these fuels (e.g. biodiesel) may contain Fatty Acid Methyl Ester (FAME).

3.2.2 There are various technical challenges associated with use of fuel having FAME content, e.g. potential oxidation of biodiesel, its biodegradable nature etc. with adverse implications, limitations in storage life etc. It also needs to be tested for stability.

3.2.3 The ISO 8217:2017* standard includes a maximum FAME content of 7.0% by volume for DFA/DFZ/DFB fuel oil grades since some ports may offer automotive diesel fuel as the only fuel available, which contains FAME and could violate the fuel flashpoint requirements addressed in SOLAS chapter II-2. The maximum 7.0% (v/v) has been chosen as this aligns with the concentrations allowed in some of the countries applying environmental regulations.

3.2.4 Manufacturers of engines and equipment like oily water separators, overboard discharge monitors, filters, coalescers etc. need to be consulted to confirm the ability of engines and equipment to handle biodiesel blends of up to B7 (i.e. 7.0% v/v).

3.2.5 It is recommended to avoid using such biodiesel blend fuels for lifeboat engines, emergency generators, fire pumps, etc. where it is stored in isolated individual unit fuel tanks and subjected to conditions for accelerated degradation.

3.2.6 CIMAC has provided a *Guideline for Ship owners and Operators on Managing Distillate Fuels up to 7.0% v/v FAME (Biodiesel).*†

3.3 Residual fuels

3.3.1 *Stability and compatibility*

3.3.1.1 It is essential to distinguish between "fuel stability" within a single batch of fuel and "fuel compatibility" between different fuel batches.

3.3.1.2 Regarding stability: the fuel shall be stable and homogeneous at delivery and it is the responsibility of the fuel oil blenders and suppliers to ensure this.

3.3.1.3 A wide range of blends of refined products will be used to make the new 0.50% sulphur fuels, and the stability and compatibility of the blends will be an important concern for shipowners/ operators. Unstable fuels can separate on their own and incompatible ones can do so when mixed in a single bunker tank, forming sludge that can block filters and ultimately cause engine failures.

3.3.1.4 It is recommended that ships have a commingling procedure. The procedure should primarily aim to ensure new bunkers are loaded into empty tanks to the extent possible. In the event that a ship finds itself possibly having to commingle a new bunker with bunkers already on board, then it is important that the ship determines the compatibility between the two said bunkers before comingling.

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* The latest edition of the ISO standard is recommended.

† https://www.cimac.com/cms/upload/workinggroups/WG7/CIMAC_WG7_Guideline_for_Ship_Owners_and_Operators_on_Managing_Distillate_Fuels_May_2013.pdf

3.3.1.5 The reference test method shall be the total potential sediment test in accordance with ISO 10307-2:2009.

3.3.2 *Catalytic fines (cat fines)*

3.3.2.1 Cat fines are a by-product of refining and consist of small particles of metal that are deliberately introduced as catalysts to "crack" the fuel oil. Unless reduced by purification, cat fines will become embedded in engine parts and cause serious and rapid engine damage. Reference should be made to engine manufacturer's guidance with respect to managing cat fines.

3.4 Key technical considerations for shipowners and operators

3.4.1 *Ship tank configuration and fuel system.* The viscosity of most of these blended residual fuels is such that they cannot be used in distillate fuel-only systems and machinery, as they require heating for cleaning and combustion. A fully segregated fuel system for both distillate fuels and these new fuels is recommended.

3.4.2 Tank cleaning is recommended when using a residual fuel tank for storing these new fuels. This is to prevent sludge that has built up in these tanks from entering the fuel system. Further information on tank cleaning is set out in appendix 3 of MEPC.1/Circ.878* on Guidance on the development of a ship implementation plan for the consistent implementation of the 0.50% sulphur limit under MARPOL Annex VI.

3.4.3 *Heating requirements.* Due to the cold flow properties of most of these new fuels, permanent heating of the fuel may be necessary to minimize the risk of wax formation, also in storage. This is especially important in colder regions.

3.4.4 *Fuel treatment system.* Some of these new fuels may contain cat fines and/or sediments and therefore need onboard cleaning. Separator temperature and settings should be adjusted to the fuels' viscosity and density. Please refer to recommendations from OEM and fuel supplier.

3.4.5 Considering that many of these new fuels have lower viscosities compared to conventional residual fuels, care should be taken to ensure no overheating occurs.

3.5 ISO Standard for residual fuels

3.5.1 The bunker market uses ISO 8217:2017† specifications to ensure that the properties of the fuels it delivers conform to a standard that mean they comply with MARPOL Annex VI.

3.5.2 The existing ISO 8217:2017† specification for marine fuels takes into consideration the diverse nature of marine fuels and incorporates a number of categories of distillate or residual fuels, even though not all categories may be available in every supply location it covers all marine petroleum fuel oils used today as well as the 0.50% sulphur fuels of 2020. The general requirements, in the ISO 8217:2017† specification for marine fuels and characteristics, included in table 1 and 2 of ISO 8217:2017† identified safety, performance and environmental concerns and further takes into consideration the onboard handling requirements, including storage, cleaning and combustion aspects of all fuel oils used today and the anticipated fuel blends of 2020, irrespective of the sulphur content of the fuel oils.

3.5.3 It is important that any new standards address and do not preclude the use of renewable and alternative non-fossil derived products, so long as they comply with the chemical properties specified for these fuel oils.

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* See page 63 of this publication.

† The latest edition of the ISO standard is recommended.

3.6 Cylinder lubrication

3.6.1 The choice of cylinder lubricating oils will often follow the fuel type in use. So, when changing to VLSFO operation from RM operation, the choice of appropriate cylinder lubricating oil should be considered in accordance with the recommendations of the engine manufacturer.

4 Verification issues and control mechanism and actions

4.1 Survey and certification by Administrations

4.1.1 When undertaking a survey in accordance with regulation 5 of MARPOL Annex VI, the Administration should conduct a survey of a ship to verify that the ship complies with the provisions to implement the 0.50% sulphur limit. In particular, the Administration should check whether the ship carries compliant fuel oils for use, based on the bunker delivery note (BDN) on board, any other document or fuel oil samples as appropriate consistent with the provisions of regulation 18 of MARPOL Annex VI. If carriage of HSHFO for use is identified, the Administration should check whether regulation 3.2, regulation 4 of MARPOL Annex VI are applied to the ship, or if the ship encountered a fuel availability problem and is operating pursuant to regulation 18.2 of MARPOL Annex VI.

4.1.2 When an Administration decides to analyse a fuel oil sample to determine compliance with the sulphur limits in regulation 14.1 or 14.4, the final analysis should be carried out in accordance with ISO 8754:2003 by a laboratory that is accredited for the purpose of conducting the test in accordance with ISO/IEC 17025 or an equivalent standard. The test results should be in accordance with ISO 8754 reporting protocol, meaning a tested value at or above 0.10% sulphur should be reported with no more than two decimal places.

4.1.3 According to regulation 11.4 of MARPOL Annex VI, the Administration shall investigate any report of an alleged violation and thereafter promptly inform the Party which made the report, as well as the Organization, of the action taken. When informing the Organization, the MARPOL Annex VI GISIS module should be used.

4.2 Control measures by port States

4.2.1 Port States should take appropriate measures to ensure compliance with the 0.50% of sulphur limit under MARPOL Annex VI, in line with the regulation 10 of MARPOL Annex VI and the 2019 Guidelines for port State control under MARPOL Annex VI (resolution MEPC.321(74)*) (2019 PSC Guidelines). Specifically, the port State should conduct initial inspections based on documents and other possible materials, including remote sensing and portable devices. Given "clear grounds" to conduct a more detailed inspection, the port State may conduct sample analysis and other detailed inspections to verify compliance to the regulation, as appropriate.

4.2.2 Regulation 18.2.3 of MARPOL Annex VI requires a Party to take into account all relevant circumstances and the evidence presented to determine the action to take, including not taking control measures. Administrations and port State control authorities may take into account the implementation plan when verifying compliance with the 0.50% sulphur limit requirement.

4.2.3 *Inspections based on documents and other possible* targeting measurements

4.2.3.1 During the port State control and other enforcement activities, the port State should investigate whether a ship carries either compliant fuel oils or HSHFOs for use, based on the

* See page 25 of this publication.

documents listed in paragraph 2.1.2 of the 2019 PSC Guidelines. Additionally records required to demonstrate compliance should also then be viewed. Results from remote sensing could be used to trigger inspections and portable devices could be used during the initial inspections, as appropriate. Remote sensing and portable devices are, however, of indicative nature and should not be regarded as the evidence of non-compliance, but may be considered clear grounds for expanding the inspection.

4.2.3.2 Port state should determine if regulations 3.2, 4 or 18.2.3 apply together with retained bunker delivery notes and IAPP Certificate when considering the status of any HSHFO being carried for use on board.

4.2.4 *Fuel oil sample analysis*

4.2.4.1 When the port State identifies clear grounds of suspected non-compliance of a ship based on initial inspections, the port State may require samples of fuel oils to be analysed. The samples to be analysed may be either the representative samples provided with BDN in accordance with regulation 18.8.2, MARPOL delivered samples or samples from designated sampling points in accordance with the 2019 Guidelines for onboard sampling for the verification of the sulphur content of the fuel oil used on board ships (MEPC.1/Circ.864/Rev.1*) (in-use fuel oil samples) or other samples obtained by the port State.

4.2.4.2 Where the MARPOL delivered sample is taken from the ship a receipt should be provided to the ship. The outcome of the analysis undertaken with appendix VI of MARPOL Annex VI should be advised to the ship for its records.

4.2.4.3 In detecting suspected non-compliance, the sample analysis should be conducted in a uniform and reliable manner as described in paragraph 4.1.2. The verification procedure for MARPOL delivered samples should be in accordance with appendix VI† of MARPOL Annex VI. For other samples taken on board the ship, the in-use and onboard sample, the sample should be deemed to meet the requirements provided the test result from the laboratory does not exceed the specification limit +0.59R (where R is the reproducibility of the test method) and no further testing is necessary.

4.2.4.4 Notwithstanding the above process, all possible efforts should be made to avoid a ship being unduly detained or delayed. In particular, sample analysis of fuel oils should not unduly delay the operation, movement or departure of the ship.

4.2.4.5 If a non-compliance is established, consistent with regulation 18.2.3 the port State may prevent the ship from sailing until the ship takes any suitable measures to achieve compliance which may include de-bunkering all non-compliant fuel oil. In addition, the port State should report the information of the ship using or carrying for use non-compliant fuel oil to the Administration of the ship and inform the Party or non-Party under whose jurisdiction a bunker delivery note was issued of cases of delivery of non-compliant fuel oil, giving all relevant information. Upon receiving the information, the Party detecting the deficiency should report the information to the MARPOL Annex VI GISIS module in accordance with paragraph 3.4 of these Guidelines.

4.2.4.6 The Parties (the port and flag States), however, may permit, with the agreement of the destination port authority, a single voyage for bunkering of compliant fuel oil for the ship, in accordance with regulation 18.2.4 of MARPOL Annex VI. The single voyage should be one way and minimum for bunkering, and the ship proceeds directly to the nearest bunkering facility appropriate to the ship. In the case that the parties permit a single voyage of a ship, the port State

* See page 39 of this publication.

† Amendments to MARPOL VI, Appendix VI, Verification procedures for a MARPOL Annex VI fuel oil sample (regulation 18.8.2 or regulation 14.8), expected to be adopted in spring 2020 and set out in annex 13 to document MEPC 74/18/Add.1.

should confirm that the Administration of the ship has advised the authority at the destination port of the approval for a single voyage including information on the ship granted with the approval and the certified record of analysis of the sample as the evidence. Once confirmation has been provided the port State should permit the ship to sail as agreed.

4.2.4.7 If the port State is made aware that a ship is carrying non-compliant fuel oil, which is not for use through an equivalent method under regulation 4 or a permit under regulation 3.2 of MARPOL Annex VI, the port State should take action to confirm the fuel is not being used. Action to confirm should include, but is not limited to the examination of the oil record book and the record of tank soundings. Where necessary the port State may require tank soundings to be undertaken during the inspection. Where it is determined that the fuel has been used the control action in paragraph 4.2.4.5 should be applied.

4.2.5 Other open-sea compliance monitoring tools:

.1 fuel oil changeover calculator;

.2 data collection system for fuel oil consumption of ships (resolution MEPC.278(70)); and

.3 continuous SO_x monitoring.

4.3 Control on fuel oil suppliers

4.3.1 Designated authorities should, if deemed necessary, take a sample and test fuel oils from bunker barges or shore bunker terminals. Sampling of fuel oils in bunker barges or shore bunker terminals can be taken and tested in the same manner that the MARPOL delivered fuel oils are tested by the PSC. All possible efforts should be made to avoid a ship being unduly detained or delayed. If a sample is analysed, sample analysis of fuel oils should not unduly delay the operation, movement or departure of the ship.

4.3.2 If non-compliance, such as issuance of an incorrect BDN or a BDN without measurement of sulphur content, was found, the designated authorities should take appropriate corrective measures against the non-compliant supplier. In such case, the designated authorities should inform the Organization for transmission to the Member States of the non-compliant supplier, in accordance with the regulation 18.9.6 of MARPOL Annex VI and paragraph 4.4 of these Guidelines.

4.4 Information sharing related to non-compliances under MARPOL Annex VI

4.4.1 When a Party finds a non-compliance of a ship or a fuel oil supplier, the information of the non-compliance should be reported to the MARPOL Annex VI GISIS module (regulation 11.4).

4.4.2 Publication of information on non-compliant ships/fuel oil suppliers or a reporting scheme to IMO to be registered on centralized information platforms are proposed as elements of an effective enforcement strategy. Various PSC regimes have successfully used the publishing of information related to substandard ships/fuel suppliers as a deterrent to non-compliance. Port States also need to report detentions of ships to IMO which may affect the future PSC targeting of the ship. The IMO GISIS database already makes available certain information related to non-compliances with the MARPOL Annex VI regulations.

5 Fuel oil non-availability

5.1 Guidance and information sharing on fuel oil non-availability

5.1.1 Regulation 18.2.1 of MARPOL Annex VI provides that in the event compliant fuel oil cannot be obtained, a Party to MARPOL Annex VI can request evidence outlining the attempts made to obtain the compliant fuel oil, including attempts made to local alternative sources. Regulations 18.2.4 and 18.2.5

then require that the ship notifies its Administration and the competent authority of the port of destination on the inability to obtain compliant fuel oil, with the Party to notify IMO of the non-availability. This notification is commonly referred to as a Fuel Oil Non-Availability Report (FONAR).

5.1.2 *Guidance on consistent evidence*

5.1.3 Regulation 18.2.1.2 of MARPOL Annex VI requires that evidence be provided to support a claim that all efforts were made to obtain compliant fuel oil. In this regard, a Party may develop more detailed guidance for the consistent use and acceptance of these reports, including what evidence is needed to accompany a report to ensure that port States are applying the provisions under regulation 18.2.3, consistently.

5.1.4 Should a ship, despite its best effort to obtain compliant fuel oil, be unable to do so, the master/company must:

.1 present a record of actions taken to attempt to bunker correct fuel oil and provide evidence of an attempt 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; and

.2 best efforts to procure compliant fuel oil include, but are not limited to, investigating alternate sources of fuel oil prior to commencing the voyage. If, despite best efforts, it was not possible to procure compliant fuel oil, the master/company must immediately notify the port State Administration in the port of arrival and the flag Administration (regulation 18.2.4 of MARPOL Annex VI).

5.1.5 In order to minimize disruption to commerce and avoid delays, the master/company should submit a FONAR as soon as it is determined or becomes aware that it will not be able to procure and use compliant fuel oil.

5.1.6 *Investigating non-availability*

5.1.7 A Party should investigate the reports of non-availability. This process is important to ensure a consistent supply of compliant fuel to industry, as well as prevent incentives for ships to use ports where it is known that compliant fuel is not available on an ongoing basis. Critical to this process will be the sharing of information between Member States on reported compliant fuel oil supply issues.

5.1.8 Regulation 18.2.5 of MARPOL Annex VI provides that a Party to MARPOL Annex VI notify the Organization when a ship has presented evidence of the non-availability of compliant fuel oil in a port or at their terminal. For this purpose, MARPOL Annex VI GISIS module provides the platform for Parties to upload such notifications.

5.1.9 Regulation 18.1 of MARPOL Annex VI provides that each Party take all reasonable steps to promote the availability of above compliant fuel oil and inform the Organization through MARPOL Annex VI GISIS module of the availability of compliant fuel oils in its ports and terminals.

5.1.10 Port State control authority may contact the submitter (and/or shipowner or operator), including in the event of an incomplete submission, and request additional information, or to pursue an enforcement action such as a notice of violation.

5.2 Standard format for reporting fuel oil non-availability

5.2.1 For ships which are unable to purchase fuel oil meeting the requirements of regulations 14.1 or 14.4 of MARPOL Annex VI, the standard format for reporting fuel oil non-availability is set out in appendix 1 to this document, pursuant to regulation 18.2.4 of MARPOL Annex VI.

6 Possible safety implications relating to fuel oils meeting the 0.50% m/m sulphur limit

6.1 MEPC 73 (October 2018) approved MEPC.1/Circ.878* on Guidance on the development of a ship implementation plan for the consistent implementation of the 0.50% sulphur limit under MARPOL Annex VI (hereafter the "Ship Implementation Plan Guidance") addresses some safety issues identified with regard to 0.50% maximum sulphur fuel oil, in particular through the section on risk assessment (section 1 of the Ship Implementation Plan Guidance) and additional guidance provided on impact on machinery systems and tank cleaning (appendix 2 and appendix 3 of the Ship Implementation Plan Guidance, respectively).

6.2 Identified potential safety implications include, but are not limited to, the following:

.1 stability of blended fuel oil;

.2 compatibility, including new tests and metrics appropriate for future fuels;

.3 cold flow properties;

.4 acid number;

.5 flash point;

.6 ignition and combustion quality;

.7 cat fines;

.8 low viscosity; and

.9 unusual components.

6.3 Additional technical information and a review, displayed in tabular format, of the possible potential safety implications is set out in appendix 2.

6.4 Reference should also be made to general industry guidance on potential safety and operational issues related to the supply and use of 0.50% maximum sulphur fuels†.

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* See page 63 of this publication.

† ICS, ASA and ECSA Guidance to shipping companies and crews on preparing for compliance with the 2020 global sulphur limit can be accessed at the following link: http://www.ics-shipping.org/free-resources/2020-sulphur-compliance

Appendix 1
Fuel oil non-availability report (FONAR)

Note:

1 This report is to be sent to the flag Administration and to the competent authorities in the relevant port(s) of destination in accordance with regulation 18.2.4 of MARPOL Annex VI. The report shall be sent as soon as it is determined that the ship/operator will be unable to procure compliant fuel oil and preferably before the ship leaves the port/terminal where compliant fuel cannot be obtained. A copy of the FONAR should be kept on board for inspection for at least 36 months.

2 This report should be used to provide evidence if a ship is unable to obtain fuel oil compliant with the provisions stipulated in regulations 14.1 or 14.4 of MARPOL Annex VI.

3 Before filing a FONAR, the following should be observed by the ship/operator:

3.1 A fuel oil non-availability report is not an exemption. According to regulation 18.2 of MARPOL Annex VI, it is the responsibility of the Party of the destination port, through its competent authority, to scrutinize the information provided and take action, as appropriate.

3.2 In the case of insufficiently supported and/or repeated claims of non-availability, the Party may require additional documentation and substantiation of fuel oil non-availability claims. The ship/operator may also be subject to more extensive inspections or examinations while in port.

