

IMO 2020 SULPHUR LIMIT

A Guide for Ships Calling to Port of Singapore



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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 area¹). 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 01 March 2020.

The above requirements would not apply to ships that use abatement technology as equivalent means of compliance, 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 compliant 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.

Singapore will enforce the IMO 2020 requirement from 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.

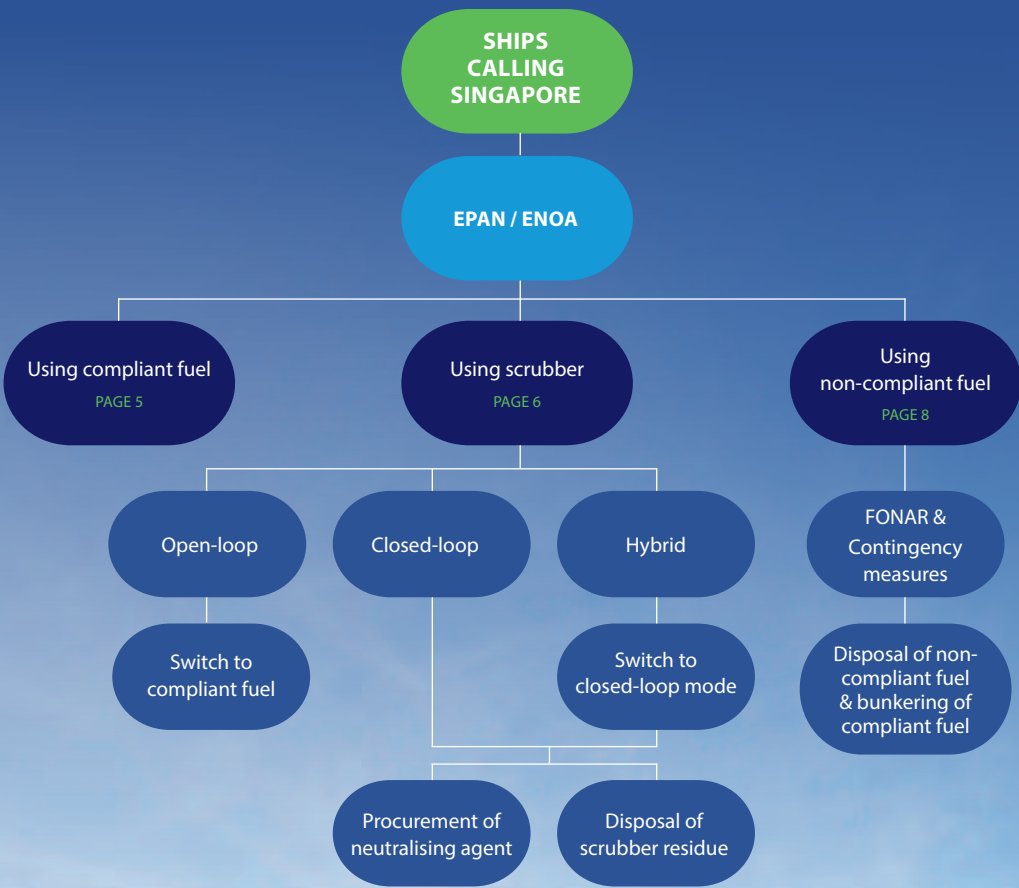
This is the second edition of the guidance note for ships calling to Singapore port, with updated information, guidelines and best practices.

We hope that you will find the guidance notes useful in preparing ships calling into Singapore port, with regard to the IMO 2020 fuel oil sulphur limit.



¹For 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.

FLOW DIAGRAM OF A SHIP CALLING INTO SINGAPORE PORT



ELECTRONIC PRE-ARRIVAL NOTIFICATION (EPAN) AND ELECTRONIC NOTIFICATION OF ARRIVAL (ENOA)



With effect from 1 January 2020, owners, agents and masters of; [(+65) 6221 3036] or email (isps@mpa.gov.sg) at least 24 hours before the ship’s arrival in Singapore.

A	Passenger ships including high-speed passenger craft,
B	Cargo ships, including high-speed craft, of 500 GT and above, and
C	Mobile offshore units, including mobile offshore drilling units,

shall complete the revised EPAN form incorporating the additional information as appended in page 4, and submit it to the MPA Security Department via facsimile into Singapore. Ships, which are not required to declare EPAN as above, will have to make the declaration in the Electronic Notification of Arrival (ENOA) to noa@mpa.gov.sg.

the EPAN and ENOA will be announced in the last quarter of 2019 via Singapore Port Marine Circular and promulgated to our stakeholders;

SULPHUR LIMIT

1 VESSEL WILL BE USING APPROVED ABATEMENT/SCRUBBER TECHNOLOGY. PLEASE SPECIFY THE TYPE OF SCRUBBER INSTALLED.

☐ OPEN-LOOP

(Note: Discharge of wastewater from open-loop scrubbers is prohibited in Port of Singapore. Vessel shall use compliant fuel while in port.)

