

Designed by Redban De Pui Ltd

# IMO 2020 SULPHUR LIMIT

## A Guide for Singapore-Registered Ships



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# PREAMBLE

Under MARPOL Annex VI Regulation 14.1, the sulphur content of any fuel oil used on board ships shall not exceed 0.50% m/m on and after 1 January 2020 (for ships operating outside an emission control area<sup>1</sup>). This is commonly referred to as the IMO 2020 fuel oil sulphur limit.

Furthermore, the amendments to MARPOL Annex VI Regulation 14.1 to prohibit the carriage of fuel oil with sulphur content exceeding 0.50% m/m for use on board ships will come into force on 1 March 2020. This is commonly referred to as the “carriage ban” of non-compliant fuel oil. The ban would not apply to carriage of non-compliant fuel oil as cargo.

In summary, for ships operating outside an emission control area, the sulphur content of any fuel oil used on board ships shall not exceed 0.50% m/m from 1 January 2020 and the sulphur content of fuel oil used or carried for use on board a ship shall not exceed 0.50% m/m from 1 March 2020.

The above requirements would not apply to ships that use abatement technology as equivalent means of compliance, if approved by the flag Administration under MARPOL Annex VI Regulation 4. One such abatement technology is the exhaust gas cleaning system (scrubber). Ships conducting trials for abatement technology may also be exempted.

Ships reporting non-availability of fuel oil are required to submit a Fuel Oil Non-Availability Report (FONAR) form and would be subject to control measures, which are detailed in subsequent sections of this guidance.

The IMO 2020 requirement will come into force on 1 January 2020 and applicable ships are required to comply with the regulation.

In November 2018, the Maritime and Port Authority of Singapore (MPA), in collaboration with the Singapore Shipping Association (SSA), published two sets of guidance notes:

i) A Guide for Singapore-registered ships (SRS); and  
ii) A Guide for ships calling to Port of Singapore. These guidance notes form part of MPA's industry engagement to assist stakeholders in preparation for the IMO 2020 fuel oil sulphur limit.

This is the second edition of the guidance note for SRS, with updated information, guidelines and best practices.

We hope that you will find the guidance notes useful in preparing for the IMO 2020 fuel oil sulphur limit.

<sup>1</sup> For ships operating within an emission control area, the sulphur content of fuel oil used on board ships shall not exceed 0.10% m/m since 1 January 2015. The emission control areas under MARPOL Annex VI Regulation 14 are the Baltic Sea area, the North Sea area, the North American Emission Control Area, and the United States Caribbean Sea Emission Control Area.



# IMO GUIDELINES



Image from www.imo.org.

## GUIDELINES ON CONSISTENT IMPLEMENTATION OF THE 0.50% M/M SULPHUR LIMIT

Marine Environmental Protection Committee 74 (MEPC 74) approved the *Guidelines on consistent implementation of the 0.50% sulphur limit under MARPOL Annex VI* in May 2019. The guidelines include considerations on matters such as control mechanism and actions, including port State control and samples of fuel oil delivered, used and stored on board; verification issues; fuel oil non-availability report (FONAR) form; possible impact on fuel oil and machinery systems resulting from new fuel oil blends or fuel oil types; and possible safety implications relating to fuel oils meeting the 0.50% m/m sulphur limit. The guidelines can be accessed at the QR Code link provided below.

## JOINT MSC-MEPC CIRCULAR ON DELIVERY OF COMPLIANT FUEL OIL BY SUPPLIERS

MEPC 74 (in May 2019) approved a joint MSC-MEPC circular on *Delivery of compliant fuel oil*



by suppliers. The circular states that Member States should urge fuel oil suppliers to take into account, as relevant: MEPC.1/Circ.875 *Guidance on best practice for fuel oil purchasers/users for assuring the quality of fuel oil used on board ships*; and MEPC.1/Circ.875/Add.1 *Guidance on best practice for fuel oil suppliers for assuring the quality of fuel oil delivered to ships*. The circular as approved by MEPC 74, can be accessed at the QR Code link provided below.



Guidelines on Consistent Implementation of IMO 2020

MSC-MEPC Circular -Delivery of Compliant Fuel Oil by Suppliers



## AMENDMENTS TO ON BOARD SAMPLING GUIDANCE

MEPC 74 approved the 2019 *Guidelines for on board sampling for the verification of the sulphur content of the fuel oil used on board ships* in May 2019. The guidelines can be accessed at the QR Code link appended below.