3.3 Ships/operators are expected to take into account logistical conditions and/or terminal/port policies when planning bunkering, including but not limited to having to change berth or anchor within a port or terminal in order to obtain compliant fuel.

3.4 Ships/operators are expected to prepare as far as reasonably practicable to be able to operate on compliant fuel oils. This could include, but is not limited to, fuel oils with different viscosity and different sulphur content not exceeding regulatory requirements (requiring different lube oils) as well as requiring heating and/or other treatment on board.

1 Particulars of ship

1.1 Name of ship: .....

1.2 IMO number: .....

1.3 Flag: .....

1.4 (if other relevant registration number is available, enter here): .....

2 Description of ship's voyage plan

2.1 Provide a description of the ship's voyage plan in place at the time of entry into "country X" waters (and ECA, if applicable) (Attach copy of plan if available):

.....

.....

.....

2.2 Details of voyage:

1 Last port of departure

.....

2 First port of arrival in "country X":

. . . . . .

3 Date of departure from last port *(dd/mm/yyyy)*:

. . . . . .

4 Date of arrival at first "country X" *(dd/mm/yyyy)*:

. . . . . .

5 Date ship first received notice that it would be transiting in "country X" waters (and ECA, if applicable) (*dd/mm/yyyy*):

. . . . . .

6 Ship's location at the time of notice:

. . . . . .

7 Date ship operator expects to enter "country X" waters (and ECA, if applicable) (*dd/mm/yyyy*):

. . . . . .

8 Time ship operator expects to enter "country X" waters (and ECA, if applicable) (hh:mm UTC):

. . . . . .

9 Date ship operator expects to exit "country X" waters (and ECA, if applicable) (*dd/mm/yyyy*):

. . . . . .

10 Time ship operator expects to exit "country X" waters (and ECA, if applicable) (hh:mm UTC):

. . . . . .

11 Projected days ship's main propulsion engines will be in operation within "country X" waters (and ECA, if applicable):

. . . . . .

12 Sulphur content of fuel oil in use when entering and operating in "country X" waters (and ECA, if applicable):

. . . . . .

3 Evidence of attempts to purchase compliant fuel oil

3.1 Provide a description of actions taken to attempt to achieve compliance prior to entering "country X" waters (and ECA, if applicable), including a description of all attempts that were made to locate alternative sources of compliant fuel oil, and a description of the reason why compliant fuel oil was not available:

. . . . . .

. . . . . .

. . . . . .

3.2 Name and email address of suppliers contacted, address and phone number and date of contact (*dd/mm/yyyy*):

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

Please attach copies of communication with suppliers (e.g. emails to and from suppliers)

4 In case of fuel oil supply disruption only

4.1 Name of port at which ship was scheduled to receive compliant fuel oil:

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

4.2 Name, email address, and phone number of the fuel oil supplier that was scheduled to deliver (and now reporting the non-availability): . . . . . .

5 Operation constraints, if applicable

5.1 If non-compliant fuel has been bunkered due to concerns that the quality of the compliant fuel available would cause operational or safety problems on board the ships, the concerns should be thoroughly documented.

5.2 Describe any operational constraints that prevented use of compliant fuel oil available at port:

. . . . . .

5.3 Specify steps taken, or to be taken, to resolve these operational constraints that will enable compliant fuel use:

. . . . . .

. . . . . .

. . . . . .

6 Plans to obtain compliant fuel oil

6.1 Describe availability of compliant fuel oil at the first port-of-call in "country X", and plans to obtain it:

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

6.2 If compliant fuel oil is not available at the first port-of-call in "country X", list the lowest sulphur content of available fuel oil(s) or the lowest sulphur content of available fuel oil at the next port-of-call:

.....

7 Previous fuel oil non-availability reports

7.1 If shipowner/operator has submitted a fuel oil non-availability report to "country X" in the previous 12 months, list the number of fuel oil non-availability reports previously submitted and provide details on the dates and ports visited while using non-compliant fuel oil, as set out below:

Report: .....

Date (*dd/mm/yyyy*): .....

Port: .....

Type of fuel: .....

Comments: .....

8 Master/company information

Master name: .....

Local agent in "country X": .....

Ship operator name: .....

Shipowner name: .....

Name and position of official: .....

Email address: .....

Address (street, city, country, postal/zip code): .....

Telephone number: .....

Signature of master: .....

Print name: .....

Date (*dd/mm/yyyy*): .....

Appendix 2

Technical review of identified potential safety implications associated with the use of 2020 compliant fuels

Fuel property	Potential challenges	Remarks
Stability	The consequences of a ship receiving an unstable fuel, or one that becomes unstable during storage or handling, can be serious. Sludge may build up in the storage tanks, piping systems or centrifuges and filters can become totally blocked by voluminous amounts of sludge.	The challenge for the fuel producer is to blend a fuel which is not only stable but also has a degree of reserve stability such that it will remain stable during periods of storage and treatment at elevated temperatures. More paraffinic blend components are expected for very low sulphur fuel oil (VLSFO) compared to existing fuels. Whereas aromatic components have a stabilizing effect on asphaltenes, paraffins do not. Fuel suppliers are responsible for ensuring that the supplied fuel is stable.
Compatibility issues	Challenges are the same as with stability (above).	An incompatible mix may be harmful to ship's operation. VLSFOs are expected to be paraffinic based in some regions and aromatic based in other regions. There is a risk of experiencing incompatibility when mixing an aromatic fuel with a paraffinic fuel. The same risk exists today, but with the wide range of products which may exist post 2020, it is important to segregate fuels as far as possible and to be cautious of how to manage/handle incompatible fuels on board.
Cold flow properties and pour point	ISO 8217:2017 limits the cold flow properties of a fuel through setting a limit on the pour point (PP). However, given that wax crystals form at temperatures above the PP, fuels that meet the specification in terms of PP can still be challenging when operating in colder regions. Wax particles can rapidly block filters, potentially plugging them completely. The paraffins may crystallize and/or deposit in the storage tanks leading to blockages at the filters and reduced fuel flow to the machinery plants. If fuels are held at temperatures below the pour point, wax will begin to precipitate. This wax may cause blocking of filters and can deposit on heat exchangers. In severe cases the wax will build up in storage tank bottoms and on heating coils, which can restrict the coils from heating the fuel (fuel will become unpumpable from the bunker tanks).	VLSFO products are expected to be more paraffinic compared to existing fuels. As such, it is important to know the cold flow properties of the bunkered fuel in order to ensure proper temperature management on board. It is important to note that for additives to be effective, they have to be applied before crystallization has occurred in the fuel. Reference 1.

Fuel property	Potential challenges	Remarks
Acid number	The fuel shall be free from strong, inorganic acids. Fuels with high acid number test results arising from acidic compounds cause accelerated damage to marine diesel engines. Such damage is found primarily within the fuel injection equipment.	There is currently no recognized correlation between an acid number test result and the corrosive activity of the fuel. ISO 8217:2017, appendix E covers the topic.
Flashpoint	Flashpoint is considered to be a useful indicator of the fire hazard associated with the storage of marine fuels. Even if fuels are stored at temperatures below the determined flash point, flammable vapours may still develop in the tank headspace.	SOLAS requirement.
Ignition and combustion quality	Fuels with poor ignition & combustion properties can, in extreme cases, result in serious operational problems, engine damage and even total breakdown. Poor combustion performance is normally characterized by an extended combustion period and/or poor rates of pressure increase and low "p max" resulting in incomplete combustion of the fuel. The resulting effects are increased levels of unburned fuel and soot that may be deposited in the combustion chamber, on the exhaust valves and in the turbocharger system, exhaust after treatment devices, waste heat recovery units and other exhaust system components. Extended combustion periods may also result in exposure of the cylinder liner to high temperatures which may disrupt the lubricating oil film, leading to increased wear rates and scuffing. Unburnt fuel droplets may also carry over impinging on the liner surfaces causing further risk of damage to the liner.	High and medium-speed engines are more prone to experience operational difficulties due to poor ignition and combustion properties than low speed two stroke types. With four stroke engines, poor ignition can result in excessive exhaust gas system deposits, black smoke, engine knocking and difficulties operating at low load. If the ignition process is delayed for too long a period by virtue of some chemical quality of the fuel, too large a quantity of fuel will be injected into the engine cylinders and will ignite at once, producing a rapid pressure and heat rise and causing associated damage to the piston rings and cylinder liners of the engine. Reference 2.
Cat fines	Cat fines will cause abrasive wear of cylinder liners, piston rings and fuel injection equipment if not reduced sufficiently by the fuel treatment system. High wear in the combustion chamber can result.	Major engine manufacturers recommend that the fuel's cat fines content does not exceed 10 mg/kg (ppm) at engine inlet.
Low viscosity	Low-viscosity fuels (less than 2 cSt at engine inlet) challenge the function of the fuel pump in the following ways: .1 breakdown of the oil film, which could result in seizures; .2 insufficient injection pressure, which results in difficulties during start-up and low-load operation; and .3 insufficient fuel index margin, which limits acceleration.	Low fuel viscosity does not only affect the engine fuel pumps. Most pumps in the external fuel oil system (supply pumps, circulating pumps, transfer pumps and feed pumps for the centrifuge) also need viscosities above 2 cSt to function properly. Viscosity is highly temperature dependent and the crew must take proper care of fuel oil temperature management to avoid viscosity related issues. Reference 3.

Fuel property	Potential challenges	Remarks
Unusual components	The below components and group of components can be linked to the risk of encountering the following problems: – Polymers (e.g. polystyrene, polyethylene, polypropylene) Associated with filter blocking – Polymethacrylates Associated with fuel pump sticking – Phenols Occasionally associated with filter blocking/fuel oil pump sticking – Tall oils Associated with filter blocking – Chlorinated hydrocarbons Associated with fuel pump seizures – Estonian shale oil Associated in the past with excessive separator sludging – Organic acids Associated with corrosion as well as fuel pump sticking	Only for few components, there exists a clear cause and effect between component and associated operational problems. There is no statistical study performed of which components are typically found in marine fuels and in which concentration. As per ISO 8217:2017, annex B: The marine industry continues to build on its understanding of the impact of specific chemical species and the respective critical concentrations at which detrimental effects are observed on the operational characteristics of marine fuels in use. Only in some of the past cases the origin of the unusual components found in bunkers were revealed and were due to various reasons such as: .1 Russia/Baltic States 1997, cross contamination in storage/piping (polypropylene); .2 Singapore 2001, 4 bunker barges received material from road tankers which, in addition to transporting fuel, also collected/transported waste oil from shipyards and motor shops (esters); .3 Ventspils 2007, Estonian shale oil to convert HSHFOs to LSFOS; and .4 Houston 2010/11, bunker barges that were not cleaned between cargoes (polyacrylates) Reference 4.

References

1 CIMAC WG07 Fuels Guideline 01/2015: *Cold flow properties of marine fuel oils*

2 CIMAC WG07 Fuels 2011: *Fuel Quality Guide – Ignition and Combustion*

3 MAN Service Letter SL2014-593/DOJA

4 Bureau Veritas Verifuel, Investigative Analysis of Marine Fuel oils: Pros & Cons

Resolution MEPC.321(74)
adopted on 17 May 2019

2019 Guidelines for port State control under MARPOL Annex VI Chapter 3

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

RECALLING Article 38(a) of the *Convention on the International Maritime Organization* concerning the functions of the Marine Environment Protection Committee conferred upon it by the international conventions for the prevention and control of marine pollution,

RECALLING ALSO that, at its fifty-eighth session, the Committee adopted, by resolution MEPC.176(58), a revised MARPOL Annex VI which significantly strengthens the controls on emissions,

NOTING that articles 5 and 6 of the MARPOL Convention and regulations 10 and 11 of MARPOL Annex VI provide control procedures to be followed by a Party to the 1997 Protocol with regard to foreign ships visiting its ports,

RECALLING that, at its fifty-ninth session, the Committee adopted, by resolution MEPC.181(59), 2009 Guidelines for port State control under the revised MARPOL Annex VI,

NOTING that the revised MARPOL Annex VI entered into force on 1 July 2010 and since then there have been several amendments to the provisions,

RECOGNIZING the need to revise the 2009 Guidelines for port State control under the revised MARPOL Annex VI, in accordance with provisions of the MARPOL Annex VI, as amended,

HAVING CONSIDERED, at is seventy-fourth session, draft 2019 Guidelines for port State control under MARPOL Annex VI prepared by the Sub-Committee on Pollution Prevention and Response, at its sixth session, following a review by the Sub-Committee on Implementation of IMO Instruments, at its fifth session,

1 ADOPTS the 2019 Guidelines for port State control under MARPOL Annex VI Chapter 3 (2019 PSC Guidelines), as set out in the annex to the present resolution;

2 INVITES Governments, when exercising port State control under MARPOL Annex VI, to apply the 2019 PSC Guidelines from 1 January 2020;

3 INVITES Governments, when exercising port State control under MARPOL Annex VI, to apply the provisions of MARPOL Annex VI concerning the prohibition on the carriage of non-compliant fuel oil for combustion purposes for propulsion or operation on board a ship from 1 March 2020;

4 INVITES Governments, when exercising port State control under MARPOL Annex VI, to apply the provisions of MARPOL Annex VI concerning electronic record books from 1 October 2020;

5 AGREES to keep these Guidelines under review in the light of experience gained with their application;

6 REVOKES the 2009 Guidelines for port State control under the revised MARPOL Annex VI adopted by resolution MEPC.181(59), from 1 January 2020.

Annex

2019 Guidelines for port State control under MARPOL Annex VI Chapter 3

Chapter 1

General

1.1 This document is intended to provide basic guidance on the conduct of port State control inspections for compliance with MARPOL Annex VI (hereinafter referred to as "the Annex") and afford consistency in the conduct of these inspections, the recognition of deficiencies and the application of control procedures.

1.2 Chapters 1 (General), 4 (Contravention and detention), 5 (Reporting requirements) and 6 (Review procedures) of the Procedures for Port State Control, as adopted by the Organization, as may be amended, also applies to these Guidelines.

Chapter 2

Inspections of ships required to carry the IAPP Certificate

2.1 Initial inspections

2.1.1 The PSCO should ascertain the date of ship construction and the date of installation of equipment on board which are subject to the provisions of the Annex, in order to confirm which regulations of the Annex are applicable.

2.1.2 Onboarding and introduction to the master or responsible ship's officer, the port State control officer (PSCO) should examine the following documents, where applicable:

.1 the International Air Pollution Prevention Certificate (IAPP Certificate) (regulation VI/6), including its Supplement;

.2 the Engine International Air Pollution Prevention Certificate (EIAPP Certificate) (paragraph 2.2 of the NO_x Technical Code) including its Supplement, for each applicable marine diesel engine;

.3 the Technical File (paragraph 2.3.4 of the NO_x Technical Code) for each applicable marine diesel engine;

.4 depending on the method used for demonstrating NO_x compliance for each applicable marine diesel engine:

.1 the Record Book of Engine Parameters for each marine diesel engine (paragraph 6.2.2.7 of the NO_x Technical Code) demonstrating compliance with regulation VI/13 by means of the marine diesel engine parameter check method; or

.2 documentation relating to the simplified measurement method; or

.3 documentation related to the direct measurement and monitoring method;

.5 for a ship to which regulation VI/13.5.1 applies for a particular NO_x Tier III emission control area and that has one or more installed marine diesel engines certified to both Tier II and Tier III or which has one or more marine diesel engines certified to Tier II

only* that there are the required log book and the recordings for the tier and on/off status of those marine diesel engines while the ship is within an applicable NO_x Tier III emission control area;

.6 the approved method file (regulation VI/13.7);

.7 the written procedures covering fuel oil change over operations (in a working language or languages understood by the crew) where separate fuel oils are used in order to achieve compliance (regulation VI/14.6);

.8 the approved documentation relating to exceptions and/or exemptions granted under regulation VI/3;

.9 the approved documentation (SECC where issued, ETM, OMM, SECP) and relating to any installed exhaust gas cleaning system (EGCS) or equivalent means, to reduce SO_x emissions (regulation VI/4);

.10 that the required EGCS monitoring records have been retained and show compliance. Additionally, that the EGCS Record Book including nitrate discharge data and performance records†, or approved alternative, has been duly maintained;

.11 the bunker delivery notes (BDNs) and representative samples or records thereof (regulation VI/18);

.12 the copy of the type approval certificate of applicable shipboard incinerator (resolutions MEPC.76(40) or MEPC.244(66));

.13 the Ozone Depleting Substances Record Book (regulation VI/12.6);

.14 the VOC Management Plan (regulation VI/15.6);

.15 any notification to the ship's flag Administration issued by the master or officer in charge of the bunker operation together with any available commercial documentation relevant to non-compliant bunker delivery, regulation VI/18.2; and

.16 if the ship has not been able to obtain compliant fuel oil, the notification to the ship's flag Administration and the competent authority of the relevant port of destination as set out in the appendix.

The Record Books referenced in sub-paragraphs .1, .5, .10 and .13 above may be presented in an electronic format. A declaration from the Administration should be viewed in order to accept this Electronic Record Book. If a declaration cannot be provided, a hard copy Record Book will need to be presented for examination.

2.1.3 As a preliminary check, the IAPP Certificate's validity should be confirmed by verifying that the Certificate is properly completed and signed and that required surveys have been performed.

2.1.4 Through examining the Supplement to the IAPP Certificate, the PSCO may establish how the ship is equipped for the prevention of air pollution.

2.1.5 In the case where the bunker delivery note or the representative sample as required by regulation VI/18 presented to the ship are not in compliance with the relevant requirements (the BDN is set out in appendix V of MARPOL Annex VI), the master or officer in charge of the

* Unified Interpretation to regulation 13.5.3 set out in MEPC.1/Circ.795/Rev.4.

† In assessing the emission ratio and discharge water records the PSCO should be mindful that such factors as transient engine operation or analyser performance outputs may result in isolated "spikes" in the recorded output which, while these measurements in themselves may be above the required Emission Ratio or discharge water limit values, do not indicate that overall the EGCS was not being operated and controlled as required and hence should not be taken as evidence of non-compliance with the requirements.

bunker operation may have documented that through a Notification to the ship's flag Administration with copies to the port authority under whose jurisdiction the ship did not receive the required documentation pursuant to the bunkering operation and to the bunker deliverer.

2.1.6 In addition, if the BDN shows compliant fuel, but the master has independent test results of the fuel oil sample taken by the ship during the bunkering which indicates non-compliance, the master may have documented that through a Notification to the ship's flag Administration with copies to the competent authority of the relevant port of destination, the Administration under whose jurisdiction the bunker deliverer is located and to the bunker deliverer.

2.1.7 In all cases, a copy may be retained on board the ship, together with any available commercial documentation, for the subsequent scrutiny of port State control.

2.2 Initial inspection on ships equipped with equivalent means of SO_x compliance

2.2.1 On ships equipped with equivalent means of compliance, the PSCO will look at:

.1 evidence that the ship has received an appropriate approval for any installed equivalent means (approved, under trial or being commissioned);

.2 evidence that the ship is using an equivalent means, as identified on the Supplement of the IAPP certificate, for fuel oil combustion units on board or that compliant fuel oil is used in equipment not so covered; and

.3 BDNs on board* which indicate that the fuel oil is intended to be used in combination with an equivalent means of SO_x compliance or the ship is subject to a relevant exemption to conduct trials for SO_x emission reduction and control technology research.

2.2.2 In the case where an EGCS is not in compliance with the relevant requirements for other than transitory periods and isolated spikes in the recorded output, the master or officer in charge may have documented that through a notification to the ship's flag Administration with copies to the competent authority of the relevant port of destination, and present those corrective actions taken in order to rectify the situation in accordance with the guidance given in the EGCS Technical Manual. If a malfunction occurs in the instrumentation for the monitoring of emission to air or the monitoring of washwater discharge to sea, the ship may have alternative documentation demonstrating compliance†.

