



TECHNICAL CIRCULARS

TC No: 005/2022
25 May 2022

TO SHIP OWNER/SHIP MANAGER/INTERESTED PARTIES

Guidelines for The Fuel Oil Sampling Points and Handling (Updated)

Please be advised that we have updated a previously issued technical circular (**TC No. 006/2021** dated on 25 April 2021) related to the fitting or designating of fuel oil sampling points and handling. This technical circular supersedes the previously issued technical circular (TC No. 006/2021).

MARPOL Annex VI amendment related to fuel oil sampling and verification procedures for the sulphur content of fuel oil was adopted as Resolution MEPC.324(75) at the 75th session of the Marine Environment Protection Committee (MEPC75) held in November 2020, and these amendments are scheduled to enter into force on 01 April 2022.

This amendment adds the following new terms "in-use sample" and "on board sample".

In-use sample:

Samples drawn from fuel oil supply system downstream of fuel oil service tanks; in other words, a sample of fuel oil in use on the ship.

On board sample:

Samples drawn from the fuel oil transfer systems from fuel oil storage tanks to fuel oil settling tanks, or from fuel oil settling/service tanks, etc.; in other words, a sample of fuel oil intended to be used or carried for use on board the ship.

Technical information related to the fitting or designation of sampling points for "in-use samples" is as follows.

1. Application

Applicable to the fuel oil supply systems for all new and existing ships of **400 GT** as well as all fixed or floating drilling rigs and other platforms. (includes all fuel oil supply systems for machinery such as main engines, auxiliary engines, boiler, incinerators, inert gas generators, emergency generators, etc., but excludes low-flashpoint fuel oil supply systems))

2. Application date

1. For ships the keel of which is laid or which is at a similar stage of construction on or after 01 April 2022, registration surveys during construction.
2. For ships the keel of which is laid or which is at a similar stage of construction before 01 April 2022, the first IAPP renewal survey carried out on or after 01 April 2023.

3. Fitting or designating of fuel sampling points

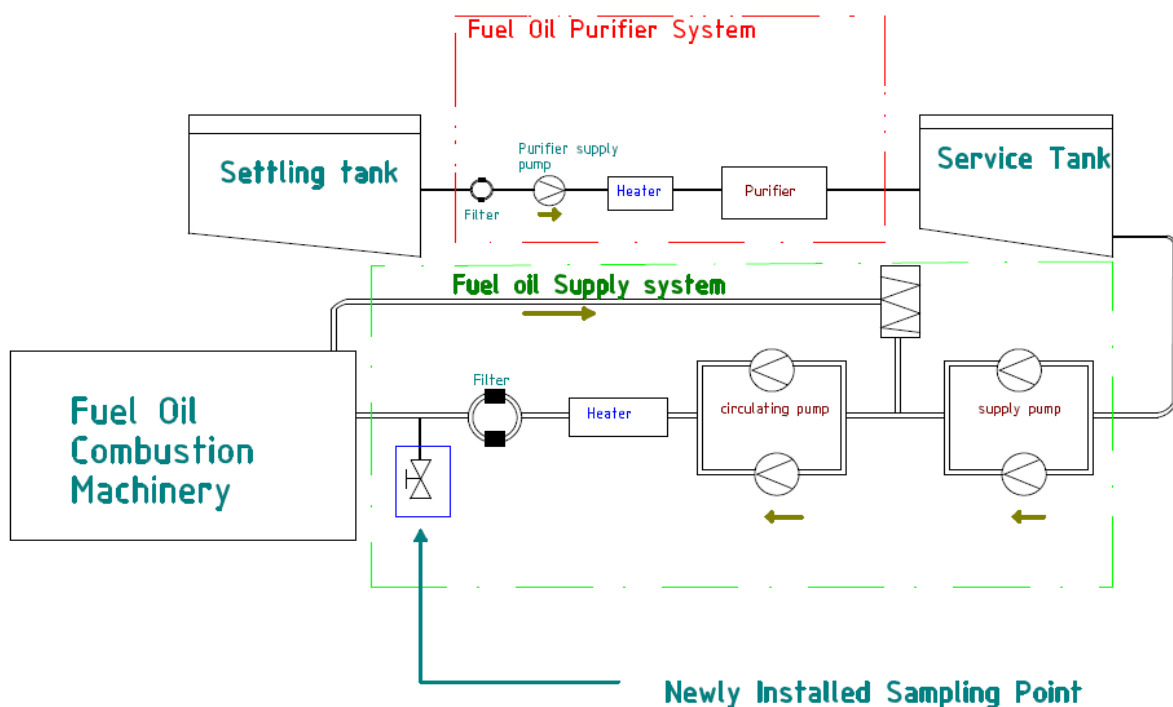
Fuel oil sampling points are required to be fitted or designated for the purpose of taking representative samples of the fuel oil being used on board the ship, taking into account MEPC.1/Circ.864/Rev.1.