At the sixth session of Sub-Committee on Pollution Prevention and Response (PPR 6 in February 2019), concerns were raised with regard to the sampling of “on board sample” which is the sample of fuel oil in the fuel oil storage tanks (for verification of compliance with the carriage ban). While the sampling procedure for the “MARPOL/delivered sample” and the “in-use sample” have been established, there has been no guidance on how the “on board sample” can be taken safely and in a practical manner to ensure that a homogenous and representative sample of the fuel oil storage tank can be made.



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



To address the concerns above, the Institute of Marine Engineering, Science and Technology (IMarEST) submitted a document to MEPC 74 proposing draft guidelines for sampling of “on board sample” of fuel oil. MEPC 74, having considered the matter, decided to forward the document to PPR 7 for further discussion.

## 2019 PORT STATE CONTROL GUIDELINES

MEPC 74 approved the 2019 *Guidelines for port State control under MARPOL Annex VI* in May 2019. The guidelines can be accessed at the QR Code link below.

## GUIDANCE FOR PORT STATE CONTROL ON CONTINGENCY MEASURES FOR ADDRESSING NON-COMPLIANT FUEL OIL

PPR 6 developed draft interim *Guidance for port State control on contingency measures for addressing non-compliant fuel oil* and invited concrete proposals to MEPC 74. The draft interim guidance covers possible actions to be taken, following discussions between ship, flag State and port State, when a ship is found to have on board non-compliant fuel oil either as a consequence of compliant fuel oil being not available when the ship bunkered fuel oil, or the ship identifying through post bunkering testing that the fuel oil on board is non-compliant.

In May 2019, MEPC 74 considered the draft interim guidelines and the submissions to MEPC 74. As a result, MEPC 74 approved the *Guidance for port State control on contingency measures for addressing non-compliant fuel oil*. The guidance can be accessed at the QR Code link provided in page 4.



Port State Control Guidelines

## REVIEW OF THE 2015 GUIDELINES ON EXHAUST GAS CLEANING SYSTEMS

The Sub-Committee on Pollution Prevention and Response (PPR) is undertaking a review of the 2015 Guidelines on Exhaust Gas Cleaning Systems (EGCS). The sixth session of the Sub-Committee (PPR 6) noted the progress made by the Correspondence Group on review of the 2015 EGCS Guidelines and requested an extension of the target completion year to 2020 with a view to continuing the work on the review at PPR 7. The extension was approved by MEPC 74 in May 2019.

In the meantime, MEPC 74 also reviewed and finalised the new Appendix 6 to the EGCS Guidelines which would be published as an MEPC circular. The new Appendix 6 provides guidance on temporary indication of ongoing compliance in case of failure of a single monitoring instrument, and recommended actions to take if the EGCS fails to meet the requirements of the guidelines. It aims to address situations where there is a malfunction of the EGCS. A copy of this guidelines can be accessed at the QR Code link below.



Contingency Measures



With consideration of the adverse effects of open-loop EGCS discharges, MEPC 74 approved in-principle a work new output to be completed within two years to:

- evaluate and harmonize the development of rules and guidance on the discharge of liquid effluents from EGCS
- conditions and protections of certain areas from the discharge of the effluents

MEPC 74 also approve for GESAMP<sup>2</sup> to carry out an independent assessment of the impact of discharges from EGCS, subject to funding.

<sup>2</sup> Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP) is an advisory body that advises the United Nations (UN) system on the scientific aspects of marine environmental protection.



Guidance on Single Failure of EGCS

## AMENDMENTS TO MARPOL ANNEX VI AND UNIFIED INTERPRETATIONS

### AMENDMENTS TO MARPOL ANNEX VI ON SULPHUR CONTENT DEFINITION AND SAMPLING

MEPC 74 approved the amendments to MARPOL Annex VI in May 2019, for subsequent adoption by MEPC 75 (Spring 2020), with an expected entry into force date of mid-2021. These amendments include definitions of sulphur content of fuel oil, low-flashpoint fuel oil, MARPOL delivered sample, in-use sample and on board sample.

