



DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MERCHANT SHIPPING SECRETARIAT
MINISTRY OF PORTS AND SHIPPING

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MSN 03/2019

05th December 2019

Notice to All Ship-Owners, Operators, Fuel Oil Suppliers, Training Institutes, Masters of Sri Lankan Flagged Ships, and Recognized Organizations.

COMPLIANCE WITH THE PROVISIONS OF MARPOL ANNEX VI,
REGULATION 14 AND REGULATION 18

1. Purpose

The purpose of this notice to provide guidance to stakeholders for a consistent and smooth implementation towards compliance with the Global Sulphur Cap effective from 1st January 2020.

2. Application

This notice is applicable to all Sri Lankan Ships, all foreign flag-vessels visiting Sri Lankan waters and all bunker suppliers operating in Sri Lankan waters.

3. Requirements

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

The 0.50% Sulphur limit extends to carriage of bunker fuel with Sulphur content of more than 0.50% for vessels not fitted with Exhaust Gas Cleaning Systems (EGSC) .The carriage ban will come into effect on 1 March 2020.

Regulation 14.1.3 states that “The sulphur content of any fuel oil used on board ships shall not exceed 0.50% m/m on and after 1 January 2020” The interpretation of “fuel oil used on board” includes use in main and auxiliary engines and boilers. This Regulation prohibits carriage of fuel with sulphur content more than 0.5% on board ships and it applies to all ships.

The ‘equivalent’ compliance mechanism is permitted by Annex VI, Regulation 4, Ships can meet the requirements by using low-sulphur “compliant” fuel oil. Also, to meet the sulphur emission requirements, ships may also use other approved methods, such as equipping of vessels with Exhaust Gas Cleaning systems (EGCS), so called scrubbers, or switching to LNG as a fuel or other alternatives (e.g. methanol). In case the equivalent arrangement has been chosen as a method to comply with the requirements, an approval has to be obtained from a Recognised Organisation approved by the Director General of Merchant Shipping.

The first level of control in respect of the compliance with the new regulation should be on the actual sulphur content of the fuel oil supplied on board. This value is to be stated by the fuel oil supplier on the bunker delivery note. Also samples of the fuel oil may be taken for verification.

In order to facilitate the need for taking fuel samples “in-use” the IMO has issued guidance (MEPC.1/Circ.864 on Guidelines for on-board sampling for the verification of the sulphur content of the fuel oil used on board ships) addressing the location of onboard fuel sampling points and the handling of samples for the testing of sulphur content for MARPOL Annex VI compliance. The guidelines describe requirements for sampling locations and sample handling.

In the event a compliant fuel oil cannot be obtained, Regulation 18 of MARPOL Annex VI currently provides that a Party to MARPOL Annex VI can request evidence outlining the attempts made to obtain the compliant fuel, including attempts made to locate alternative sources. When a ship is visiting a port where the operator cannot purchase compliant fuel oil due to non-availability, the operator is to notify the ship’s Administration and the next destination port authority. Detail guidelines are given in MEPC.1/Circ 881.

3.1 Responsibilities of Ship Owner:

IMO has developed the Guidance on the Development of a Ship Implementation Plan (SIP) for the consistent implementation of the 0.50% sulphur limit under MARPOL Annex VI (MEPC.1/Circ.878). This MEPC Circular consists of a guidance on developing the non-mandatory SIP, which also includes a sample format for the implementation plan, potential impacts of low sulphur fuel oil on machinery systems and guidance for fuel oil tank cleaning. It should be emphasized that the SIP is not mandatory. However, the SIP can be utilised by ship operators to help them plan and demonstrate the actions taken by their ships to prepare for compliance with the 0.50% m/m sulphur limit come January 1, 2020. Preparatory measures such as modifications to fuel oil systems, fuel oil capacity and segregation capability, tank cleaning and bunkering

plans, complemented with the record of implementation in the lead-up to the compliance date would serve to facilitate the documentation check by inspectors

ISM Code requires Companies to assess all identified risks to its ships, personnel and the environment and establish appropriate safeguards. To meet these requirements all companies are required to develop a ship specific implementation plan to comply with the above relevant requirements based on a risk assessment and taking into consideration guidance developed by IMO. For ships which are issued with a Safety Management Certificate this plan is to be developed and it shall be reviewed by a Recognized Organization prior end 15/12/2019.

Ships which decide to implement equivalent compliance mechanisms

For ships intending to use an Exhaust Gas Cleaning System(EGCS) in part, or in full, to comply with Regulation 14 of Annex VI following documents/certification as required by MEPC.184(59) 2009 (Guidelines for Exhaust Gas Cleaning Systems) must be available on board:

- A Sox Emissions Compliance Plan (SECP) approved by RO detailing the method of compliance for all fuel oil combustion machinery installed on board.
- Sox Emissions Compliance Certificate (SECC) issued by RO on behalf of Administration.
- RO approved EGC Technical Manual, Scheme A (ETM-A) or EGC Technical Manual Scheme B (ETM-B) as applicable.
- An Onboard Monitoring Manual (OMM) approved by RO.
- EGC Record Book or Electronic Logging System.