2.3 Initial inspection within an ECA

2.3.1 When a ship is inspected in a port in an ECA designated for SO_x emission control, the PSCO should look at:

.1 evidence of fuel oil delivered to and used on board with a sulphur content of not more than 0.10% m/m through the BDNs and appropriate onboard records including records of bunkering operations as set out in the Oil Record Book Part 1 (regulation VI/18.5 and VI/14.4); and

* The Prohibition on the carriage of non-compliant fuel oil for combustion purposes for propulsion or operation on board a ship (resolution MEPC.305(73); see page 3 of this publication) is not applicable to fuel oil carried as cargo or for ships fitted with an approved equivalent means of compliance.

† Refer to Guidance on indication of ongoing compliance in the case of the failure of a single monitoring instrument, and recommended actions to take if the Exhaust Gas Cleaning Systems (EGCS) fails to meet the provisions of the 2015 EGCS Guidelines (resolution MEPC.259(68)) (MEPC.1/Circ.883; see page 87 of this publication); ships should have documented notification of system non-compliance to relevant authorities as in paragraph 2.2.2.

.2 for those ships using separate fuel oils for compliance with regulation VI/14, evidence of a written procedure (in a working language or languages understood by the crew) and records of changeover to fuel oil with a sulphur content of not more than 0.10% m/m before entering the ECA such that compliant fuel was being used while sailing in the entire ECA as required in regulation VI/14.6.

2.3.2 When a ship to which regulation VI/13.5.1 applies for a particular NO_x Tier III emission control area is inspected in a port in that area, the PSCO should look at:

.1 the records in respect of the tier and on/off status, together with any changes to that status while within that NO_x Tier III emission control area, which are to be logged as required by regulation VI/13.5.3 in respect of an installed marine diesel engine certified to both Tier II and Tier III or which is certified to Tier II only*; and

.2 the status of an installed marine diesel engine which is certified to both Tier II and Tier III showing that that engine was operating in its Tier III condition on entry into that NO_x Tier III emission control area and that status was maintained at all times while that marine diesel engine was in operation within that area; or

.3 the records related to the conditions associated with an exemption granted under regulation VI/13.5.4 have been logged as required by that exemption and that the terms and duration of that exemption have been complied with as required.

2.4 Initial inspection outside an ECA or first port after transiting an ECA

2.4.1 When a ship is inspected in a port outside ECA the PSCO will look to the same documentation and evidence as during inspections in ports inside the ECA. The PSCO should in particular look at:

.1 evidence that the sulphur content of the fuel oil is in accordance with regulation VI/14.1† through the BDNs and appropriate onboard records including records of bunkering operations as set out in the Oil Record Book Part 1 (regulation VI/18.5 and VI/14.4); and

.2 evidence of a written procedure (in a working language or languages understood by the crew) and records of changeover from fuel oil with a sulphur content of not more than 0.10% m/m after leaving the ECA such that compliant fuel was being used while sailing in the in the entire ECA.

2.4.2 When a ship to which regulation VI/13.5.1 applies for a particular NO_x Tier III emission control area is inspected in a port outside that area, the PSCO should look at the records required by 2.3.2.1 and 2.3.2.2 or 2.3.2.3 to ensure that the relevant requirements were complied with for the whole period of time the ship was operating in that area.

2.5 Outcome of initial inspection

2.5.1 If the certificates and documents are valid and appropriate and, after an inspection of the ship to check that the overall condition of the ship meets generally accepted international rules and standards, the PSCO's general impressions and observations on board confirm a good standard of maintenance, the inspection should be considered satisfactorily concluded.

* Unified Interpretation to regulation 13.5.3 set out in MEPC.1/Circ.795/Rev.4.

† The Prohibition on the carriage of non-compliant fuel oil for combustion purposes for propulsion or operation on board a ship (resolution MEPC.305(73); see page 3 of this publication) is not applicable to fuel oil carried as cargo or for ships fitted with an approved equivalent means of compliance.

2.5.2 If, however, the PSCO's general impressions or observations on board give clear grounds (see paragraph 2.5.3) for believing that the condition of the ship or its equipment do not correspond substantially with the particulars of the certificates or the documents, the PSCO should proceed to a more detailed inspection.

2.5.3 "Clear grounds" to conduct a more detailed inspection include:

.1 evidence that certificates required by the Annex are missing or clearly invalid;

.2 evidence that documents required by the Annex are missing or clearly invalid;

.3 the absence or malfunctioning of equipment or arrangements specified in the certificates or documents;

.4 the presence of equipment or arrangements not specified in the certificates or documents;

.5 evidence from the PSCO's general impressions or observations that serious deficiencies exist in the equipment or arrangements specified in the certificates or documents;

.6 information or evidence that the master or crew are not familiar with essential shipboard operations relating to the prevention of air pollution, or that such operations have not been carried out;

.7 evidence of inconsistency between information in the bunker delivery note and paragraph 2.3 of the Supplement to the IAPP certificate;

.8 evidence that an equivalent means has not been used as required; or

.9 evidence, for example by fuel calculators, that the quantity of bunkered compliant fuel oil is inconsistent with the ship's voyage plan; and

.10 receipt of a report or complaint containing information that the ship appears to be non-compliant including but not limited to information from remote sensing surveillance of SO_x emissions or portable fuel oil sulphur content measurement devices indicating that a ship appears to use non-compliant fuel while in operation/underway;

.11 evidence that the tier and/or on/off status of applicable installed marine diesel engines has not been maintained correctly or as required;

.12 receipt of a report or complaint containing information that one or more of the installed marine diesel engines has not been operated in accordance with the provisions of the respective Technical File or the requirements relevant to a particular NO_x Tier III emission control area; and

.13 receipt of a report or complaint containing information that the conditions attached to an exemption granted under regulation VI/13.5.4 have not been complied with.

2.6 More detailed inspections

2.6.1 The PSCO should verify that:

.1 there are effectively implemented maintenance procedures for the equipment containing ozone-depleting substances; and

.2 there are no deliberate emissions of ozone-depleting substances.

2.6.2 In order to verify that each installed marine diesel engine with a power output of more than 130 kW is approved by the Administration in accordance with the NO_x Technical Code and maintained appropriately, the PSCO should pay particular attention to the following:

.1 examine such marine diesel engines to be consistent with the EIAPP Certificate and its Supplement, Technical File and, if applicable, Record Book of Engine Parameters or onboard monitoring manual and related data;

.2 examine marine diesel engines specified in the Technical Files to verify that no unapproved modifications, which may affect NO_x emission, have been made to the marine diesel engines;

.3 in the case of an installed marine diesel engine certified to Tier III that the required records, if applicable, in accordance with regulation VI/13.5.3 or in the Technical File, including those required by 2.3.6 of the NO_x Technical Code, have been maintained as necessary and that the marine diesel engine, including any NO_x control device and associated ancillary systems and equipment, including, where fitted, bypass arrangements, is maintained in accordance with the associated Technical File and is in good order;

.4 if applicable, examine whether the conditions attached to an exemption granted under regulation VI/13.5.4 have been complied with as required;

.5 examine marine diesel engines with a power output of more than 5,000 kW and a per cylinder displacement at or above 90 L installed on a ship constructed on or after 1 January 1990 but prior to 1 January 2000 to verify that they are certified, if so required, in accordance with regulation VI/13.7;

.6 in the case of ships constructed before 1 January 2000, verify that any marine diesel engine which has been subject to a major conversion, as defined in regulation VI/13, has been approved by the Administration; and

.7 emergency marine diesel engines intended to be used solely in case of emergency are still in use for this purpose.

2.6.3 The PSCO should check and verify whether fuel oil complies with the provisions of regulation VI/14 taking into account appendix VI* of this Annex.

2.6.4 The PSCO should pay attention to the record required in regulation VI/14.6 in order to identify the sulphur content of fuel oil used by the ship depending on the area of trade, or that other equivalent approved means have been applied as required, the fuel oil consumed in and outside the ECA, and that there is enough fuel in compliance with regulation VI/14 to reach the next port destination.

2.6.5 Where EGCS is used, the PSCO should check that it has been installed and operated, together with its monitoring systems, in accordance with the associated approved documentation according to the survey procedures as established in the OMM.

2.6.6 If the ship is equipped with an EGCS as an equivalent means of SO_x compliance, the PSCO should verify that the system is properly functioning, is in operation, there are continuous-monitoring systems with tamper-proof data recording and processing devices†, if applicable and the records demonstrate the necessary compliance when set against the limits given in the approved

* Amendments to MARPOL VI, Appendix VI, Verification procedures for a MARPOL Annex VI fuel oil sample (regulation 18.8.2 or regulation 14.8), expected to be adopted in spring 2020 and set out in annex 13 to document MEPC 74/18/Add.1.

† Equivalent emission values for emission abatement methods are 4.3 and 21.7 SO_2 (ppm)/CO_2 (% v/v) for marine fuels with a sulphur content of 0.10 and 0.50 (% m/m) respectively.

documentation and applies to relevant fuel combustion units on board. Checking can include but is not limited to: emissions ratio, pH, PAH, turbidity readings as limit values given in ETM-A or ETM-B and operation parameters as listed in the system documentation.

2.6.7 If the ship is a tanker, as defined in regulation VI/2.21, the PSCO should verify that the vapour collection system approved by the Administration, taking into account MSC/Circ.585, is installed, if required under regulation VI/15.

2.6.8 If the ship is a tanker carrying crude oil, the PSCO should verify that there is on board an approved VOC Management Plan.

2.6.9 The PSCO should verify that prohibited materials are not incinerated.

2.6.10 The PSCO should verify that shipboard incineration of sewage sludge or sludge oil in boilers or marine power plants is not undertaken while the ship is inside ports, harbours or estuaries (regulation VI/16.4).

2.6.11 The PSCO should verify that the shipboard incinerator, if required by regulation VI/16.6.1, is approved by the Administration. For these units, it should be verified that the incinerator is properly maintained, therefore the PSCO should examine whether:

.1 the shipboard incinerator is consistent with the certificate of shipboard incinerator;

.2 the operational manual, in order to operate the shipboard incinerator within the limits provided in appendix IV to the Annex, is provided; and

.3 the combustion chamber flue gas outlet temperature is monitored at all times the unit is in operation (regulation VI/16.9).

2.6.12 If there are clear grounds as defined in paragraph 2.5.3, the PSCO may examine operational procedures by confirming that:

.1 the master or crew are familiar with the procedures to prevent emissions of ozone-depleting substances;

.2 the master or crew are familiar with the proper operation and maintenance of marine diesel engines, in accordance with their Technical Files or Approved Method file, as applicable, and with due regard for emission control areas for NO_x control;

.3 the master or crew are familiar with fuel oil bunkering procedures in connection to the respective bunker delivery notes and onboard records including the Oil Record Book Part 1 (regulation VI/18.5 and VI/14.4) and retained samples as required by regulation VI/18;

.4 the master or crew are familiar with the correct operation of an EGCS or other equivalent means on board together with any applicable monitoring and recording, and record keeping requirements;

.5 the master or crew are familiar and have undertaken the necessary fuel oil changeover procedures, or equivalent, associated with demonstrating compliance within an emission control area;

.6 the master or crew are familiar with the garbage screening procedure to ensure that prohibited garbage is not incinerated;

.7 the master or crew are familiar with the operation of the shipboard incinerator, as required by regulation VI/16.6, within the limits provided in appendix IV to the Annex, in accordance with its operational manual;

.8 the master or crew are familiar with the regulation of emissions of VOCs, when the ship is in ports or terminals under the jurisdiction of a Party to the 1997 Protocol to MARPOL 73/78 in which VOCs emissions are to be regulated, and are familiar with the proper operation of a vapour collection system approved by the Administration (in case the ship is a tanker as defined in regulation VI/2.21); and

.9 the master or crew are familiar with the application of the VOC Management Plan, if applicable.

2.7 Detainable deficiencies

2.7.1 In exercising his/her functions, the PSCO should use professional judgment to determine whether to detain the ship until any noted deficiencies are corrected or to allow it to sail with certain deficiencies which do not pose an unreasonable threat of harm under the scope of the Annex provided they will be timely addressed. In doing this, the PSCO should be guided by the principle that the requirements contained in the Annex, with respect to the construction, equipment and operation of the ship, are essential for the protection of the marine environment, the navigational safety or the human health and that departure from these requirements could constitute an unreasonable threat of harm to the mentioned protection aspects and should be avoided.

2.7.2 In order to assist the PSCO in the use of these Guidelines, there follows a list of deficiencies, which are considered, taking into account the provisions of regulation VI/3, to be of such a serious nature that they may warrant the detention of the ship involved:

.1 absence of valid IAPP Certificate, EIAPP Certificates or Technical Files, if applicable;

.2 a marine diesel engine, with a power output of more than 130 kW, which is installed on board a ship constructed on or after 1 January 2000, or a marine diesel engine having undergone a major conversion on or after 1 January 2000, which does not conform to its Technical File, or where the required records have not been maintained as necessary or where it has not met the applicable requirements of the particular NO_x Tier III emission control area in which it is operating;

.3 a marine diesel engine, with a power output of more than 5,000 kW and a per cylinder displacement at or above 90 L, which is installed on board a ship constructed on or after 1 January 1990 but prior to 1 January 2000, and an approved method for that engine has been certified by an Administration and was commercially available, for which an approved method is not installed after the first renewal survey specified in regulation VI/13.7.2;

.4 on ships not equipped with equivalent means of SO_x compliance, based on the methodology of sample analysis in accordance with appendix VI* of MARPOL Annex VI, the sulphur content of any fuel oil being used or carried for use on board exceeds the applicable limit required by regulation VI/14. If the master claims that it was not possible to bunker compliant fuel oil, the PSCO should take into account the provisions of regulation VI/18.2 (see the appendix).

.5 on ships equipped with equivalent means of SO_x compliance, absence of an appropriate approval for the equivalent means, which applies to relevant fuel combustion units on board. With regard to combustion units not connected to an EGCS, the sulphur content of any fuel oil being used on these combustion units exceeds the limits stipulated in regulation VI/14, taking into account the provisions of regulation VI/18.2 (see the appendix).

* Amendments to MARPOL VI, appendix VI, Verification procedures for a MARPOL Annex VI fuel oil sample (regulation 18.8.2 or regulation 14.8), expected to be adopted in spring 2020 and set out in annex 13 to document MEPC 74/18/Add.1.

.6 non-compliance with the relevant requirements while operating within an emission control area for SO_x and particulate matter control;

.7 an incinerator installed on board the ship on or after 1 January 2000 does not comply with requirements contained in appendix IV to the Annex, or the standard specifications for shipboard incinerators developed by the Organization (resolutions MEPC.76(40) and MEPC.244(66)); and

.8 the master or crew are not familiar with essential procedures regarding the operation of air pollution prevention equipment as defined in paragraph 2.6.12 above.

Chapter 3

Inspections of ships of non-Parties to the Annex and other ships not required to carry the IAPP Certificate

3.1 As this category of ships is not provided with the IAPP Certificate, the PSCO should judge whether the condition of the ship and its equipment satisfies the requirements set out in the Annex. In this respect, the PSCO should take into account that, in accordance with article 5(4) of the MARPOL Convention, no more favourable treatment is to be given to ships of non-Parties.

3.2 In all other respects the PSCO should be guided by the procedures for ships referred to in chapter 2 and should be satisfied that the ship and crew do not present a danger to those on board or an unreasonable threat of harm to the marine environment.

3.3 If the ship has a form of certification other than the IAPP Certificate, the PSCO may take such documentation into account in the evaluation of the ship.

Appendix
Non-availability of compliant fuel oil claimed

In case non-availability of compliant fuel oil is claimed the master/owner must present a record of actions taken to attempt to bunker compliant fuel oil and provide evidence:

- of attempts to purchase compliant fuel oil in accordance with its voyage plan;
- if the fuel oil was not made available where expected, 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.

Best efforts to procure compliant fuel oil include, but are not limited to, investigating alternative sources of fuel oil prior to commencing the voyage or en route.

The ship should not be required to deviate from its intended voyage or to unduly delay the voyage in order to achieve compliance.

If the ship provides the information, as above, the port State should take into account all relevant circumstances and the evidence presented to determine the appropriate action to take, including not taking control measures.

The master/owner may provide evidence as below to support their claim (not exhaustive):

- a copy (or description) of the ship's voyage plan, including the ship's port of origin and port of destination;
- the time the ship first received notice it would be conducting a voyage involving transit/arrival in the port and the ship's location when it first received such notice;
- a description of the actions taken to attempt to achieve compliance, including a description of all attempts that were made to locate alternative sources of compliant fuel oil, and a description of the reason why compliant fuel was not available (e.g. compliant fuel oil was not available at ports on the "intended voyage", fuel oil supply disruptions at port, etc.);
- the cost of compliant fuel is not considered to be a valid basis for claiming non-availability of fuel;
- include names and addresses of the fuel oil suppliers contacted and the dates on which contact was made;
- in cases of fuel oil supply disruption, the name of the port at which the ship was scheduled to receive compliant fuel oil and the name of the fuel supplier that is reporting the non-availability of compliant fuel oil;
- the availability of compliant fuel oil at the next port-of-call and plans to obtain that fuel oil; and
- if applicable, identify and describe any operational constraints that prevented use of compliant fuel oil, e.g. with respect to viscosity or other fuel oil parameters.

If, despite best efforts, it was not possible to procure compliant fuel oil the master/owner must notify the port State control authorities in the port of arrival and the flag Administration (regulation VI/18.2.4).

IMO circulars

MEPC.1/Circ.864/Rev.1
21 May 2019

2019 Guidelines for onboard sampling for the verification of the sulphur content of the fuel oil used on board ships

1 The Marine Environment Protection Committee, at its seventy-fourth session (13 to 17 May 2019), approved the 2019 Guidelines for onboard sampling for the verification of the sulphur content of the fuel oil used on board ships.

2 Member Governments are invited to bring the annexed Guidelines to the attention of Administrations, industry, relevant shipping organizations, shipping companies and other stakeholders concerned.

3 This circular revokes MEPC.1/Circ.864.

Annex

2019 Guidelines for onboard sampling for the verification of the sulphur content of the fuel oil used on board ships

1 Preface

The objective of these Guidelines is to establish an agreed method for sampling to enable effective control and enforcement of liquid fuel oil being used on board ships under the provisions of MARPOL Annex VI.

2 Sampling location

The in-use* representative sample or samples should be obtained from a designated sampling point or points. The number and location of designated fuel oil sampling points should be confirmed by the Administration following consideration of possible fuel oil cross-contamination and service tank arrangements. Fuel oil sampling points to be used should fulfil all of the following conditions:

.1 be easily and safely accessible;

.2 take into account different fuel oil grades being used for the fuel oil combustion machinery item;

.3 be downstream of the in-use fuel oil service tank;

.4 be as close to the fuel oil combustion machinery as safely feasible taking into account the type of fuel oil, flow-rate, temperature, and pressure behind the selected sampling point;

.5 be clearly marked for easy identification and described in either the piping diagram or other relevant documents;

.6 each sampling point should be located in a position shielded from any heated surface or electrical equipment and the shielding device or construction should be sturdy enough to endure leaks, splashes or spray under design pressure of the fuel oil supply line so as to preclude impingement of fuel oil onto such surface or equipment; and

.7 the sampling arrangement should be provided with suitable drainage to the drain tank or other safe location.