Sampling points required by MEPC.1/Circ.864/Rev.1 are as follows:

1. be easily and safely accessible;
2. take into account different fuel oil grades being used for the fuel oil combustion machinery item;
3. be downstream of the in-use fuel oil service tank;
4. be as close to the fuel oil combustion machinery as safely feasible taking into account the type of fuel oil, flow-rate, temperature, and pressure behind the selected sampling point;
5. be clearly marked for easy identification and described in either the piping diagram or other relevant documents;
6. each sampling point should be located in a position shielded from any heated surface or electrical equipment and the shielding device or construction should be sturdy enough to endure leaks, splashes or spray under design pressure of the fuel oil supply line so as to preclude impingement of fuel oil onto such surface or equipment; and
7. the sampling arrangement should be provided with suitable drainage to the drain tank or other safe location.

4. Utilization of existing equipment, handling when modification is carried out, etc.

1. Existing equipment (e.g. air-bleeding plugs/drain valves on fuel oil strainers) may be designated as sampling points. In cases where a common F.O. supply line serves two or more units of combustion machinery, a single sampling point is acceptable, and plan approval is not required unless modification is made to install the sampling points.
2. Plan approval is required in cases where fitting sampling point modifications are needed for the ships mentioned in 2(2) above. Fuel oil piping diagrams related to any modification plans should be submitted to SCM for approval prior to the commencement of any modification work.



Example of sampling point installation (Modification)

3. The main requirements for sampling points are as follows:

a) Fuel oil pipes

- i. The materials used for pipes are to comply with recognized standards. However, pipes with design pressures above 1 MPa or design temperatures over 230°C are to comply with the requirements of SCM Classrules V1P1C5/ Section 5.

b) Valves and pipe fittings for fuel oil pipes

- i. Valves and pipe fittings are to be constructed according to recognized standards or as per SCM Classrules V1P1C5/ Section 6.
- ii. The materials used for valves and pipe fittings are to comply with recognized standards. However, pipes with design pressures above 3 MPa or design temperatures over 230°C are to comply with the requirements of SCM Classrules V1P1C5/ Section 6.
- iii. Cast iron products with elongations less than 12% are not to be used for the valves and pipe fittings used for fuel oil pipes with design pressures over 0.7 MPa or design temperatures over 60°C. [SCM Classrules V1P1C5/ Section 8.]
- iv. Valves and pipe fittings are to be suitable for use under pressures of not less than 0.5 MPa. However, valves and pipe fittings with design temperatures over 60°C and design pressures over 1 MPa are to be suitable for use under pressures of not less than 1.6 MPa. [SCM Classrules V1P1C5/ Section 9.]

5. Survey

1. Statutory survey

Surveyors are to confirm that the ship complies with the relevant requirements mentioned in Paragraph 3 above before attending survey on board.

2. Class survey for modification

The following surveys related to modifications are required for the ships mentioned in 2(2) above in cases where modifications are made.

- i. Visual inspection of modified installations
- ii. Leak test for modified parts of fuel oil piping (at a pressure of 1.5 times the design pressure)

3. Re-writing to the new form of the supplement to the IAPP Certificate

The form for the supplement to the IAPP Certificate will be replaced, and items related to the fitting or designating of the sampling points will be added. The certificate will be replaced with the new form at the time of issuance or written onto the certificate on or after 01 April 2022 (i.e. the effective date).

In addition, after the completion of survey mentioned in Paragraph 5(1) above, the checkbox in paragraph of the new form of the Supplement to IAPP Certificate will be ticked off.