- ☐ Does the vessel has enough compliant fuel oil on board throughout the vessel's stay in Singapore?
☐ Yes ☐ No. (Has arrangement been made to procure compliant fuel in Singapore?)
 ☐ Yes ☐ No

☐ CLOSED-LOOP

☐ HYBRID TYPE

(Note: Scrubber shall only be operated in closed-loop mode)

2 VESSEL WILL BE USING COMPLIANT FUEL OIL ($\leq 0.50\%$ M/M SULPHUR CONTENT). PLEASE SPECIFY THE TYPE OF COMPLIANT FUEL OIL BEING USED.

- ☐ VESSEL WILL BE USING LOW SULPHUR FUEL OIL (LSFO)
- ☐ VESSEL WILL BE USING MARINE GAS OIL (MGO)
- ☐ VESSEL WILL BE USING LIQUEFIED NATURAL GAS (LNG)
- ☐ VESSEL WILL BE USING OTHER ALTERNATIVE FUEL OIL TO COMPLY WITH THE REQUIREMENT

Please specify:

3 IF NONE OF THE ABOVE, HAS THE VESSEL COMPLETED THE FUEL OIL NON-AVAILABILITY REPORT (FONAR)?

- ☐ **YES** (a copy of the FONAR is to be submitted to shipping@mpa.gov.sg)
- ☐ Has arrangement been made to dispose the non-compliant fuel oil in Singapore?
- ☐ Yes ☐ No
- ☐ Has arrangement been made to procure compliant fuel oil in Singapore?
- ☐ Yes ☐ No

- ☐ **NO**
- ☐ The vessel took on board compliant fuel oil as per BDN but later test results show the fuel to be non-compliant.
 - ☐ Other reason for not completing the FONAR,

please specify: _____

SUPPLY OF COMPLIANT FUEL

IMO 2020 compliant fuel oil is available in Singapore.

As the world's largest bunkering port, Singapore continuously strives to ensure that we remain a trusted and reliable bunkering hub. MPA has been working closely with our licensed bunker suppliers to ensure the availability of compliant fuel oil.

Come 1 January 2020, the range of fuel oils that will be available in Singapore are as follows:

Marine Gas Oil (MGO)

Low Sulphur Fuel Oil (LSFO) (includes blended products (distillates or residual fuel oil-based))

Liquefied Natural Gas (LNG)

High Sulphur Fuel Oil (HSFO)
(for ships fitted with scrubber)



An information sheet on the list of licensed bunker suppliers of low-sulphur fuels in the Port of Singapore can be found on MPA website, via the QR Code link provided on the right.

List of availability of compliant fuels in Singapore



SUPPLY OF NEUTRALISING AGENTS FOR HYBRID/CLOSED-LOOP SCRUBBERS



Exhaust gas cleaning systems which operate on the closed-loop mode rely on the dosage of chemicals into its washwater medium so as to provide the alkalinity required to neutralise the sulphur oxides in the exhaust gas being “scrubbed”. The neutralising agents/chemicals used are typically Sodium Hydroxide/Caustic Soda (NaOH), Sodium Carbonate (Na_2CO_3) or Magnesium Oxide (MgO).

Ships fitted with hybrid/closed-loop scrubbers would be able to receive supplies of these neutralising agents at Singapore.

Supply of these neutralising agents/chemicals at shipyard, berth and terminals is permitted as ship stores with prior approval of the terminal operator. Supply of these neutralising agents/chemicals at the anchorage is permitted in packaged form (e.g. ISO Tanks, intermediate bulk container or drums). Ship masters are advised to liaise with their designated local agents for the above.

In this context, “supply” means the transfer of neutralising agents/chemicals that are specifically used for the exhaust gas cleaning systems and is not applicable for ship-to-ship transfer of chemical cargo operation.

For clarifications, please contact MPA’s Port Chemists at (+65) 6325 2421 or hazmat@mpa.gov.sg.