3 Sample handling

The fuel oil sample should be taken when a steady flow is established in the fuel oil circulating system. The sampling connection† should be thoroughly flushed through with the fuel oil in use prior to drawing the sample. The sample or samples should be collected in a sampling container or containers and should be representative of the fuel oil being used. The sample bottles should be sealed by the inspector with a unique means of identification installed in the presence of the ship's representative. The ship should be given the option of retaining a sample. The label should include the following information:

.1 sampling point location where the sample was drawn;

.2 date and port of sampling;

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* *In-use sample* means the sample of fuel oil in use on a ship.

† The sampling connection is the valve and associated pipework designated for sample collection which is connected to the fuel oil service system.

.3 name and IMO number of the ship;

.4 details of seal identification; and

.5 signatures and names of the inspector and the ship's representative.

MEPC.1/Circ.875
26 April 2018

Guidance on best practice for fuel oil purchasers/users for assuring the quality of fuel oil used on board ships

1 The Marine Environment Protection Committee, at its seventy-second session (9 to 13 April 2018) approved the Guidance on best practice for fuel oil purchasers/users for assuring the quality of fuel oil used on board ships, as set out in the annex.

2 Member Governments are invited to bring the annexed Guidance to the attention of their Administration, industry, relevant shipping organizations, shipping companies and other stakeholders concerned, as appropriate.

Annex

Guidance on best practice for fuel oil purchasers/users for assuring the quality of fuel oil used on board ships

1 Introduction

1.1 MARPOL Annex VI contains requirements that apply to fuel oil used on board ships. Regulation 14 of MARPOL Annex VI sets limits on the sulphur content of fuel oil used on board ships, both within designated SO_x emission control areas (regulation 14.4) and outside those areas (regulation 14.1). Regulation 18.3 contains requirements that fuel oil delivered to and used on board ships shall not jeopardize the safety of ships or adversely affect the performance of machinery.

1.2 Fuel oil purchasers are responsible for correctly specifying the fuel oil which is to be supplied. It is the responsibility of the supplier to deliver fuel oil which is compliant with the agreed specification.

1.3 These best practices are intended to assist fuel oil purchasers/users in assuring the quality of fuel oil delivered to, and used on board ships, with respect to both compliance with the MARPOL requirements and the safe and efficient operation of the ship.

1.4 These best practices are recommended for all ships and should also be taken into account in those cases where fuel oil purchasing decisions are made by the ship charterer pursuant to a chartering agreement. Under such a charter agreement, communication between the owner and the charterer is paramount. It is recommended that clear requirements on these communications should be included within the appropriate charter party clause.

1.5 It should be noted that, under MARPOL Annex VI, compliance with regulation 14 begins with sourcing and purchasing compliant fuel oil and mitigating the risk of poor quality fuel oil being delivered to the ship.

1.6 These best practices do not comprehensively address fuel oil handling procedures subsequent to fuel oil loading:

.1 onboard fuel oil management is an important element of preventing operational issues and sulphur non-compliance. Improper handling of fuel oil on board may lead to non-compliance with MARPOL requirements, even if the fuel oil received was compliant;

.2 marine fuel oil completely meeting a recognized standard, such as ISO 8217 purchase specifications, still requires fuel oil treatment before it meets most manufacturers' requirements for combustion, particularly residual grades;

.3 to ensure continued compliance once compliant fuel oil is delivered on board, ships should have suitable procedures and documents for use and safe handling of fuel oil on board. These procedures should form part of the company's safety management system (SMS) as required by the ISM Code, supported by equipment operating and maintenance manuals; and

.4 each ship should be provided with onboard fuel oil change over procedures (where applicable). Crew members should receive appropriate familiarization in implementing these procedures.

1.7 When developing their onboard procedures, ship operators should also consider the guidance provided by existing industry practices and standards, for example those published by the International Organization for Standardization (ISO).

1.8 There is increasing interest in low sulphur fuel oils, which are being developed as an alternative to conventional marine heavy fuel oils or low sulphur distillate oils specified by ISO 8217 *Petroleum products – Fuels (class F) – Specifications of marine fuels*. These fuel oils may be blends which carry a higher risk of incompatibility with other fuels than is the case with more traditional fuel oils, and therefore it may be necessary to clean storage tanks and fuel piping before handling such fuel oils. Machinery and fuel oil handling systems may require modification in order to use such fuel oils safely and reliably.

1.9 Fuel oil purchasers considering the use of such fuel oils should engage with suppliers to establish any special requirements for such products and perform a detailed technical analysis, including issues of compatibility and whether it will be necessary to make modifications and adjustments to machinery and fuel oil handling systems before ordering the product.

1.10 It should be noted that unintended contamination of a product may happen in any part of the supply chain, including onboard bunker barges. This is especially important for 0.10% sulphur fuel oil since any contamination with higher sulphur content fuel oil is likely to result in that batch of fuel oil becoming non-compliant.

2 Definitions

2.1 *SOLAS Convention:* International Convention for the Safety of Life at Sea, 1974, as amended.

2.2 *MARPOL Convention:* International Convention for the Prevention of Pollution from Ships, 1973, as amended.

2.3 *ISM Code:* International Safety Management Code.

2.4 *Fuel oil purchaser/purchaser:* Secures and pays for bunkers delivered to a ship at the operator side (user) and not a trader. Can be a shipowner's operator or a charterer's operator; and often used in contracts as counterpart of the supplier.

2.5 *Trader:* The trader buys bunkers from a physical supplier and sells to a purchaser without holding the product physically.

2.6 *Broker:* The broker is used by purchasers and physical suppliers to facilitate buying and selling of fuel oil.

2.7 *Physical supplier/supplier:* Buys, owns and stores fuel oil and sells bunkers. Distributes bunkers from pipelines, trucks and/or barges. May blend products to meet the customer's specifications. May own or charter a distribution network or may hire a barge provider from supply to supply. Issues the bunker delivery note (BDN).

2.8 *Shipowner:* The company which holds the International Safety Management Document of Compliance for the ship under the ISM Code.

2.9 *Quality-oriented fuel oil supplier:* A fuel oil supplier with a quality management system certified in accordance with an internationally recognized standard (ISO 9001 or equivalent), and which may be registered with the Member State and/or licensed, where such licensing/accreditation schemes are in place; and therefore can be expected to be on time, meet the statutory requirements, supply the quantity and quality stated on the BDN, provide support and be able to address relevant issues.

3 Goals

3.1 The best practices set forth in this document reflect a set of goals intended to assure the quality of fuel oil used on board ships, as follows:

.1 support informed decision-making by fuel oil purchasers;

.2 guide fuel oil purchasers in ordering fuel oil of the correct specification and implementing measures to confirm that the fuel oil delivered is compliant with this specification;

.3 encourage proper interactions between the ship crew responsible for fuel oil handling and all other parties (including the fuel oil supplier) from when fuel oil is ordered up to the point of delivery;

.4 mitigate or minimize risk for technical or administrative problems emanating from bunkering of fuel oil;

.5 avoid disputes in the supply process; and

.6 promote compliance with all aspects of regulations 14 and 18 of MARPOL Annex VI which specify the permissible sulphur content in fuel oil and the quality of marine fuel oil.

3.2 The best practices provided in section 4 are intended to assist fuel oil purchasers to achieve the above goals.

3.3 Where a ship is exempted from some of the provisions of MARPOL Annex VI under regulation 3 of the Annex, or will comply with the requirements of the Convention using an equivalent means under regulation 4 of the Annex, fuel oil purchasers should consider any conditions attached to the exemption or equivalent means which may affect fuel oil purchasing.

4 Best practices

General

4.1 The fuel oil purchaser should ensure that the fuel oil ordered is correctly specified considering the ship's known technical capabilities and intended area of operation. These requirements should be communicated to the charterer in those cases where the charterer purchases the fuel oil (see paragraph 1.4).

4.2 In addition to these guidelines, fuel oil purchasers should also refer to ISO 13739:2010 *Petroleum products – Procedures for transfer of bunkers to vessels,* relevant national standards such as SS 524:2014 – Singapore Standard – *Specification for quality management for bunker supply chain (QMBS),* SS 600 – *Singapore Standard Code of Practice for Bunkering,* and to industry best practices such as recommendations published by CIMAC*.

4.3 It should also be noted that engine and equipment manufacturers may have set additional requirements for the quality of fuel oil to be used and those should also be taken into account.

* See http://www.cimac.com/publication-press/publications/wg-publications350/index.html

Choice of fuel oil supplier

4.4 Fuel oil purchasers should strive to purchase fuel oil from quality-oriented fuel oil suppliers. The following questions are intended to help fuel oil purchasers to identify quality-oriented fuel oil suppliers:

4.4.1 *Is the fuel oil supplier included in a local or national registry?*

Verify that the supplier is listed on the register of local suppliers of fuel oil required to be maintained by the Parties to MARPOL Annex VI pursuant to regulation 18.9.1 of MARPOL Annex VI. Inclusion on such a register is not a substitute for purchaser due diligence since the regulation 18.9.1 register is simply a list of local fuel oil suppliers and the qualifications for inclusion on the register may vary significantly between ports and Administrations. This information should be easily accessible, in most cases the information should be available on the internet.

4.4.2 *Does the fuel oil supplier have a license issued by the coastal State or a local port authority?*

In those States/ports that operate established licensing regimes for fuel oil suppliers, a quality-oriented fuel oil supplier will provide evidence to confirm that it is licensed.

4.4.3 *Does the fuel oil supplier have a quality management system (QMS) in place?*

A quality-oriented fuel oil supplier should have a QMS meeting the requirements of ISO 9001:2015 *Quality management systems – Requirements* and ISO 14001:2015 *Environmental management systems – Requirements with guidance for use* (or equivalent national standards). The QMS should include references to the standards which the supplier will adhere to along with any independent third party accreditation of the QMS or elements of the QMS.

4.4.4 *Does the fuel oil supplier have procedures for fuel oil transfer operations?*

Request documentation from the supplier with regard to their fuel oil transfer procedures, including certification under local authorities' quality procedures for bunkering, where applicable.

4.4.5 If fuel oil will be delivered using barges or tankers, fuel oil purchasers should request that information on quality assurance for these vessels should be included within the information provided on their QMS (see paragraph 4.4.3).

4.4.6 Fuel oil purchasers should consider utilising other sources of information, assessment methods and the reviews and experiences of other purchasers. Although third party reviews and information may be of assistance to fuel oil purchasers, caution should be exercised in placing undue reliance on third party opinion since it may be incomplete or contain errors. These other sources of information and assessment methods may include:

.1 consulting the reviews of others (where available) and seeking the views of other purchasers of fuel oil;

.2 requesting that the supplier provides references from existing customers;

.3 use of local knowledge, consulting local agents;

.4 use of statistics. Various sources collect data concerning fuel oil supplier activities which may be used by fuel oil purchasers to help them ascertain if a fuel oil supplier is quality-oriented;

.5 reviewing information made public by Member States pursuant to regulation 18.9 of MARPOL Annex VI, in particular any information submitted to the Organization regarding failures by fuel oil suppliers to meet the requirements of regulations 14 and/or 18 of MARPOL Annex VI;

.6 where available, consulting lists which grade suppliers by the quality of the fuel oils supplied through testing agency data; and

.7 any other sources of information and assessment procedures a purchaser may have in defining the reputability of the fuel oil supplier within the context of this guidance.

4.4.7 Fuel oil testing statistics may help identify supplier-specific trends for sulphur compliance and other quality parameters. Note, however, that caution is needed when using this data, for example, samples which are tested above the specification limit but within ISO 4259:2006 *Petroleum products – Determination and application of precision data in relation to methods of test* – (or ISO 4259-1:2017 *Petroleum and related products – Precision of measurement methods and results – Part 1: Determination of precision data in relation to methods of test* and ISO 4259-2:2017 *Petroleum and related products – Precision of measurement methods and results – Part 2: Interpretation and application of precision data in relation to methods of test*) are sometimes incorrectly reported as off-specification, resulting in the statistical analysis being misleading.

4.4.8 It should be noted that testing agencies may not necessarily have information on supplier quality of service or ability to deliver the right quantity.

Contracting

4.5 The contract specifies the fuel oil to be supplied, and how the supplier will fulfil the contractual agreement.

4.5.1 Where the charterer supplies the fuel oil it should be recognized that the "purchaser" (the charterer) is not the same as the "user" (the ship), and their interests are not necessarily aligned. In these cases, the technical requirements of the user/ship should be communicated to, and taken into account, by the purchaser even when the commercial interests of the "purchaser" and "user" differ.

4.5.2 Fuel oil purchasers may purchase fuel oil directly from a physical supplier or they may utilize the services of traders or brokers when purchasing fuel oil. Traders buy and sell fuel oil and carry the financial risk associated with buying and selling. A broker usually works on commission and does not buy and sell the bunkers, hence they do not carry the financial risk associated with buying and selling.

4.5.3 Purchasers should require that suppliers follow best practices with regard to fuel oil quality, including a quality assurance system (see paragraph 4.4.3), and confirm that procedures are in place if non-compliant fuel oil is detected or delivered.

4.5.4 Bunker specifications and any requirements for bunkering procedures should be stated in the contract. The contract should:

.1 state the quantity ordered. This is usually in metric tonnes by mass; however, other units are sometimes used. The unit used should be clearly stated. The required maximum sulphur content of the fuel oil should meet the applicable requirements of regulation 14 of MARPOL Annex VI;

.2 include a detailed technical specification for the fuel oil along with acceptable quality parameters;

.3 where the fuel oil is to be specified with reference to ISO 8217 *Petroleum products – Fuels (class F) – Specifications of marine fuels,* clearly state which edition is to be used (i.e. 2005, 2010, 2012 or 2017; use of the latest edition of specification is encouraged but this may not be practical in all countries) or, when available, ISO/PAS 23263 *Petroleum products – Fuels (class F) – Considerations for fuel suppliers and users regarding marine fuel quality in view of the implementation of maximum 0,50 % S in 2020;* and

.4 for non-ISO 8217 standard fuel oils, as a minimum the specification should require that the fuel oils need to meet the requirements of regulations 18.3.1 and 18.3.2 of MARPOL Annex VI, and SOLAS chapter II-2.

4.5.5 If fuel oil which is outside the requirements of regulation 14.1 or 14.4 of MARPOL Annex VI is ordered for use with an approved alternative means of compliance such as exhaust gas cleaning systems, this should be communicated to the supplier.

4.5.6 Fuel oil purchasers should include a requirement in their Quality assurance (QA) system to check and approve the quantity to be ordered and quality requirement prior to transmitting their order to the supplier.

Documentation

4.6.1 Bunker delivery notes (BDNs), as required by regulation 18 of MARPOL Annex VI, should be provided by the supplier. Text on the BDN should as a minimum include the requirements of appendix V of MARPOL Annex VI.

4.6.2 In case the product supplied differs in handling characteristics from traditional/mainstream fuel oils, the supplier should provide a guide/publication of best practice which includes recommendations for storage and handling of the supplied product.

Fuel oil receiving onboard, sampling and testing

4.7.1 There should be appropriate record keeping on board, especially with regard to maintaining the oil record book required by MARPOL Annex VI and MARPOL Annex I, regulation 17. Detailed guidance for making entries into the oil record book is provided in MEPC.1/Circ.736/Rev.2 on Guidance for the recording of operations in the Oil Record Book Part I – Machinery space operations (all ships), as revised.

4.7.2 The receiving ship should have procedures for bunkering, fuel oil handling, and storage of fuel oil, including spill, pollution and emergency response. Shipboard emergency plans addressing different categories of emergencies are required under the provisions of both the SOLAS and MARPOL Conventions, the ISM Code and supporting guidance, including:

.1 resolution A.1072(28) on Revised guidelines for a structure of an integrated system of contingency planning for shipboard emergencies provides guidance for integrated emergency response planning; and

.2 regulation 37 of MARPOL Annex I requires ships to have a shipboard oil pollution emergency plan (SOPEP), guidance for developing the SOPEP is provided by resolution MEPC.54(32) on Guidelines for the development of shipboard oil pollution emergency plans, as amended by resolution MEPC.86(44).

4.7.3 Detailed guidance for bunkering procedures, including a sample bunkering checklist, may be found in various available guidance documents, for example chapter 25 of the International Safety Guide for Oil Tankers and Terminals (ISGOTT).

4.7.4 Clear communications should be established between the receiving ship and supplier (bunker barge, truck or terminal) and emergency stop and response actions agreed prior to any bunkering activities commencing.

4.7.5 Handling onboard should, so far as is possible, avoid co-mingling of fuel oils in tanks or fuel oil lines in order to minimize cross contamination.

4.7.6 A representative fuel oil sample should be collected during the bunkering process. Guidelines for collecting the MARPOL sample are provided in resolution MEPC.182(59) on 2009 Guidelines for the sampling of fuel oil for determination of compliance with the revised MARPOL Annex VI.

4.7.7 The use of cameras arranged to witness and record bunkering and sampling processes could be considered.

4.7.8 It is recommended that the fuel oil purchaser has a sample of fuel oil collected during bunkering analysed to confirm that it complies with the agreed specification in the contract. Sample analysis should be performed by an independent laboratory and according to relevant international test standards accredited to ISO/IEC 17025 *General requirements for the competence of testing and calibration laboratories* or an equivalent national standard. Accredited laboratories in a particular country should be listed on the national accreditation bodies' website. It is also recommended that laboratories have an ISO 9001 *Quality management systems – Requirements,* or equivalent quality management system. Where possible, it is recommended that fuel oil should not be used until this analysis has been completed.

4.7.9 Purchasers should confirm the accreditation or certification of the laboratory they intend to use, in particular they should check whether any accreditation is general in nature (overall lab practices) or for specific analytical methods.

4.7.10 The contract terms and conditions should stipulate how the laboratory analysis will be carried out in the case of disputes.

4.7.11 In some circumstances it is not necessary to make full laboratory analyses before using the fuel oil which has been delivered (e.g. fuel oil is frequently supplied on contract with same supplier).

4.7.12 Where an analysis is required by the Administration then the analysis should be carried out in accordance with the verification procedures of the Administration.

4.7.13 While a fuel oil purchaser/user may choose to use ISO 13739, ISO 4259, or other testing protocols, it should be mindful that MARPOL Annex VI sets out the procedures for compliance and enforcement, including Appendix VI fuel verification procedure for MARPOL Annex VI fuel oil samples. Guidance is also provided in resolution MEPC.182(59) on 2009 Guidelines for the sampling of fuel oil for determination of compliance with the revised MARPOL Annex VI, and the Guidelines for onboard sampling for the verification of the sulphur content of the fuel oil used on board ships (MEPC.1/Circ.864*). If a different test or a different accreditation is desired, it can be specified in the fuel oil purchase contract itself. However, that contract will not override the requirements of MARPOL Annex VI with respect to determining compliance with the mandatory standards in a compliance or enforcement action brought by a flag, port, or coastal State.

Dispute resolution

4.8 Dispute handling/resolution arrangements in case of dispute should be specified in the contract.

* As amended by MEPC.1/Circ.864/Rev.1 (see page 39 of this publication).

MEPC.1/Circ.875/Add.1
9 November 2018

Guidance on best practice for fuel oil suppliers for assuring the quality of fuel oil delivered to ships

1 The Marine Environment Protection Committee, at its seventy-third session (22 to 26 October 2018), approved the Guidance on best practice for fuel oil suppliers for assuring the quality of fuel oil delivered to ships, as set out in the annex.

2 Member Governments are invited to bring the annexed Guidance to the attention of their Administration, industry, relevant shipping organizations, shipping companies and other stakeholders concerned, as appropriate.