6. Fuel oil samples should be handled as below:

1. Samples should be taken when a steady flow is established in the fuel oil circulating system.
2. The sampling connection should be thoroughly flushed through with the fuel oil in use prior to drawing the sample.
3. The samples should be collected in a sampling container and should be representative of the fuel oil being used.
4. The sample bottles should be sealed by the inspector with a unique means of identification installed in the presence of the ship's representative. The ship should be given the option of retaining a sample.

7. The sample's container label should include the following information:

1. sampling point location where the sample was drawn;
2. date and port of sampling;
3. name and IMO number of the ship;
4. details of seal identification; and
5. signatures and names of the inspector and the ship's representative.

As for onboard samples taking into account MEPC.1/Circ.889, the fitting and designating of sampling points are not required.

Ship Owners, Managers and Masters are advised to be guided by this updated technical circular and review their fuel oil sampling point and procedures to ensure that samples can be drawn safely from the ship's fuel service system. It is also imperative that the ship's crew are aware of the above-mentioned requirements and familiarized with the ship-specific system.

For further details, please refer to the attached IMO resolutions:

1. MEPC.324(75)
2. MEPC.1/Circ.864/Rev.1
3. MEPC.1/Circ.889.

For information, you may contact

SCM Office : 603-55138170, Fax : 603-55138086, Email : infohq@myscm.com.my

Captain M. Prathaban	+6012 2997278	mprathaban@myscm.com.my
Mohd Marby	+6012 6071147	marby@myscm.com.my
Mohd Nor Sahat	+6012 2349521	mdnor@myscm.com.my
Sosanto Yusup	+6013 3841229	sosanto@myscm.com.my

ANNEX 1

**RESOLUTION MEPC.324(75)
(adopted on 20 November 2020)**

**AMENDMENTS TO THE ANNEX OF THE PROTOCOL OF 1997 TO AMEND THE
INTERNATIONAL CONVENTION FOR THE PREVENTION OF POLLUTION FROM SHIPS,
1973, AS MODIFIED BY THE PROTOCOL OF 1978 RELATING THERETO**

Amendments to MARPOL Annex VI

**(Procedures for sampling and verification of the sulphur content of fuel oil and
the Energy Efficiency Design Index (EEDI))**

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

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

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

RECALLING FURTHER that MEPC.1/Circ.882 had requested the Parties to apply the amendments to appendix VI of MARPOL Annex VI related to the verification procedure for a MARPOL Annex VI fuel oil sample (regulation 18.8.2 or regulation 14.8) in advance of their entry into force,

HAVING CONSIDERED, at its seventy-fifth session, proposed amendments to MARPOL Annex VI concerning procedures for sampling and verification of the sulphur content of fuel oil and the Energy Efficiency Design Index (EEDI), which were circulated in accordance with article 16(2)(a) of MARPOL,

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

2 DETERMINES, in accordance with article 16(2)(f)(iii) of MARPOL, that the amendments shall be deemed to have been accepted on 1 October 2021 unless prior to that date, not less than one third of the Parties or Parties the combined merchant fleets of which constitute not less than 50% of the gross tonnage of the world's merchant fleet, have communicated to the Organization their objection to the amendments;

3 INVITES the Parties to note that, in accordance with article 16(2)(g)(ii) of MARPOL, the said amendments shall enter into force on 1 April 2022 upon their acceptance in accordance with paragraph 2 above;

4 INVITES ALSO the Parties to consider the early application of the annexed amendments;

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

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

ANNEX

AMENDMENTS TO MARPOL ANNEX VI

(Procedures for sampling and verification of the sulphur content of fuel oil and the Energy Efficiency Design Index (EEDI))

Regulation 1

Application

- 1 The full text of regulation 1 is replaced by the following:

"The provisions of this Annex shall apply to all ships, except where expressly provided otherwise."

Regulation 2

Definitions

- 2 New paragraphs 52 to 56 are inserted after paragraph 51, as follows:

"52 *Sulphur content of fuel oil* means the concentration of sulphur in a fuel oil, measured in % m/m as tested in accordance with a standard acceptable to the Organization.¹

53 *Low-flashpoint fuel* means gaseous or liquid fuel oil having a flashpoint lower than otherwise permitted under paragraph 2.1.1 of regulation 4 of chapter II-2 of the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended.

