#### MEPC.305(73)决议

## (2018年10月26日通过)

# 经 1978 年议定书修订的 1973 年国际防止船舶造成污染公约的 1997 年议定书附则修正

#### 案

#### 防污公约附则 VI 修正案

#### (禁止船上携带用于推进或操作目的而燃烧的非符合性燃油)

海上环境保护委员会,

**忆及**国际海事组织公约第 38(a)条关于防止和控制海洋污染的国际公约赋予海上环境保 护委员会的职能,

**注意到**经 1978 年和 1997 年议定书修订的 1973 年国际防止船舶造成污染公约(以下称防污公约)第 16 条规定的防污公约修正程序和赋予本组织的相关机构审议并通过防污公约修正案的职能,

在其第 73 届会议上,**审议了**对防污公约附则 VI 关于船上禁止为了船舶推进或运转而 载运不合格燃油用于燃烧而提出的修正案,

1. 按防污公约第 16(2)(d)条规定, 通过防污公约附则 VI 修正案, 其文本载于本决议附件;

2. 按防污公约第 16(2)(f)(iii)条规定, **决定**该修正案于 2019 年 9 月 1 日应视为已被接 受,除非在此日期之前,有不少于三分之一的缔约国或拥有商船合计吨位数不少于世界商船 总吨数 50%的缔约国通知本组织其反对该修正案;

3. **提请**各缔约国注意,按防污公约第16(2)(g)(ii)条规定,该修正案在其按上述2接受 后,应于2020年3月1日生效;

4. **要求**秘书长按防污公约第 16(2)(e)条规定,将核准无误的本决议副本及其附件中的 修正案文本分发给防污公约所有缔约国;和

5. 进一步要求秘书长将本决议及其附件的副本分发给非防污公约缔约国的本组织成员。

#### 附件

## 防污公约附则 VI 修正案

#### (禁止船上携带用于推进或操作目的而燃烧的非符合性燃油)

# 附则 VI

# 防止船舶造成空气污染规则

#### 第14条

硫氧化物 (SO<sub>x</sub>) 和颗粒物质

#### 一般要求

1. 1 由以下文字替代:

"1 船上使用的或为使用而载运的任何燃油的硫含量不应超过 0.50% m/m。"

#### 排放控制区内的要求

2. 3 由以下文字替代:

"3 就本条而言,排放控制区应为由本组织根据本附则附录 III 中设定的衡准和程序而 指定的任何海域,包括任何港口区域。本条规定的排放控制区为:

.1 本公约附则 I 第 1.11.2 条中定义的波罗的海区域;

.2 本公约附则 V 第 1.14.6 条中定义的北海区域;

- .3 本附则附录 VII 中坐标所述的北美排放控制区域;和
- .4 本附则附录 VII 中坐标所述的美国加勒比海排放控制区域。"

3. 4 由以下文字替代:

"4 当船舶在排放控制区域内航行时,船上使用的燃油的硫含量不应超过 0.10% m/m。"

4. 删除小标题"评审规定"和第8、9和10段。

#### 附录 I 国际防止空气污染(IAPP)证书格式(第8条)

## 国际防止空气污染(IAPP)证书的附件

5. 第 2.3.1 和 2.3.2 由以下文字替代,并新增第 2.3.3 如下:

"2.3.1 当船舶在第14.3条规定的排放控制区域外营运时,该船使用:

.1 硫含量不超过 0.50% m/m 限值的燃油(见燃油交付单记录),和/或 …………□

2.3.2 当船舶在第14.3条规定的排放控制区域内营运时,该船使用:

.1 硫含量不超过 0.10% m/m 限值的燃油(见燃油交付单记录),和/或 ………□

.2 2.6 列出的按第 4.1 条认可的等效布置,该等效布置在 SOx 减排方面至少与使用硫含量限值为 0.10% m/m 的燃油一样有效 …………□

2.3.3 对于没有按 2.6 列出的按第 4.1 条认可的等效布置的船舶,船上为使用而载运的 燃 油 硫 含 量 不 应 超 过 0.50% m/m (见 燃 油 交 付 单 记录) ······□"

# ANNEX 1

# RESOLUTION MEPC.305(73) (adopted on 26 October 2018)

# 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

# (Prohibition on the carriage of non-compliant fuel oil for combustion purposes for propulsion or operation on board a ship)

## 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,

NOTING 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,

HAVING CONSIDERED, at its seventy-third session, proposed amendments to MARPOL Annex VI concerning the prohibition on the carriage of non-compliant fuel oil for combustion purposes for propulsion or operation on board a ship,

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 September 2019 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 March 2020 upon their acceptance in accordance with paragraph 2 above;

4 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;

5 REQUESTS FURTHER 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

# (Prohibition on the carriage of non-compliant fuel oil for combustion purposes for propulsion or operation on board a ship)

# ANNEX VI

# **REGULATIONS FOR THE PREVENTION OF AIR POLLUTION FROM SHIPS**

## **Regulation 14**

Sulphur oxides (SO<sub>X</sub>) and particulate matter

## **General requirements**

1 Paragraph 1 is replaced by the following:

"1 The sulphur content of fuel oil used or carried for use on board a ship shall not exceed 0.50% m/m."

#### Requirements within emission control areas

- 2 Paragraph 3 is replaced by the following:
  - "3 For the purpose of this regulation, an emission control area shall be any sea area, including any port area, designated by the Organization in accordance with the criteria and procedures set forth in appendix III to this Annex. The emission control areas under this regulation are:
    - .1 the Baltic Sea area as defined in regulation 1.11.2 of Annex I of the present Convention;
    - .2 the North Sea area as defined in regulation 1.14.6 of Annex V of the present Convention;
    - .3 the North American Emission Control Area, which means the area described by the coordinates provided in appendix VII to this Annex; and
    - .4 the United States Caribbean Sea Emission Control Area, which means the area described by the coordinates provided in appendix VII to this Annex."
- 3 Paragraph 4 is replaced by the following:

"4 While a ship is operating within an emission control area, the sulphur content of fuel oil used on board that ship shall not exceed 0.10% m/m."

4 The subtitle "Review provision" and paragraphs 8, 9 and 10 are deleted.

# Appendix I

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

# Supplement to International Air Pollution Prevention Certificate (IAPP Certificate)

5 Paragraphs 2.3.1 and 2.3.2 are replaced by the following and a new paragraph 2.3.3 is added as follows:

"2.3.1 When the ship operates outside of an emission control area specified in regulation 14.3, the ship uses:

- .1 fuel oil with a sulphur content as documented by bunker delivery notes that does not exceed the limit value of 0.50% m/m, and/or
- .2 an equivalent arrangement approved in accordance with regulation 4.1 as listed in paragraph 2.6 that is at least as effective in terms of  $SO_X$  emission reductions as compared to using a fuel oil with a sulphur content limit value of 0.50% m/m

2.3.2 When the ship operates inside an emission control area specified in regulation 14.3, the ship uses:

- .1 fuel oil with a sulphur content as documented by bunker delivery notes that does not exceed the limit value of 0.10% m/m, and/or
- .2 an equivalent arrangement approved in accordance with regulation 4.1 as listed in paragraph 2.6 that is at least as effective in terms of  $SO_x$  emission reductions as compared to using a fuel oil with a sulphur content limit value of 0.10% m/m

2.3.3 For a ship without an equivalent arrangement approved in accordance with regulation 4.1 as listed in paragraph 2.6, the sulphur content of fuel oil carried for use on board the ship shall not exceed 0.50% m/m as documented by bunker delivery notes

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# 环保会 MEPC.1/Circ.875/Add.1 通函

# (2018年11月9日)

## 燃油供应商为确保交付至船上的燃油质量的最佳实践指南

1 海上环境保护委员会在其第73届会议(2018年10月22日至26日)上,批准了《燃燃油供应商为确保交付至船上的燃油质量的最佳实践指南》,其文本载于附件。

2 提请各成员国政府使其主管机关、行业、相关航运组织、航运公司和其他利益相关 方适当注意到附件中的指南。

#### 附件

#### 燃油供应商为确保交付至船上的燃油质量的最佳实践指南

### 1 前言

1.1 MARPOL 附则 VI 规定了船上使用燃油的要求。第 14 条规定了指定 SO<sub>x</sub> 排放控制 区内(第 14.4 条)和全球范围(第 14.1 条)船上使用燃油的硫含量限值。第 18.3 条要求交 付并在船上使用的燃油应不使船舶安全遭受危险或对机械设备的性能产生不利影响。 SOLAS 第 II-2 章第 4.2.1.1 条规定除另有允许外,不应使用闪点低于 60℃的燃油。

1.2 燃油购买者负责提出拟供燃油的正确规格。供应商负责交付符合商定规格和法定 限值的燃油。

1.3 最佳实践旨在协助燃油供应商确保交付至船上的燃油质量符合商定规格和法定限 值。

1.4 在制定其程序时,燃油供应商还应考虑现有行业惯例和标准提供的指导,例如国际标准化组织(ISO)的出版物。

1.5 本指南不适用于低闪点燃料(诸如 LNG、LPG 或甲基/乙基醇)和纯生物燃料的供应。

#### 2 定义

2.1 SOLAS: 经修正的《1974年国际海上人命安全公约》。

2.2 MARPOL: 经修正的《1973年国际防止船舶造成污染公约》。

2.3 船用燃油:用于船舶消耗的碳氢基燃料。主要来自石油,可能也包含合成或再生 来源的碳氢化合物。船用燃油主要被分类为蒸馏或残余燃油,在 IMO 文件中通常被称为"燃 油"。

2.4 船用燃油供应商/供应商:生产或购买、拥有、储存和销售船用燃油。通过管道、 卡车和/或驳船分销船用燃油。可混合产品以满足顾客的需求。可拥有或承租一个分销网络 或可雇佣第三方的货运服务。签发船用燃油交付单(BDN)。

2.5 燃油加装驳船供应商:向实物供应商提供运输服务的液货船或驳船船东/经营者。 通常代表供应商签发 BDN。

2.6 卡车供应商:液罐车的车主/经营者。通常代表供应商签发 BDN。

2.7 货物专员/供应商代表:船用燃油供应商指定的人员,负责船用燃油交付至船上和 负责填写向接收船舶提供的文件。

2.8 船用燃油买家/购买者:作为经营者(使用者)一方,而非交易方,获得并支付交付至船上的船用燃油费用,可以是船东的经营者或船舶承租人的经营者,在合同中常常作为供应商的对应方。

2.9 以质量为本的燃油供应商:具有按国际公认标准(ISO 9001 或等效标准)认证的 质量管理体系的燃料供应商,其可在成员国注册和/或获得许可证(如有适当的许可/认证机

制);从而可准时按法定要求供应 BDN 上规定数量和质量的燃油,同时提供支持并能解决相关问题。

#### 3 目标

- 3.1 本文件中所述的最佳实践反映了如下一组目标,旨在确保交付至船上燃油的质量:
- .1 在托管点(可以是接收船舶的船舷或集管)交付的船用燃油满足买家订购的规格;
- .2 根据 MARPOL 附则 VI 第 14 条交付的船用燃油满足买家规定的硫含量限值;
- .3 交付的船用燃油满足 MARPOL 附则 VI 第 18.3 条,即交付并在船上使用的燃油应 不包含含有下列危害的任何添加的物质或化学杂质:使船舶安全遭受危险或对机械 设备的性能产生不利影响、对人员造成伤害或增加空气污染;
- .4 交付的船用燃油满足 SOLAS 第 II-2 章关于闪点的要求;
- .5 向买家提供详细描述燃料属性的安全数据单(SDS,之前为MSDS——物质安全数 据单)和其他相关文件;
- .6 以安全有效的方式交付船用燃油至船上,防止损害安全和船员健康或交付至接收船舶的船用燃油质量的做法;
- .7 根据 MARPOL 附则 VI 第18.8.1 条在交付过程中进行代表性样品的采集,考虑到《为确定符合经修订的防污公约附则 VI 要求的燃油取样指南》(MEPC.182(59)决议);
- .8 寻求透明度/可追溯性并确保整个船用燃油供应链的质量控制;
- .9 在整个供应链中减少质量风险以避免争议;
- .10 鼓励从订购船用燃油至交付期间船用燃油供应商和船用燃油买家之间就应遵循的 程序进行互动和清楚的沟通,和
- .11 鼓励各方通过合作和沟通有效解决争议。