RECEPTION FACILITIES FOR HYBRID/ CLOSED LOOP SCRUBBER RESIDUE

Regulation 17.2 of MARPOL Annex VI states that each Party to the Convention undertakes to ensure the provision of facilities adequate to meet the needs of ships using its ports, terminals or repair ports for the reception of exhaust gas cleaning residues from a scrubber, without causing undue delay to ships. The exhaust gas cleaning residues are produced as a result of the use of hybrid/closed-loop scrubber by ships to comply with the IMO 2020 fuel oil sulphur limit.

As a Party to the Convention, Singapore will provide reception facilities to receive the residues generated from the operation of hybrid/closed-loop scrubber.

Under Singapore’s Environmental Public Health (Toxic Industrial Waste) Regulations, exhaust gas cleaning residues generated by ships are classified as toxic industrial waste (TIW). In accordance with these regulations, TIW must be collected and managed by licensed Toxic Industrial Waste Collectors (TIWCs). Ships that wish to dispose of exhaust gas cleaning residues in Singapore are required to engage a licensed TIWC for the collection and disposal of such residues.

When a ship is at berth, the residues can be offloaded in packaged forms or in intermediate bulk container tanks directly to trucks arranged by the licensed TIWCs.

When a ship is at the anchorage, the residues can be offloaded in packaged forms or in intermediate bulk container tanks to MPA-licensed craft to be brought ashore and



transferred to the trucks arranged by the licensed TIWCs.

For more details and also the list of licensed TIWCs, please refer to the Port Marine Circular No. 11 of 2019 accessible at the QR Code link appended below.

For clarifications, please contact MPA’s Port Chemists at (+65) 6325 2421 or hazmat@mpa.gov.sg.



Port Marine Circular No. 11 of 2019

DISPOSAL OF NON-COMPLIANT FUEL OIL



In October 2018, the 73rd 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.

There are various scenarios whereby a ship may end up with non-compliant fuel oil on board post 1 March 2020, e.g. the ship has received non-complaint fuel oil due to the non-availability of compliant fuel oil at the bunkering port, or the ship has received compliant fuel oil as per the Bunker Delivery Note (BDN) but subsequently received a fuel test report indicating non-compliance.

Ships that have on board non-compliant fuel oil post 1 March 2020 would be required to dispose the non-compliant fuel oil at a port where reception facilities are available.

In Singapore, de-bunkering is only allowed if the vessel had received wrong grade(s) of bunker fuel from her last call to Singapore Port. For ships requiring de-bunkering of bunker fuel received from other ports due to non-compliance with sulphur content limits, please contact MPA Bunker Services Department at bsd@mpa.gov.sg.

The procedures and requirements for de-bunkering non-compliant fuel oil will be added to the existing procedures in the MPA website at the QR code link provided below.



Application for de-bunkering
operation in port

PROHIBITION OF OPEN-LOOP SCRUBBER WASHWATER DISCHARGE IN THE PORT OF SINGAPORE

The discharge of washwater from open-loop scrubbers is prohibited in the Port of Singapore. This is to maintain the standard of Singapore's marine water quality.

While in the port of Singapore, ships fitted with hybrid type of scrubbers shall switch to the closed-loop mode of operation. Ships fitted with open-loop scrubbers shall switch over to compliant fuel oil. Such declaration have to be made by the ships via the EPAN prior to entering the Port of Singapore. Please refer to Section 2 of this guidance.

It is advisable to carry out the switch to either closed-loop mode or to compliant fuel oil well in advance of the vessel's arrival at the port waters, so that any operational issues can be identified and dealt with promptly prior to entering Singapore port limits.

For ships fitted with open-loop scrubbers and calling into ports where discharge from open-loop scrubbers is prohibited, appropriate procedures in the safety management system should be established to ensure that the changeover to compliant fuel oil is carried out safely. 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 is to be carried out. The company's Safety Management System (SMS) should also ensure that the ship's crew is properly trained.

This prohibition does not apply to ships transiting the Traffic Separation Scheme (TSS) without calling into the Port of Singapore.



ENFORCEMENT MEASURES



ENFORCEMENT FOR SHIPS CALLING SINGAPORE

Come 1 January 2020, ships that call Singapore may be subjected to verification on compliance with the sulphur limit, including the carriage ban of non-compliant fuel, during Port State Control (PSC) and Flag State Control (FSC) inspections.

Ships are selected for PSC/FSC inspections based on a risk matrix, which takes into account whether a FONAR has been submitted.

The ship inspection will normally be carried out in 3 steps, starting from Step 1, and should there be clear grounds, escalating to Steps 2 and 3.