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

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

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

Regulation 14

Sulphur oxides (SO_x) and particulate matter

- 3 New paragraphs 8 to 13 and associated headings are inserted after existing paragraph 7 as follows:

"In-use and onboard fuel oil sampling and testing

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

¹ Refer to ISO 8754:2003 Petroleum products – Determination of sulphur content – Energy-dispersive X-ray fluorescence spectrometry.

developed by the Organization.² The onboard sample shall be drawn taking into account the guidelines developed by the Organization.³

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

In-use fuel oil sampling point

10 For each ship subject to regulations 5 and 6 of this Annex, sampling point(s) shall be fitted or designated for the purpose of taking representative samples of the fuel oil being used on board the ship taking into account the guidelines developed by the Organization.²

11 For a ship constructed before 1 April 2022, the sampling point(s) referred to in paragraph 10 shall be fitted or designated not later than the first renewal survey as identified in regulation 5.1.2 of this Annex on or after 1 April 2023.

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

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

Regulation 18

Fuel oil availability and quality

4 Paragraph 8.2 is replaced by the following:

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

Regulation 20

Attained Energy Efficiency Design Index (attained EEDI)

5 A new paragraph 3 is added after existing paragraph 2, as follows:

"3 For each ship subject to regulation 21 of this Annex, the Administration or any organization duly authorized by it shall report to the Organization the required and attained EEDI values and relevant information, taking into account the guidelines developed by the Organization,⁴ via electronic communication:

² Refer to the *2019 Guidelines for on board sampling for the verification of the sulphur content of the fuel oil used on board ships* (MEPC.1/Circ.864/Rev.1).

³ Refer to the *2020 Guidelines for on board sampling of fuel oil intended to be used or carried for use on board a ship* (MEPC.1/Circ.889).

⁴ Refer to the *2018 Guidelines on the method of calculation of the attained Energy Efficiency Design Index (EEDI) for new ships* (resolution MEPC.308(73)), as amended by the Organization.

- .1 within 7 months of completing the survey required under regulation 5.4 of this Annex; or
- .2 within 7 months following 1 April 2022 for a ship delivered prior to 1 April 2022."

Regulation 21
Required EEDI

6 The existing table 1 (Reduction factors (in percentage) for the EEDI relative to the EEDI reference line) and the associated footnotes are replaced by the following:

"

Ship Type	Size	Phase 0	Phase 1	Phase 2	Phase 2	Phase 3	Phase 3
		1 Jan 2013 – 31 Dec 2014	1 Jan 2015 – 31 Dec 2019	1 Jan 2020 – 31 Mar 2022	1 Jan 2020 – 31 Dec 2024	1 Apr 2022 and onwards	1 Jan 2025 and onwards
Bulk carrier	20,000 DWT and above	0	10		20		30
	10,000 and above but less than 20,000 DWT	n/a	0-10*		0-20*		0-30*
Gas carrier	15,000 DWT and above	0	10	20		30	
	10,000 and above but less than 15,000 DWT	0	10		20		30
	2,000 and above but less than 10,000 DWT	n/a	0-10*		0-20*		0-30*
Tanker	20,000 DWT and above	0	10		20		30
	4,000 and above but less than 20,000 DWT	n/a	0-10*		0-20*		0-30*
Containership	200,000 DWT and above	0	10	20		50	
	120,000 and above but less than 200,000 DWT	0	10	20		45	
	80,000 and above but less than 120,000 DWT	0	10	20		40	
	40,000 and above but less than 80,000 DWT	0	10	20		35	
	15,000 and above but less than 40,000 DWT	0	10	20		30	