"Wash water resulting from exhaust gas cleaning systems which make use of chemicals, additives, preparations and relevant chemical created in situ", referred to in point 10.1.6.1 of Resolution MEPC.184 (59), shall not be discharged into the sea, including enclosed ports, harbours and estuaries, unless it is demonstrated by the ship operator that such wash water discharge has no significant negative impacts and do not pose risks to human health and the environment. If the chemical used is caustic soda and its pH does not exceed 8.0, it is sufficient that the wash-water meets the criteria set out in Resolution MEPC.184 (59)

3.2 Responsibility of approved Bunker Suppliers

The Bunker supplier should ensure that fuel supplied to ships apart from meeting the requirements of Regulation 18 of MARPOL Annex VI has a sulphur content not exceeding 0.5% m/m.

In case of ships fitted with Exhaust Gas Scrubbers (EGS), the bunker supplier can supply fuel with sulphur content more than 0.5% m/m only after ensuring fitment of EGS from "Supplement to International Air Pollution Prevention Certificate" issued by vessel Flag or RO. A copy of the same has to be retained in records.

Further fuel with Sulphur content more than 0.5% shall be supplied to ships (Sri Lanka & Foreign Flag ships not fitted with EGCS) in Sri Lanka coastal waters by approved Bunker suppliers only with the prior approval.

Registration of Bunker Suppliers

For the purpose of monitoring and maintaining a register of local suppliers of fuel oil in compliance with the MARPOL Reg. VI/18, all bunker suppliers are required to register at the Merchant Shipping Secretariat by fulfilling the requirement given in the attachment-2 and shall demonstrate compliance annually.

Demonstrating Compliance

You are required to maintain and, if requested, make available to DGMS, the following:

- .1 Bunker delivery notes, for vessels 400 gross tonnage and above. While bunker delivery notes are not required for ships less than 400 gross tonnage, owners and operators of such ships may maintain appropriate fuel oil records that document the sulphur content of fuel oil used onboard to demonstrate compliance with the requirements;
- .2 Representative fuel oil samples, taken at the time of fuel oil delivery.
- .3 Written fuel oil changeover procedures, which show how and when the fuel oil changeover is to be done to ensure that only compliant fuel oil is burned; and
- .4 The fuel oil changeover logbook that contains the volume of compliant fuel oil in each tank as well as the date, time, and position of the ship when any fuel oil changeover operation is completed prior to entry into or commenced after exiting Emission Control Area (ECA).

These records may be inspected to determine if the fuel oil used onboard the ship while operating in foreign ports and may also verify compliance by any methods available to it including, but not limited to, sampling and analysing fuel oil from a ship's fuel oil tanks and lines, and sampling and analysing air emissions from a ship's plume.

3.3 Fuel Non-Availability

Fuel oil that complies with the 0.50% m/m sulphur standard is expected to be available for ships that plan to operate on the international waters. The possibility exists, that despite your best efforts to obtain compliant fuel oil, vessels may be unable to do so, and the respective authorities have the authority to take into account all relevant circumstances to determine the appropriate action to take, including not taking control measures. Masters should provide information in the Fuel Oil Non-Availability Report (FONAR), as given in the attachment.

3.4 Attachments

1. Specimen Bunker Fuel oil non-availability report
2. Specimen Application Form for registration
3. Guidance on best practice for fuel oil suppliers for assuring the quality of fuel oil delivered to ships (MEPC.1/Circ.875/Ad1)
4. Guidance on the development of a ship implementation plan for the consistent implementation of the 0.50% sulphur limit under marpol annex vi (MEPC.1/Circ.878)
5. Guidance for port state control on contingency measures for addressing non-compliant fuel oil (MEPC.1/Circ.881).