Annex

Guidance on best practice for fuel oil suppliers for assuring the quality of fuel oil delivered to ships

1 Introduction

1.1 MARPOL Annex VI contains requirements that apply to fuel oil used on board ships. Regulation 14 sets limits on the sulphur content of fuel oil used on board ships, both within designated SO_x emission control areas (regulation 14.4) and globally (regulation 14.1). Regulation 18.3 contains requirements that fuel oil delivered to and used on board ships should not jeopardize the safety of ships or adversely affect the performance of machinery. Regulation 4.2.1.1 of SOLAS II-2 stipulates that except as otherwise permitted, no fuel oil with a flashpoint of less than 60°C shall be used.

1.2 Fuel oil purchasers are responsible for correctly specifying the fuel oil which is to be supplied. It is the responsibility of the supplier to deliver fuel oil which is compliant with the agreed specification and statutory limits.

1.3 These best practices are intended to assist fuel oil suppliers to ensure the quality of fuel oils delivered to ships which is compliant with the agreed specification and statutory limits.

1.4 When developing their procedures, fuel oil suppliers should also consider the guidance provided by existing industry practices and standards, for example those published by the International Organization for Standardization (ISO).

1.5 This guidance does not apply to supply of low flashpoint fuels such as LNG, LPG or methyl/ethyl alcohols, nor to pure biofuels.

2 Definitions

2.1 *SOLAS:* International Convention for the Safety of Life at Sea, 1974, as amended.

2.2 *MARPOL:* International Convention for the Prevention of Pollution from Ships, 1973, as amended.

2.3 *Bunker(s):* Hydrocarbon based fuel for ship consumption. Primarily derived from petroleum sources, may also contain hydrocarbons from synthetic or renewable sources. Bunkers are chiefly classified as distillate or residual fuel oils usually referred to as "fuel oils" in IMO documents.

2.4 *Bunker supplier/supplier:* Manufactures or buys, owns, stores and sells bunkers. Distributes bunkers from pipelines, trucks and/or barges. May blend products to meet the customer's specifications. May own or charter a distribution network or may hire delivery services from a third party. Issues the bunker delivery note (BDN).

2.5 *Bunker barge provider:* Owner/operator of tankers or barges providing transportation services for a physical supplier. Usually issues the BDN on behalf of the supplier.

2.6 *Truck provider:* Owner/operator of tank trucks. Usually issues BDN on behalf of the supplier.

2.7 *Cargo officer/supplier's representative:* Person appointed by the bunker supplier to be responsible for the delivery of bunkers to the ship and is responsible for the completion of the documentation to be provided to the receiving ship.

2.8 *Bunker buyer/purchaser:* Secures and pays for bunkers delivered to a ship at the operator side (user) and not a trader. Can be a shipowner's operator or a charterer's operator; and often used in contracts as counterpart of the supplier.

2.9 *Quality-oriented fuel oil supplier:* A fuel supplier with a quality management system certified in accordance with an internationally recognized standard (ISO 9001 or equivalent), and which may be registered with the Member State and/or licensed, where such licensing/accreditation schemes are in place; and therefore can be expected to be on time, meet the statutory requirements, supply the quantity and quality stated on the BDN, provide support and be able to address relevant issues.

3 Goals/objectives

3.1 The best practices set forth in this document reflect a set of goals intended to assure the quality of fuel oil delivered to ships, as follows:

.1 bunkers delivered at the point of custody, which can be the receiving ship's rail or manifold, to meet the buyer's ordered specifications;

.2 bunkers delivered to be in compliance with sulphur limits specified by the buyer in accordance with regulation 14 of MARPOL Annex VI;

.3 bunkers delivered to be in compliance with regulation 18.3 of MARPOL Annex VI which contains requirements that fuel oil delivered to and used on board ships shall not include any added substance or chemical waste that jeopardizes the safety of ships, adversely affect the performance of the machinery, is harmful to personnel or contributes to additional air pollution;

.4 bunkers delivered to meet SOLAS chapter II-2 requirements regarding flashpoint;

.5 Safety data sheets (SDS, formerly known as MSDS – material safety data sheets) and other relevant documentation detailing the fuel properties to be provided to the buyer;

.6 bunkers to be delivered to the ship in a safe and efficient manner, preventing practices that may compromise safety and crew health or the quality as delivered to the receiving ship;

.7 representative samples to be taken during delivery in accordance with regulation 18.8.1 of MARPOL Annex VI, taking into account the 2009 Guidelines for the sampling of fuel oil for determination of compliance with the revised MARPOL Annex VI (resolution MEPC.182(59));

.8 seek transparency/traceability and ensure quality control throughout the bunker supply chain;

.9 mitigating quality risks throughout the supply chain to avoid disputes;

.10 encourage interactions and clear lines of communication regarding procedures to be followed between bunker suppliers and bunker buyers from the point of order up to the point of delivery; and

.11 encourage effective dispute resolution through collaboration and communication between parties.

Best practices

4 General

4.1 In order to ensure that the quality of bunkers delivered to ships meets the relevant specifications, suppliers should source from appropriate refinery streams and/or hydrocarbon streams from synthetic or renewable sources to produce bunkers meeting the relevant specifications. The end product should be homogeneous and stable.

4.2 To ensure that the product conforms to relevant specifications and statutory limits, the final blend should always be tested against the relevant standards and the test results should be documented.

4.3 In order to maintain quality control throughout the supply chain, it is important to have documentation to help identify product origins back to the manufacturing source and the various links in the chain to enable traceability, especially if problems arise to help pinpoint the source of the problem and take remedial action.

4.4 Once a bunker blend has been produced and tested, appropriate storage and cargo handling in shore tanks and onboard cargo and bunker supply tankers should be adopted to maintain product integrity.

4.5 The supplier is responsible for providing the required representative samples of the product delivered to ships to be taken at the ship's manifold and the required documentation including the bunker delivery note (BDN) and safety data sheets (SDS).

4.6 In addition to these guidelines, fuel oil suppliers should also refer to ISO 13739 *Petroleum products – Procedures for transfer of bunkers to ships*, relevant national standards such as SS 524:2014 – *Singapore Standard – Specification for quality management for bunker supply chain (QMBS)*, SS 600 – *Singapore Standard Code of Practice for Bunkering*, and to industry best practices such as guidelines published by CIMAC.

5 Quality control during production of bunkers

5.1 Blending should, in principle, only take place in shore tanks in order to ensure the end product is homogeneous. The quality of the resultant blends should be tested and confirmed prior to delivery to ship.

5.2 The bunker supplier should ensure control of individual blend component quality. This includes knowing their individual properties through accurate data, and the component origins, supported by relevant documentation.

5.3 Blend components should be tried and tested so that their typical properties and suitability for bunker fuel production, and how they combine with other components, is well understood, with particular attention being given to the compatibility between blend components. Blending operatives should have appropriate knowledge of blending bunkers.

5.4 Where there are any uncertainties as to the nature and quality of a blend component, any issue should be identified and resolved before its use in the production of bunkers.

5.5 The following are recommended for bunker suppliers to ensure the quality of blends:

.1 maintain a database of suitable and unsuitable blend components based on experience, industry knowledge and reported incidents;

.2 development and/or use of appropriate blend modelling tools; and

.3 test new/unfamiliar blends rigorously to meet the requirements of regulation 18.3 of MARPOL Annex VI and recognized standards, such as ISO 8217 *Petroleum products – Fuels (class F) – Specifications of marine fuels.*

5.6 The blend should not contain extraneous, potentially deleterious, materials as defined in clause 5 in ISO 8217 and regulation 18.3 of MARPOL Annex VI. This does not preclude the use of additives intended to improve specific fuel characteristics such as cold flow properties or combustion properties.

5.7 Any additives used should be known and have a proven track record in marine fuel application. Any new additive should be thoroughly evaluated to ensure it is fit for use in marine fuel application (for example, be accepted by engine manufacturers).

5.8 Key data of the blend components include, but are not limited to, viscosity, density, flashpoint and sulphur. Sufficient data should be available on blending components to ensure the final blend fully meets the requirements of the grade of bunkers being made.

5.9 Blend proportions as determined from component data need to be correctly calculated and set and thereafter maintained during production of the specified product.

5.10 To ensure the end product is stable, the producer should ensure that all blend components are mutually compatible to avoid precipitation of solids. This can be done through testing compatibility of the blend components.

5.11 The final blend should be tested at a qualified laboratory. The sample sent for testing should be taken in accordance with guidelines for obtaining a representative sample (bottom, middle and top of the tank).

5.12 Blending during delivery should be avoided.

5.13 If it is anticipated that the product will be close to a limit maximum/minimum, the producer should keep in mind the precision of individual test methods when setting blend targets to ensure the product meets the specification limit with sufficient confidence. In the case of fuel oil sulphur content, producers are recommended to follow the guidelines provided in ISO 4259 *Petroleum products – Determination and application of precision data in relation to methods of test.*

6 Quality control in the supply chain

6.1 Fuel quality can be compromised at several points in the supply chain, up to and including delivery to ship. It is therefore recommended that the supplier establishes, documents and maintains a quality management system (QMS) covering all stages from taking custody of the product until the product passes the point of custody transfer to the receiving ship.

6.2 If part of the supplier's supply chain is performed by other parties, such as terminal operators and bunker barge or truck providers, these should be identified in the QMS and the supplier should strive to ensure control and maintain oversight over the supply chain.

7 Bunker transport, storage and transfer

7.1 The quality of a bunker fuel or blend components may change compared to its origin during transport, storage and transfer. The supplier should seek to prevent the quality known from the original test report and/or certificate of quality (COQ) from being compromised through working closely with third parties as follows:

.1 tankers intending to transport the fuels as cargo should demonstrate to the supplier that the tanker is certified to carry this type of cargo (e.g. clean/dirty petroleum products). Suppliers should seek information about previous cargoes in case remaining

residues could contaminate the product. Suppliers should also seek guarantees that the cargo tank has been properly cleaned if the previous cargo presents a risk of cross-contamination;

.2 ensure that storage tanks at refineries or at independent storage facilities are suitable for the type of cargo to be stored, and that storage tanks are in good condition (e.g. no rust) before a new cargo is loaded. If tanks are not empty before loading new cargoes, ensure the resulting blend is properly mixed so that it is homogeneous and stable and that the new blend is properly tested using samples from the bottom, middle and top of the tank;

.3 ensure good housekeeping during storage. This includes keeping products at the right temperature and preventing water ingress into the tank. Any water that accumulates should be removed to avoid conditions leading to microbial/bacterial growth that can severely compromise the bunker quality;

.4 if part of the supplier's supply chain is performed by other parties, such as terminal operators and operators of supply ships or trucks, these should be identified in the QMS and the supplier should strive to ensure control and/or maintain oversight over the supply chain;

.5 pipelines at terminals may be used to transfer several types of cargo (known as multiproduct pipelines). If this is the case, seek verification that pipelines have been adequately cleared to prevent cross-contamination that may affect the overall quality or compromise the product specification;

.6 prior to loading, barge providers should seek verification from the loading terminal that the product transfer pipelines have been properly cleared to prevent cross-contamination with the previous products transferred via the pipeline;

.7 bunker tankers/barges should avoid loading cargo from different shore tanks into the same cargo tank, unless the shore tanks contain products of the same grade and with the same certificate of quality;

.8 a representative sample should be taken during the loading of the bunker tanker/barge. The sampling should be witnessed and countersigned by a representative from the bunker tanker/barge and a representative of the loading terminal. The sample should be taken in accordance with recognized standards, such as ISO 3170/ASTM D4057 (manual sampling standard) or ISO 3171 (pipeline auto-sampling);

.9 ensure good housekeeping during product storage and handling on the barge. This includes keeping fuels at the right temperature and preventing water ingress into the tank from external sources or condensation;

.10 suction line strainers on cargo pumps should be cleaned periodically, and always cleaned before changing to a different grade of cargo; and

.11 when loading the bunker supply tanker/barge (or truck), the following precautions are recommended:

.1 avoid loading different product batches into the same cargo tank;

.2 ensure the cargo tank is empty before loading a new cargo into it; and

.3 seek information about previous cargoes in case residues from a previous cargo could contaminate the product. Seek guarantees that the cargo tank has been properly cleaned if the previous cargo presents a risk of cross-contamination.

8 Delivery to ship (bunkering operations)

8.1 Delivery to ship can be directly from a shore tank (at refinery or terminal) via pipeline, from a bunker tanker/barge coming alongside the ship at berth, at anchorage or off-shore, or from a road truck or rail car at berth.

8.2 Detailed guidance for bunkering procedures, including a sample bunkering checklist, may be found in various available guidance documents, for example chapter 25 of the International Safety Guide for Oil Tankers and Terminals (ISGOTT).

8.3 Clear communications should be established between supplier (bunker barge, truck or terminal) and the receiving ship and emergency stop and response actions agreed prior to any bunkering activities commencing.

8.4 In order to address the health and safety risk to crew on both the supply ship and receiving ship, all parties involved in the bunkering operation should wear adequate personal protective equipment (PPE) and take due care to prevent skin contact with bunkers and exposure to hazardous fumes.

8.5 If more than one grade of bunkers is to be supplied, the order in which the grades are to be supplied should be agreed between the cargo officer and the receiving ship's chief engineer. To avoid contamination of product during delivery, it is recommended that the lighter/lowest sulphur grade is supplied first followed by the heavier/higher sulphur grade.

8.6 Ensure that all supply pipelines and hoses are thoroughly cleared of residue prior to every new delivery, especially if the supply pipeline/hose is going to be used to supply a different product specification than the previous delivery.

8.7 Carry out line clearing of bunker hose(s)/pipelines at the end of the pumping operation. Once line clearing is completed, the contents in the hose should be drained back into the bunker tanker's cargo tank.

8.8 There should be segregated pipelines/hoses and bunker connections for supply of materially different types of product, e.g. for residual and distillate grades, and for high and low sulphur bunkers to prevent cross-contamination of products.

8.9 Collection of a representative sample should be performed for each separate grade being delivered. If more than one tanker/barge or truck is used to supply the ship, a separate set of representative sample(s) should be taken and a separate BDN issued for each tanker/barge or truck.

9 Representative sampling

9.1 Sampling is an integral part of quality control and vital in protecting the interest of all parties involved. Samples may be used as evidence both for commercial, regulatory or even criminal disputes and in court cases. The objective is to obtain samples that are truly representative of the product being transferred, both during delivery to ship and upstream in the supply chain as appropriate prior to the bunker delivery.

9.2 To ensure samples are representative, a single primary sample for each grade of fuel delivered from each tanker/barge or truck should be drawn continuously throughout the entire product transfer by either an automatic sampler or manual continuous drip sampler.

9.3 While a fuel oil supplier may use ISO 13739 and ISO 3171 for automatic pipeline sampling, ISO 3170 for manual methods or some other protocol for obtaining samples, it should be remembered that MARPOL Annex VI sets out the procedures for compliance and enforcement which includes resolution MEPC.182(59) on the 2009 Guidelines for the sampling of fuel oil for determination of compliance with the revised MARPOL Annex VI.

10 Testing and interpretation of test results in the supply chain

10.1 Testing should be carried out on samples from each point of product custody transfer throughout the supply chain and documented so the analysis report is matched to the product origin. This is a key part of a QMS to enable transparency and traceability and assist the supplier to identify the origin of potential problems and take steps to remedy and prevent further quality issues.

10.2 The testing analysis should be done according to the relevant internationally recognized test methods.

10.3 For the bunker producer/supplier, the recommendation is that the blend target should not be the actual specification limit, but rather the limit minus (or plus if it is a minimum limit) an appropriate safety margin. For the bunker producer/supplier to ensure that the product meets the specification limit with 95% confidence, the blend target should be the limit minus 0.59R for a maximum limit (or plus 0.59R for a minimum limit).

10.4 Further information can be found in a 2016 guidance document from CIMAC freely available online at the following link:

http://www.cimac.com/cms/upload/workinggroups/WG7/CIMAC_WG07_2016_Feb_Guideline_Interpretation__Fuel_Analysis_Test_Results_Final.pdf and Section 8 of ISO 8217, Precision and interpretation of test results.

11 Documentation

11.1 Documentation is a crucial part of the QMS in order to achieve transparency and traceability in the supply chain. This includes records of custody transfer of cargoes, certificates of quality (COQ), sample seal numbers and quality analysis reports.

11.2 Suppliers are responsible for providing bunker delivery notes (BDNs) to the receiving ship and safety data sheets (SDS) in line with the requirements of SOLAS regulation VI/5-1. It is the supplier's responsibility to ensure that the bunkers delivered to ship are in conformity with the details provided on the BDN and SDS.

11.3 In addition to the minimum requirements (BDN and SDS), suppliers are recommended to provide other supportive documentation such as copies of COQs and quality analysis reports and information on properties that may affect how the bunkers behave during storage and handling on the receiving ship. This might assist the ship to store and handle the fuel in a safe and efficient manner.

Cargo custody transfer

11.4 For cargo custody transfers, documentation should include at least the following:

.1 certificate of receipt identifying the owner of the cargo prior to custody transfer and the new owner;

.2 name of tanker or tank terminal supplying the cargo to the new owner;

.3 certificate of quality accompanied by laboratory analysis report; and

.4 sampling sheet recording sampling location(s), sampling method(s) and all sample seal numbers.

Sample labels

11.5 Sample labels should comply with regulation 18.8 of MARPOL Annex VI, as detailed in the 2009 Guidelines for the sampling of fuel oil for determination of compliance with the revised MARPOL Annex VI (resolution MEPC.182(59)). The following information is required on all sample labels:

.1 location at which, and the method by which, the sample was drawn;

.2 date of commencement of delivery;

.3 name of bunker tanker/bunker installation;

.4 name and IMO number of the receiving ship;

.5 signatures and names of the supplier's representative and the ship's representative;

.6 details of seal identification; and

.7 bunker grade.

11.6 Details of the sample seals should be recorded on the bunker delivery note.

Safety data sheets – SDS (formerly known as material safety data sheets (MSDS)

11.7 SOLAS regulation VI/5-1 requires that safety data sheets are provided to a ship prior to loading MARPOL Annex I type cargoes and marine fuel oils.

11.8 SDS are intended to inform crew on the receiving ship of all health, safety, handling and environmental risks associated with the cargo/product. Details of the required information are set out in resolution MSC.286(86) on the Recommendations for material safety data sheets (MSDS) for MARPOL Annex I oil cargo and oil fuel.

Bunker delivery note – BDN

11.9 The bunker delivery note (BDN) is the official receipt stating the grade and quantity of bunkers supplied to the receiving ship. Regulation 18.5 of MARPOL Annex VI and appendix V of MARPOL Annex VI stipulates information to be included in the BDN.

11.10 Additional details, beyond the MARPOL requirements, may be included on the BDN according to local requirements and the commercial requirements of the supplier.

11.11 The BDN should be signed by both the supplier's representative and the representative of the receiving ship and retained by the supplier for at least three years as per regulation 18.9.3 of MARPOL Annex VI.

Supporting documentation

11.12 Suppliers should, where possible, provide bunker buyers with copies of the product's certificate of quality (COQ) and associated laboratory analysis reports verifying the details on the COQ. These may include more detailed information on specific quality parameters which would be helpful to the crew on the receiving ship in applying appropriate fuel management, including pre-treatment prior to use.

Fuel properties/handling advice

11.13 The supplier should provide information on properties that may affect how the bunkers behave during storage and handling on the receiving ship, if the product supplied differs in handling characteristics from traditional/mainstream bunkers.

11.14 This information should include any special fuel management and handling requirements such as heating, special attention to pre-treatment in separators and centrifuges, and any known compatibility issues particular to the product.