Ship Type	Size	Phase 0 1 Jan 2013 – 31 Dec 2014	Phase 1 1 Jan 2015 – 31 Dec 2019	Phase 2 1 Jan 2020 – 31 Mar 2022	Phase 2 1 Jan 2020 – 31 Dec 2024	Phase 3 1 Apr 2022 and onwards	Phase 3 1 Jan 2025 and onwards
	10,000 and above but less than 15,000 DWT	n/a	0-10*	0-20*		15-30*	
General Cargo ships	15,000 DWT and above	0	10	15		30	
	3,000 and above but less than 15,000 DWT	n/a	0-10*	0-15*		0-30*	
Refrigerated cargo carrier	5,000 DWT and above	0	10		15		30
	3,000 and above but less than 5,000 DWT	n/a	0-10*		0-15*		0-30*
Combination carrier	20,000 DWT and above	0	10		20		30
	4,000 and above but less than 20,000 DWT	n/a	0-10*		0-20*		0-30*
LNG carrier***	10,000 DWT and above	n/a	10**	20		30	
Ro-ro cargo ship (vehicle carrier)***	10,000 DWT and above	n/a	5**		15		30
Ro-ro cargo ship***	2,000 DWT and above	n/a	5**		20		30
	1,000 and above but less than 2,000 DWT	n/a	0-5*, **		0-20*		0-30*
Ro-ro passenger ship***	1,000 DWT and above	n/a	5**		20		30
	250 and above but less than 1,000 DWT	n/a	0-5*, **		0-20*		0-30*
Cruise passenger ship*** having non-conventional propulsion	85,000 GT and above	n/a	5**	20		30	
	25,000 and above but less than 85,000 GT	n/a	0-5*, **	0-20*		0-30*	

* Reduction factor to be linearly interpolated between the two values dependent upon ship size. The lower value of the reduction factor is to be applied to the smaller ship size.

** Phase 1 commences for those ships on 1 September 2015.

*** Reduction factor applies to those ships delivered on or after 1 September 2019, as defined in paragraph 43 of regulation 2.

Note: n/a means that no required EEDI applies."

7 In table 2 (Parameters for determination of reference values for the different ship types), the first row corresponding to Ship type defined in regulation 2.25 is replaced by the following:

"2.25 Bulk carrier	961.79	DWT of the ship where DWT ≤ 279,000 279,000 where DWT > 279,000	0.477"
--------------------	--------	--	--------

Appendix I

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

Supplement to International Air Pollution Prevention Certificate (IAPP Certificate) Record of construction and equipment

8 New paragraphs 2.3.4 and 2.3.5 are inserted after paragraph 2.3.3 as follows:

"2.3.4 The ship is fitted with designated sampling point(s) in accordance with regulation 14.10 or 14.11.....

2.3.5 In accordance with regulation 14.12, the requirement for fitting or designating sampling point(s) in accordance with regulation 14.10 or 14.11 is not applicable for a fuel oil service system for a low-flashpoint fuel for combustion purposes for propulsion or operation on board the ship
.....

Appendix VI

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

9 The full text of appendix VI is replaced by the following:

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

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

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

Part 1 – sample of fuel oil delivered⁵ in accordance with regulation 18.8.1, hereafter referred to as the "MARPOL delivered sample" as defined in regulation 2.54.

⁵ Samples taken in accordance with the 2009 Guidelines for the sampling of fuel oil for determination of compliance with the revised MARPOL Annex VI (resolution MEPC.182(59)).

Part 2 – sample of fuel oil in use,⁶ intended to be used or carried for use on board in accordance with regulation 14.8, hereafter referred to as the "in-use sample" as defined in regulation 2.55 and "onboard sample"⁷ as defined in regulation 2.56.

Part 1 – MARPOL delivered sample

1 General Requirements

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

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

1.3 A laboratory undertaking the sulphur testing procedure given in this appendix shall have valid accreditation⁸ in respect of the test method to be used.

2 Verification Procedure Part 1

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

2.2 The laboratory shall:

- .1 record the details of the seal number and the sample label on the test record;
- .2 record the condition of the seal of the sample as received on the test record; and
- .3 reject any sample where the seal has been broken prior to receipt and record that rejection on the test record.

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

- .1 unseal the sample;
- .2 ensure that the sample is thoroughly homogenized;
- .3 draw two subsamples from the sample; and
- .4 reseal the sample and record the new reseal details on the test record.

⁶ Samples taken in accordance with the *2019 Guidelines for on board sampling for the verification of the sulphur content of the fuel oil used on board ships* (MEPC.1/Circ.864/Rev.1).

⁷ Refer to the *2020 Guidelines for on board sampling of fuel oil intended to be used or carried for use on board a ship* (MEPC.1/Circ.889).