Issued on 05th December 2019

Director General of Merchant Shipping
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FUEL OIL NON AVAILABILITY REPORT

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):

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): _____

Application for Registration

1.	Name of the Company/organization: Address & Contact details of the Company/organization: Company Registration No.:																											
2.	Scope of the Quality Management System (QMS)																											
3.	Name and address of the Operation office of the Organization with full contact details: Mode of supplying bunker fuel: [barge/road/direct from terminal]: Whether the Mode of Supply is owned/leased/hired/Chartered: Details of Storage facilities: [Owned/hired/Chartered]:																											
4.	Names of Bunker Barges, if engaged in supplying bunker fuel: Issue and Expiry dates of Statutory and Class certificates:																											
5.	Name address of the Mother Company/Organization if above is a subsidiary: List of other Subsidiary companies engaged in the bunker supply business under above Mother company:																											
6.	Minimum time required for Bunker delivery upon receiving an order: The Maximum Rate of Pumping:																											
7.	List of additional documents required to deliver HSFO (>0.50%):																											
8.	Grade of fuel intended to supply/supplied: <table border="1" data-bbox="272 1098 1398 1184"> <thead> <tr> <th>MGO (<0.50%)</th> <th>LSFO (<0.50%)</th> <th>ULSFO (<0.10%)</th> <th>HSFO (>0.50%)</th> <th>Others</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> √ denote if available now or Indicate quarter of the year if intend to supply (Ex 4Q in 2019, 1Q in 2020 ect.....)	MGO (<0.50%)	LSFO (<0.50%)	ULSFO (<0.10%)	HSFO (>0.50%)	Others																						
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9.	Details of the authorized signatory(s) if appointed to represent the Company/Org: Name(s): Designation: Telephone Number(s): Fax Number: e-mail and Website if any:																											
10.	Details of the Bunker deliveries in the last year as in below table: <table border="1" data-bbox="272 1528 1422 1692"> <thead> <tr> <th rowspan="2">S/N</th> <th rowspan="2">Name of Ship</th> <th rowspan="2">Date and time (Start/Stop)</th> <th rowspan="2">Product Supplier</th> <th colspan="6">Quantity of each Grade of Fuel supplied [M T]</th> </tr> <tr> <th>MGO (<0.50%)</th> <th>LSFO (<0.50%)</th> <th>ULSFO (<0.10%)</th> <th>HSFO (>0.50%)</th> <th>Others, specify.</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td></td> </tr> </tbody> </table>	S/N	Name of Ship	Date and time (Start/Stop)	Product Supplier	Quantity of each Grade of Fuel supplied [M T]						MGO (<0.50%)	LSFO (<0.50%)	ULSFO (<0.10%)	HSFO (>0.50%)	Others, specify.	Total											
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		MGO (<0.50%)	LSFO (<0.50%)	ULSFO (<0.10%)	HSFO (>0.50%)			Others, specify.	Total																			
11.	Handling procedure if there are disputes, Complains or Letters of Protests received																											
12.	The methodology to ensure the quality of Bunker fuel supplied:																											
13.	The methodology to ensure the quantity of Bunker fuel supplied:																											

Application for Registration

14.	<p>Declaration:</p> <p>I....., on behalf of M/s.....hereby undertake that:</p> <p>I. the Company shall strictly abide by all the procedures and guidelines mandated by the applicable legislations/notices as amended;</p> <p>II. in case of wrong supply of bunker fuel to ships, i.e. bunker supplies not conforming to the specifications as mentioned in the Bunker Delivery Note (BDN), the Company shall bear all the losses incurred by the ship-owner/company, and shall abide by the final in this regard with respect to cancellation/suspension of registration as Bunker Supplier.</p> <p>III. for supplies made under our registration, the Company shall be fully responsible for any query/clarification/dispute, arising out of the entire supply chain, with respect to quality, quantity and possible hazards like spillage;</p> <p>IV. the Company shall be responsible for drawing and retention of the MARPOL samples in accordance with the relevant guidelines;</p> <p>Name of the Authorized Representative of the Bunker Supplier: Designation: Signature: Stamp: Place: Date:</p>																									
15	<p>Check List</p> <table border="1"> <tr> <td data-bbox="264 1062 1450 1094">.1 Certificate of Incorporation of the Company or equivalent.</td> <td data-bbox="1458 1062 1490 1094"></td> </tr> <tr> <td data-bbox="264 1104 1450 1136">.2 Licenses associated with the mode of Bunker delivery. (barge/road/Terminal)</td> <td data-bbox="1458 1104 1490 1136"></td> </tr> <tr> <td data-bbox="264 1146 1450 1178">.3 MoUs/Agreements with the producers, product suppliers.</td> <td data-bbox="1458 1146 1490 1178"></td> </tr> <tr> <td data-bbox="264 1188 1450 1220">.4 Quality Management System (QMS) Certificate.</td> <td data-bbox="1458 1188 1490 1220"></td> </tr> <tr> <td data-bbox="264 1230 1450 1262">.5 Approvals from the Govt. & other relevant authorities.</td> <td data-bbox="1458 1230 1490 1262"></td> </tr> <tr> <td data-bbox="264 1272 1450 1304">.6 Copies check lists used in bunkering operation</td> <td data-bbox="1458 1272 1490 1304"></td> </tr> <tr> <td data-bbox="264 1314 1450 1346">.7 A Specimen of a BDN</td> <td data-bbox="1458 1314 1490 1346"></td> </tr> <tr> <td data-bbox="264 1356 1450 1388">.8 A Record of Samples</td> <td data-bbox="1458 1356 1490 1388"></td> </tr> <tr> <td data-bbox="264 1398 1450 1430">.9 Authorization letter for Representative of the Bunker Supplier</td> <td data-bbox="1458 1398 1490 1430"></td> </tr> <tr> <td data-bbox="264 1440 1450 1472">.10 Copies of Statutory and Class certificates of the Bunker Barges</td> <td data-bbox="1458 1440 1490 1472"></td> </tr> <tr> <td data-bbox="264 1482 1450 1514">.11 Any other relevant documents:</td> <td data-bbox="1458 1482 1490 1514"></td> </tr> <tr> <td data-bbox="264 1524 1450 1556"></td> <td data-bbox="1458 1524 1490 1556">` `</td> </tr> </table>	.1 Certificate of Incorporation of the Company or equivalent.		.2 Licenses associated with the mode of Bunker delivery. (barge/road/Terminal)		.3 MoUs/Agreements with the producers, product suppliers.		.4 Quality Management System (QMS) Certificate.		.5 Approvals from the Govt. & other relevant authorities.		.6 Copies check lists used in bunkering operation		.7 A Specimen of a BDN		.8 A Record of Samples		.9 Authorization letter for Representative of the Bunker Supplier		.10 Copies of Statutory and Class certificates of the Bunker Barges		.11 Any other relevant documents:			` `	
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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 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*.