#### 最佳实践

#### 4 一般要求

4.1 为确保交付至船上的船用燃油的质量满足相关规格,供应商应从合适的精炼油和/ 或来自合成或再生能源的碳氢化合物中制造满足相关规格的船用燃油。最终产品应均质且稳 定。

4.2 为确保产品符合相关的规格和法定限值,应对照相关标准测试最终混合物并记录测试结果。

4.3 为在整个供应链中保持质量控制,帮助识别产品来源至生产源头和供应链中的各 个环节的文件很重要,特别是当出现问题时,文件能帮助找到问题源头并采取补救措施。

4.4 船用燃油混合物一经生产和测试,岸上液罐内和液货船及船用燃油供应船船上应 采用合适的储存和货物装卸设备以保持产品的完整性。

4.5 供应商负责提供交付至船上的产品在船舶总管处采集的所需样品以及所需的文件, 包括船用燃油交付单(BDN)和安全数据单(SDS)。 4.6 除本指南外,燃油供应商还应参见 ISO 13739 石油产品—船舶燃油驳运程序,相关国家标准如 SS 524:2014—新加坡燃油供应链质量控制(QMBS)规范、SS 600—新加坡燃油加装标准操作守则,以及行业最佳实践,例如 CIMAC 出版的建议案。

#### 5 船用燃油生产期间的质量控制

5.1 原则上,混合应只在岸上液罐进行,以确保最终产品是均质的。应在交付至船上 前测试和确认合成混合物的质量。

5.2 船用燃油供应商应确保每个混合物组成部分的质量控制。这包括通过准确的数据 知道其各自属性,和通过相关文件知道组成部分的来源。

5.3 应尝试和测试混合物的组成部分,以清楚了解其典型属性和对船用燃油生产的适 合性,以及其如何和其他组成部分混合。应特别注意混合物组成部分的相容性。混合技工应 具备混合船用燃油的适当知识。

5.4 如对混合物组成部分的性质和质量不确定,应先确定和解决问题再将其投入船用 燃油生产中。

5.5 为确保混合物质量, 对船用燃油供应商建议如下:

- .1 基于经验、行业知识和报道的事例维护适合和不适合混合物组成部分数据库;
- .2 开发和/或使用适当的混合模型工具;和
- .3 严格测试新/不熟悉的混合物,以满足 MARPOL 附则 VI 第 18.3 条的要求和认可的标准,比如《ISO 8217 石油产品—燃油(F级)--船用燃油规格》。

5.6 混合物应不包含 ISO 8217 第 5 条和 MARPOL 附则 VI 第 18.3 条中定义的外来、 潜在有害物质。这不包括旨在提高具体燃料特性(比如冷流属性或燃烧属性)而使用的添加 剂。

5.7 所使用的任何添加剂应是已知的,并且在船用燃料应用有可证实的记录。应彻底 评估任何新的添加剂,以确保其适合船用燃料应用(例如,被轮机制造商接受)。

5.8 混合物组成部分的主要数据包括但不限于粘度、密度、闪点和硫含量。混合物组成部分应有详细数据以确保最终混合物完全满足所生产的船用燃油的等级要求。

5.9 从组成部分数据确定的混合比例需要正确计算和设定并在之后具体产品的生产时保持。

5.10 为确保最终产品是稳定的,制造商应确保所有混合组成部分相容,以避免产生固体沉淀。这可通过测试混合物组成部分的相容性完成。

5.11 最终混合物应在有资质的实验室进行测试。用于测试的样品应根据获取代表性样品的指南进行采集(液罐的底部、中部和顶部)。

5.12 应避免交付期间混合。

5.13 如预计产品将接近最大/最小限值,制造商在设定混合目标时应牢记各个试验方法的精度以确保产品有足够置信度满足规定限值。对于燃油硫含量,建议制造商遵循 ISO 4259 《石油制品—针对试验方法的数据精度的确定与应用》。

#### 6 供应链中的质量控制

6.1 燃料质量可在供应链中几个环节受到影响(直至并包括交付至船上)。因此建议供应商建立文件并维持覆盖从产品托管至产品经过托管点驳运至接收船舶的所有阶段的质量管理体系(QMS)。

6.2 如果供应商的供应链中有一部分是其他方(诸如油码头操作员和燃油加装驳船或 卡车供应商)完成的,应在 QMS 中予以明确,并且供应商应努力确保控制整个供应链和保 持对其的监管。

#### 7 船用燃油运输、储存和驳运

7.1 供船燃料或混合物组成部分的质量在运输、储存和驳运过程中与其最初状态相比可能发生变化。供应商应通过密切同第三方进行如下合作寻求防止从原试验报告和/或质量证书(COQ)已知的质量受到影响:

- .1 拟将燃料作为货物进行运输的液货船应向供应商证明其经认证运载此类货物(如轻油/重油)。供应商应寻求之前的货物信息以防残留物污染产品。如果之前的货物存在交叉污染风险,供应商还应寻求保证证明液货船已被妥善清理;
- .2 在装载新货物前,确保精炼厂的储存罐或独立储存设施适合拟被储存的货物,并且 储存罐状态良好(如没有锈蚀)。如果液罐在装载新货物前不是空的,确保合成的 混合物适当混合、均质并稳定,并确保使用液罐底部、中部和顶部的样品对新的混 合物进行适当测试;
- .3 确保储存过程中的清洁和管理。这包括保持产品在合适的温度并防止水进入液罐。 应去除任何积聚的水以避免导致微生物/细菌增长的条件,微生物/细菌增长可严重 影响供船燃料的质量;
- .4 如果供应商的供应链有一部分是其他方(诸如油码头操作员和供应船或卡车操作员) 完成的,应在QMS中予以明确,并且供应商应努力确保控制整个供应链和/或保持 对其的监管;
- .5 油码头的管道可被用于驳运几种类型的货物(被称为多产品管道)。如果情况如此, 寻求验证管道已被适当清理以防止可能影响整体质量或产品规格的交叉污染;
- .6 装载前,驳船供应商应从装载油码头寻求验证证明货物驳运管道已经妥善清理以防止与之前通过该管道驳运的产品交叉污染;
- .7 燃油加装液货船/驳船应防止将从来自不同岸上液罐的货物装载至同一液货舱内,除 非岸上液罐中的产品属于相同等级并具有相同的质量证书;
- .8 燃油加装液货船/驳船装载货物时应采集代表性样品。取样应由燃油加装液货船/驳船的代表和装载油码头的代表共同见证并会签。取样应根据公认的标准,诸如 ISO 3170/ASTM D4057(手动取样标准)或 ISO 3171(管道自动取样);
- .9 在驳船上储存和装卸货物时确保良好的清洁和管理。这包括保持燃料在合适的温度 并防止水从外部或因为冷凝进入液罐;
- .10 应定期清理吸入管滤网,并始终在更换至不同等级货物前进行清理;和
- .11 在装载船用燃油供应液货船/驳船(或卡车)时,建议采取下列预防措施:

- .1 避免将不同的货物批次装入同一液货舱内;
- .2 确保在装载新货物前液货舱是空的;和
- .3 寻求之前装载的货物信息,以防之前货物的残留物污染产品。如果之前的货物存在交叉污染的可能,寻求液货舱已经妥善清理的保证。

#### 8 交付至船舶(燃油加装操作)

**8.1** 交付至船舶的燃油可直接通过管道来自岸上的液罐(在精炼厂或油码头)、来自在码头、锚泊地或海上与船舶并排的燃料油供应船/驳船、或来自码头的卡车或火车车厢。

8.2 在各种可获得的指导性文件中都可以找到燃油加装程序的详细指导(包括燃油加 装检查清单的样本),例如《国际油船和油码头安全指南》(ISGOTT)第25章。

8.3 任何燃油加装活动开始前,供应商(燃油加装驳船、卡车或油码头)和接收船舶 之间应建立明确的通信并商定紧急停止和响应行动。

8.4 为应对供应船舶和接收船舶上船员的健康和安全风险,加装操作涉及的所有各方 应穿戴适当的个人防护设备(PPE)并防止皮肤接触船用燃油和暴露在有害烟气中。

8.5 如果拟供应不同等级的船用燃油,货物专员和接收船舶的轮机长应商定不同等级船用燃油的供应顺序。为避免交付过程中产品被污染,建议先供应较轻/较低硫含量等级再供应较重/较高硫含量等级。

8.6 在每次交付货物之前,确保所有的供应管道已经彻底清洁,没有残留物,特别是 当供应管道/软管将被用于供应与之前货物不同规格的货物。

8.7 在泵压操作后对供油软管/管道进行清理。管道清理完毕后,软管中的物质应流回 至燃料油供应船的液货舱。

8.8 对于材料不同的产品的供应应有专用的管道/软管和供油接头,例如,对于残留和 蒸馏等级、和对于高和低硫含量船用燃油,以防产品的交叉污染。

8.9 对于交付的每个不同等级的货物,应收集代表性样品。如果使用多于一艘液货船/ 驳船或一辆卡车供应船舶,应分别采集代表性样品,并为每艘液货船/驳船或每辆卡车分别 签发 BDN。

#### 9 代表性取样

9.1 取样是质量控制不可缺少的组成部分,而且对于保护所有各方的利益很重要。样品可作为商业、监管或甚至刑事争议和法庭上的证据。目的是获得真正代表驳运产品的样品,包括交付至船舶和船用燃油交付前的供应链上游(如适用)。

9.2 为确保样品具有代表性,应在整个产品驳运过程中通过自动取样器或手动连续滴 注取样器连续对每艘液货船/驳船或每辆卡车交付的每种等级燃油收集单个主样品。

9.3 虽然,燃油供应商对于自动管道取样可使用 ISO 13739 和 ISO 3171,对于手动方 法可使用 ISO 3170,或其他试协议获取样品,应牢记 MARPOL 附则 VI 规定了符合和执行 程序,包括 MEPC.182(59)决议《为确定符合经修订的 MARPOL 附则 VI 要求的 2009 年燃 油取样指南》。

9.4 交付过程中或从液罐采集的样品应放在一个足够容量的干净容器中,再分为所需

数量的子样品,每个子样品都应足以进行所需的试验,通常每个子样品为 500-750 ml,并且 任何情况下都不应少于 400 ml。

9.5 单个原样品的内容物应被倒入所需数量的干净子样品容器中。这通常涉及搅动散装容器,逐个倒入每个子样品容器容积的四分之一或三分之一,然后重复该过程(搅动和倒出)直至倒满所有的子样品容器。

9.6 整个过程,包括将样品容器密封和贴上标签,应由双方(供应货物或产品的一方和接收方)代表共同见证,并且最终唯一的样品密封号应记录在相关的文件(如 BDN)中并由双方代表会签。

9.7 也可考虑雇佣独立验船师的服务监督和见证该过程,在这种情况下取样涉及的所 有样品密封号应由供油验船师记录在样品见证和收据上。

#### 供应链中的取样

9.8 应在供应链全过程中的每个产品托管交付点进行取样测试并予以记录。

9.9 当供应船舶从岸上液罐、浮式储存设备和液货船装载船用燃油时,应采集代表性样品。推荐的方法是在托管驳运点装载的整个过程中抽取样品。取样应经见证,并且最终样品容器应由货物接收方和油码头代表共同密封、贴上标签和会签。

9.10 供应商应留存货物驳运样品至少 30 天。如果发生质量争议,样品应留存至争议 解决。

#### 交付至船舶过程中的取样

9.11 供应商应遵循《为确定符合经修订的 MARPOL 附则 VI 要求的 2009 年燃油取样 指南》(MEPC.182(59)决议),该决议规定供应商应提供供应商代表从接收船舶的燃油入口 集管处抽取的 MARPOL 样品。

9.12 如果出于安全或实际原因供应商代表无法在驳船和接收船舶之间移动以亲自在场,可通过替代方式观察该过程。

9.13 为便于远程见证商业样品的抽取,可通过用高可见度胶带或油漆标示出取样区提高供油驳船上取样设备的可见度。

9.14 最终的样品容器应由双方代表共同密封、贴上标签和会签。

9.15 供应商应留存供应商代表的商业样品至少 30 天。如果在样品留存期间发生质量 争议,样品应留存至争议解决。

#### 10 供应链中试验和试验结果的解读

10.1 应在供应链全过程中的每个产品托管驳运点进行取样测试并予以记录,使分析报告与产品源匹配。这是 QMS 的主要部分,能使过程透明并可追溯,并帮助供应商识别潜在问题的源头,采取补救措施并防止进一步的安全问题。