⁸ The laboratory is to be accredited to ISO/IEC 17025:2017 or an equivalent standard for the performance of the given sulphur content test ISO 8754:2003.

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

- .1 results '1A' and '1B' shall be recorded on the test record in accordance with the requirements of the test method; and
- .2 if the results of '1A' and '1B' are within the repeatability (r)⁹ of the test method, the results shall be considered valid; or
- .3 if the results '1A' and '1B' are not within the repeatability (r) of the test method, both results shall be rejected and two new subsamples shall be taken by the laboratory and tested. The sample bottle shall be resealed in accordance with paragraph 2.3.4 after the new subsamples have been taken.
- .4 in the case of two failures to achieve repeatability between '1A' and '1B', the cause of that failure shall be investigated by the laboratory and resolved before further testing of the sample is undertaken. On resolution of that repeatability issue, two new subsamples shall be taken in accordance with paragraph 2.3. The sample shall be resealed in accordance with paragraph 2.3.4 after the new subsamples have been taken.

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

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

Table 1: Summary of Part 1 MARPOL delivered sample procedure

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

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

⁹ Repeatability (r) calculation in accordance with ISO 4259:2017-2 and as defined in the test method used.

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

Part 2 – In-use and onboard samples

3 General Requirements

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

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

3.3 A laboratory undertaking the sulphur testing procedure given in this appendix shall have valid accreditation¹⁰ in respect of the test method to be used.

4 Verification Procedure Part 2

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

4.2 The laboratory shall:

- .1 record the details of the seal number and the sample label on the test record;
- .2 record the condition of the seal of the sample as received on the test record; and
- .3 reject any sample where the seal has been broken prior to receipt and record that rejection on the test record.

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

- .1 unseal the sample;
- .2 ensure that the sample is thoroughly homogenized;
- .3 draw two subsamples from the sample; and
- .4 reseal the sample and record the new reseal details on the test record.

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

¹⁰ The laboratory is to be accredited to ISO/IEC 17025:2017 or an equivalent standard for the performance of the given sulphur content test ISO 8754:2003.

- .1 results '2A' and '2B' shall be recorded on the test record in accordance with requirements of the test method; and
 - .2 if the results of '2A' and '2B' are within the repeatability (r)¹¹ of the test method, the results shall be considered valid; or
 - .3 if the results of '2A' and '2B' are not within the repeatability (r) of the test method, both results shall be rejected and two new subsamples shall be taken by the laboratory and tested. The sample bottle shall be resealed in accordance with paragraph 4.3.4 after the new subsamples have been taken; and
 - .4 in the case of two failures to achieve repeatability between '2A' and '2B', the cause of that failure shall be investigated by the laboratory and resolved before further testing of the sample is undertaken. On resolution of that repeatability issue, two new subsamples shall be taken in accordance with paragraph 4.3. The sample shall be resealed in accordance with paragraph 4.3.4 after the new subsamples have been taken.
- 4.5 If the test results of '2A' and '2B' are valid, an average of these two results shall be calculated. That average value shall be referred to as 'Z' and shall be recorded on the test record:
- .1 if 'Z' is equal to or less than the applicable limit required by regulation 14, the sulphur content of the fuel oil as represented by the tested sample shall be considered to have met the requirement;
 - .2 if 'Z' is greater than the applicable limit required by regulation 14 but less than or equal to that applicable limit + 0.59R (where R is the reproducibility of the test method),¹² the sulphur content of the fuel oil as represented by the tested sample shall be considered to have met the requirement; or
 - .3 if 'Z' is greater than the applicable limit required by regulation 14 + 0.59R, the sulphur content of the fuel oil as represented by the tested sample shall be considered to have not met the requirement.

Table 2: Summary of in-use or onboard sample procedure¹³

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

¹¹ Repeatability (r) calculation in accordance with ISO 4259:2017-2 and as defined in the test method used.

¹² Reproducibility (R) calculation in accordance with ISO 4259:2017-2 and as defined in the test method used.

¹³ Results of testing undertaken by the Company or other entities are outside the MARPOL process and hence should be considered within the approach given by ISO 4259:2017-2 regarding recipient drawn samples.