11.15 For distillate fuels, suppliers should report cloud point (CP), cold filter plugging point (CFPP) and pour point (PP). ISO 8217 fuel oil specifications require these fuel oil cold characteristic to be tested. This information helps the ship's crew determine if the fuel will need heating. The responsibility for ordering a product with appropriate CP, CFPP and PP for the ship's operational needs rests with the buyer.

Licensing

11.16 In those States/ports that operate established licensing regimes for bunker suppliers, the bunker supplier should provide evidence to confirm the licence(s).

Quality management systems (QMS)

11.17 Suppliers should have quality management systems (QMS) in place and be able to provide evidence to bunker buyers if required. In cases where a supplier has its own internal QMS, it should be able to provide a summary to bunker buyers upon request. The QMS documentation should include references to the standards which the supplier will adhere to along with any independent third party accreditation of the QMS or elements of the QMS.

12 Contracting

12.1 Selling and buying bunkers is a commercial activity involving contracting parties, which in the case of bunker suppliers and bunker buyers can include a variety of parties. The "contract" in this instance covers both the supplier's general terms and conditions and the actual purchasing order.

12.2 The contract specifies the product(s) to be supplied, quantity and details of how the supplier will fulfil the contractual agreement, and should include claim/dispute clauses. Dispute handling/ resolution arrangements in case of dispute should be specified.

12.3 Bunker specifications and any requirements for bunkering procedures should be stated in the contract. The contract should:

.1 state the quantity ordered, the required maximum sulphur content and that the fuel is to meet the applicable requirements in regulation 18 of MARPOL Annex VI;

.2 include a detailed technical specification for the fuel along with acceptable quality parameters;

.3 where the fuel is specified with reference to ISO 8217 *Petroleum products – Fuels (class F) – Specifications of marine fuels*, the contract should clearly state which edition is to be used (i.e. 2005, 2010, 2012 or 2017). Using the latest edition is encouraged where possible; and

.4 for non-ISO 8217 standard fuel oils, as a minimum the contract should specify that the bunkers provided meet the requirements of regulations 18.3.1 and 18.3.2 of MARPOL Annex VI, and SOLAS chapter II-2. If the product is close to an ISO 8217 grade, but will not meet specific parameters, those exemptions should be mutually agreed in advance and specified in the purchase order and contract.

12.4 If the bunker buyer orders fuel with a sulphur content exceeding the limit in MARPOL Annex VI, the supplier should obtain a notification from the bunker buyer that the fuel will be used with an approved alternative means of compliance such as exhaust gas cleaning. The supplier should ensure the notification is communicated to the supplier's representative overseeing the physical delivery (e.g. the cargo officer).

12.5 Unless otherwise permitted by MARPOL Annex VI and confirmed by supporting documentation, e.g. ships installed with an alternative means of compliance with the fuel oil sulphur content limit, the supplier should not supply fuel oil which is not compliant with relevant statutory requirements and specifications.

12.6 The contract terms and conditions should stipulate how the laboratory analysis will be carried out in the case of disputes.

12.7 The contract should specify that the laboratory should be independent and certified to ISO 17025 or an equivalent standard.

13 Dispute resolution

13.1 Dispute handling/resolution arrangements in case of dispute should be specified in the contract.

13.2 Following the ship's own testing programme, if the results lead to a quality dispute where the supplier's retained commercial sample is to be tested, it is recommended that breaking the seal of that sample is witnessed by representatives for both the supplier and the buyer. If the test on the supplier's retained commercial sample fails to meet the specified maximum/minimum limit, the product has not met that specification limit.

13.3 If the cause for the failure of the product to meet specification lies with parties other than the contracting bunker supplier, for example the original bunker blend provider or the bunker tanker/barge operator delivering the product on the contracting supplier's behalf, it is up to the supplier to seek compensation from these parties.

13.4 If a product that has been delivered is proven by test results to be off-specification, but has not yet been used, the supplier should enter into constructive dialogue with the buyer and support the buyer with regards to remedial action including debunkering, if required.

13.5 In cases where a ship experiences operational problems suspected but not specifically proven to be caused by the fuel, the supplier should offer any assistance they are capable of to the buyer in trying to determine the root cause. This may involve, for example, information on product origin to help build knowledge of cargo sources that may be associated with unusual or unexpected operational issues.

MEPC.1/Circ.878
9 November 2018

Guidance on the development of a ship implementation plan for the consistent implementation of the 0.50% sulphur limit under MARPOL Annex VI

1 The Marine Environment Protection Committee, at its seventy-third session (22 to 26 October 2018), approved the Guidance on the development of a ship implementation plan for the consistent implementation of the 0.50% sulphur limit under MARPOL Annex VI, as set out in the annex.

2 Member Governments are invited to bring the annexed Guidance to the attention of their Administration, industry, relevant shipping organizations, shipping companies and other stakeholders concerned.

Annex

Guidance on the development of a ship implementation plan for the consistent implementation of the 0.50% sulphur limit under MARPOL Annex VI

Introduction

1 MEPC 70 agreed to "1 January 2020" as the effective date of implementation for ships to comply with global 0.50% m/m sulphur content of fuel oil requirement and adopted resolution MEPC.280(70) on the Effective date of implementation of the fuel oil standard in regulation 14.1.3 of MARPOL Annex VI*.

2 In this context, MEPC 73 agreed that Administrations should encourage ships flying their flag to develop implementation plans, outlining how the ship may prepare in order to comply with the required sulphur content limit of 0.50% by 1 January 2020. The plan could be complemented with a record of actions taken by the ship in order to be compliant by the applicable date.

3 Regulation 18.2.3 of MARPOL Annex VI requires a Party to take into account all relevant circumstances and the evidence presented to determine the action to take, including not taking control measures. Administrations and port State control authorities may take into account the implementation plan when verifying compliance with the 0.50% sulphur limit requirement.

4 A ship implementation plan is not a mandatory requirement. A lack of a ship implementation plan or an incomplete ship implementation plan should not be considered as "clear grounds" for a more detailed inspection.

Ship implementation plan for the consistent implementation of 0.50% sulphur limit under MARPOL Annex VI

5 The ship implementation plan for 2020 could cover various items relevant for the specific ship, including, as appropriate, but not limited to:

.1 risk assessment and mitigation plan (impact of new fuels);

.2 fuel oil system modifications and tank cleaning (if needed);

.3 fuel oil capacity and segregation capability;

.4 procurement of compliant fuel;

.5 fuel oil changeover plan (conventional residual fuel oils to 0.50% sulphur compliant fuel oil); and

.6 documentation and reporting.

Issues relating to use of sulphur compliant fuel oil

6 All fuel oil supplied to a ship shall comply with regulation 18.3 of MARPOL Annex VI and chapter II-2 of SOLAS. Furthermore, ship operators could consider ordering fuel oil specified in accordance with the ISO 8217 marine fuel standard. The following potential fuel-related issues may

* Amendments to regulation 14.1.3 of MARPOL Annex VI were adopted by MEPC 73 (October 2018).

need to be assessed and addressed by ships in preparation for and implementation of the 0.50% sulphur limit requirement:

.1 technical capability of ships to handle different types of fuel (e.g. suitability of fuel pumps to handle both higher and lower viscosity fuels, restrictions on fuels suitable for use in a ship's boilers, particularly the use of distillate fuels in large marine boilers);

.2 compatibility of different types of fuels e.g. when paraffinic and aromatic fuels containing asphaltenes are commingled in bunkering or fuel oil changeover;

.3 handling sulphur non-compliant fuels in the event of non-availability of sulphur compliant fuels; and

.4 crew preparedness including possible training with changeover procedures during fuel switching from residual fuel oil to 0.50% compliant fuel oils.

7 The ship implementation plan could be used as the appropriate tool to identify any specific safety risks related to sulphur compliant fuel oil, as may be relevant to the ship, and to develop an appropriate action plan for the Company to address and mitigate the concerns identified. Examples should include:

.1 procedures to segregate different types of fuel and fuels from different sources;

.2 detailed procedures for compatibility testing and segregating fuels from different sources until compatibility can be confirmed;

.3 procedures to changeover from one type of fuel to another or a fuel oil that is known to be incompatible with another fuel oil;

.4 plans to address any mechanical constraints with respect to handling specific fuels, including ensuring that minimum/maximum characteristics of fuel oil as identified in ISO 8217 can be safely handled on board the ship; and

.5 procedures to verify machinery performance on fuel oil with characteristics with which the ship does not have prior experience.

8 A ship implementation plan for the consistent implementation of the 0.50% sulphur limit under MARPOL Annex VI is recommended to be developed based on the indicative example as set out in appendix 1.

9 The plan could take into account the issues identified in:

.1 appendix 2: additional guidance for development of the ship implementation plan (impact on machinery systems); and

.2 appendix 3: additional guidance for development of the ship implementation plan (tank cleaning).

Appendix 1

Indicative example for ship implementation plan for achieving compliance with the 0.50% sulphur limit entering into force on 1 January 2020 using compliant fuel oil only

Particulars of ship

1 Name of ship: .....

2 Distinctive number or letters: .....

3 IMO Number: .....

Planning and preparation (before 1 January 2020)

1 Risk assessment and mitigation plan

1.1 Risk assessment (impact of new fuels): Yes/No

1.2 Linked to onboard SMS: Yes/No

2 Fuel oil system modifications and tank cleaning (if needed)

2.1 Schedule for meeting with manufacturers and/or classification societies:

2.2 Structural Modifications (installation of fuel oil systems/tankage) required: Yes/No/Not applicable

If Yes, then: .....

2.2.1 Fuel oil storage system: .....

Description of modification: .....

Details of yard booking (as applicable), time schedules etc.:

Estimated date of completion of modification: .....

2.2.2 Fuel transfer, filtration and delivery systems: .....

Description of modification:

Details of yard booking (as applicable), time schedules etc.:

Estimated date of completion of modification: .....

2.2.3 Combustion equipment: .....

Description of modification: .....

Details of yard booking (as applicable), time schedules etc.:

Estimated date of completion of modification: .....

2.3 Tank cleaning required: Yes/No/Not applicable

If Yes, then: .....

Details of cleaning schedule (including, yard booking, time schedules etc., if applicable):

Estimated date of completion of cleaning: .....

3 Fuel oil capacity and segregation capability

Following any required modifications as per Section 2:

3.1 Expected number of bunker tanks designated to store 0.50% sulphur compliant fuel oil:

. . . . . .

3.2 Expected total storage capacity (m^3) for 0.50% sulphur compliant fuel oil:

. . . . . .

3.3 Expected number of bunker tanks designated to store 0.10% sulphur compliant fuel oil:

. . . . . .

3.4 Expected total storage capacity (m^3) for 0.10% sulphur compliant fuel oil:

. . . . . .

3.5 Approximate total fuel oil content (m^3) in the fuel oil transfer, purification and delivery systems:

. . . . . .

4 Procurement of compliant fuel oil

4.1 Details of fuel purchasing procedure to source compliant fuels, including procedures in cases where compliant fuel oil is not readily available:

4.2 Estimated date for bunkering compliant fuel oil, not later than 24:00 hrs 31 December 2019:

. . . . . .

4.3 If fuel arranged by charterer, is there an intention to accept charter party contracts that do not have a specified obligation to provide compliant fuel oil after 1 June 2019 or other date to be identified: Yes/No

If Yes, then: . . . . . .

Details of alternate steps taken to ensure that the charter party provides timely delivery of compliant fuel:

4.4 Is there confirmation from bunker supplier(s) to provide compliant fuel oil on the specified date: Yes/No

If No, then:. . . . . .

Details of alternate steps taken to ensure timely availability of compliant fuel oil:

4.5 Details of arrangements (if any planned) to dispose of any remaining non-compliant fuel oil:

5 Fuel oil changeover plan

5.1 Consider whether a ship-specific fuel changeover plan is to be made available. The plan should include measures to offload or consume any remaining non-compliant fuel oil. The plan should also demonstrate how the ship intends to ensure that all its combustion units will be using compliant fuel oil no later than 1 January 2020.

5.2 As per the ship-specific fuel changeover plan, the maximum time period required to changeover the ship's fuel oil system to use compliant fuel oil at all combustion units:

.....

5.3 Expected date and approximate time of completion of the above-mentioned changeover procedure:

.....

5.4 Consider availability of adequately trained officers and crew familiar with the ship's fuel system and fuel changeover procedures to carry out the fuel oil changeover procedure. If this cannot be confirmed, then consider whether there is a sufficient amount of time dedicated for ship-specific familiarization and training of new officers and crew.

6 Documentation and reporting

6.1 If there are modifications planned as per section 2, related documents including the shipboard fuel oil tank management plans and stability and trim booklets should be consequently updated.

6.2 The implementation plan could be kept on board and updated as applicable.

6.3 If when following the implementation plan the ship has to bunker and use non-compliant fuel oil due to unavailability of compliant fuel oil safe for use on board the ship, steps to limit the impact of using non-compliant fuel oil could be:

6.4 The ship should have a procedure for Fuel Oil Non-Availability Report (FONAR). The master and chief engineer should be conversant about when and how FONAR should be used and who it should be reported to.

Appendix 2
Additional guidance for development of the ship implementation plan (impact on machinery systems)

1 Ships are advised to assess potential impact on machinery systems with the use of distillates and fuel oil blends and prepare ships in consultation with chief engineers, equipment manufacturers and suppliers.

2 The ship tank configuration and fuel system may require adjustments. A fully segregated fuel system for distillate fuels and blended fuels is recommended because they may require special attention. Ship tank configuration and segregated fuel system will also allow for better management of potentially incompatible fuels.

Distillates

3 If distillates have been chosen as the option for compliance the following may be considered:

.1 a decrease in fuel oil viscosity may cause an increase in fuel oil leakage between the fuel pump plunger and barrel of diesel engines. Internal leakages in the fuel injection system may result in reduced fuel pressure to the engine, which may have consequences for the engine performance (e.g. starting of the engine). Equipment makers' recommendations should be consulted, and adequate testing, maintenance and possible installation of coolers etc. may be performed;

.2 shipowners may also consider installing fuel pumps and injection nozzles, suitable to fuel oil with low viscosity. Fuel oil with too low viscosity may lead to increased wear or seizure of fuel oil pumps. Engine and boilermakers should be consulted to ensure its safe and efficient operation. Implications for validity of NO_x certification (EIAPP Certificate) should be considered;

.3 while some compliant fuels may not require heating, others, including some distillates, will require heating. It would therefore be prudent to review heating arrangements for distillate fuels on board and, where appropriate, maintain the existing heating arrangements; and

.4 in some locations, bunker suppliers may only be able to offer automotive diesel fuel containing biodiesel (FAME) in accordance with the ISO 8217:2017 standard which provides a marine biodiesel specification (DFA/DFB) with up to 7.0% by volume of FAME. CIMAC has provided a "Guideline for Ship owners and Operators on Managing Distillate Fuels up to 7.0 % v/v FAME (Biodiesel)".*

4 In view of paragraph 3.3 manufacturers of engines and equipment such as oily water separators, overboard discharge monitors, filters and coalescers, etc. need to be consulted to confirm ability to handle biodiesel blends up to 7% v/v.

5 Also, some parts of the fuel oil supply system, i.e. fuel pumps, pipefittings and gaskets may need to be overhauled to ensure integrity.

* https://www.cimac.com/cms/upload/workinggroups/WG7/CIMAC_WG7_Guideline_for_Ship_Owners_and_Operators_on_Managing_Distillate_Fuels_May_2013.pdf

Blended residual fuels

6 New blended 0.50% sulphur fuel oil as and when offered could provide an alternative to conventional distillate fuel such as Marine Distillate Fuel.

7 When using such new blended sulphur fuel oils, the technical specification of such fuels are (a) either within the limits specified by ISO 8217 or (b) issued with formal documentation indicating no objection to its use by the engine/boiler makers.

8 Before purchasing a new fuel oil product, operators should carefully consider the specific technical and operational challenges that this type of fuel oil may have and, where necessary, contact the fuel oil supplier or original equipment manufacturer (OEM) for the considerations to be made to ensure safe operation.

9 Densities of these fuel oils are in general lower than conventional residual fuel oils. This may require adjustment of centrifuges to ensure adequate cleaning of the fuel oil.

Cold flow

10 Since most distillate fuels do not require heating (in fact, typically, heating is not recommended due to the low viscosity of these products), the fuel's cold flow properties become a potential handling/storage challenge, especially when operating in colder regions.

11 It is however possible to successfully manage cold flow properties through good fuel management, from procurement to technical operation, by considering the following:

.1 where the ship will be operating;

.2 where the risk is higher of getting fuels with poor cold flow properties;

.3 can the required cold flow properties be specified in the fuel contract;

.4 what is the actual low-temperature flow properties of the bunkered fuel; and

.5 which actions have to be taken in order to safely consume the bunkered fuel (e.g. tank and filter heating).

Appendix 3
Additional guidance for development of the ship implementation plan (tank cleaning)

Introduction

1 Most ships will have been using high viscosity high sulphur fuel oil (HSFO) based primarily on residual fuel oils. Such fuels tend to adhere to the inside of fuel tanks forming layers of semi-solid substances containing sediments and asphaltenic sludge; such residues will also typically have solidified and settled in various parts of the fuel oil service system including pipelines, settling and service tanks.

2 The ship operator may choose to clean the fuel oil tanks of these residues before loading compliant fuel prior to 1 January 2020 based on the following considerations.

3 Some of the fuels complying with the 0.50% sulphur limit are expected to be very paraffinic due to crude sources of blending components and also a high content of distillate components. If such fuels are loaded into HSFO fuel tanks that have not been cleaned, there is a possibility that they could dissolve and dislodge sediments and asphaltenic sludge in storage tanks, settling tanks and pipelines, potentially leading to purifier and filter operational issues and in extreme cases fuel starvation resulting in loss of power.

4 Alternatively, ships have been using ship specific changeover procedures to effectively and safely load on top of existing fuel oil and gradually flushing through the fuel system until the sulphur content in the fuel oil is at a compliant level.

5 Should the ship operator determine it is appropriate to clean the ship's fuel oil tanks and system, the following considerations may need to be taken into account when making arrangements for tank cleaning.

Options for tank cleaning, approximate timelines and considerations

6 Fuel oil tanks are normally cleaned on a regular basis on ships to remove built-up sediments and sludge, usually during dry docking and whenever inspections of the fuel tanks are due. However, leading up to 1 January 2020, it would not be practicable for the majority of the global fleet that has been running on HSFO and decided to opt for tank cleaning to undergo dry docking during a very short period. Hence, other options for cleaning tanks and fuel oil systems during service may need to be considered.

7 The time and work involved in cleaning HSFO tanks cannot be defined precisely, as it will vary depending on how long it has been since the last time the tanks were cleaned, the condition of the tank coating and the effectiveness of the cleaning process itself. The estimates in this document may err on the side of caution as it is almost impossible to pinpoint at what stage the ship's fuel oil system is sufficiently clean to guarantee compliance.

Manual cleaning during dry docking

8 Time required varies; it can be done in 2 to 4 days per tank. In addition to cleaning tanks, all of the pipework in the fuel oil service system needs to be flushed through. Overall, it may take 1 to 2 weeks.

9 A ship that has had all its fuel oil tanks and fuel system cleaned can start loading compliant fuels and expect to be fully compliant right away.

10 However, if only the tanks have been cleaned in dry dock, it could take 2 to 5 days to flush through the pipework in the fuel oil service system to ensure full compliance with the 0.50% sulphur limit.

Manual cleaning during service

11 If tanks are to be cleaned manually during service, risk assessment and safety measures are paramount; refer to IMO resolution A.1050(27) on Revised recommendations for entering enclosed spaces aboard ships.