STEP 1	Document check
STEP 2	Indicative fuel oil analysis (portable fuel oil sulphur content measurement tool)
STEP 3	Detailed fuel oil analysis (sampling for laboratory test)

Legislations have been incorporated in the Prevention of Pollution of the Sea (Air) Regulations for implementation of the MARPOL Annex VI amendments with regard to the fuel oil sulphur limit. The Prevention of Pollution of the Sea (Air) Regulation can be accessed in the QR Code link provided below.



Prevention of Pollution of the Sea (Air) Regulations 2005

FUEL OIL NON-AVAILABILITY REPORT (FONAR)

From 1 January 2020, a ship which has to procure non-compliant fuel oil due to the unavailability of compliant fuel would need to complete and submit a fuel oil non-availability report form (FONAR) to the ship's flag Administration, the port authorities where the non-compliant fuel was purchased and the destination port authorities.

The intention of the FONAR is to report non-availability of compliant fuel oil in the last port of call. It should not be misconstrued as an exemption from compliance with the sulphur limit.

MEPC 74 approved the format of the FONAR. A copy of the FONAR can be accessed at the QR Code link provided below.

The report shall be sent as soon as it is determined that the ship/operator will be unable to procure compliant fuel oil and preferably before the ship leaves the port/terminal where compliant fuel oil cannot be obtained. A copy of the FONAR should be kept on board for inspection for at least 12 months.

Ships calling into Singapore and submitting a FONAR would need to declare so in the EPAN or the ENOA (see section 2 on EPAN/ENOA). Such ships would be required to bunker compliant fuel oil in Singapore. The remaining non-compliant fuel oil should be handled in accordance to the procedures mentioned in page 8.



Fuel Oil Non-Availability Report (FONAR)

IMO GUIDELINES



Image from www.imo.org.

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

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 and machinery systems resulting from new fuel blends or fuel 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 appended below.



Guidelines on Consistent Implementation of IMO 2020

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

MEPC 74 approved a joint MSC-MEPC circular on *Delivery of compliant fuel oil by suppliers* in May 2019. 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 appended below.



Joint 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 in the fuel 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 storage tank can be made.

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. MEPC 74, having considered the matter, decided to forward the paper to PPR 7 for further discussion.

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.



Guidelines
for On Board
Sampling

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

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 appended below.

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

PPR 6 developed draft *Guidance for port State control on contingency measures for addressing non-compliant fuel oil* and invited concrete proposals to MEPC 74. The draft 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 approved the guidelines, a copy of which can be accessed at the QR Code link appended in page 13.

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



Port State
Control
Guidelines



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.

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 approved for GESAMP² to carry out an independent assessment of the impact of discharges from EGCS, subject to funding.

Contingency Measures



REFERENCES

ENVIRONMENTAL PUBLIC HEALTH (TOXIC INDUSTRIAL WASTE) REGULATIONS

Singapore National Environment Agency (NEA)

PREVENTION OF POLLUTION OF THE SEA ACT (CHAPTER 243)

Maritime and Port Authority of Singapore (MPA)

PREVENTION OF POLLUTION OF THE SEA (AIR) REGULATIONS

Maritime and Port Authority of Singapore (MPA)

INFORMATION SHEET ON THE LIST OF LICENSED BUNKER SUPPLIERS OF LOW-SULPHUR FUELS IN THE PORT OF SINGAPORE

Maritime and Port Authority of Singapore (MPA)

PORT MARINE CIRCULAR NO.11 OF 2019 - RECEPTION FACILITIES FOR RESIDUES DISPOSAL ARISING FROM EXHAUST GAS CLEANING SYSTEMS (SCRUBBERS)

Maritime and Port Authority of Singapore (MPA)

RESOLUTION MEPC.259(68) - 2015 GUIDELINES FOR EXHAUST GAS CLEANING SYSTEMS

International Maritime Organization (IMO)

FUEL OIL NON-AVAILABILITY REPORT (FONAR)

International Maritime Organization (IMO)

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

International Maritime Organization (IMO)

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

International Maritime Organization (IMO)

2019 GUIDELINES FOR ON BOARD SAMPLING FOR THE VERIFICATION OF THE SULPHUR CONTENT OF THE FUEL OIL USED ON BOARD SHIPS

International Maritime Organization (IMO)

2019 PORT STATE CONTROL GUIDELINES

International Maritime Organization (IMO)

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

International Maritime Organization (IMO)

NOTIFICATION OF EARLY APPLICATION OF THE VERIFICATION PROCEDURES FOR A MARPOL ANNEX VI FUEL OIL SAMPLE

International Maritime Organization (IMO)

² 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.