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

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

4 ALBERT EMBANKMENT
LONDON SE1 7SR
Telephone: +44 (0)20 7735 7611 Fax: +44 (0)20 7587 3210

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

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

- 1 The Marine Environment Protection Committee, at its seventy-fourth session (13 to 17 May 2019), approved the *2019 Guidelines for on board sampling for the verification of the sulphur content of the fuel oil used on board ships*.
- 2 Member Governments are invited to bring the annexed Guidelines to the attention of Administrations, industry, relevant shipping organizations, shipping companies and other stakeholders concerned.
- 3 This circular revokes MEPC.1/Circ.864.

ANNEX

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

1 Preface

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

2 Sampling location

The in-use¹ representative sample or samples should be obtained from a designated sampling point or points. The number and location of designated fuel oil sampling points should be confirmed by the Administration following consideration of possible fuel oil cross-contamination and service tank arrangements. Fuel oil sampling points to be used should fulfil all of the following conditions:

- .1 be easily and safely accessible;
- .2 take into account different fuel oil grades being used for the fuel oil combustion machinery item;
- .3 be downstream of the in-use fuel oil service tank;
- .4 be as close to the fuel oil combustion machinery as safely feasible taking into account the type of fuel oil, flow-rate, temperature, and pressure behind the selected sampling point;
- .5 be clearly marked for easy identification and described in either the piping diagram or other relevant documents;
- .6 each sampling point should be located in a position shielded from any heated surface or electrical equipment and the shielding device or construction should be sturdy enough to endure leaks, splashes or spray under design pressure of the fuel oil supply line so as to preclude impingement of fuel oil onto such surface or equipment; and
- .7 the sampling arrangement should be provided with suitable drainage to the drain tank or other safe location.

¹ In-use sample means the sample of fuel oil in use on a ship.

3 Sample handling

The fuel oil sample should be taken when a steady flow is established in the fuel oil circulating system. The sampling connection² should be thoroughly flushed through with the fuel oil in use prior to drawing the sample. The sample or samples should be collected in a sampling container or containers and should be representative of the fuel oil being used. The sample bottles should be sealed by the inspector with a unique means of identification installed in the presence of the ship's representative. The ship should be given the option of retaining a sample. The label should include the following information:

- .1 sampling point location where the sample was drawn;
- .2 date and port of sampling;
- .3 name and IMO number of the ship;
- .4 details of seal identification; and
- .5 signatures and names of the inspector and the ship's representative.

² The sampling connection is the valve and associated pipework designated for sample collection which is connected to the fuel oil service system.

4 ALBERT EMBANKMENT
LONDON SE1 7SR
Telephone: +44 (0)20 7735 7611 Fax: +44 (0)20 7587 3210

MEPC.1/Circ.889
7 December 2020

**2020 GUIDELINES FOR ON BOARD SAMPLING OF FUEL OIL INTENDED TO BE USED
OR CARRIED FOR USE ON BOARD A SHIP**

1 The Marine Environment Protection Committee, at its seventy-fifth session (16 to 20 November 2020), approved the *2020 Guidelines for on board sampling of fuel oil intended to be used or carried for use on board a ship*.

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

ANNEX

2020 GUIDELINES FOR ON BOARD SAMPLING OF FUEL OIL INTENDED TO BE USED OR CARRIED FOR USE ON BOARD A SHIP

1 Preface

1.1 The objective of these Guidelines is to establish an agreed method for the sampling, from tanks, of liquid fuel oil intended to be used or carried for use on board a ship and thereby promoting the effective control and enforcement of the relevant provisions of MARPOL Annex VI.

1.2 Fuel oil sampling should be performed in a manner that ensures the safety of personnel and of the ship. Fuel oil sampling in accordance with these Guidelines should be undertaken expeditiously and should not cause undue delay to the ship.

2 Sampling procedures

2.1 General

2.1.1 Tank sampling involves obtaining a sample of fuel oil from the tank in question. The sample obtained is representative of the fuel oil at the location from where it was drawn. Fuel oil in a tank may be sampled by use of the ship's fuel oil transfer system or, in some instances, directly from the tank. Alternative sampling approaches may be used provided they deliver a fuel oil sample which is representative of the fuel oil at the location from where the sample was drawn.