The amendments to Regulation 2 (Definitions) include the following:

**“Sulphur content of fuel oil”** - means the concentration of sulphur in any fuel oil, measured in % m/m as tested in accordance with standard acceptable to the Organisation;

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

**“MARPOL delivered sample”** - means the sample of fuel oil delivered in accordance with regulation 18.8.1 of MARPOL Annex VI;

**“In-use sample”** - means the sample of fuel oil in use on a ship; and

**“On board sample”** - means the sample of fuel oil intended to be used or carried for use on board that ship.

**“Fuel oil sampling and testing”** - amendments to Regulation 14 (Sulphur oxides (SO<sub>x</sub>) and particulate matter) to add new paragraphs related to in-use and on board fuel oil sampling and testing, and to add new paragraphs to require one or more sampling points to be fitted or designated for the purpose of taking representative samples of the fuel oil being used or carried for use on board the ship. The representative samples of the fuel oil being used on board are to be taken in order to verify the fuel oil complies with the regulation.

**“Appendix I amendments to the International Air Pollution Prevention (IAPP) certificate”** - consequential amendments to update the IAPP certificate as a result of the amendments to MARPOL Annex VI, to add a reference to sampling points, and also to note where there is an exemption to the provision for low-flashpoint fuel oil.

**“Appendix VI Fuel oil verification procedure for MARPOL Annex VI fuel oil sample”** - consequential amendments to the verification procedures as a result of the amendments to MARPOL Annex VI, and to cover verification of the representative samples of in-use fuel oil and on board fuel oil.

Note: At PPR 6, it was agreed to apply ISO 4259 methodology (i.e. 0.59R) only for the “in-use” and “on board” fuel oil samples. The ISO 4259 methodology does not apply to “MARPOL/delivered” sample. This essentially means that allowance will be given to the “in-use” and “on board” fuel oil samples test results up to 0.53% m/m, while for the “MARPOL/delivered” sample, the absolute limit of not more than 0.50% m/m will remain. PPR 6 also agreed to simplify the verification of MARPOL sample (i.e. delete Stage 2 testing of Part 1). The amendments to MARPOL Annex VI can accessed at the QR Code link below.

Additionally, MEPC 74 approved a circular for notification of early application of the verification procedures for a MARPOL Annex VI fuel oil sample. A copy of the circular can be accessed at the QR Code link appended below.

### UNIFIED INTERPRETATION

MEPC 74 approved a unified interpretation to MARPOL Annex VI Regulation 14.1, which confirms that the regulation for the prohibition on carriage of non-compliant fuel oil should also be applied to the fuel oil of emergency equipment.



Notification of Early Application of the Verification Procedures for a MARPOL Annex VI Fuel Oil Sample



Amendments to MARPOL Annex VI

## SHIP IMPLEMENTATION PLAN

MEPC 73 (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*. A copy of this circular and a template of the ship implementation plan (SIP) can be accessed at the QR Code link provided below.

This circular provides guidance on how the ship may prepare in order to comply with the required sulphur content limit of 0.50% m/m by 1 January 2020. As part of the plan, ship operators should record the actions taken to ensure compliance by the applicable date.



The ship implementation plan for 2020 covers various items relevant for a specific ship, including, as appropriate, but not limited to:

<b>A</b>	risk assessment and mitigation plan (impact of new fuel oils);
<b>B</b>	fuel oil system modifications and tank cleaning (if needed);
<b>C</b>	fuel oil capacity and segregation capability;
<b>D</b>	procurement of compliant fuel oil;
<b>E</b>	fuel oil changeover plan (conventional residual fuel oils to 0.50% m/m sulphur compliant fuel oil); and
<b>F</b>	documentation and reporting.

It should be emphasised that the Ship Implementation Plan (SIP) is not mandatory and hence, the absence of which or incorrect entries etc. should not form the basis for a PSC deficiency. 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 1 January 2020.

SRS are strongly encouraged to have a SIP on board.



Ship Implementation Plan

## FUEL OIL NON-AVAILABILITY REPORT (FONAR) FORM

Pursuant to MARPOL Annex VI Regulation 18.1, 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 IMO of the availability of compliant fuel oils in its ports and terminals. MEPC 73 (October 2018), urged Parties to MARPOL Annex VI and other Member Governments to report on the availability of compliant fuel oils in its ports and terminals via the IMO Global Integrated Shipping Information System (GISIS) MARPOL Annex VI module well in advance of 1 January 2020 (<https://gisis.imo.org>). MEPC 74 approved a guidance for best practice for member state/coastal state, a copy of which can be accessed at the QR Code link provided below.

However, it is envisaged that there will be potential non-availability situations especially in the early stages of 2020. MARPOL Annex VI Regulation 18.2 states that a ship should not be forced to deviate or unduly delay its voyage if, despite reasonable efforts, it cannot bunker compliant fuel oil. With that in mind, the IMO developed a standard format for reporting non-availability for when a ship is unable to obtain compliant fuel oil.