10.2 试验分析应根据相关的国际认可试验方法进行。

10.3 对于船用燃油制造商/供应商,建议混合目标不应是实际的规格限值,而是限值减去(或如是最低限值则加上)适当的安全裕度。当船用燃油制造商/供应商想确保产品以95%置信度满足规格限值时,混合目标应是最大限值减去0.59R(或最低限值加上0.59R)。

10.4 如需更多信息可参见 CIMAC 网上免费的 2016 年指导文件,链接如下: http://www.cimac.com/cms/upload/workinggroups/WG7/CIMAC\_WG07\_2016\_Feb\_Guideline\_I nterpretation\_\_Fuel\_Analysis\_Test\_Results\_Final.pdf 和 ISO 8217 的第 8 节,试验结果的精度 和解读。

# 11 文件

11.1 为使供应链透明并可追溯,文件是 QMS 的关键部分。这包括货物托管驳运记录、 质量证书(COQ)、样品密封号和质量分析报告。

11.2 供应商负责根据 SOLA 第 VI/5-1 章的要求向接收船舶提供船用燃油交付单(BDN) 和安全数据单(SDS)。供应商有责任确保交付至船舶的船用燃油与 BDN 和 SDS 中的数据一致。

11.3 除最低要求(BDN和 SDS)外,建议供应商提供其他支持性文件(诸如 COQ 副本和质量分析报告)和可能影响船用燃油在接收船舶的储存和装卸期间性质的属性信息。这可以帮助船舶以安全高效的方式储存和装卸燃油。

#### 货物托管驳运

11.4 对于货物托管驳运,文件应至少包括下列内容:

- .1 识别托管驳运前的货物所有者和新所有者的收据证书;
- .2 向新所有者提供货物的液货船或油码头的名称;
- .3 附有实验室分析报告的质量证书;和
- .4 记录取样地点、取样方法和所有样品密封号的取样单。

#### 样品标签

11.5 样品标签应符合 MARPOL 附则 VI 第 18.8 条,详见《为确定符合经修订的 MARPOL 附则 VI 要求的 2009 年燃油取样指南》(MEPC.182(59)决议)。所有样品标签上应 有下列信息:

- .1 抽取样品的位置和方法:
- .2 交付开始的日期;
- .3 燃油加装液货船/燃油加装装置的名称;
- .4 接收船舶的名称和 IMO 编号;
- .5 供应商代表和船舶代表的签字和姓名;
- .6 密封标识的细节;和
- .7 燃油等级。

11.6 船用燃油交付单上应记录样品密封的详情。

## 安全数据单——SDS(之前为物质安全数据单——MSDS)

11.7 SOLAS 第 VI/5-1 条要求在装载 MARPOL 附则 I 类货物和船用燃油时向船舶提供

安全数据单。

11.8 SDS 旨在告知接收船舶上的船员所有与货物/产品相关的健康、安全、装卸和环境风险。所要求信息的详情见 MSC.286(86)决议《关于 MARPOL 附则 I 货油和燃油所用物 质安全数据单(MSDS)的建议案》。

#### 船用燃油交付单(BDN)

11.9 船用燃油交付单(BDN)是声明向接收船舶供应船用燃油的等级和数量的官方收据。MARPOL 附则 VI 第 18.5 条和 MARPOL 附则 VI 附录规定了 BDN 中应包括的信息。

11.10 根据当地要求和供应商的商业要求,BDN中可包括 MARPOL 要求以外的信息。

11.11 BDN 应由供应商代表和接收船舶代表共同签署并根据 MARPOL 附则 VI 第 18.9.3 条由供应商留存至少 3 年。

#### 支持性文件

11.12 如可能,供应商应向船用燃油买家提供产品的质量证书(COQ)副本和验证 COQ 详情的相关的实验室分析报告。这可以包括具体质量参数的更详细信息,这将帮助接收船舶的船员应用适当的燃料管理,包括使用前的预处理。

#### 燃料属性/装卸建议

11.13 如果供应的产品在装卸特点上与传统/主流船用燃油不同,供应商应提供可能影响船用燃油在接收船舶上存储和装卸期间属性的信息。

11.14 该信息应包括任何特殊燃料管理和装卸要求,诸如加热、分离器和离心机中预 处理的特别注意事项、和该产品特有的任何已知的兼容问题。

11.15 对于馏分油,供应商应报告浊点(CP)、冷滤点(CFPP)和倾点(PP)。ISO 8217 燃油规格要求测试这些燃油冷特性。该信息帮助船舶的船员确定燃料是否需要加热。为船舶 营运需求订购具有合适 CP、CFPP 和 PP 的产品的责任由买家承担。

#### 许可

11.16 在已建立燃油供应商许可机制的国家/港口中,船用燃油供应商应提供证据以确 认其具有许可证。

#### 质量管理体系(QMS)

11.17 供应商应运行质量管理体系(QMS)并能在被要求时向船用燃油买家提供证据。 如果供应商有其内部 QMS,应能在船用燃油买家要求时提供总结。QMS 文件应包括供应商 需遵循的标准的参考文献以及任何独立第三方对 QMS 或 QMS 要素的认证。

#### 12 签订合同

12.1 出售和购买船用燃油是涉及合同各方的商业活动,对于船用燃油供应商和船用燃油买家来说可以包括许多相关方。在这种情况中"合同"既包含供应商的一般条款和条件也包含实际的订购单。

12.2 合同规定了应提供的燃油、数量以及供应商如何履行合同协议的详情,并应包括 索赔/争议条款。如果遇到争议,应规定争议处理/解决的安排。

- 12.3 燃油规格和燃油加装程序的任何要求应在合同中予以注明。合同应:
- .1 规定订购的数量,要求的最大硫含量和燃油应满足 MARPOL 附则 VI 第 18 条的适 用要求;
- .2 包括燃油详细的技术说明以及可接受的质量参数;
- .3 如果燃油参照《ISO 8217 石油产品—燃油(F级)--规格》进行指定,合同应明确 指出将使用哪个版本(即 2005、2010、2012 或 2017)。如可行,鼓励使用最新版 本;和
- .4 对于非 ISO 8217 标准的燃油,合同至少应要求供应的船用燃油满足 MARPOL 附则 VI 第 18.3.1 条和第 18.3.2 条以及 SOLAS 公约第 II-2 章的要求。如果产品接近 ISO 8217 级,但不满足具体的参数,免除部分应经双方提前同意并在订购单和合同中 予以明确。

12.4 如果船用燃油买家订购的燃油超出了 MARPOL 附则 VI 的限值,船用燃油买家应 通知供应商燃油将与认可的替代符合方式(如废气清洗系统)共同使用。供应商应确保通知 送达监管实际交付的供应商代表(如货物专员)。

12.5 除 MARPOL 附则 VI 另有允许并有支持性文件证实外(如船舶装有对燃油硫含量 限值的认可的替代符合方式),供应商应不供应不符合相关法定要求和规格的燃油。

12.6 合同的条款和条件应规定遇到争议时如何进行实验室分析。

12.7 合同应规定实验室应独立并经 ISO 17025 或等效标准认证。

#### 13 争议解决

13.1 发生争议时的争议处理/解决安排应在合同中予以规定。

13.2 在船舶执行其试验计划后,如果结果导致质量争议需要测试供应商留存的商业样品,建议样品的拆封由供应商代表和买家代表共同见证。如果供应商留存的商业样品经测试 无法满足规定的最大/最小限值,则产品没有满足规格限值。

13.3 如果产品无法满足规格是由于合约船用燃油供应商以外的各方造成的,如最初的船用燃油混合供应商或代表合约供应商交付产品的燃油加装液货船/驳船经营者,供应商有权向这些各方寻求赔偿。

13.4 如果已交付的产品经测试结果不符合规格,但尚未被使用,供应商应和买家进行 建设性的对话并支持买家展开补救行动,包括卸载船用燃油(如需要)。

13.5 如果船舶遭遇营运问题怀疑但未具体证实由燃油引起,供应商应就确定问题根源 向买家提供其力所能及的协助。这可能涉及,如产品来源的信息以帮助建立可能和异常或意 外营运问题相关的货物源知识。



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# GUIDANCE ON BEST PRACTICE FOR FUEL OIL SUPPLIERS FOR ASSURING THE QUALITY OF FUEL OIL DELIVERED TO SHIPS

1 The Marine Environment Protection Committee, at its seventy-third session (22 to 26 October 2018), approved the *Guidance on best practice for fuel oil suppliers for assuring the quality of fuel oil delivered to ships*, as set out in the annex.

2 Member Governments are invited to bring the annexed Guidance to the attention of their Administration, industry, relevant shipping organizations, shipping companies and other stakeholders concerned, as appropriate.

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# ANNEX

# GUIDANCE ON BEST PRACTICE FOR FUEL OIL SUPPLIERS FOR ASSURING THE QUALITY OF FUEL OIL DELIVERED TO SHIPS

# 1 INTRODUCTION

1.1 MARPOL Annex VI contains requirements that apply to fuel oil used on board ships. Regulation 14 sets limits on the sulphur content of fuel oil used on board ships, both within designated  $SO_X$  emission control areas (regulation 14.4) and globally (regulation 14.1). Regulation 18.3 contains requirements that fuel oil delivered to and used on board ships should not jeopardize the safety of ships or adversely affect the performance of machinery. Regulation 4.2.1.1 of SOLAS II-2 stipulates that except as otherwise permitted, no fuel oil with a flashpoint of less than 60°C shall be used.

1.2 Fuel oil purchasers are responsible for correctly specifying the fuel oil which is to be supplied. It is the responsibility of the supplier to deliver fuel oil which is compliant with the agreed specification and statutory limits.

1.3 These best practices are intended to assist fuel oil suppliers to ensure the quality of fuel oils delivered to ships which is compliant with the agreed specification and statutory limits.

1.4 When developing their procedures, fuel oil suppliers should also consider the guidance provided by existing industry practices and standards, for example those published by the International Organization for Standardization (ISO).

1.5 This guidance does not apply to supply of low flashpoint fuels such as LNG, LPG or methyl/ethyl alcohols, nor to pure biofuels.

# 2 DEFINITIONS

2.1 SOLAS: International Convention for the Safety of Life at Sea, 1974, as amended.

2.2 *MARPOL*: International Convention for the Prevention of Pollution from Ships, 1973, as amended.

2.3 *Bunker(s)*: Hydrocarbon based fuel for ship consumption. Primarily derived from petroleum sources, may also contain hydrocarbons from synthetic or renewable sources. Bunkers are chiefly classified as distillate or residual fuel oils usually referred to as "fuel oils" in IMO documents.

2.4 *Bunker supplier/Supplier*. Manufactures or buys, owns, stores and sells bunkers. Distributes bunkers from pipelines, trucks and/or barges. May blend products to meet the customer's specifications. May own or charter a distribution network or may hire delivery services from a third party. Issues the bunker delivery note (BDN).

2.5 *Bunker barge provider*: Owner/operator of tankers or barges providing transportation services for a physical supplier. Usually issues the BDN on behalf of the supplier.

2.6 *Truck provider*. Owner/operator of tank trucks. Usually issues BDN on behalf of the supplier.

2.7 *Cargo officer/Supplier's representative*: Person appointed by the bunker supplier to be responsible for the delivery of bunkers to the ship and is responsible for the completion of the documentation to be provided to the receiving ship.

2.8 *Bunker buyer/Purchaser*. Secures and pays for bunkers delivered to a ship at the operator side (user) and not a trader. Can be a shipowner's operator or a charterer's operator; and often used in contracts as counterpart of the supplier.

2.9 *Quality-oriented fuel oil supplier:* A fuel supplier with a quality management system certified in accordance with an internationally recognized standard (ISO 9001 or equivalent), and which may be registered with the Member State and/or licensed, where such licensing/accreditation schemes are in place; and therefore can be expected to be on time, meet the statutory requirements, supply the quantity and quality stated on the BDN, provide support and be able to address relevant issues.