12 Time required will vary depending on tank size and the number of tanks, how long it has been since the last tank cleaning and the number of crew available to perform safe and complete tank cleaning operations. Tank cleaning can be performed by the ship's crew and/or by employing a riding crew for this purpose. It is always good practice to inspect the tank once cleaned to check its condition and to inspect heating coils, conduct pressure tests and undertake repairs as necessary.

13 If the cleaning is done by the ship's existing crew, it would likely take a minimum of 4 days per tank. For an average tank, a week should be allowed. If employing a riding crew to clean the tanks, if working in shifts, it would likely take a minimum of 2 days to clean a tank, but 4 days per tank should be allowed.

14 Tanks need to be empty before they can be cleaned, hence the time needed to drain tanks needs to be taken into account when estimating the overall time required.

15 In addition to cleaning tanks, all of the pipework in the fuel oil service system needs to be flushed. Flushing the remaining pipework and fuel oil service system after all tanks have been cleaned could take another 1 to 2 days.

16 The residues from tank cleaning should be retained on board until they can be disposed of correctly or disposed to shore reception facilities.

Cleaning tanks in service with specialized additives

17 As an alternative to manual cleaning, consideration can be given to gradually cleaning the sediments and asphaltenic sludge from HSFO tanks and fuel systems by dosing additives. There are successful examples of this approach for ships that needed to reallocate HSFO tanks to fuels complying with the 0.10% sulphur limit that took effect in ECAs in 2015.

MEPC.1/Circ.880
9 November 2018

Reporting of availability of compliant fuel oils in accordance with regulation 18.1 of MARPOL Annex VI

1 The Marine Environment Protection Committee, at its seventy-third session (22 to 26 October 2018), urged Parties to MARPOL Annex VI and other Member Governments to inform the Organization of the availability of compliant fuel oils in its ports and terminals via the GISIS MARPOL Annex VI module well in advance of 1 January 2020.

2 MEPC 70 in October 2016 decided to retain 1 January 2020 as the effective date of implementation for the 0.50% m/m sulphur limit for fuel oil used on board ships operating outside emission control areas designated for the control of sulphur oxides.

3 MEPC 71 in July 2017, approved the new output on consistent implementation of the 0.50% m/m sulphur limit, and also agreed to the holding of an intersessional meeting dedicated to progressing this output.

4 MEPC 73 in October 2018, approved MEPC.1/Circ.878* Guidance on the development of a ship implementation plan for the consistent implementation of the 0.50% sulphur limit under MARPOL Annex VI includes guidance on the procurement of compliant fuel oil.

5 Pursuant to regulation 18.1 of MARPOL Annex VI, Parties to MARPOL Annex VI should take all reasonable steps to promote the availability of fuel oils that comply with MARPOL Annex VI and inform the Organization of the availability of compliant fuel oils in its ports and terminals.

6 The twenty-eighth session of the IMO Assembly adopted resolution A.1074(28) on Notification and circulation through the Global Integrated Shipping Information System (GISIS). Resolution A.1074(28) agreed that GISIS should be considered as an effective way for Contracting Governments or Parties to IMO instruments to fulfil their reporting obligations under the various mandatory IMO instruments.

7 Availability of fuels can be reported using the MARPOL Annex VI module on GISIS (https://gisis.imo.org). For regulation 18.1 of MARPOL Annex VI, the information that can be added is set out in the annex.

* See page 63 of this publication.

Annex

GISIS module for regulation 18.1 of MARPOL Annex VI

Fuel oil availability (regulation 18.1)

1 Party notifying the Organization (select from drop down menu)

2 Port/terminal where compliant fuel oil is available

- .1 Name of port (select from drop down menu)
- .2 Terminal name (if applicable)

3 Type of compliant fuel oil available at the port/terminal identified above

- .1 Fuel type (tick boxes)
  - .1 HFO
  - .2 MDO
  - .3 MGO
- .2 Sulphur content of compliant fuel oil available (tick boxes)
  - .1 not exceeding 4.50% m/m
  - .2 not exceeding 3.50% m/m (in effect 1 January 2012)
  - .3 not exceeding 1.00% m/m
  - .4 not exceeding 0.50% m/m (in effect 1 January 2020)
  - .5 not exceeding 0.10% m/m (in effect 1 January 2015)

4 Additional information/references (attach file)

- .1 File title/description

MEPC.1/Circ.881
21 May 2019

Guidance for port State control on contingency measures for addressing non-compliant fuel oil

1 The Marine Environment Protection Committee, at its seventy-fourth session (13 to 17 May 2019), approved the Guidance for port State control on contingency measures for addressing non-compliant fuel oil, as set out in the annex.

2 Member Governments are invited to bring the annexed Guidance to the attention of their Administration, industry, relevant shipping and fuel industry organizations, shipping companies and other stakeholders concerned, as appropriate.

Annex

Guidance for port State control on contingency measures for addressing non-compliant fuel oil

1 In the case of non-compliant fuel oil, communication between the ship and the port State should occur. The ship and the port State should consider the following as possible contingency measures:

.1 actions predetermined in the ship implementation plan, if available, for consistent implementation of the 0.50% sulphur limit under MARPOL Annex VI (MEPC.1/Circ.878*);

.2 discharging non-compliant fuel oil to another ship to be carried as cargo or to an appropriate shipboard or land-based facility, if practicable and available;

.3 managing the non-compliant fuel oil in accordance with a method acceptable to the port State; and

.4 operational actions, such as modifying sailing or bunkering schedules and/or retention of non-compliant fuel oil on board the ship. The port State and the ship should consider any safety issues and avoid possible undue delays.

2 Having considered all of the options in paragraph 1 above, the non-compliant fuel oil may be discharged to the port or retained on board, as acceptable to the port State. Port State consideration may include environmental, safety, operational and logistical implications of allowing or disallowing the carriage of non-compliant fuel oil. The carriage of non-compliant fuel oil is subject to any conditions of the port State.

3 The port State, the flag State and the ship should work together to agree on the most appropriate solution, taking into account the information provided in the Fuel Oil Non-Availability Report (FONAR)†, to address the non-compliant fuel oil.

4 After the non-compliant fuel oil is completely used or discharged, such actions should include the possibility of cleaning and/or flushing through or dilution of remaining residues by using compliant fuel oil with the lowest sulphur content available.

* See page 63 of this publication.

† Appendix 1 of the 2019 Guidelines for consistent implementation of the 0.50% sulphur limit under MARPOL Annex VI (resolution MEPC.320(74); see page 17 of this publication)).

MEPC.1/Circ.882
16 July 2019

Early application of the verification procedures for a MARPOL Annex VI fuel oil sample (regulation 18.8.2 or regulation 14.8)

1 The Marine Environment Protection Committee, at its seventy-fourth session (13 to 17 May 2019), approved amendments to appendix VI of MARPOL Annex VI on Verification procedures for a MARPOL Annex VI fuel oil sample (regulation 18.8.2 or regulation 14.8), providing an agreed method to determine whether the fuel oil delivered to, in-use or carried for use on board a ship is in accordance with the applicable sulphur limit of regulation 14 of MARPOL Annex VI.

2 To ensure a consistent approach to verifying the sulphur limit of the fuel oil delivered to, in-use or carried for use on board a ship until the entry into force of the approved amendments, Member Governments are invited to apply the approved amendments to appendix VI of MARPOL Annex VI related to the verification procedure for a MARPOL Annex VI fuel oil sample (regulation 18.8.2 or regulation 14.8), as contained in the annex to this circular, in advance of their entry into force.

3 Member Governments are invited to bring the annexed Guidance to the attention of Administrations, port State control authorities, industry, fuel oil suppliers, relevant shipping organizations, shipping companies and other stakeholders concerned.

4 This circular expires on entry into force of the amendments.

Annex

The approved amendments to the verification procedures for a MARPOL Annex VI fuel oil sample (regulation 18.8.2 or regulation 14.8)

Regulation 2

Definitions

1 *New paragraphs 52, 53, 54, 55 and 56 are added as follows:*

"**52** *Sulphur content of fuel oil* means the concentration of sulphur in a fuel oil, measured in % m/m as tested in accordance with a standard acceptable to the Organization*.

53 *Low-flashpoint fuel* means gaseous or liquid fuel oil having a flashpoint lower than otherwise permitted under paragraph 2.1.1 of SOLAS regulation II-2/4.

54 *MARPOL delivered sample* means the sample of fuel oil delivered in accordance with regulation 18.8.1 of MARPOL Annex VI.

55 *In-use sample* means the sample of fuel oil in use on a ship.

56 *Onboard sample* means the sample of fuel oil intended to be used or carried for use on board that ship."

Regulation 14

Sulphur oxides (SO_x) and particulate matter

2 "In-use and onboard fuel oil sampling and testing" *and a new paragraph 8 and 9 are added at the end of regulation 14 as follows:*

"In-use and onboard fuel oil sampling and testing

8 If the competent authority of a Party requires the in-use or onboard fuel oil sample to be analysed, it shall be done in accordance with the verification procedure set forth in appendix VI to determine whether the fuel oil being used or carried for use on board meets the requirements in paragraph 1 or paragraph 4 of this regulation. The in-use fuel oil sample shall be drawn taking into account the guidelines developed by the Organization†. The onboard fuel oil sample shall be drawn taking into account the guidelines to be developed by the Organization.‡

9 The sample shall be sealed by the representative of the competent authority with a unique means of identification installed in the presence of the ship's representative. The ship shall be given the option of retaining a duplicate sample."

---

* Refer to ISO 8754:2003 *Petroleum products – Determination of sulfur content – Energy-dispersive X-ray fluorescence spectrometry.*

† Refer to the 2019 Guidelines for onboard sampling for the verification of the sulphur content of the fuel oil used on board ships (MEPC.1/Circ.864/Rev.1; see page 39 of this publication).

‡ Refer to the Guidelines to be developed prior to entry into force of the provision.

3 "In-use fuel oil sampling point" *and new paragraphs 10, 11, 12 and 13 are added at the end of regulation 14 as follows:*

"In-use fuel oil sampling point

10 For each ship subject to regulations 5 and 6 of this Annex, sampling point(s) shall be fitted or designated for the purpose of taking representative samples of the fuel oil being used on board the ship taking into account guidelines developed by the Organization*.

11 For a ship constructed before entry into force of these requirements, the sampling point(s) referred to in paragraph 10 shall be fitted or designated no later than the first renewal survey that occurs 12 months or more after the entry into force of this regulation.

12 The requirements of paragraphs 10 and 11 above are not applicable to a fuel oil service system for a low-flashpoint fuel for combustion purposes for propulsion or operation on board the ship.

13 The competent authority of a Party shall, as appropriate, utilize the sampling point(s) which is fitted or designated for the purpose of taking representative sample(s) of the fuel oil being used on board in order to verify the fuel oil complies with this regulation. Taking fuel oil samples by the competent authority of the Party shall be performed as expeditiously as possible without causing the ship to be unduly delayed."

Regulation 18
Fuel oil availability and quality

4 *Paragraph 8.2 is replaced with the following:*

"**8.2** If a Party requires the representative sample to be analysed, it shall be done in accordance with the verification procedure set forth in appendix VI to determine whether the fuel oil meets the requirements of this Annex."

Appendix VI

Fuel verification procedure for MARPOL Annex VI fuel oil samples (regulation 18.8.2)

5 *Appendix VI is replaced with the following:*

"Verification procedures for a MARPOL Annex VI fuel oil sample (regulation 18.8.2 or regulation 14.8)

The following relevant verification procedure shall be used to determine whether the fuel oil delivered to, in-use or carried for use on board a ship has met the applicable sulphur limit of regulation 14 of this Annex.

This appendix refers to the following representative MARPOL Annex VI fuel oil samples:

Part 1 – sample of fuel oil delivered† in accordance with regulation 18.8.1, hereafter referred to as the 'MARPOL delivered sample' as defined in regulation 2.54.

* Refer to the 2019 Guidelines for onboard sampling for the verification of the sulphur content of the fuel oil used on board ships (MEPC.1/Circ.864/Rev.1; see page 39 of this publication).

† "Samples taken in accordance with the 2009 Guidelines for the sampling of fuel oil for determination of compliance with the revised MARPOL Annex VI (resolution MEPC.182(59))."

Part 2 – sample of fuel oil in use*, intended to be used or carried for use on board in accordance with regulation 14.8, hereafter referred to as the 'in-use sample' as defined in regulation 2.55 and 'onboard sample'† as defined in regulation 2.56.

Part 1 – MARPOL delivered fuel oil sample

1 General requirements

1.1 The representative fuel oil sample, which is required by regulation 18.8.1 (the MARPOL delivered sample) shall be used to verify the sulphur content of the fuel oil delivered to a ship.

1.2 A Party, through its competent authority, shall manage the verification procedure.

1.3 A laboratory undertaking the sulphur testing procedure given in this appendix shall have valid accreditation* in respect of the test method to be used.

2 Verification procedure Part 1

2.1 The MARPOL delivered sample shall be conveyed by the competent authority to the laboratory.

2.2 The laboratory shall:

.1 record the details of the seal number and the sample label on the test record;

.2 record the condition of the seal of the sample as received on the test record; and

.3 reject any sample where the seal has been broken prior to receipt and record that rejection on the test record.

2.3 If the seal of the sample as received has not been broken, the laboratory shall proceed with the verification procedure and shall:

.1 unseal the sample;

.2 ensure that the sample is thoroughly homogenized;

.3 draw two subsamples from the sample; and

.4 reseal the sample and record the new reseal details on the test record.

2.4 The two subsamples shall be tested in succession, in accordance with the specified test method referred to in regulation 2.52 of this Annex. For the purposes of this Part 1 verification procedure, the results of the test analysis shall be referred to as '1A' and '1B':

.1 results '1A' and '1B' shall be recorded on the test record in accordance with the requirements of the test method; and

.2 if the results of '1A' and '1B' are within the repeatability (r)† of the test method, the results shall be considered valid; or

* Samples taken in accordance with the 2019 Guidelines for onboard sampling for the verification of the sulphur content of the fuel oil used on board ships (MEPC.1/Circ.864/Rev.1; see page 39 of this publication).

† Refer to the Guidelines to be developed by the Organization prior to entry into force of the provision.

* The laboratory is to be accredited to ISO/IEC 17025:2017 or an equivalent standard for the performance of the given sulphur content test ISO 8754:2003.

† Repeatability (r) calculation in accordance with ISO 4259-2:2017 and as defined in the test method used.

.3 if the results '1A' and '1B' are not within the repeatability (r) of the test method, both results shall be rejected and two new subsamples shall be taken by the laboratory and tested. The sample bottle shall be resealed in accordance with paragraph 2.3.4 after the new subsamples have been taken.

.4 in the case of two failures to achieve repeatability between '1A' and '1B', the cause of that failure shall be investigated by the laboratory and resolved before further testing of the sample is undertaken. On resolution of that repeatability issue, two new subsamples shall be taken in accordance with paragraph 2.3. The sample shall be resealed in accordance with paragraph 2.3.4 after the new subsamples have been taken.

2.5 If the test results of '1A' and '1B' are valid, an average of these two results shall be calculated. The average value shall be referred to as 'X' and shall be recorded on the test record:

.1 if the result 'X' is equal to or less than the applicable limit required by regulation 14, the fuel oil shall be considered to have met the requirement; or

.2 if the result 'X' is greater than the applicable limit required by regulation 14, the fuel oil shall be considered to have not met the requirement.

Table 1: *Summary of Part 1 MARPOL delivered fuel oil sample procedure*

On the basis of the test method referred to in regulation 2.52 of this Annex		
Applicable limit % m/m: V	Result 2.5.1: $X \leq V$	Result 2.5.2: $X > V$
0.10	Met the requirement	Not met the requirement
0.50		
	Result 'X' reported to 2 decimal places	

2.6 The final results obtained from this verification procedure shall be evaluated by the competent authority.

2.7 The laboratory shall provide a copy of the test record to the competent authority managing the verification procedure.

Part 2 – In-use and onboard fuel oil samples

3 General requirements

3.1 The in-use or onboard fuel oil sample, as appropriate, shall be used to verify the sulphur content of the fuel oil as represented by that sample of fuel oil at the point of sampling.

3.2 A Party, through its competent authority, shall manage the verification procedure.

3.3 A laboratory undertaking the sulphur testing procedure given in this appendix shall have valid accreditation* in respect of the test method to be used.

4 Verification procedure Part 2

4.1 The in-use or onboard fuel oil sample shall be conveyed by the competent authority to the laboratory.

* The laboratory is to be accredited to ISO/IEC 17025:2017 or an equivalent standard for the performance of the given sulphur content test ISO 8754:2003.

4.2 The laboratory shall:

.1 record the details of the seal number and the sample label on the test record;

.2 record the condition of the seal of the sample as received on the test record; and

.3 reject any sample where the seal has been broken prior to receipt and record that rejection on the test record.

4.3 If the seal of the sample as received has not been broken, the laboratory shall proceed with the verification procedure and shall:

.1 unseal the sample;

.2 ensure that the sample is thoroughly homogenized;

.3 draw two subsamples from the sample; and

.4 reseal the sample and record the new reseal details on the test record.

4.4 The two subsamples shall be tested in succession, in accordance with the specified test method referred to in regulation 2.52 of this Annex. For the purposes of this Part 2 verification procedure, the results obtained shall be referred to as '2A' and '2B':

.1 results '2A' and '2B' shall be recorded on the test record in accordance with requirements of the test method; and

.2 if the results of '2A' and '2B' are within the repeatability (r)* of the test method, the results shall be considered valid; or

.3 if the results of '2A' and '2B' are not within the repeatability (r) of the test method, both results shall be rejected and two new subsamples shall be taken by the laboratory and tested. The sample bottle shall be resealed in accordance with paragraph 4.3.4 after the new subsamples have been taken.

.4 in the case of two failures to achieve repeatability between '2A' and '2B', the cause of that failure shall be investigated by the laboratory and resolved before further testing of the sample is undertaken. On resolution of that repeatability issue, two new subsamples shall be taken in accordance with paragraph 4.3. The sample shall be resealed in accordance with paragraph 4.3.4 after the new subsamples have been taken.

4.5 If the test results of '2A' and '2B' are valid, an average of these two results shall be calculated. That average value shall be referred to as 'Z' and shall be recorded on the test record:

.1 if 'Z' is equal to or less than the applicable limit required by regulation 14, the sulphur content of the fuel oil as represented by the tested sample shall be considered to have met the requirement;

.2 if 'Z' is greater than the applicable limit required by regulation 14 but less than or equal to that applicable limit + 0.59R (where R is the reproducibility of the test method)†, the sulphur content of the fuel oil as represented by the tested sample shall be considered to have met the requirement; or

.3 if 'Z' is greater than the applicable limit required by regulation 14 + 0.59R, the sulphur content of the fuel oil as represented by the tested sample shall be considered to have not met the requirement.

* Repeatability (r) calculation in accordance with ISO 4259-2:2017 and as defined in the test method used.

† Reproducibility (R) calculation in accordance with ISO 4259-2:2017 and as defined in the test method.

Table 2: *Summary of in-use or onboard fuel oil sample procedure*[*]

On the basis of the test method referred to in regulation 2.52 of this Annex				
Applicable limit % m/m: V	Test margin value: W	Result 4.5.1: $Z \leq V$	Result 4.5.2: $V < Z \leq W$	Result 4.5.3: $Z > W$
0.10	0.11	Met the requirement	Met the requirement	Not met the requirement
0.50	0.53			
		Result 'Z' reported to 2 decimal places		

4.6 The final results obtained from this verification procedure shall be evaluated by the competent authority.

4.7 The laboratory shall provide a copy of the test record to the competent authority managing the verification procedure."

