

RESOLUTION MEPC.192(61)  
Adopted on 1 October 2010  
2010 GUIDELINES FOR MONITORING THE WORLDWIDE AVERAGE  
SULPHUR CONTENT OF FUEL OILS SUPPLIED FOR USE ON BOARD SHIPS

**ANNEX 1**

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THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

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

RECALLING ALSO that revised MARPOL Annex VI entered into force on 1 July 2010,

RECALLING FURTHER resolution MEPC.183(59) by which the Committee adopted the 2009 Guidelines for monitoring the worldwide average sulphur content of residual fuel oils supplied for use on board ships,

NOTING that regulation 14.2 of the revised MARPOL Annex VI requires monitoring of the worldwide average sulphur content of residual fuel oil supplied for use on board ships, taking into account guidelines developed by the Organization,

RECOGNIZING the need to revise the 2009 Guidelines for monitoring the worldwide average sulphur content of residual fuel oils supplied for use on board ships, to expand the monitoring programme to all petroleum fuel types covered by the revised MARPOL Annex VI,

HAVING CONSIDERED the 2010 Guidelines for monitoring the worldwide average sulphur content of fuel oils supplied for use on board ships prepared by the Sub-Committee on Bulk Liquids and Gases at its fourteenth session,

1. ADOPTS the 2010 Guidelines for monitoring the worldwide average sulphur content of fuel oils supplied for use on board ships, as set out in the Annex to the present resolution;
2. URGES Member Governments and interested organizations to make available the resources and expertise necessary for the implementation of the Guidelines from 1 January 2011; and
3. REVOKES the Guidelines adopted by resolution MEPC.183(59), as from this date.

## ANNEX

**2010 GUIDELINES FOR MONITORING THE WORLDWIDE AVERAGE  
SULPHUR CONTENT OF FUEL OILS SUPPLIED FOR USE ON BOARD SHIPS****Preface**

1 The primary objective of the Guidelines is to establish an agreed method to monitor the average sulphur content of fuel oils supplied for use on board ships taking into account the different sulphur limits as required by regulation 14 of the revised MARPOL Annex VI.

**Introduction**

2 The basis for these Guidelines is provided in regulation 14.2 of the revised Annex VI of MARPOL and in Conference Resolution 4 (in MP/CONF.3/35), on monitoring the worldwide average sulphur content of residual fuel supplied for use on board ships, and document MEPC 59/24. Among the emissions addressed by Annex VI are emissions resulting from the combustion of fuel oils containing sulphur. An upper limit for the sulphur content of fuel oils was set and it was further decided to monitor the average sulphur content of fuel oils. Monitoring of the worldwide average sulphur content of distillate fuel supplied for use on board ships is not specified in regulation 14.2 of the Annex VI. However, in the meantime, it was agreed to monitor the average sulphur content of distillate fuel.

3 The independent testing companies analyse over 100,000 samples annually, which cover between 25% and 35% of all deliveries. From the data gathered by these testing services, the current average figures for the sulphur content of residual fuels can be derived. These figures are publicized regularly and are currently in the order of 2.4% by mass<sup>1</sup>.

**Definitions**

4 For the purpose of these Guidelines the following definitions should apply:

.1 *Residual fuel:*

Fuel oil for combustion purposes delivered to and used on board ships with a kinematic viscosity at 40°C greater than 11.00 centistokes<sup>2</sup> (mm<sup>2</sup>/s).

.2 *Distillate fuel:*

Fuel oil for combustion purposes delivered to and used on board ships with a kinematic viscosity at 40°C lower than or equal to 11.00 centistokes<sup>2</sup> (mm<sup>2</sup>/s).

.3 *Provider of sampling and testing services:*

A company that, on a commercial basis, provides testing and sampling services of bunker fuels delivered to ships for the purpose of assessing quality parameters of these fuels, including the sulphur content.

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<sup>1</sup> See document MEPC 61/4.

<sup>2</sup> Reference is made to ISO Standard 8217, 2010.

.4 *Reference value  $A_{wr}$ :*

The value of the worldwide average sulphur content in residual fuels supplied for use on board ships, based on the first three years of data collected and as determined on the basis of paragraphs 5 to 11 of these Guidelines.

.5 *Reference value  $A_{wd}$ :*

The value of the worldwide average sulphur content in distillate fuels supplied for use on board ships, based on the first three years of data collected and as determined on the basis of paragraphs 5 to 11 of these Guidelines.