# 3 GOALS/OBJECTIVES

3.1 The best practices set forth in this document reflect a set of goals intended to assure the quality of fuel oil delivered to ships, as follows:

- .1 bunkers delivered at the point of custody, which can be the receiving ship's rail or manifold, to meet the buyer's ordered specifications;
- .2 bunkers delivered to be in compliance with sulphur limits specified by the buyer in accordance with regulation 14 of MARPOL Annex VI;
- .3 bunkers delivered to be in compliance with regulation 18.3 of MARPOL Annex VI which contains requirements that fuel oil delivered to and used on board ships shall not include any added substance or chemical waste that jeopardizes the safety of ships, adversely affect the performance of the machinery, is harmful to personnel or contributes to additional air pollution;
- .4 bunkers delivered to meet SOLAS Chapter II-2 requirements regarding flashpoint;
- .5 Safety Data Sheets (SDS, formerly known as MSDS Material Safety Data Sheets) and other relevant documentation detailing the fuel properties to be provided to the buyer;
- .6 bunkers to be delivered to the ship in a safe and efficient manner, preventing practices that may compromise safety and crew health or the quality as delivered to the receiving ship;
- .7 representative samples to be taken during delivery in accordance with regulation 18.8.1 of MARPOL Annex VI, taking into account the 2009 Guidelines for the sampling of fuel oil for determination of compliance with the revised MARPOL Annex VI (resolution MEPC.182(59));
- .8 seek transparency/traceability and ensure quality control throughout the bunker supply chain;
- .9 mitigating quality risks throughout the supply chain to avoid disputes;

- .10 encourage interactions and clear lines of communication regarding procedures to be followed between bunker suppliers and bunker buyers from the point of order up to the point of delivery; and
- .11 encourage effective dispute resolution through collaboration and communication between parties.

# **BEST PRACTICES**

# 4 General

4.1 In order to ensure that the quality of bunkers delivered to ships meets the relevant specifications, suppliers should source from appropriate refinery streams and/or hydrocarbon streams from synthetic or renewable sources to produce bunkers meeting the relevant specifications. The end product should be homogeneous and stable.

4.2 To ensure that the product conforms to relevant specifications and statutory limits, the final blend should always be tested against the relevant standards and the test results should be documented.

4.3 In order to maintain quality control throughout the supply chain, it is important to have documentation to help identify product origins back to the manufacturing source and the various links in the chain to enable traceability, especially if problems arise to help pinpoint the source of the problem and take remedial action.

4.4 Once a bunker blend has been produced and tested, appropriate storage and cargo handling in shore tanks and onboard cargo and bunker supply tankers should be adopted to maintain product integrity.

4.5 The supplier is responsible for providing the required representative samples of the product delivered to ships to be taken at the ship's manifold and the required documentation including the bunker delivery note (BDN) and safety data sheets (SDS).

4.6 In addition to these guidelines, fuel oil suppliers should also refer to ISO 13739 Petroleum products – Procedures for transfer of bunkers to ships, relevant national standards such as SS 524: 2014 – Singapore Specification for quality management for bunker supply chain (QMBS), SS 600 – Singapore Standard Code of Practice for Bunkering, and to industry best practices such as guidelines published by CIMAC.

# 5 Quality control during production of bunkers

5.1 Blending should, in principle, only take place in shore tanks in order to ensure the end product is homogeneous. The quality of the resultant blends should be tested and confirmed prior to delivery to ship.

5.2 The bunker supplier should ensure control of individual blend component quality. This includes knowing their individual properties through accurate data, and the component origins, supported by relevant documentation.

5.3 Blend components should be tried and tested so that their typical properties and suitability for bunker fuel production, and how they combine with other components, is well understood, with particular attention being given to the compatibility between blend components. Blending operatives should have appropriate knowledge of blending bunkers.

5.4 Where there are any uncertainties as to the nature and quality of a blend component, any issue should be identified and resolved before its use in the production of bunkers.

5.5 The following are recommended for bunker suppliers to ensure the quality of blends:

- .1 maintain a database of suitable and unsuitable blend components based on experience, industry knowledge and reported incidents;
- .2 development and/or use of appropriate blend modelling tools; and
- .3 test new/unfamiliar blends rigorously to meet the requirements of regulation 18.3 of MARPOL Annex VI and recognized standards, such as ISO 8217 Petroleum products -- Fuels (class F) -- Specifications of marine fuels.

5.6 The blend should not contain extraneous, potentially deleterious, materials as defined in clause 5 in ISO 8217 and regulation 18.3 of MARPOL Annex VI. This does not preclude the use of additives intended to improve specific fuel characteristics such as cold flow properties or combustion properties.

5.7 Any additives used should be known and have a proven track record in marine fuel application. Any new additive should be thoroughly evaluated to ensure it is fit for use in marine fuel application (for example, be accepted by engine manufacturers).

5.8 Key data of the blend components include, but are not limited to, viscosity, density, flashpoint and sulphur. Sufficient data should be available on blending components to ensure the final blend fully meets the requirements of the grade of bunkers being made.

5.9 Blend proportions as determined from component data need to be correctly calculated and set and thereafter maintained during production of the specified product.

5.10 To ensure the end product is stable, the producer should ensure that all blend components are mutually compatible to avoid precipitation of solids. This can be done through testing compatibility of the blend components.

5.11 The final blend should be tested at a qualified laboratory. The sample sent for testing should be taken in accordance with guidelines for obtaining a representative sample (bottom, middle and top of the tank).

5.12 Blending during delivery should be avoided.

5.13 If it is anticipated that the product will be close to a limit maximum/minimum, the producer should keep in mind the precision of individual test methods when setting blend targets to ensure the product meets the specification limit with sufficient confidence. In the case of fuel oil sulphur content, producers are recommended to follow the guidelines provided in ISO 4259 Petroleum products -- Determination and application of precision data in relation to methods of test.

# 6 Quality control in the supply chain

6.1 Fuel quality can be compromised at several points in the supply chain, up to and including delivery to ship. It is therefore recommended that the supplier establishes, documents and maintains a quality management system (QMS) covering all stages from taking custody of the product until the product passes the point of custody transfer to the receiving ship.

6.2 If part of the supplier's supply chain is performed by other parties, such as terminal operators and bunker barge or truck providers, these should be identified in the QMS and the supplier should strive to ensure control and maintain oversight over the supply chain.

# 7 Bunker transport, storage and transfer

7.1 The quality of a bunker fuel or blend components may change compared to its origin during transport, storage and transfer. The supplier should seek to prevent the quality known from the original test report and/or certificate of quality (COQ) from being compromised through working closely with third parties as follows:

- .1 tankers intending to transport the fuels as cargo should demonstrate to the supplier that the tanker is certified to carry this type of cargo (e.g. clean/dirty petroleum products). Suppliers should seek information about previous cargoes in case remaining residues could contaminate the product. Suppliers should also seek guarantees that the cargo tank has been properly cleaned if the previous cargo presents a risk of cross-contamination;
- .2 ensure that storage tanks at refineries or at independent storage facilities are suitable for the type of cargo to be stored, and that storage tanks are in good condition (e.g. no rust) before a new cargo is loaded. If tanks are not empty before loading new cargoes, ensure the resulting blend is properly mixed so that it is homogeneous and stable and that the new blend is properly tested using samples from the bottom, middle and top of the tank;
- .3 ensure good housekeeping during storage. This includes keeping products at the right temperature and preventing water ingress into the tank. Any water that accumulates should be removed to avoid conditions leading to microbial/bacterial growth that can severely compromise the bunker quality;
- .4 if part of the supplier's supply chain is performed by other parties, such as terminal operators and operators of supply ships or trucks, these should be identified in the QMS and the supplier should strive to ensure control and/or maintain oversight over the supply chain;
- .5 pipelines at terminals may be used to transfer several types of cargo (known as multiproduct pipelines). If this is the case, seek verification that pipelines have been adequately cleared to prevent cross-contamination that may affect the overall quality or compromise the product specification;
- .6 prior to loading, barge providers should seek verification from the loading terminal that the product transfer pipelines have been properly cleared to prevent cross-contamination with the previous products transferred via the pipeline;

- .7 bunker tankers/barges should avoid loading cargo from different shore tanks into the same cargo tank, unless the shore tanks contain products of the same grade and with the same certificate of quality;
- .8 a representative sample should be taken during the loading of the bunker tanker/barge. The sampling should be witnessed and countersigned by a representative from the bunker tanker/barge and a representative of the loading terminal. The sample should be taken in accordance with recognized standards, such as ISO 3170/ASTM D4057 (manual sampling standard) or ISO 3171 (pipeline auto-sampling);
- .9 ensure good housekeeping during product storage and handling on the barge. This includes keeping fuels at the right temperature and preventing water ingress into the tank from external sources or condensation;
- .10 suction line strainers on cargo pumps should be cleaned periodically, and always cleaned before changing to a different grade of cargo; and
- .11 when loading the bunker supply tanker/barge (or truck), the following precautions are recommended:
  - .1 avoid loading different product batches into the same cargo tank;
  - .2 ensure the cargo tank is empty before loading a new cargo into it; and
  - .3 seek information about previous cargoes in case residues from a previous cargo could contaminate the product. Seek guarantees that the cargo tank has been properly cleaned if the previous cargo presents a risk of cross-contamination.

# 8 Delivery to ship (bunkering operations)

8.1 Delivery to ship can be directly from a shore tank (at refinery or terminal) via pipeline, from a bunker tanker/barge coming alongside the ship at berth, at anchorage or off-shore, or from a road truck or rail car at berth.

8.2 Detailed guidance for bunkering procedures, including a sample bunkering checklist, may be found in various available guidance documents, for example chapter 25 of the International Safety Guide for Oil Tankers and Terminals (ISGOTT).

8.3 Clear communications should be established between supplier (bunker barge, truck or terminal) and the receiving ship and emergency stop and response actions agreed prior to any bunkering activities commencing.

8.4 In order to address the health and safety risk to crew on both the supply ship and receiving ship, all parties involved in the bunkering operation should wear adequate personal protective equipment (PPE) and take due care to prevent skin contact with bunkers and exposure to hazardous fumes.

8.5 If more than one grade of bunkers is to be supplied, the order in which the grades are to be supplied should be agreed between the cargo officer and the receiving ship's chief engineer. To avoid contamination of product during delivery, it is recommended that the lighter/lowest sulphur grade is supplied first followed by the heavier/higher sulphur grade.

8.6 Ensure that all supply pipelines and hoses are thoroughly cleared of residue prior to every new delivery, especially if the supply pipeline/hose is going to be used to supply a different product specification than the previous delivery.

8.7 Carry out line clearing of bunker hose(s)/pipelines at the end of the pumping operation. Once line clearing is completed, the contents in the hose should be drained back into the bunker tanker's cargo tank.

8.8 There should be segregated pipelines/hoses and bunker connections for supply of materially different types of product, e.g. for residual and distillate grades, and for high and low sulphur bunkers to prevent cross-contamination of products.

8.9 Collection of a representative sample should be performed for each separate grade being delivered. If more than one tanker/barge or truck is used to supply the ship, a separate set of representative sample(s) should be taken and a separate BDN issued for each tanker/barge or truck.

# 9 Representative sampling

9.1 Sampling is an integral part of quality control and vital in protecting the interest of all parties involved. Samples may be used as evidence both for commercial, regulatory or even criminal disputes and in court cases. The objective is to obtain samples that are truly representative of the product being transferred, both during delivery to ship and upstream in the supply chain as appropriate prior to the bunker delivery.

9.2 To ensure samples are representative, a single primary sample for each grade of fuel delivered from each tanker/barge or truck should be drawn continuously throughout the entire product transfer by either an automatic sampler or manual continuous drip sampler.

9.3 While a fuel oil supplier may use ISO 13739 and ISO 3171 for automatic pipeline sampling, ISO 3170 for manual methods or some other protocol for obtaining samples, it should be remembered that MARPOL Annex VI sets out the procedures for compliance and enforcement which includes resolution MEPC.182(59) on the 2009 Guidelines for the sampling of fuel oil for determination of compliance with the revised MARPOL Annex VI.

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

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

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

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

# Sampling in the supply chain

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

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

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

# Sampling during delivery to ship

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

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

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

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

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

# 10 Testing and interpretation of test results in the supply chain

10.1 Testing should be carried out on samples from each point of product custody transfer throughout the supply chain and documented so the analysis report is matched to the product origin. This is a key part of a QMS to enable transparency and traceability and assist the supplier to identify the origin of potential problems and take steps to remedy and prevent further quality issues.

10.2 The testing analysis should be done according to the relevant internationally recognized test methods.

10.3 For the bunker producer/supplier, the recommendation is that the blend target should not be the actual specification limit, but rather the limit minus (or plus if it is a minimum limit) an appropriate safety margin. For the bunker producer/supplier to ensure that the product meets the specification limit with 95% confidence, the blend target should be the limit minus 0.59R for a maximum limit (or plus 0.59R for a minimum limit).