There were concerns that a FONAR system can be abused. For example, ships might be

tempted to deliberately visit ports where non-availability is known to be frequent to get cheaper non-compliant fuel oil under the guise of a FONAR. In that regard, it is to be noted that a FONAR is not an exemption from compliance with the sulphur limit. The ship is still non-compliant, but enforcement officers may take into consideration the approach stipulated in MARPOL Annex VI Regulation 18.2.

SRS operators are also advised to note that when a ship arrives at a port where compliant fuel oil is available, any remaining non-compliant fuel oil left on board a ship that has provided a FONAR, would then need to be removed from the ship. Not all ports will provide discharge facilities for reception of the non-compliant fuel oil. Even if discharge facilities are available, the owners may not be able to recoup the value of the non-compliant fuel oil. In addition to that, cost may need to be incurred for cleaning of the fuel oil tank before loading of compliant fuel oil to avoid contamination.

In view of the above, the usage of FONAR should be considered as a last resort akin to an emergency measure. A copy of the FONAR developed by the IMO can be assessed at the QR Code link provided below.



Fuel oil non-availability report (FONAR) form



Guidance for Best Practice for Member State/Coastal State

## DISPOSAL OF NON-COMPLIANT FUEL OIL

In October 2018, the 73<sup>rd</sup> session of the Marine Environmental Protection Committee (MEPC 73) adopted the amendments to MARPOL Annex VI Regulation 14.1, which states that the sulphur content of fuel oil used or carried for use on board a ship shall not exceed 0.50% m/m. This is commonly referred to as the “carriage ban” of non-compliant fuel oil and will come into force on 1 March 2020. The ban would not apply to ships fitted with approved abatement technology such as scrubber. The ban would also not apply to carriage of non-compliant fuel oil as cargo.

Aside from the potential non-availability of compliant fuel oil, a ship may end up with non-compliant fuel oil unintentionally and involuntarily. This can be caused by the ship receiving bunker that complies with the sulphur limit according to the supplier’s documentation on the bunker delivery note (BDN), but which later proves to be non-compliant based on fuel oil test results received after the ship has left the bunkering port.

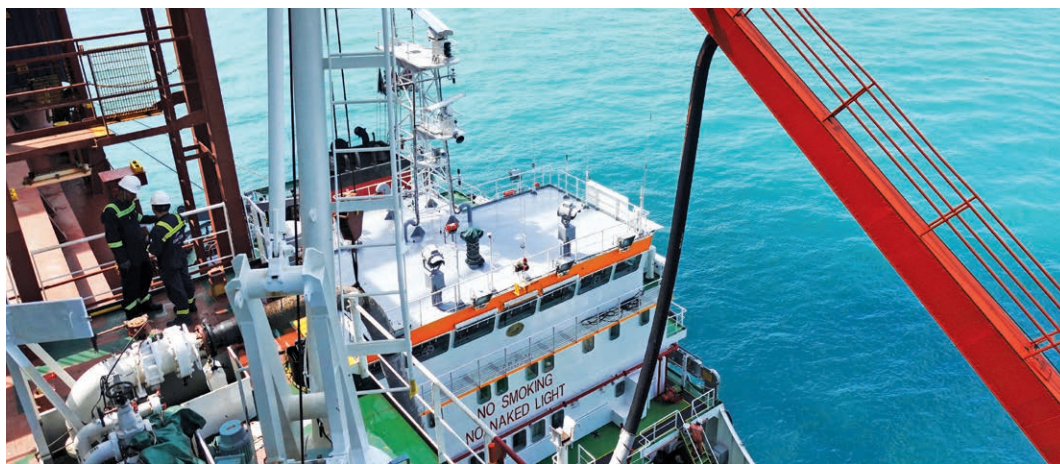
PPR 6 (February 2019) agreed that the FONAR will not be applicable in such cases. Nevertheless, FONAR or not, after 1 March 2020 when the carriage ban comes into force, disposal of the

remaining non-compliant fuel oil on board would need to be carried out when the ship comes into a port where compliant fuel oil is available.

There was concern that some ports do not provide facilities for such disposal of non-compliant fuel oil. Proposals on what to do in such cases were submitted to PPR 6, ranging from allowing the non-compliant fuel oil to be consumed at 200nm from nearest land to allowing the non-compliant fuel oil to be kept on board until the next drydock or a period of 6 months, whichever is earlier. There was also a proposal to use “contingency measures” similar to the Ballast Water Management Convention (BWM.2/Circ.62), i.e., contingency measures proposed by ship and agreed by port and flag States.