2.1.2 The exact arrangements in each case should be agreed in advance with the ship's representative.

2.1.3 In all instances, attention should be given to avoiding sample contamination by extraneous or sedimented matter.

2.2 Sampling by use of the ship's fuel oil transfer system

2.2.1 When sampling by use of the ship's fuel oil transfer system it should preferably be set up to recirculate to the tank from which it is drawing. In instances where that is not possible, close attention should be given to not over-filling the receiving tank or mixing fuel oils from different consignments. It should be noted that for a viscous fuel oil to be in a pumpable condition it will typically need to be at a temperature corresponding to a viscosity of around 800 – 1,000 cSt.

2.2.2 Sampling should be undertaken downstream of the pump using a suitable sampling connection drawing from the flowing fuel oil. That sampling connection should fulfil all the following conditions:

- .1 it should be easily and safely accessible;
- .2 the sampling connection point should be in a position shielded from heated surfaces or electrical equipment, and any necessary shielding device or construction should be sturdy enough to ensure that any leaks, splashes or spray, under transfer pump discharge pressure, do not impinge onto such surfaces or equipment; and

- .3 the sampling connection should be provided with suitable spill collection arrangements or drainage to the drain tank or other safe location.

2.2.3 Having established that the fuel oil transfer system is handling the fuel oil to be sampled, the sampling connection should be thoroughly flushed through and thereafter the required sample should be obtained.

2.3 Direct sampling from a tank

2.3.1 System tanks, such as settling or service tanks, should preferably be sampled using the *2019 Guidelines for on board sampling for the verification of the sulphur content of the fuel oil used on board ships*. To be noted that viscous fuel oils in such tanks will be at elevated temperatures and hence due caution would be necessary. Such tanks may be sampled directly only by means of tapping points mounted on the tank which should meet the requirements given above in 2.2.2.1 to 2.2.2.3. Sampling from a system tank should not be undertaken by means of removing an access plate or from the test drain connection.

2.3.2 Loaded cargo or other ship operational factors may preclude direct sampling from a tank.

2.3.3 Where direct tank sampling is to be undertaken, via – for example – a suitable access plate or tank hatch, it should be understood that the ship itself may not carry the necessary sampling equipment. In order to take a fuel oil sample direct from a tank, consideration should be given to the use of a specialist service provider having the appropriate sampling equipment, such as that given in ISO 3170:2004, and the expertise necessary to obtain the required sample in a safe and competent manner.

2.3.4 Since a sample obtained is representative of the fuel oil at the level or point from where it was drawn, it will therefore not always be necessary to take samples from more than one level or point in a tank.

2.3.5 Sampling may alternatively be undertaken from the sounding pipe of a tank by means of a suitable sampling arrangement.* When sampling from a sounding pipe, the design of that sounding pipe and the recent filling history of that tank should be considered to assess the relationship of the fuel oil in the sounding pipe to that in the associated tank.

3 Sample handling

3.1 The sample obtained should be collected into a suitable sample bottle. The sample bottle should be sealed by the inspector with a unique means of identification installed in the presence of the ship's representative. The ship should be given the option of retaining a duplicate sample. The label should include the following information:

* An example of a suitable arrangement for sampling from a tank's sounding pipe would be an external pumping device, either powered or manual, drawing fuel oil up through a hose lowered down the sounding pipe with a dedicated sampling head at the lower end. That sampling head should be of a diameter that allows free movement in the sounding pipe and of restricted length to avoid snagging in bends or change of section. Both ends of the sampling head should be conical to avoid snagging and scraping of the sounding pipe walls with a boring from the lower end to the hose connection – to avoid sample contamination the shape of the lower cone should be such that when pumping the sampling head will not tilt to draw directly from fuel oil adjacent to the pipe wall. The sampling head should be of sufficient weight for the hose to sink through the fuel oil to the required depth. In use the pumping rate should be sufficiently restricted that the flow into the sampling head is only from the bulk of the fuel oil being sampled – not also pulling-in pipe wall or sedimented matter.

- .1 sampling point location where the sample was drawn;
 - .2 bunker delivery note details of the fuel oil sampled, as per information required by appendix V of MARPOL Annex VI;
 - .3 date and port of sampling;
 - .4 name and IMO number of the ship;
 - .5 details of seal identification; and
 - .6 signatures and names of the inspector and the ship's representative.
-