### **Monitoring and calculation of yearly and three-year rolling averages**

#### *Monitoring*

5 Monitoring should be based on calculation of average sulphur content of residual and distillate fuels on the basis of sampling and testing by independent testing services. Every year the average sulphur content of residual and distillate fuels should be calculated. After three years the reference value for monitoring will be set as described in paragraph 11.

#### *Calculation of yearly averages*

6 At the basis of monitoring is the calculation, on an annual basis, of the average sulphur content of residual and distillate fuel.

7 The calculation of the average sulphur content is executed as follows:

For a certain calendar year, the sulphur contents of the samples analysed<sup>3</sup> (one sample for each delivery of which the sulphur content is determined by fuel oil analysis) are recorded. The sulphur contents of the samples analysed are multiplied by the corresponding mass of fuel oils added up and then divided by the total mass of bunker analysed. The outcome of that division is the average sulphur content of residual and distillate fuels for that year.

8 As a basis for well-informed decisions a graphical representation of the distribution of the global sulphur content plotted against the quantity of fuel oils associated with each incremental sulphur content range should be made available by 31 January of each year:

- .1 residual fuels: in terms of the % sulphur in increments of 0.5% sulphur;
- .2 distillate fuel for sulphur content below 0.5%: in terms of the % sulphur in increments of 0.1%; and
- .3 distillate fuels for sulphur content above 0.5%: in terms of the % sulphur in increments of 0.5%.

9 The mathematical formula for the method of calculation described is given in the appendix to these Guidelines.

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<sup>3</sup> Reference is made to ISO Standard 8754, 2003.

*Three-year rolling average*

10 A three-year rolling average should be calculated as follows:

$$A_{cr} = (A_{c1} + A_{c2} + A_{c3})/3$$

in which:

$A_{cr}$  = rolling average S-content of all deliveries tested over a three-year period

$A_{c1}, A_{c2}, A_{c3}$  = individual average S-contents of all deliveries tested for each year under consideration

$A_{cr}$  is to be recalculated each year by adding the latest figure for  $A_c$  and deleting the oldest.

For the calculation of yearly average of distillate fuels, any fuel oils less than 0.05% of sulphur should be calculated as 0.03%.

*Setting of the reference values*

11 The reference value of the world wide average sulphur content of residual and distillate fuels supplied for use on board ships should be  $A_{wx}$ , where  $x=r, r_{ECA}, d, d_{ECA}$  and  $A_{wx} = A_{cr}$  as calculated in January of the year following the first three years in which data were collected on the basis of these Guidelines.  $A_w$  should be expressed as a percentage.

**Providers of sampling and testing services**

12 There are presently three providers of sampling and testing services under these Guidelines.

13 Any additional providers of sampling and testing services will be approved by the MEPC in accordance with the following criteria:

- .1 be subject to the approval of the Marine Environment Protection Committee, which should apply these criteria;
- .2 be provided with a technical and managerial staff of qualified professionals providing adequate geographical coverage and local representation to ensure quality services in a timely manner;
- .3 provide services governed by a documented Code of Ethics;
- .4 be independent as regards commercial interest in the outcome of monitoring;
- .5 implement and maintain an internationally recognized quality system, certified by an independent auditing body, which ensures reproducibility and repeatability of services which are internally audited, monitored and carried out under controlled conditions;
- .6 take a significant number of samples on an annual basis for the purpose of globally monitoring average sulphur content of residual and distillate fuels.

### **Standardized method of calculation**

14 Each of the providers of sampling and testing services should provide the necessary information for the calculation of the average sulphur content of the residual and distillate fuels to the Secretariat of IMO or another agreed third party on the basis of a mutually agreed format, approved by MEPC. This party will process the information and will provide the outcome in the agreed format to MEPC. From the viewpoint of competitive positions the information involved should be considered sensitive.

## APPENDIX

## CALCULATION OF AVERAGE SULPHUR CONTENT BASED ON QUANTITY

**Note:** wherever "all deliveries" are mentioned, this is meant to refer to all deliveries sampled and tested for sulphur and being taken into account for the purpose of monitoring.

**Calculation weighted for quantity**

$$A_{cj} = \frac{\sum_{i=1}^{i=N_j} a_i \cdot m_i}{\sum_{i=1}^{i=N_j} m_i}$$

in which:

$A_{cj}$  = the average sulphur content of all deliveries sampled worldwide in year j

$a_i$  = the sulphur content of individual sample for delivery i

$N_j$  = total number of samples taken in year j

$m_i$  = the mass of fuel oils with a sulphur content of  $a_i$ .

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