There was no consensus achieved at PPR 6 and the matter was deferred to MEPC 74.

In May 2019, MEPC 74 considered the matter further and approved the *Guidance for port State control on contingency measures for addressing non-compliant fuel oil*. A QR code link to this guidance is provided in page 4 of the guidebook.



## FUEL OIL SAFETY

In the first edition of this guidance published in November 2018, we had delved into the operational best practices pertaining to properties of fuel oil and fuel oil change-over procedures.

The expected increase in the range of blended low sulphur fuel oil (LSFO) available to meet the IMO 2020 requirements has led to concerns over the stability and compatibility of different fuel oils (especially for vessels that require bunkering at different ports), and introduced ancillary complications such as the correct lubricants and engine oil to be used for each blend.

At PPR 6 in February 2019, it was noted that a joint industry guidance on potential safety and operational issues related to the supply and use of 0.50% m/m sulphur fuel oils (by OCIMF, IPIECA and IBIA) was almost complete and would be released in the second half of 2019. This timeline was designed to ensure incorporation of the relevant ISO Publicly Available Specifications (PAS) which is expected to be released in the second half of 2019 as well. Once published, the guidance would be made available as a free-to-download information paper to the industry and would also be submitted as an information document to MEPC 75. In the meantime, a list of potential safety implications with regard to the use of fuel oil is incorporated into the guidelines for consistent implementation of IMO 2020. The list of potential safety implications can be accessed at the QR Code link provided below.

The 100th session of the Maritime Safety Committee (MSC 100) in December 2018 approved a new output on fuel oil safety issues and invited interested Member States and international organisations to submit proposals to MSC 101 (in June 2019). MSC 100 also agreed that a Working Group would be established at MSC 101, with a view to further progress this work.



In the meantime, aside from the identification of suitable and reliable fuel oil suppliers and commercial arrangements which are outside the purview of this technical guidance, SRS operators may need to consider an overall fuel oil management plan (including tank cleaning protocols, consideration of multiple tank installation, and investment in crew technical training).

Some oil majors are undertaking test to ensure reliability of low sulphur fuel use for ships and so far seen satisfactory results.



Potential Safety Implications on the use of IMO 2020 Compliant Fuels

## SCRUBBER RESIDUE AND WASHWATER DISCHARGE

As mentioned earlier in this guidance, aside from using compliant fuel oil, ships may also use abatement technology approved by flag Administration as equivalent under MARPOL Annex VI Regulation 4. The most commonly used abatement technology is the exhaust gas cleaning systems (EGCS), commonly referred to as scrubbers.

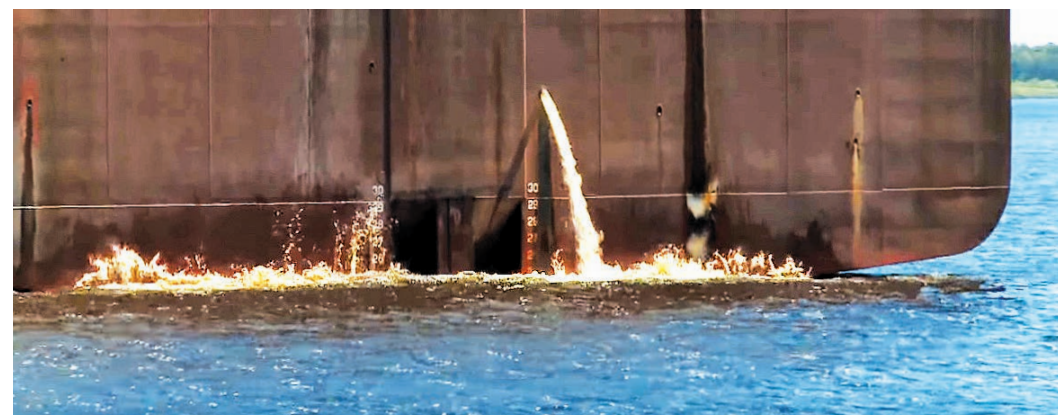
For ships using scrubbers in a closed-loop mode, the residue which is separated from the washwater, is not allowed to be incinerated on board the ship as prohibited under MARPOL Annex VI Regulation 16.2.6. Such residue would need to be retained on board for subsequent disposal to port reception facilities.