[*] Results of testing undertaken by the Company or other entities are outside the MARPOL process and hence should be considered within the approach given by ISO 4259-2:2017 regarding recipient drawn samples.

MEPC.1/Circ.883
21 May 2019

Guidance on indication of ongoing compliance in the case of the failure of a single monitoring instrument, and recommended actions to take if the exhaust gas cleaning system (EGCS) fails to meet the provisions of the 2015 EGCS Guidelines (resolution MEPC.259(68))

1 The Marine Environment Protection Committee, at its seventy-fourth session (13 to 17 May 2019), approved the Guidance on indication of ongoing compliance in the case of the failure of a single monitoring instrument, and recommended actions to take if the Exhaust Gas Cleaning System (EGCS) fails to meet the provisions of the 2015 EGCS Guidelines (resolution MEPC.259(68)).

2 Member Governments are invited to bring the annexed Guidance to the attention of Administrations, port State control authorities, industry, relevant shipping organizations, shipping companies and other stakeholders concerned.

Annex

Guidance on indication of ongoing compliance in the case of the failure of a single monitoring instrument, and recommended actions to take if the exhaust gas cleaning system (EGCS) fails to meet the provisions of the 2015 EGCS Guidelines (resolution MEPC.259(68))

System malfunction

1 An exhaust gas cleaning system (EGCS) malfunction is any condition that leads to an emission exceedance, with the exception of the short-term temporary emission exceedance cases described in sections 7 and 8, or an interim indication of ongoing compliance in the case of sensor failure described in sections 9 to 11.

2 As soon as possible after evidence of a malfunction (e.g. alarm is triggered), the ship should take action to identify and remedy the malfunction.

3 The ship operator should follow the process to identify and remedy the malfunction in the exhaust gas cleaning system – Technical Manual that is approved at the time the EGCS is certified or in other documentation provided by the EGCS manufacturer.

4 The trouble-shooting process specified by the EGCS manufacturer should describe how to determine, within a reasonable amount of time, if the system itself is not working properly and whether the system fault must be addressed through adjustment and/or repair. The procedure would describe events that can trigger a monitoring alarm or other evidence of a scrubber malfunction (e.g. pump flow rates) and the troubleshooting process to identify and remedy the malfunction. The process should include at a minimum the following:

.1 a checklist for the operator to use to identify a malfunction; and

.2 a list of remedial actions that can be taken to resolve the malfunction after it is identified.

5 An EGCS malfunction event should be included in the EGCS Record Book including the date and time the malfunction began and, if relevant, how it was resolved, the actions taken to resolve it and any necessary follow-up actions.

6 A system malfunction that cannot be rectified is regarded as an accidental breakdown. The ship should then change over to compliant fuel oil if the EGCS cannot be put back into a compliant condition within one hour. If the ship does not have compliant fuel oil or sufficient amount of compliant fuel oil on board, a proposed course of action, in order to bunker compliant fuel oil or carry out repair works, should be communicated to relevant authorities including the ship's administration, for their agreement.

Short-term exceedances

7 A short-term temporary emission exceedance is an exceedance of the applicable emissions ratio that may occur due to the EGCS dynamic response when there is a sudden change in the exhaust gas flow rate to the EGCS. There may be a short period during which the measured emission values might indicate that the applicable emissions ratio limit has been exceeded. This is a common behaviour of monitoring equipment and EGCS dynamic response (due to a sudden change in

exhaust gas flow rate). A time lapse between when the sensor takes its reading and when the unit responds may trigger an alarm from the continuous emission monitoring device even though the EGCS has not malfunctioned. Thus, transitory periods and isolated spikes in the recorded output do not necessarily mean exceedance of emissions and should therefore not be considered as a breach of the requirements.

8 The typical operating conditions that may result in a short-term temporary emission exceedance should be specified by the EGCS manufacturer in the EGCS Technical Manual that is approved at the time the EGCS is certified.

Interim indication of ongoing compliance in the case of sensor failure

9 When running on a fuel oil with a constant sulphur content and at constant washwater engine load ratio, all parameters monitored according to the 2015 EGCS Guidelines (MEPC.259(68)) (i.e. emission ratio, washwater pH, etc.) will be in a certain interrelation, all depending on each other. If one of the parameters changes, some other(s) will necessarily also have to change.

10 This interrelation also serves as an indicator of instrumentation malfunction; i.e. if a single sensor signal starts to deviate or even does not display, the effect on the other parameters may indicate whether the change in signal is caused by sensor failure or whether the performance of the EGCS itself has changed. If the other parameters are continuing at the normal levels, it is an indication that there is only an instrumentation malfunction rather than non-compliance with regard to the levels allowed in the exhaust gas and the discharge water.

11 If a malfunction occurs in the instrumentation for the monitoring of Emission Ratio or discharge water (pH, PAH, turbidity), the ship should keep records of interim indication for demonstrating compliance. The documentation and actions should include (but are not limited to):

.1 the manual or automatic recording of the data at the time of malfunction may be used to confirm that all other relevant data as recorded for the performance of the EGCS are showing values in line with values prior to the malfunction;

.2 the ship operator should record the sulphur content of the various grades of fuel oil used in the affected fuel oil combustion units from the time when the malfunction started;

.3 the ship operator should log the malfunctioning of the monitoring equipment and (for Scheme A) record all parameters that might be suitable to indicate compliant operation. This record could serve as an alternative documentation demonstrating compliance until the malfunction is rectified; and

.4 the monitoring equipment that has suffered a malfunction should be repaired or replaced as soon as practicable.

Notifications to relevant authorities

12 Any EGCS malfunction that lasts more than one hour or repetitive malfunctions should be reported to the flag and port State's Administration along with an explanation of the steps the ship operator is taking to address the failure. At their discretion, the flag and port State's Administration could take such information and other relevant circumstances into account to determine the appropriate action to take in the case of an EGCS malfunction, including not taking action.

MEPC.1/Circ.884
21 May 2019

Guidance for best practice for Member State/coastal State

1 The Marine Environment Protection Committee, at its seventy-fourth session (13 to 17 May 2019) approved the Guidance for best practice for Member State/coastal State, as set out in the annex.

2 Member Governments are invited to bring the annexed Guidance to the attention of their Administration, industry, relevant shipping and fuel industry organizations, shipping companies and other stakeholders concerned, as appropriate.

Annex

Guidance for best practice for Member State/coastal State

1 Introduction

1.1 These best practices are intended to assist Member States in carrying out their responsibilities under MARPOL Annex VI, to ensure effective implementation and enforcement of statutory requirements of that Annex.

1.2 It should be noted that these best practices are not intended to create any responsibilities for Member States beyond what is required in MARPOL Annex VI.

1.3 Non-Parties to MARPOL Annex VI are also encouraged to make use of these best practices.

2 Definitions

For the purpose of this best practice guidance:

2.1 *Fuel oil purchaser/purchaser:* Secures and pays for bunkers delivered to a ship at the operator side (user) and not a trader. The "Fuel oil purchaser/purchaser" can be a shipowner's operator or a charterer's operator; and is often used in contracts as counterpart of the supplier.

2.2 *III Code:* IMO Instruments Implementation Code adopted by the Organization by resolution A.1070(28).

2.3 *MARPOL Convention:* International Convention for the Prevention of Pollution from Ships, 1973, as amended.

2.4 *Physical supplier/supplier:* Buys, owns and stores fuel oil and sells bunkers. Distributes bunkers from pipelines, trucks and/or barges. May blend products to meet the customer's specifications. May own or charter a distribution network or may hire a barge provider from supply to supply. Issues the bunker delivery note (BDN).

2.5 *Register of local suppliers of fuel oil:* A register of those local suppliers of fuel oil which includes that contact information which is required on the bunker delivery note as per appendix V of MARPOL Annex VI, as well as a homepage address, and if the fuel oil supplier has a quality management system (voluntary, based on supplier's own information, reference to supplier's homepage).

2.6 *MARPOL delivered sample:* means the sample of fuel oil referred to in regulation 18.8.1 of MARPOL Annex VI.

2.7 *Shipowner:* the Company which holds the International Safety Management Document of Compliance for the ship under the International Safety Management (ISM) Code.

2.8 *Trader:* The trader buys bunkers from a physical supplier and sells to a purchaser without holding the product physically.

3 Goals

3.1 Parties should strive to fully understand their obligations and responsibilities as Member, flag, port and coastal States and to carefully communicate those obligations and responsibilities to the ships operating under their authority and the fuel oil suppliers located in their jurisdictions.

3.2 The best practices set forth in this document reflect a set of goals that should be strived for to assure fuel oil used on board ships meets statutory requirements, as follows:

.1 Strive to ensure that existing requirements under MARPOL Annex VI are effectively applied:

.1 Implementation and enforcement of MARPOL requirements is an obligation by the III Code; and

.2 Guidance for port State control, including guidance on control of sulphur content of any fuel oil used on board ships, is given in the 2019 Guidelines for port State control under MARPOL Annex VI Chapter 3 (MEPC.321(74)*). Member States should refer to amendments to appendix VI of MARPOL Annex VI† when verifying the sulphur content of fuel oil.

.2 Relevant parts of the 2019 Guidelines for port State control under MARPOL Annex VI Chapter 3 (MEPC.321(74)*) related to examination of the bunker delivery notes and associated samples or records thereof;

.3 As appropriate under domestic regulatory arrangements, strive to address the reliability of the local bunker suppliers under the jurisdiction of the Member State/coastal State, under its domestic legal authority;

.4 Provide practical information on the effective implementation of a Member State/coastal State's obligations under MARPOL Annex VI, including recommendations on appropriate action that could be taken should an issue be raised in a Member State's/coastal State's jurisdiction; and

.5 Provide practical information and encourage the use of guidance in the form of best practices developed by IMO (fuel oil purchasers) and industry (fuel oil suppliers) to fuel oil purchasers and fuel oil suppliers, as appropriate, to ensure the provision of fuel oils in accordance with the fuel oil quality requirements of MARPOL Annex VI. Making the information and guidance available on relevant websites is a good method for disseminating information.

4 Best practices

4.1 The following best practices reflect aspects of the goals described above and are intended to help Member States/coastal States to achieve them. Best practices may include only those aspects deemed most appropriate for each national government, but they should all observe the provisions of regulation 18 as per Goal 1 (strive to ensure existing requirements of MARPOL Annex VI are effectively applied).

4.2 Best practices with respect to provisions of regulation 18 of MARPOL Annex VI are as follows:

Regulation 18.1 – *Best practice/experience on how to promote availability of compliant fuel oil:*

.1 Member States/coastal States should promote the availability of fuel oils which comply with MARPOL Annex VI and require suppliers under their jurisdiction to provide fuel oils that comply with the requirements of regulation 14 and regulation 18.3 of MARPOL Annex VI;

* See page 25 of this publication.

† Refer to the Early application of the verification procedures for a MARPOL Annex VI fuel oil sample (regulation 18.8.2 or regulation 14.8) (MEPC.1/Circ.882, see page 79 of this publication).

.2 any measures to promote the availability of fuel oils in ports should not lead to distortion of competition. It should be left to individual fuel oil suppliers to make investment decisions based on the market opportunities they see; and

.3 Member States/coastal States should provide timely information on upcoming regulations to suppliers under their jurisdiction, including revisions of the information required on the bunker delivery note.

Regulation 18.2 – *Best practice for handling of notifications of the non-availability of fuel oil that complies with MARPOL Annex VI based on experience until now, including a harmonized format for such notifications:*

.1 Member States/coastal States should strive to follow the procedure for reporting compliant fuel oil non-availability and make use of the related standard format as developed by the Organization when notifying other Parties.

Regulation 18.3 – *Fuel oil quality:*

.1 Regulation 18.3 requires fuel delivered to ships to comply with a number of qualitative requirements. However, no specifications (i.e. ISO 8217) or routine testing scheme exists, which would guarantee that a fuel complies with such qualitative requirements. In cases where it is documented that the fuel delivered does not comply with those qualitative requirements of the regulation the port State/coastal State should take action against the supplier; and

.2 Member States/coastal States should encourage fuel oil suppliers under their jurisdiction to use detailed fuel specifications, as well as the Guidance on best practice for fuel oil suppliers for assuring the quality of fuel oil delivered to ships (MEPC.1/Circ.875/Add.1*).

Regulation 18.7 – *Best practices for inspection of bunker delivery notes by competent authorities:*

.1 Member States/port States should verify the availability of bunker delivery notes on board and their compliance with MARPOL Annex VI, appendix V during all port State control inspections.

Regulation 18.8.2 – *Best practice/guidance on when an Administration would require the MARPOL delivered sample to be analysed, and if a written statement should be delivered to the ship if the MARPOL sample is required for analyses:*

.1 Analysis of the MARPOL delivered sample may be relevant if there are indications that the bunker delivery note is not representative of the fuel oil delivered. An indication could be information from another port State that the bunker delivery note or the MARPOL delivered sample as required by regulation 18 of MARPOL Annex VI presented to a port State control officer were not in compliance with the relevant requirements;

.2 It could also be a notification from a ship that the sulphur analysis resulting from a commercial analysis does not match the bunker delivery note;

.3 If a port State/Member State has reasons to believe that the bunker delivery note issued by a supplier is not representative for the fuel oil delivered, it may want to request an analysis of the MARPOL delivered sample; and

.4 If the MARPOL delivered sample is claimed for analysis, a written statement should be provided to the ship stating which State claimed the sample and the reasons. If a port

* Refer to page 51 of this publication.

State/Member State/coastal State claims the MARPOL delivered sample, the flag State should be informed.

Regulation 18.9 – *Best practice on:*

.1 Member States/coastal States and the maintaining of a register of local suppliers of fuel oil:

.1 Information which should be included in the register of fuel oil suppliers:

.1 Name, address and telephone number of marine fuel oil supplier as requested on the bunker delivery note (appendix V to Annex VI), as well as home page address;

.2 A copy of "standard" bunker delivery note from the supplier (voluntary as there is no requirement for suppliers to submit a "standard" bunker delivery note to the authority); and

.3 Information if supplier has a quality management system (voluntary, based on supplier's own information, reference to supplier's homepage).

.2 Member States/coastal States have an obligation under MARPOL Annex VI to require those fuel oil suppliers to provide a bunker delivery note containing at least the information specified in appendix V to MARPOL Annex VI, accompanied by a MARPOL delivered sample of the fuel oil delivered that has been sealed and signed by the supplier's representative and the master or officer in charge of the bunker operation on completion of bunkering operations:

.1 How to check that local fuel oil suppliers provide a bunker delivery note and a fuel oil sample?

Member State/coastal State could visit barges and terminals and check that the supplier provides a bunker delivery note and a MARPOL delivered sample, and that the MARPOL delivered sample is taken correctly, and they could take their own sample during delivery, preferably from the rail of the receiving ships or from onboard bunker barge or shore terminal supplying the bunker.

.3 Member States/coastal States undertake to require local suppliers to retain a copy of the bunker delivery note for at least three years for inspection.

The Member State/coastal State should implement provisions in their national regulation that enables them to address situations where suppliers are found to deliver fuel oil that does not comply with the associated bunker delivery note.

.1 how to check that local suppliers retain a copy of the bunker delivery note?

.4 Member States/coastal States undertake to take action as appropriate against fuel oil suppliers that have been proven to deliver fuel oil that does not comply with that stated on the bunker delivery note.

.1 Member States/coastal States that receive documentation of delivery of fuel oil to a ship that does not comply with that stated on the bunker delivery note by a fuel oil supplier within their jurisdiction should verify whether any action as appropriate needs to be taken regarding the fuel oil supplier.

.5 Member States/coastal States undertake to inform the Party or non-Party under whose jurisdiction a bunker delivery note was issued of cases of delivery of proven non-compliant fuel oil and to inform the Organization of all cases where fuel oil suppliers have failed to meet the requirements specified in regulation 14 or 18 of MARPOL Annex VI; and

.6 Member States/coastal States undertake to inform the flag State of any ship that have received non-compliant fuel from a supplier under their jurisdiction and to inform the Organization of all cases where fuel oil suppliers (under their jurisdiction) have failed to meet the requirements specified in regulation 14 or 18 of MARPOL Annex VI.

.1 Which information is to be included when informing Administrations and the Organization?

.1 name of supplier as stated on bunker delivery note;

.2 description of the nature of violation;

.3 laboratory analysis of the MARPOL delivered sample*; and

.4 was a penalty applied, and if so, what was the size of the penalty.

4.3 Best practices should address statutory requirements under MARPOL Annex VI but could also include additional aspects, as appropriate, that a national government could consider to apply if appropriate for their internal needs, provided such additional aspects do not adversely affect international harmonization:

.1 Member States/coastal States should consider actions it deems appropriate, under domestic legal arrangements, with respect to promoting the availability of compliant fuel oils, consistent with regulation 18.1 of MARPOL Annex VI; and

.2 Member States or other relevant authorities desiring to do so may decide to establish or promote a licensing scheme for bunker suppliers.

* The analysis should be carried out in accordance with ISO 8754:2003 by a laboratory accredited for the purpose of conducting the test in accordance with ISO/IEC 17025 or an equivalent standard.

MEPC.1/Circ.887
21 June 2019

Reporting of data related to fuel oil availability and quality in GISIS to promote greater understanding of the consistent implementation of the 0.50% m/m sulphur limit under MARPOL Annex VI

1 The Marine Environment Protection Committee at its seventieth session agreed to retain 1 January 2020 as the effective date of implementation for the 0.50% m/m sulphur limit for fuel oil used on board ships operating outside emission control areas designated for the control of sulphur oxides.

2 The Marine Environment Protection Committee at its seventy-third session adopted amendments to MARPOL Annex VI prohibiting the carriage of non-compliant fuel oil for combustion purposes for propulsion or operation on board a ship by resolution MEPC.305(73)*, which is expected to enter into force on 1 March 2020.

3 The Marine Environment Protection Committee at its seventy-third and seventy-fourth sessions considered the collection of data related to the availability and quality of fuel oil compliant with the 0.50% m/m sulphur limit and its analysis, with a view to strengthening and facilitating consistent implementation of regulations 14 and 18 of MARPOL Annex VI.

4 The Marine Environment Protection Committee at its seventy-fourth session instructed the Secretariat to report to MEPC 75 (April 2020) a preliminary overview of data on fuel oil quality and availability currently available in GISIS as well as an overview of the current use of GISIS with reference to obligations under regulations 14 and 18 of MARPOL Annex VI; and to advise the Maritime Safety Committee on the progress made on the new GISIS module for fuel oil safety matters.

5 Having recognized the need for a full understanding of the effectiveness and impact on safe ship operation due to the implementation of the aforementioned regulations soon after their entry into effect date, Member Governments are:

.1 urged to submit relevant data to the MARPOL Annex VI GISIS database as called for by regulation 18 of MARPOL Annex VI; and

.2 invited to consider collaborating with third party entities, where relevant and appropriate, to enter data on a voluntary basis relating to fuel oil quality parameters, while ensuring the accuracy of the third-party data.

* See page 3 of this publication.

Notes

In October 2008, the Marine Environment Protection Committee (MEPC) of the International Maritime Organization (IMO) adopted revisions to the international regulations for the prevention of air pollution from ships (MARPOL Annex VI). The revised regulations included a requirement that, from 1 January 2020, the sulphur content of fuel oil used by ships operating outside designated emission control areas shall not exceed 0.50% by mass, known as "IMO 2020". Reducing emissions of sulphur oxides will bring significant global benefits for human health and the environment.

IMO 2020 will have a major impact worldwide. To support its successful implementation by the international shipping sector, this publication brings together all the instruments and guidance prepared into one document for easy reference, including IMO resolutions and circulars.

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