10.4 Further information can be found in a 2016 guidance document from CIMAC freely available online at the following link:

http://www.cimac.com/cms/upload/workinggroups/WG7/CIMAC\_WG07\_2016\_Feb\_Guideline \_Interpretation\_\_Fuel\_Analysis\_Test\_Results\_Final.pdf and Section 8 of ISO 8217, precision and interpretation of test results.

# 11 Documentation

11.1 Documentation is a crucial part of the QMS in order to achieve transparency and traceability in the supply chain. This includes records of custody transfer of cargoes, certificates of quality (COQ), sample seal numbers and quality analysis reports.

11.2 Suppliers are responsible for providing bunker delivery notes (BDNs) to the receiving ship and safety data sheets (SDS) in line with the requirements of SOLAS regulation VI/5-1. It is the supplier's responsibility to ensure that the bunkers delivered to ship are in conformity with the details provided on the BDN and SDS.

11.3 In addition to the minimum requirements (BDN and SDS), suppliers are recommended to provide other supportive documentation such as copies of COQs and quality analysis reports and information on properties that may affect how the bunkers behave during storage and handling on the receiving ship. This might assist the ship to store and handle the fuel in a safe and efficient manner.

# Cargo custody transfer

- 11.4 For cargo custody transfers, documentation should include at least the following:
  - .1 certificate of receipt identifying the owner of the cargo prior to custody transfer and the new owner;
  - .2 name of tanker or tank terminal supplying the cargo to the new owner;
  - .3 certificate of quality accompanied by laboratory analysis report; and
  - .4 sampling sheet recording sampling location(s), sampling method(s) and all sample seal numbers.

## Sample labels

11.5 Sample labels should comply with regulation 18.8 of MARPOL Annex VI, as detailed in the 2009 Guidelines for the sampling of fuel oil for determination of compliance with the revised MARPOL Annex VI (resolution MEPC 182(59)). The following information is required on all sample labels:

- .1 location at which, and the method by which, the sample was drawn;
- .2 date of commencement of delivery;
- .3 name of bunker tanker/bunker installation;
- .4 name and IMO number of the receiving ship;
- .5 signatures and names of the supplier's representative and the ship's representative;
- .6 details of seal identification; and
- .7 bunker grade.

11.6 Details of the sample seals should be recorded on the bunker delivery note.

# Safety data sheets – SDS (Formerly known as material safety data sheets – MSDS)

11.7 SOLAS regulation VI/5-1 requires that safety data sheets are provided to a ship prior to loading MARPOL Annex I type cargoes and marine fuel oils.

11.8 SDS are intended to inform crew on the receiving ship of all health, safety, handling and environmental risks associated with the cargo/product. Details of the required information are set out in resolution MSC.286(86) on the *Recommendations for material safety data sheets* (MSDS) for MARPOL Annex I oil cargo and oil fuel.

# Bunker delivery note – BDN

11.9 The bunker delivery note (BDN) is the official receipt stating the grade and quantity of bunkers supplied to the receiving ship. Regulation 18.5 of MARPOL Annex VI and appendix V of MARPOL Annex VI stipulates information to be included in the BDN.

11.10 Additional details, beyond the MARPOL requirements, may be included on the BDN according to local requirements and the commercial requirements of the supplier.

11.11 The BDN should be signed by both the supplier's representative and the representative of the receiving ship and retained by the supplier for at least three years as per regulation 18.9.3 of MARPOL Annex VI.

# Supporting documentation

11.12 Suppliers should, where possible, provide bunker buyers with copies of the product's certificate of quality (COQ) and associated laboratory analysis reports verifying the details on the COQ. These may include more detailed information on specific quality parameters which would be helpful to the crew on the receiving ship in applying appropriate fuel management, including pre-treatment prior to use.

# Fuel properties/handling advice

11.13 The supplier should provide information on properties that may affect how the bunkers behave during storage and handling on the receiving ship, if the product supplied differs in handling characteristics from traditional/mainstream bunkers.

11.14 This information should include any special fuel management and handling requirements such as heating, special attention to pre-treatment in separators and centrifuges, and any known compatibility issues particular to the product.

11.15 For distillate fuels, suppliers should report cloud point (CP), cold filter plugging point (CFPP) and pour point (PP). ISO 8217 fuel oil specifications require these fuel oil cold characteristic to be tested. This information helps the ship's crew determine if the fuel will need heating. The responsibility for ordering a product with appropriate CP, CFPP and PP for the ship's operational needs rests with the buyer.

# Licensing

11.16 In those States/ports that operate established licensing regimes for bunker suppliers, the bunker supplier should provide evidence to confirm the licence(s).

# Quality management systems (QMS)

11.17 Suppliers should have quality management systems (QMS) in place and be able to provide evidence to bunker buyers if required. In cases where a supplier has its own internal QMS, it should be able to provide a summary to bunker buyers upon request. The QMS documentation should include references to the standards which the supplier will adhere to along with any independent third party accreditation of the QMS or elements of the QMS.

# 12 Contracting

12.1 Selling and buying bunkers is a commercial activity involving contracting parties, which in the case of bunker suppliers and bunker buyers can include a variety of parties. The "contract" in this instance covers both the supplier's general terms and conditions and the actual purchasing order.

12.2 The contract specifies the product(s) to be supplied, quantity and details of how the supplier will fulfil the contractual agreement, and should include claim/dispute clauses. Dispute handling/resolution arrangements in case of dispute should be specified.

12.3 Bunker specifications and any requirements for bunkering procedures should be stated in the contract. The contract should:

- .1 state the quantity ordered, the required maximum sulphur content and that the fuel is to meet the applicable requirements in regulation 18 of MARPOL Annex VI;
- .2 include a detailed technical specification for the fuel along with acceptable quality parameters;
- .3 where the fuel is specified with reference to ISO 8217 Petroleum products --Fuels (class F) -- Specifications, the contract should clearly state which edition is to be used (i.e. 2005, 2010, 2012 or 2017). Using the latest edition is encouraged where possible; and
- .4 for non-ISO 8217 standard fuel oils, as a minimum the contract should specify that the bunkers provided meet the requirements of regulations 18.3.1 and 18.3.2 of MARPOL Annex VI, and SOLAS chapter II-2. If the product is close to an ISO 8217 grade, but will not meet specific parameters, those exemptions should be mutually agreed in advance and specified in the purchase order and contract.

12.4 If the bunker buyer orders fuel with a sulphur content exceeding the limit in MARPOL Annex VI, the supplier should obtain a notification from the bunker buyer that the fuel will be used with an approved alternative means of compliance such as exhaust gas cleaning. The supplier should ensure the notification is communicated to the supplier's representative overseeing the physical delivery (e.g. the cargo officer). 12.5 Unless otherwise permitted by MARPOL Annex VI and confirmed by supporting documentation, e.g. ships installed with an alternative means of compliance with the fuel oil sulphur content limit, the supplier should not supply fuel oil which is not compliant with relevant statutory requirements and specifications.

12.6 The contract terms and conditions should stipulate how the laboratory analysis will be carried out in the case of disputes.

12.7 The contract should specify that the laboratory should be independent and certified to ISO 17025 or an equivalent standard.

# 13 Dispute resolution

13.1 Dispute handling/resolution arrangements in case of dispute should be specified in the contract.

13.2 Following the ship's own testing programme, if the results lead to a quality dispute where the suppliers retained commercial sample is to be tested, it is recommended that breaking the seal of that sample is witnessed by representatives for both the supplier and the buyer. If the test on the supplier's retained commercial sample fails to meet the specified maximum/minimum limit, the product has not met that specification limit.

13.3 If the cause for the failure of the product to meet specification lies with parties other than the contracting bunker supplier, for example the original bunker blend provider or the bunker tanker/barge operator delivering the product on the contracting supplier's behalf, it is up to the supplier to seek compensation from these parties.

13.4 If a product that has been delivered is proven by test results to be off-specification, but has not yet been used, the supplier should enter into constructive dialogue with the buyer and support the buyer with regards to remedial action including debunkering, if required.

13.5 In cases where a ship experiences operational problems suspected but not specifically proven to be caused by the fuel, the supplier should offer any assistance they are capable of to the buyer in trying to determine the root cause. This may involve, for example, information on product origin to help build knowledge of cargo sources that may be associated with unusual or unexpected operational issues.

# 环保会 MEPC.1/Circ.878 通函

# (2018年11月9日)

### 统一实施 MARPOL 附则 VI 关于 0.50% 硫含量限制的船舶实施计划的制定指南

1 海上环境保护委员会在其第73届会议(2018年10月22日至26日)上,批准了《统 一实施 MARPOL 附则 VI 关于 0.50% 硫含量限制的船舶实施计划的制定指南》,文本载于附件。

2 提请各成员国政府使其主管机关、行业、相关航运组织、航运公司和其他利益相关 方注意附件中的指南。

#### 统一实施 MARPOL 附则 VI 关于 0.50% 硫含量限制的船舶实施计划的制定指南

#### 前言

1 MEPC70 同意"2020 年 1 月 1 日"作为船舶符合全球 0.50% m/m 燃油硫含量要求的有效实施日期并通过 MEPC.280(70)决议"MARPOL 附则 VI 第 14.1.3 条中燃油标准实施的有效日期"<sup>10</sup>。

2 在这个背景下,MEPC73 同意主管机关应鼓励悬挂其国旗的船舶制定实施计划,概述船舶可如何准备以到 2020 年 1 月 1 日时符合要求的 0.50% 硫含量限制。计划可与船舶采取的行动的记录相互补充以在适用日期前符合。

3 MARPOL 附则 VI 第 18.2.3 条要求缔约国考虑所有相关情况和所提供的证据,以确 定采取行动,但不包括采取控制措施。验证符合 0.50% 硫含量限制要求时,主管机关和港口 国控制当局可考虑实施计划。

4 船舶实施计划不是强制性要求。无船舶实施计划或不完整的船舶实施计划不应视作 更详细检查的明确理由。

#### 统一实施 MARPOL 附则 VI 关于 0.50% 硫含量限制的船舶实施计划

5 2020船舶实施计划可根据具体情况覆盖与特定船舶相关的各项,但不限于:

- .1 风险评估和缓解计划(新燃料的影响);
- .2 燃油系统改造和洗舱(如需要);
- .3 燃油容量和隔离能力;
- .4 符合燃料的采购;
- .5 燃油转换计划(常规残余燃油至0.50%硫含量符合燃油);和

.6 文件记录和报告。

#### 与使用硫含量符合燃油相关的问题

6 提供给船舶的所有燃油应符合 MARPOL 附则 VI 第 18.3 条和 SOLAS 第 II/2 章。此 外,船舶经营者可考虑订购按照 ISO8217 船用燃料标准规定的燃油。在准备和实施 0.50% 硫 含量限制要求时,船舶可能需要对下列潜在的与燃料相关的问题进行评估并解决:

.1 船舶处理不同类型燃料的技术能力(例如燃油泵处理较高和较低粘度燃料的适合性, 适合在船舶锅炉中使用的燃料限制,特别是在大型船用锅炉中使用蒸馏燃料);

.2 不同类型燃料的兼容性,例如当包含沥青质的石蜡和芳香燃料在装燃料或燃油转换 时混合;

.3 如果无法获得硫含量符合的燃料,处理硫含量不符合的燃料;和

① MARPOL 附则 VI 第 14.1.3 条的修正案经 MEPC73 通过(2018年10月)。

.4 燃料从残余燃油转换成 0.50% 符合燃油期间的船员准备,包括对转换程序的可能的培训。

7 船舶实施计划能用作确定与硫符合燃油相关的任何特定安全风险的适当工具,其可 能与船舶相关,并用作为公司制定适当的行动计划的适当工具以解决和减轻确定的问题。举 例应包括:

.1 分隔不同来源燃油和不同类型燃油的程序;

.2 兼容性测试和分隔不同来源燃料直至能确认兼容性的具体程序;

.3 从一种类型的燃料转换成另一种类型的燃料或已知与另一种燃油不兼容的燃油的 程序;

.4 解决关于处理特定燃料的任何机械限制的计划,包括确保 ISO 8217 中确定的燃油 的最小/最大特征能在船上安全处理;和

.5 验证船舶没有先前经验的燃油机械性能的程序。

8 建议基于附录 1 中所载的指示性例子制定统一实施 MARPOL 附则 VI 关于 0.50% 硫 含量限制的船舶实施计划。

9 计划可考虑下列确定的问题:

.1 附录 2: 制定船舶实施计划的附加指南(对机械系统的影响); 和

.2 附录 3: 制定船舶实施计划的附加指南(洗舱)。

# 附录1

# 只使用符合燃油满足 2020 年 1 月 1 日生效的 0.50% 硫含量限制的船舶实施计划的指示 性例子

# 船舶资料

- 1 船名:
- 2 船舶编号或呼号:
- 3 IMO 编号:

# 计划和准备(2020年1月1日前)

- 1 风险评估和缓解计划
  - 1.1 风险评估 (新燃料的影响): 是/否
  - 1.2 与船上 SMS 关联 是/否

## 2 燃油系统改建和洗舱(如需要)

2.1 与制造商和/或船级社见面的计划表:

# 2.2 要求的结构改建(安装燃油系统/舱室): 是/否/不适用

如果是,则:

2.2.1 燃油储存系统:

改建描述:

船坞预定详情(如适用),时间表等:

改建预计完工时间:

2.2.2 燃油驳运、过滤和交付系统:

改建描述:

船坞预定详情(如适用),时间表等:

改建预计完工时间:

2.2.3 燃烧设备:

改建描述:

船坞预定详情(如适用),时间表:

改建预计完工时间:

2.3 要求的洗舱:是/否/不适用

如果是,则:

清洗时间安排的详情(包括船坞预定、时间表等,如适用):

清洗预计完工时间:

## 3 燃油容量和分隔能力:

按照第2节下列任何要求的改建:

3.1 指定储存 0.50% 硫含量符合燃油的燃油舱的预计数量:

3.2 0.50% 硫含量符合燃油的预计总储存容量 (m<sup>3</sup>):

3.3 指定储存 0.10% 硫含量符合燃油的燃油舱的预计数量:

3.4 0.10% 硫含量符合燃油的预计总储存容量 (m<sup>3</sup>):

3.5 燃油驳运、净化和交付系统中的大约总燃油含量 (m<sup>3</sup>):

4 符合燃油的采购

4.1 获取符合燃料的燃料采购程序的详情,包括符合燃油不能轻易获得时的程序:

4.2 加装符合燃油的预计日期,不迟于 2019 年 12 月 31 日 24 点:

4.3 如果燃料由租船人安排,是否打算接受在 2019 年 6 月 1 日或待确定的其他日期后 没有规定义务提供符合燃油的租船合同: 是/否

如果是,则:

采取的替代措施以确保租船方及时交付符合燃料的详情:

4.4 是否经燃料提供方确认在规定日期提供符合燃油: 是/否

如果否,则:

采取的替代措施以确保及时可用符合燃料的详情:

4.5 处理任何剩余的不符合燃油的安排(如任何计划的)详情:

#### 5 燃油转换计划

5.1 考虑船舶特定燃料转换计划是否可用。计划应包括卸载或消耗任何剩余不符合燃油的措施。计划也应证明船舶如何打算确保所有其燃烧装置在不迟于 2020 年 1 月 1 日使用符合燃油。

5.2 按照船舶特定燃料转换计划,转换船舶燃油系统以使所有燃烧装置使用符合燃油 所要求的最大周期:

5.3 完成上述转换程序的预计日期和大致时间:

5.4 考虑是否有经过足够培训并熟悉船舶燃料系统和燃料转换程序的高级船员和船员 执行燃油转换程序。如果这不能得到确认,那么考虑是否有足够时间对新的高级船员和船员 进行船舶特定熟悉和培训。

#### 6 文件记录和报告

6.1 如果按照第 2 节计划改建,相关文件包括船上燃油舱管理计划以及稳性和纵倾手 册应据此更新。

6.2 实施计划可保存在船上并适时更新。

6.3 如果在执行实施计划时,由于没有船上使用安全的符合燃油,船舶不得不加装并 使用不符合燃油,限制使用不符合燃油的影响的步骤为:

6.4 船舶应备有燃油不可用报告(FONAR)的程序。船长和轮机长应熟悉何时和如何 使用 FONAR 以及向谁报告。

#### 附录 2

#### 制定船舶实施计划的附加指南(对机械系统的影响)

1 建议船舶评估使用馏分油和燃油混合物对机械系统的潜在影响,并准备船舶与轮机 长、设备制造商和供应方之间的协商。

2 船舶舱室布置和燃料系统可能要求调整。建议一个完全分隔的燃料系统用于蒸馏燃料和混合燃料,因为其可能要求特别注意。船舶舱室布置和分隔燃料系统也将允许更好的管理潜在不兼容燃料。

#### 馏分油

- 3 如果已选择馏分油作为符合选项,下列可予以考虑:
- .1 燃油粘度的降低可引起燃油泵柱塞和柴油机活塞之间燃油泄漏的增加。燃油喷射系 统中的内部泄漏可导致发动机燃油压力降低,这可能对发动机性能(例如发动机的 起动)产生影响。应咨询设备制造商的建议,并可对冷却器进行适当的测试、维护 保养和可能的安装;
- .2 船东也可考虑安装适合低粘度燃油的燃油泵和喷油嘴。粘度太低的燃油会导致燃油 泵的磨损增加或卡住。应咨询发动机和锅炉制造商以确保其安全有效的运行。应考 虑对 NOx 发证(EIAPP 证书)有效性的影响;
- .3 虽然一些符合燃料可能不要求加热,其他(包括一些馏分油)会要求加热。因此, 谨慎的做法是检查船上馏分油的加热装置,并在适当时对现有加热装置进行维护保 养;和
- .4 在有些位置,燃料供应方可能只能按照 ISO 8217-2017标准提供包含生物柴油的车 用燃油(FAME),该标准提供船用生物柴油规格(DFA/DFB),FAME体积含量达 到 7.0%。CIMAC 已提供"高达 7.0% v/v FAME(生物柴油)的馏分油管理船东和船 舶经营者指南"。<sup>①</sup>

4 鉴于 3.3,需要咨询发动机和设备(例如油水分离器、舷外排放监控、过滤器和聚结器等)制造商以确认处理高达 7% v/v 生物柴油混合物的能力。

5 同样,燃油供应系统的某些部分(即燃油泵、管道配件和垫圈)可能需要进行彻底 检查以确保完整性。

#### 混合残余燃料

6 新的 0.50% 硫含量混合燃油能提供常规馏分燃料(例如船用馏分燃料)的替代物。

7 当使用这类新的混合燃油时,这类燃油的技术说明要么(a)在 ISO 8217 规定的限制范围内,要么(b)以正式文件发布,指出发动机/锅炉制造商不反对其使用。

8 购买新燃油产品前,经营者应仔细考虑这类燃油可能有的具体的技术和操作挑战,并在需要时联系燃油供应方或初始设备制造商(OEM)以考虑确保安全运作。

①https://www.cimac.com/cms/upload/workinggroups/WG7/CIMAC\_WG7\_Guideline\_for\_Ship-Owners\_and\_Op erators\_on\_Managing\_Distillate\_Fuels\_May\_2013.pdf

**9** 这些燃油的密度通常低于常规残余燃油。这可能要求对离心机进行调整以确保足够的燃油清洁。

## 冷流

10 由于大多数馏分燃料不要求加热(实际上,通常由于这些产品粘度低,不建议加热), 燃料的冷流特性成为一个潜在的处理/储存挑战,特别是当在较冷区域中操作时。

11 然而,有可能通过良好的燃料管理,从采购到技术操作,并考虑下列因素来成功管理冷流特性:

.1 船舶将在哪里营运;

.2 在哪里获得较差冷流特性的燃料的风险较高;

.3 要求的冷流特性能否在燃料合同中予以规定;

.4 加装的燃料的实际低温流动特性是什么;和

.5 必须采取什么行动以安全消耗加装的燃料(例如舱和过滤器加热)。

#### 附录3

#### 制定船舶实施计划的附加指南(洗舱)

#### 前言

1 大多数船舶将一直使用主要基于残余燃油的高粘度高硫含量燃油(HSFO)。此类燃料易于粘附在燃油舱内部形成包含沉积物和沥青质污泥的半固体物质层;这类残余物通常也 已在燃油服务系统的各个部分(包括管道,沉淀柜和日用柜)凝固并沉淀。

2 船舶经营者可选择基于下述考虑在 2020 年 1 月 1 日前在装载符合燃料前将这些残余 物从燃油舱中清除。

3 符合 0.50%硫含量限制的某些燃料由于混合成分的原油来源预计石蜡质严重且也含 有较高的馏分成分。如果这类燃料装载至未经清洗的 HSFO 燃料舱,有可能在储存舱、沉 淀柜和管道中溶解并逐出沉积物和沥青质污泥,可能导致净化器和过滤器的操作问题,且在 极端情况下,燃料不足引起失去动力。

4 或者,船舶一直使用船舶特定转换程序有效安全地在现有燃油顶部装载,并逐渐通 过燃油系统冲洗直至燃油的硫含量处于符合水平。

5 一旦船舶经营者确定清洗船舶燃油舱和系统是适当的,安排洗舱时可能需要考虑下 列注意事项。

#### 洗舱选项、大致的时间和注意事项

6 燃油舱一般在船上定期清洗以清除形成的沉积物和污泥,通常在干坞期间以及燃油 舱检查到期时。然而,直至2020年1月1日,大多数已使用 HSFO 并决定选择洗舱的全球 舰队在非常短的时间内进干坞是不可行的。因此,可能需要考虑营运期间洗舱和燃油系统的 其他选项。

7 清洗 HSFO 舱所涉及的时间和工作不能精确定义,因为这会随着距离最后一次洗舱 时间的时间长短,舱涂层条件和清洗过程本身的有效性而发生变化。本文件中的估算可能由 于过于谨慎而出错,因为明确船舶的燃油系统在什么阶段足够清洁以保证符合几乎是不可能 的。

#### 干坞期间手动清洗

8 要求的时间发生变化;每舱可进行2至4天。除洗舱外,燃油服务系统中的所有管 道需要进行冲洗。整个过程可能需要1至2周。

9 所有燃油舱和燃油系统已经清洗的船舶可立即开始装载符合燃料并期望完全符合。

10 然而,如果在干坞中只有舱已经清洗,则可能需2至5天冲洗燃油服务系统中的管道以确保完全符合0.50%硫含量限制。

#### 服务期间手动清洗

11 如果舱在服务期间手动清洗,风险评估和安全措施是至关重要的;参见 IMO A.1050(27)决议《经修订的进入船上围蔽处所的建议案》。

12 要求的时间会随着舱尺寸和舱数量、距离最后一次洗舱的时间和能进行安全完整洗 舱作业的可用船员数量而变化。洗舱可由船舶的船员进行和/或通过雇佣相关船员来进行。 清洗后检查舱以核查其状况并检查加热线圈、进行压力试验和在必要时进行修理一直是好的 做法。

13 如果由船舶现有船员进行清洗,可能每舱需至少4天。对于一个普通舱,应允许1 星期。如果雇佣一个相关人员进行洗舱,如果轮班工作,洗舱可能需要至少2天,但应允许 每舱4天。

14 洗舱前需空舱,因此在估算要求的总时间时,需考虑舱排空所需的时间。

15 除洗舱外,燃油服务系统中的所有管道也需要进行冲洗。所有舱已进行清洗后冲洗 剩余的管道和燃油服务系统需另外1至2天。

16 洗舱残余应保留在船上直至其能正确处置或排放至岸上接收设施。

#### 用专门的添加剂清洗正在使用的舱

17 作为手动清洗的替代,可考虑通过使用添加剂逐渐清洗 HSFO 舱和燃油系统中的 沉积物和沥青质污泥。对需要重新安排 HSFO 舱使用符合 0.10%硫含量限制的燃油 (2015 年对 ECA 生效) 的船舶来说,采取这种方法有成功的例子。



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## GUIDANCE ON THE DEVELOPMENT OF A SHIP IMPLEMENTATION PLAN FOR THE CONSISTENT IMPLEMENTATION OF THE 0.50% SULPHUR LIMIT UNDER MARPOL ANNEX VI

1 The Marine Environment Protection Committee, at its seventy-third session (22 to 26 October 2018), approved the *Guidance on the development of a ship implementation plan for the consistent implementation of the 0.50% sulphur limit under MARPOL Annex VI*, as set out in the annex.

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

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# ANNEX

# GUIDANCE ON THE DEVELOPMENT OF A SHIP IMPLEMENTATION PLAN FOR THE CONSISTENT IMPLEMENTATION OF THE 0.50% SULPHUR LIMIT UNDER MARPOL ANNEX VI

## Introduction

1 MEPC 70 agreed to "1 January 2020" as the effective date of implementation for ships to comply with global 0.50% m/m sulphur content of fuel oil requirement and adopted resolution MEPC.280(70) on the *Effective date of implementation of the fuel oil standard in regulation 14.1.3 of MARPOL Annex VI*<sup>1</sup>.