SRS operators with ships installed with closed-loop scrubbers or hybrid scrubbers operating in closed-loop mode would need to consider the logistical arrangements for supply of neutralising agents (e.g. caustic soda) for the scrubber washwater and also port reception facilities for the separated residue.

For ships using open-loop scrubbers, normally there would be no need for supply of neutralising agents as the system works on the basis of the natural alkalinity of sea water to neutralise the acidity of the exhaust gas sulphur content. There would also not be a need for residue reception facility as any residue is normally discharged overboard along with the scrubber washwater.

However, there has been much debate regarding the possible adverse impacts which the open-loop scrubber washwater may have on the marine environment. As a result, various ports around the world have imposed stricter local regulation on the discharge of washwater from open-loop scrubber, such as prohibiting the discharge. It is also to be noted that open-loop scrubbers work on the basis of the sea water's alkalinity and hence, may not function as intended at fresh water ports.

SRS operators with ships installed with open-loop scrubbers are advised to take note of ports which have prohibited the discharge of washwater from open-loop scrubbers.



The Owner of the ship or any other organisation or person such as the Manager (i.e. the Company) who has assumed the responsibility for operation of the ship, is responsible for the implementation of the International Safety Management (ISM) Code. The Company is responsible with regard to compliance with mandatory rules and regulations related to the safe operation of ships and protection of the environment, including all applicable local requirements. The Company should establish procedures, plans and instructions, including checklists as appropriate, for key shipboard operations concerning the safety of the personnel, ship and protection of the

environment. The various tasks should be also be defined and assigned to qualified personnel.

For ships fitted with open-loop scrubbers and calling into ports where discharge from open-loop scrubbers is prohibited, the Company should establish appropriate procedures to ensure that the changeover to compliant fuel oil is carried out safely, in line with the ISM Code. Such procedures should take into consideration the mode of engine operation, traffic density, duration of passage etc., including identifying locations where such changeover to compliant fuel oil is to be carried out. The Company's Safety Management System (SMS) should also ensure that the ship's crew is properly trained.



# ENFORCEMENT MEASURES



As Singapore is Party to the International Convention for the Prevention of Pollution from Ships of 1973 as modified by the Protocol of 1978 ("MARPOL"), MPA will enforce the IMO 2020 regulations by incorporating its requirements into the national legislation. MPA will inspect Singapore-registered ships (SRS) as well as foreign-registered ships in the Port of Singapore in accordance with the Flag State and Port State Control regimes respectively. Ships that fail to use an approved abatement technology, alternative fuel oil or compliant fuel oil will be considered as non-compliant with the IMO 2020 regulations, and punitive actions will be taken.

MPA will be updating the Electronic Pre-Arrival Notification (EPAN) for ships to declare their method of compliance prior to their arrival in the port of Singapore. Inspection of ships in Singapore port under both the Flag State Control (FSC) and Port State Control (PSC) regimes is based on a risk-assessment matrix. Compliance with the IMO 2020 requirements will be part of our FSC and PSC inspections to ensure ships are compliant with the relevant statutory regulations.

In terms of technology, MPA will be using portable fuel oil sulphur content measuring tool to equip our officers for in-situ testing. MPA will also be engaging fuel oil-testing service providers for detailed laboratory analysis of fuel oil samples.

To ensure compliance by SRS at sea, MPA may request SRS (selected based on a risk assessment matrix) to submit relevant documentation and records (such as Bunker Delivery Notes, Oil Record Book extracts, Scrubber operational records, etc.) for audit review. MPA may also conduct overseas FSC inspections on selected SRS.



Come 1 January 2020, SRS may be subjected to verification by PSC when calling at foreign ports which are Parties to MARPOL for compliance with MARPOL Annex VI Regulation 14 (fuel oil sulphur limit). These verifications would include the carriage ban on non-compliant fuel oil on board ships come 1 March 2020.

As mentioned earlier in this guidance, the *2019 Guidelines for port State control under MARPOL Annex VI* was adopted by MEPC 74 in May 2019. A QR code link to this guidance is provided in page 3.

SRS are also advised to take note of the *Guideline for port State control on contingency measures for addressing non-compliant fuel oil* that was approved at MEPC 74. This guideline covers possible actions to be taken, following discussions between ship, flag State and port State, when a ship is found to have on board non-compliant fuel oil either as a consequence of compliant fuel oil being not available when the ship bunkered fuel oil or the ship identifying through post bunkering testing that the fuel oil on board is non-compliant. A QR code link to this guidance is provided in page 4.



## REFERENCES

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Maritime and Port Authority of Singapore (MPA)
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