9.4 The sample taken during delivery or from a tank should be collected in a clean container of sufficient quantity to be divided into the required number of sub-samples which in turn should be sufficient to carry out the required tests, typically 500-750 ml per sub-sample and in any case no less than 400 ml.

9.5 The contents of the single original sample should be decanted into the required number of clean sub-sample containers. This will typically involve agitating the bulk container and partially filling each sub-sample container in turn to a quarter or a third of their capacity, then repeating the process (agitating and decanting) until all the sub-sample containers have been filled.

9.6 The entire process, including sealing and labelling the sample containers, should be witnessed by representatives for both parties (the party supplying a cargo or product and the receiving party) and the resulting unique sample seal numbers recorded on the relevant documentation (e.g. the BDN) and countersigned by representatives for both parties.

9.7 Employing the services of an independent surveyor to oversee and witness the process may also be considered, in which case all sample seal numbers pertaining to the sampling should be recorded by the bunker surveyor in the sample witnessing and receipt.

Sampling in the supply chain

9.8 Sampling and testing should be carried out and documented at each point of product custody transfer throughout the supply chain.

9.9 A representative sample should be collected when loading bunker supply ships from shore tanks, floating storage facilities and tankers. The recommended method is a sample drawn throughout the loading at the point of custody transfer. The sampling should be witnessed and the resulting sample containers sealed, labelled and countersigned by representatives for both the cargo recipient and the tank terminal.

9.10 The supplier should retain the cargo transfer samples for at least 30 days. In the event of a quality dispute arising, samples should be kept until the dispute has been resolved.

Sampling during delivery to ship

9.11 Suppliers should follow the *2009 Guidelines for the sampling of fuel oil for determination of compliance with the revised MARPOL Annex VI* (resolution MEPC.182(59)) which states that the supplier should provide a MARPOL sample drawn by the supplier's representative at the receiving ship's bunker inlet manifold.

9.12 If for safety or practical reasons the supplier's representative cannot move between the barge and the receiving ship to be physically present, the process may be observed visually by alternative means.

9.13 To facilitate effective remote witnessing of drawing of commercial samples, visibility of the sampling equipment on bunker barge can be improved by marking the sampling zone with high visibility tape or paint.

9.14 The final resulting sample containers should be sealed, labelled and countersigned by representatives for both parties.

9.15 The supplier's representative commercial samples should be retained by the supplier for a minimum of 30 days. In the event of a quality dispute arising during the sample retention period, the samples should be retained until the dispute has been resolved.

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, 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 suppliers 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.

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**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*¹.

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.

¹ Amendments to regulation 14.1.3 of MARPOL Annex VI were adopted by MEPC 73 (October 2018).

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 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 on development of ship implementation plan (impact on machinery systems); and
- .2 appendix 3: additional guidance on development of 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 (m³) 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 (m³) for 0.10% sulphur compliant fuel oil:
- 3.5 Approximate total fuel oil content (m³) 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 24:00hrs 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 Reporting (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 boiler makers 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)".²

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.

² 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 are (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.

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**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.

* Appendix 1 of the 2019 Guidelines for consistent implementation of the 0.50% sulphur limit under MARPOL Annex VI (MEPC.320(74)).