2 In this context, MEPC 73 agreed that Administrations should encourage ships flying their flag to develop implementation plans, outlining how the ship may prepare in order to comply with the required sulphur content limit of 0.50% by 1 January 2020. The plan could be complemented with a record of actions taken by the ship in order to be compliant by the applicable date.

3 Regulation 18.2.3 of MARPOL Annex VI requires a Party to take into account all relevant circumstances and the evidence presented to determine the action to take, including not taking control measures. Administrations and port State control authorities may take into account the implementation plan when verifying compliance with the 0.50% sulphur limit requirement.

4 A ship implementation plan is not a mandatory requirement. A lack of a ship implementation plan or an incomplete ship implementation plan should not be considered as "clear grounds" for a more detailed inspection.

# Ship implementation plan for the consistent implementation of 0.50% sulphur limit under MARPOL Annex VI

5 The ship implementation plan for 2020 could cover various items relevant for the specific ship, including, as appropriate, but not limited to:

- .1 risk assessment and mitigation plan (impact of new fuels);
- .2 fuel oil system modifications and tank cleaning (if needed);
- .3 fuel oil capacity and segregation capability;
- .4 procurement of compliant fuel;
- .5 fuel oil changeover plan (conventional residual fuel oils to 0.50% sulphur compliant fuel oil); and
- .6 documentation and reporting.

<sup>&</sup>lt;sup>1</sup> Amendments to regulation 14.1.3 of MARPOL Annex VI were adopted by MEPC 73 (October 2018).

# Issues relating to use of sulphur compliant fuel oil

6 All fuel oil supplied to a ship shall comply with regulation 18.3 of MARPOL Annex VI and chapter II/2 of SOLAS. Furthermore, ship operators could consider ordering fuel oil specified in accordance with the ISO 8217 marine fuel standard. The following potential fuel-related issues may need to be assessed and addressed by ships in preparation for and implementation of the 0.50% sulphur limit requirement:

- .1 technical capability of ships to handle different types of fuel (e.g. suitability of fuel pumps to handle both higher and lower viscosity fuels, restrictions on fuels suitable for use in a ship's boilers, particularly the use of distillate fuels in large marine boilers);
- .2 compatibility of different types of fuels e.g. when paraffinic and aromatic fuels containing asphaltenes are commingled in bunkering or fuel oil changeover;
- .3 handling sulphur non-compliant fuels in the event of non-availability of sulphur compliant fuels; and
- .4 crew preparedness including possible training with changeover procedures during fuel switching from residual fuel oil to 0.50% compliant fuel oils.

7 The ship implementation plan could be used as the appropriate tool to identify any specific safety risks related to sulphur compliant fuel oil, as may be relevant to the ship, and to develop an appropriate action plan for the Company to address and mitigate the concerns identified. Examples should include:

- .1 procedures to segregate different types of fuel and fuels from different sources;
- .2 detailed procedures for compatibility testing and segregating fuels from different sources until compatibility can be confirmed;
- .3 procedures to changeover from one type of fuel to another or a fuel oil that is known to be incompatible with another fuel oil;
- .4 plans to address any mechanical constraints with respect to handling specific fuels, including ensuring that minimum/maximum characteristics of fuel oil as identified in ISO 8217 can be safely handled on board the ship; and
- .5 procedures to verify machinery performance on fuel oil with characteristics with which the ship does not have prior experience.

8 A ship implementation plan for the consistent implementation of the 0.50% sulphur limit under MARPOL Annex VI is recommended to be developed based on the indicative example as set out in appendix 1.

- 9 The plan could take into account the issues identified in:
  - .1 appendix 2: additional guidance on development of ship implementation plan (impact on machinery systems); and
  - .2 appendix 3: additional guidance on development of ship implementation plan (tank cleaning).

# **APPENDIX 1**

# INDICATIVE EXAMPLE FOR SHIP IMPLEMENTATION PLAN FOR ACHIEVING COMPLIANCE WITH THE 0.50% SULPHUR LIMIT ENTERING INTO FORCE ON 1 JANUARY 2020 USING COMPLIANT FUEL OIL ONLY

## Particulars of ship

- 1. Name of ship:
- 2. Distinctive number or letters:
- 3. IMO Number:

# Planning and preparation (before 1 January 2020)

## 1 Risk assessment and mitigation plan

- 1.1 Risk assessment (impact of new fuels): YES/NO
- 1.2 Linked to onboard SMS YES/NO

# 2 Fuel oil system modifications and tank cleaning (if needed)

2.1 Schedule for meeting with manufacturers and/or classification societies:

# 2.2 Structural Modifications (installation of fuel oil systems/tankage) required: YES/NO/NOT APPLICABLE

If YES, then:

2.2.1 Fuel oil storage system:

Description of modification:

Details of yard booking (as applicable), time schedules etc.:

Estimated date of completion of modification:

2.2.2 Fuel transfer, filtration and delivery systems:

Description of modification:

Details of yard booking (as applicable), time schedules etc.:

Estimated date of completion of modification:

2.2.3 Combustion equipment:

Description of modification:

Details of yard booking (as applicable), time schedules etc.:

Estimated date of completion of modification:

2.3 Tank cleaning required: YES/NO/NOT APPLICABLE

If YES, then:

Details of cleaning schedule (including, yard booking, time schedules etc., if applicable):

Estimated date of completion of cleaning:

# 3 Fuel oil capacity and segregation capability:

Following any required modifications as per Section 2:

- 3.1 Expected number of bunker tanks designated to store 0.50% sulphur compliant fuel oil:
- 3.2 Expected total storage capacity (m<sup>3</sup>) for 0.50% sulphur compliant fuel oil:
- 3.3 Expected number of bunker tanks designated to store 0.10% sulphur compliant fuel oil:
- 3.4 Expected total storage capacity (m<sup>3</sup>) for 0.10% sulphur compliant fuel oil:
- 3.5 Approximate total fuel oil content (m<sup>3</sup>) in the fuel oil transfer, purification and delivery systems:

## 4 Procurement of compliant fuel oil

- 4.1 Details of fuel purchasing procedure to source compliant fuels, including procedures in cases where compliant fuel oil is not readily available:
- 4.2 Estimated date for bunkering compliant fuel oil, not later than 24:00hrs 31 December 2019:
- 4.3 If fuel arranged by charterer, is there an intention to accept charter party contracts that do not have a specified obligation to provide compliant fuel oil after 1 June 2019 or other date to be identified: YES/NO

If YES, then:

Details of alternate steps taken to ensure that the charter party provides timely delivery of compliant fuel:

4.4 Is there confirmation from bunker supplier(s) to provide compliant fuel oil on the specified date: YES/NO

If NO, then:

Details of alternate steps taken to ensure timely availability of compliant fuel oil:

4.5 Details of arrangements (if any planned) to dispose of any remaining non-compliant fuel oil:

# 5 Fuel oil changeover plan

- 5.1 Consider whether a ship-specific fuel changeover plan is to be made available. The plan should include measures to offload or consume any remaining non-compliant fuel oil. The plan should also demonstrate how the ship intends to ensure that all its combustion units will be using compliant fuel oil no later than 1 January 2020.
- 5.2 As per the ship-specific fuel changeover plan, the maximum time period required to changeover the ship's fuel oil system to use compliant fuel oil at all combustion units:
- 5.3 Expected date and approximate time of completion of the above-mentioned changeover procedure:
- 5.4 Consider availability of adequately trained officers and crew familiar with the ship's fuel system and fuel changeover procedures to carry out the fuel oil changeover procedure. If this cannot be confirmed, then consider whether there is a sufficient amount of time dedicated for ship-specific familiarization and training of new officers and crew.

# 6 Documentation and reporting

- 6.1 If there are modifications planned as per section 2, related documents including the shipboard fuel oil tank management plans and stability and trim booklets should be consequently updated.
- 6.2 The implementation plan could be kept on board and updated as applicable.
- 6.3 If when following the implementation plan the ship has to bunker and use non-compliant fuel oil due to unavailability of compliant fuel oil safe for use on board the ship, steps to limit the impact of using non-compliant fuel oil could be:

6.4 The ship should have a procedure for Fuel Oil Non-Availability Reporting (FONAR). The master and chief engineer should be conversant about when and how FONAR should be used and who it should be reported to.

# **APPENDIX 2**

# ADDITIONAL GUIDANCE FOR DEVELOPMENT OF THE SHIP IMPLEMENTATION PLAN (IMPACT ON MACHINERY SYSTEMS)

1 Ships are advised to assess potential impact on machinery systems with the use of distillates and fuel oil blends and prepare ships in consultation with chief engineers, equipment manufacturers and suppliers.

2 The ship tank configuration and fuel system may require adjustments. A fully segregated fuel system for distillate fuels and blended fuels is recommended because they may require special attention. Ship tank configuration and segregated fuel system will also allow for better management of potentially incompatible fuels.

# Distillates

3 If distillates have been chosen as the option for compliance the following may be considered:

- .1 a decrease in fuel oil viscosity may cause an increase in fuel oil leakage between the fuel pump plunger and barrel of diesel engines. Internal leakages in the fuel injection system may result in reduced fuel pressure to the engine, which may have consequences for the engine performance (e.g. starting of the engine). Equipment makers' recommendations should be consulted, and adequate testing, maintenance and possible installation of coolers etc. may be performed;
- .2 shipowners may also consider installing fuel pumps and injection nozzles, suitable to fuel oil with low viscosity. Fuel oil with too low viscosity may lead to increased wear or seizure of fuel oil pumps. Engine and boilermakers should be consulted to ensure its safe and efficient operation. Implications for validity of NO<sub>x</sub> certification (EIAPP Certificate) should be considered;
- .3 while some compliant fuels may not require heating, others, including some distillates, will require heating. It would therefore be prudent to review heating arrangements for distillate fuels on board and, where appropriate, maintain the existing heating arrangements; and
- .4 in some locations, bunker suppliers may only be able to offer automotive diesel fuel containing biodiesel (FAME) in accordance with the ISO 8217-2017 Standard which provides a marine biodiesel specification (DFA/DFB) with up to 7.0% by volume of FAME. CIMAC has provided a "Guideline for Ship Owners and Operators on Managing Distillate Fuels up to 7.0 % v/v Fame (Biodiesel)".<sup>2</sup>

4 In view of paragraph 3.3 manufacturers of engines and equipment such as oily water separators, overboard discharge monitors, filters and coalescers, etc. need to be consulted to confirm ability to handle biodiesel blends up to 7% v/v.

5 Also, some parts of the fuel oil supply system, i.e. fuel pumps, pipefittings and gaskets may need to be overhauled to ensure integrity.

<sup>&</sup>lt;sup>2</sup> https://www.cimac.com/cms/upload/workinggroups/WG7/CIMAC\_WG7\_Guideline\_for\_Ship\_Owners\_and\_Oper ators\_on\_Managing\_Distillate\_Fuels\_May\_2013.pdf

# Blended residual fuels

6 New blended 0.50% sulphur fuel oil as and when offered could provide an alternative to conventional distillate fuel such as Marine Distillate Fuel.

7 When using such new blended sulphur fuel oils, the technical specification of such fuels are (a) either within the limits specified by ISO 8217 or are (b) issued with formal documentation indicating no objection to its use by the engine/boiler makers.

8 Before purchasing a new fuel oil product, operators should carefully consider the specific technical and operational challenges that this type of fuel oil may have and, where necessary, contact the fuel oil supplier or Original Equipment Manufacturer (OEM) for the considerations to be made to ensure safe operation.

9 Densities of these fuel oils are in general lower than conventional residual fuel oils. This may require adjustment of centrifuges to ensure adequate cleaning of the fuel oil.

# Cold flow

10 Since most distillate fuels do not require heating (in fact, typically, heating is not recommended due to the low viscosity of these products), the fuel's cold flow properties become a potential handling/storage challenge, especially when operating in colder regions.

11 It is however possible to successfully manage cold flow properties through good fuel management, from procurement to technical operation, by considering the following:

- .1 where the ship will be operating;
- .2 where the risk is higher of getting fuels with poor cold flow properties;
- .3 can the required cold flow properties be specified in the fuel contract;
- .4 what is the actual low-temperature flow properties of the bunkered fuel; and
- .5 which actions have to be taken in order to safely consume the bunkered fuel (e.g. tank and filter heating).

# **APPENDIX 3**

# ADDITIONAL GUIDANCE FOR DEVELOPMENT OF THE SHIP IMPLEMENTATION PLAN (TANK CLEANING)

# Introduction

1 Most ships will have been using high viscosity high sulphur fuel oil (HSFO) based primarily on residual fuel oils. Such fuels tend to adhere to the inside of fuel tanks forming layers of semi-solid substances containing sediments and asphaltenic sludge; such residues will also typically have solidified and settled in various parts of the fuel oil service system including pipelines, settling and service tanks.

2 The ship operator may choose to clean the fuel oil tanks of these residues before loading compliant fuel prior to 1 January 2020 based on the following considerations.

3 Some of the fuels complying with the 0.50% sulphur limit are expected to be very paraffinic due to crude sources of blending components and also a high content of distillate components. If such fuels are loaded into HSFO fuel tanks that have not been cleaned, there is a possibility that they could dissolve and dislodge sediments and asphaltenic sludge in storage tanks, settling tanks and pipelines, potentially leading to purifier and filter operational issues and in extreme cases fuel starvation resulting in loss of power.

4 Alternatively, ships have been using ship specific changeover procedures to effectively and safely load on top of existing fuel oil and gradually flushing through the fuel system until the sulphur content in the fuel oil is at a compliant level.

5 Should the ship operator determine it is appropriate to clean the ship's fuel oil tanks and system, the following considerations may need to be taken into account when making arrangements for tank cleaning.

# Options for tank cleaning, approximate timelines and considerations

6 Fuel oil tanks are normally cleaned on a regular basis on ships to remove built-up sediments and sludge, usually during dry docking and whenever inspections of the fuel tanks are due. However, leading up to 1 January 2020, it would not be practicable for the majority of the global fleet that has been running on HSFO and decided to opt for tank cleaning to undergo dry docking during a very short period. Hence, other options for cleaning tanks and fuel oil systems during service may need to be considered.

7 The time and work involved in cleaning HSFO tanks cannot be defined precisely, as it will vary depending on how long it has been since the last time the tanks were cleaned, the condition of the tank coating and the effectiveness of the cleaning process itself. The estimates in this document may err on the side of caution as it is almost impossible to pinpoint at what stage the ship's fuel oil system is sufficiently clean to guarantee compliance.

# Manual cleaning during dry docking

8 Time required varies; it can be done in 2 to 4 days per tank. In addition to cleaning tanks, all of the pipework in the fuel oil service system needs to be flushed through. Overall, it may take 1 to 2 weeks.

9 A ship that has had all its fuel oil tanks and fuel system cleaned can start loading compliant fuels and expect to be fully compliant right away.

10 However, if only the tanks have been cleaned in dry dock, it could take 2 to 5 days to flush through the pipework in the fuel oil service system to ensure full compliance with the 0.50% sulphur limit.

# Manual cleaning during service

11 If tanks are to be cleaned manually during service, risk assessment and safety measures are paramount; refer to IMO resolution A.1050(27) on *Revised recommendations for entering enclosed spaces aboard ships*.

12 Time required will vary depending on tank size and the number of tanks, how long it has been since the last tank cleaning and the number of crew available to perform safe and complete tank cleaning operations. Tank cleaning can be performed by the ship's crew and/or by employing a riding crew for this purpose. It is always good practice to inspect the tank once cleaned to check its condition and to inspect heating coils, conduct pressure tests and undertake repairs as necessary.

13 If the cleaning is done by the ship's existing crew, it would likely take a minimum of 4 days per tank. For an average tank, a week should be allowed. If employing a riding crew to clean the tanks, if working in shifts, it would likely take a minimum of 2 days to clean a tank, but 4 days per tank should be allowed.

14 Tanks need to be empty before they can be cleaned, hence the time needed to drain tanks needs to be taken into account when estimating the overall time required.

15 In addition to cleaning tanks, all of the pipework in the fuel oil service system needs to be flushed. Flushing the remaining pipework and fuel oil service system after all tanks have been cleaned could take another 1 to 2 days.

16 The residues from tank cleaning should be retained on board until they can be disposed of correctly or disposed to shore reception facilities.

# Cleaning tanks in service with specialized additives

As an alternative to manual cleaning, consideration can be given to gradually cleaning the sediments and asphaltenic sludge from HSFO tanks and fuel systems by dosing additives. There are successful examples of this approach for ships that needed to reallocate HSFO tanks to fuels complying with the 0.10% sulphur limit that took effect in ECAs in 2015.

#### 环保会通函 MEPC.1/Circ.879

# (2018年11月15日)

### 富能量燃料及其混合物的载运指南

1 海上环境保护委员会在其第73届会议(2018年10月22日至26日)上,认识到有 必要澄清富能量燃料或其与按照 MARPOL 附则 I 的石油和/或按照 MARPOL 附则 II 的生物 燃料的混合物如何能根据 MARPOL 的正确附则散装装运,批准了《富能量燃料及其混合物 的载运指南》,其文本载于附件。

2 提请各成员国政府和国际组织使主管机关、认可的组织、港口当局、船东、船舶经 营者和其他相关方注意附件中的指南。

#### 附件

#### 富能量燃料及其混合物的载运指南

#### 1 适用范围

1.1 本指南适用于载运富能量燃料或其与按照 MARPOL 附则 I 和附则 II 的石油和/或 生物燃料的混合物的船舶以确保这些产品根据 MARPOL 正确的附则进行装运。

# 2 范围

2.1 本指南已经制定以澄清富能量燃料如何根据 MARPOL 正确的附则进行装运。

#### 3 定义

就本指南而言:

3.1 *富能量燃料*由评估化学品安全和污染危害的 PPR 工作组基于一个适当的提议确定 为本指南范围内的产品。富能量燃料将记录在 MEPC.2/通函附件 12"按照 MARPOL 附则 II 和 IBC 规则液体物质的临时分类"中。富能量燃料全部或部分源自非石油原料,其能无需混 合产生或通过与石油产品混合产生。

#### 4 富能量燃料的描述

4.1 富能量燃料从生物起源或非石油来源(例如海藻、植物油)获得,或是石油基燃料和从生物起源或非石油来源(例如海藻、天然气合成油、加氢精制的植物油、协同处理)获得的产品的混合物。

4.2 富能量燃料只由能以碳氢化合物家族的单个化学品表示的成分组成,例如具有直 链或支链的烷烃和环烷等。

4.3 富能量燃料是一个复杂的混合物,以 UVCB 为特征,<sup>①</sup>由相对大量的成分构成,不能由一个简单的化学结构代表,且具有可能分批变化的成分。

#### 5 富能量燃料的载运

5.1 载运 MEPC.2/通函附件 12 中所列的富能量燃料时, MARPOL 附则 I 的要求应适用。

5.2 载运富能量燃料时,油排放监控设备(ODME)应符合 MARPOL 附则 I 第 31 条。

#### 6 富能量燃料和生物燃料混合物的载运

MEPC.2/通函附件 11 中记录的生物燃料混合物的载运规定是基于如下混合物的容积组成:

#### 6.1 包含 75% 或更多富能量燃料的生物燃料混合物

6.1.1 如果包含 75% 或更多富能量燃料, 混合物应遵照 MARPOL 附则 I。

6.1.2 如果载运这类生物燃料混合物,油排放监控设备应符合 MARPOL 附则 I 第 31

① UVCB 是未知或可变成分、复杂反应产品或生物材料构成的物质(OECD 化学品分组导则第二版,测试和评估系列,2017 年第 194 号)。

条并应批准用于所载运的混合物。

6.1.3 当考虑 SOLAS 公约第 II-2 章第 1.6.1 条和第 1.6.2 条的甲板灭火系统要求时,如果载运包含乙醇的生物燃料混合物,应使用抗乙醇泡沫。

# 6.2 包含小于 75% 富能量燃料的生物燃料混合物

6.2.1 如果包含小于 75%的富能量燃料,生物燃料混合物应遵照 MARPOL 附则 II。

6.2.2 对于确定为本指南范围内的生物燃料, 应视情况作为 MARPOL 附则 II 货物载运的特定生物燃料/富能量燃料混合物的载运要求将纳入 MEPC.2/通函的清单 1。



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> MEPC.1/Circ.879 15 November 2018

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# GUIDELINES FOR THE CARRIAGE OF ENERGY-RICH FUELS AND THEIR BLENDS

1 The Marine Environment Protection Committee, at its seventy-third session (22 to 26 October 2018), recognizing the need to clarify how energy-rich fuels or their blends with petroleum oils subject to Annex I of MARPOL and/or with biofuels subject to Annex II of MARPOL can be shipped in bulk under the correct annex of MARPOL, approved the *Guidelines for the carriage of energy-rich fuels and their blends*, which are set out in the annex.

2 Member Governments and international organizations are invited to bring the annexed Guidelines to the attention of Administrations, recognized organizations, port authorities, shipowners, ship operators and other parties concerned.

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# ANNEX

# GUIDELINES FOR THE CARRIAGE OF ENERGY-RICH FUELS AND THEIR BLENDS

# 1 APPLICATION

1.1 These Guidelines apply to ships when carrying energy-rich fuels or their blends with petroleum oils and/or biofuels subject to Annex I and Annex II of MARPOL to ensure these products are shipped under the correct Annex of MARPOL.

# 2 SCOPE

2.1 These Guidelines have been developed to clarify how energy-rich fuels are shipped under the correct Annex of MARPOL.

# 3 DEFINITIONS

For the purpose of these Guidelines:

3.1 *Energy-rich fuels* are identified by the PPR Working Group on the Evaluation of Safety and Pollution Hazards of Chemicals (ESPH), based on an appropriate proposal, as products falling under the scope of these Guidelines. Energy-rich fuels will be recorded in annex 12 of the MEPC.2/Circular on *Provisional categorization of liquid substances in accordance with MARPOL Annex II and the IBC Code.* Energy-rich fuels are wholly or partly derived from non-petroleum feedstock and they can be produced either without blending as such or by blending with petroleum products.

# 4 DESCRIPTION OF ENERGY-RICH FUELS

4.1 An energy-rich fuel is obtained from biological origin or non-petroleum sources (e.g. algae, vegetable oils) or is a blend of petroleum-based fuel and a product obtained from biological origin or non-petroleum sources (e.g. algae, Gas-to-Liquid (GTL) process, Hydrotreated Vegetable Oil (HVO), co-processing).

4.2 An energy-rich fuel is comprised only of constituents that can be expressed as individual chemicals of the hydrocarbon family, for example alkanes with straight or branched chain and cycloalkanes, etc.

4.3 An energy-rich fuel is a complex mixture that is characterized as UVCB,\* is formed of a relatively large amount of constituents, cannot be represented by a simple chemical structure and has a composition that may vary from batch to batch.

# 5 CARRIAGE OF ENERGY-RICH FUELS

5.1 When carrying energy-rich fuels listed in annex 12 of the MEPC.2/Circular, the requirements of Annex I of MARPOL should apply.

5.2 When carrying energy-rich fuels, the Oil Discharge Monitoring Equipment (ODME) shall be in compliance with regulation 31 of Annex I of MARPOL.

<sup>\*</sup> UVCB are substances of unknown or variable composition, complex reaction products or biological material (OECD Guidance on Grouping of Chemicals, Second Edition, Series on Testing & Assessment, No. 194, 2017).

# 6 CARRIAGE OF BLENDS OF ENERGY-RICH FUELS AND BIOFUELS

The carriage provision for blends of biofuels that are recorded in annex 11 of the MEPC.2/Circular is based on the volumetric composition of the blends as follows:

# 6.1 Biofuel blends containing 75% or more of energy-rich fuel

6.1.1 When containing 75% or more of energy-rich fuel, the blend is subject to Annex I of MARPOL.

6.1.2 When carrying such biofuel blends, ODME shall be in compliance with regulation 31 of Annex I of MARPOL and should be approved for the mixture being transported.

6.1.3 When considering the deck fire-fighting system requirements of SOLAS chapter II-2, regulations 1.6.1 and 1.6.2, when carrying biofuel blends containing ethyl alcohol, then alcohol resistant foams should be used.

# 6.2 Biofuel blends containing less than 75% of energy-rich fuel

6.2.1 When containing less than 75% of energy-rich fuel, the biofuel blends are subject to Annex II of MARPOL.

6.2.2 With respect to biofuels identified as falling under the scope of these Guidelines, carriage requirements for specific biofuel/energy-rich fuel blends to be shipped as MARPOL Annex II cargoes will be incorporated into list 1 of the MEPC.2/Circular, as appropriate.