

# Market Update Note



14 November 2018

## Legislative requirements regarding sulphur in pilot fuel

### Dual fuel engines

MAN Energy Solutions receives many questions about the legislation regarding the sulphur content in pilot fuel for our dual fuel engines. Dual fuel engines operate on a low-flashpoint fuel (LNG, ethane, methanol or LPG) and a pilot fuel, either residual (RM) or distillate (DM) fuel as defined in ISO 8217.

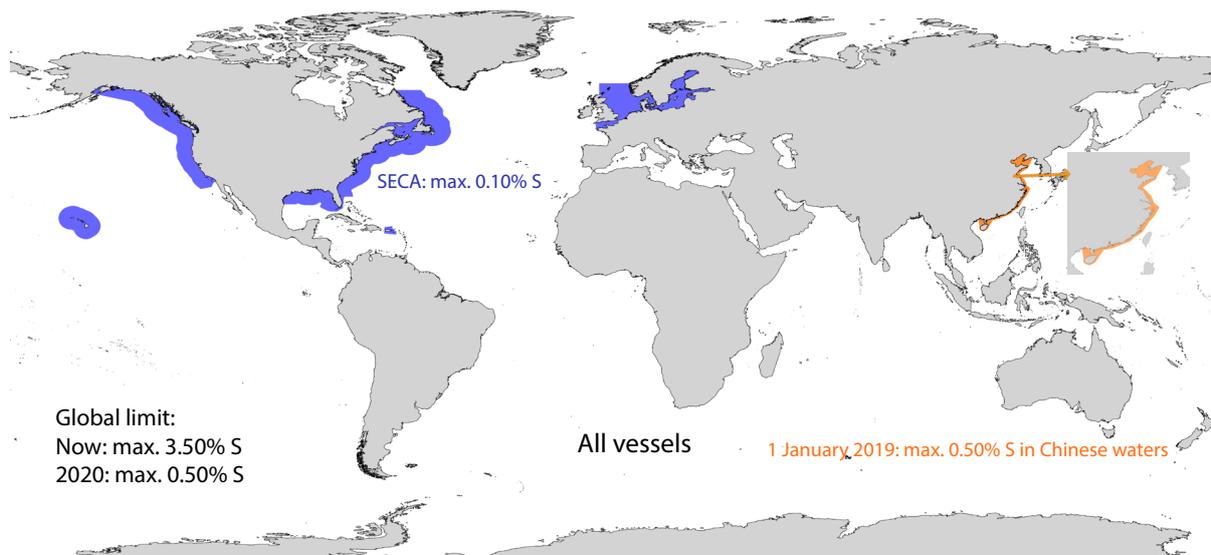
It is not allowed to mix high-sulphur and low-sulphur fuels on-board a vessel, or in the engine, to obtain a certain sulphur content that meets the regulatory limits. For dual fuel engines operating on low-flashpoint fuel and pilot fuel, this

means that both fuels must meet the sulphur limit, even if the amount of pilot fuel is small.

The letter attached (ref.: EEEDF/JUSV/PLB/DUN.28.2018) gives an overview of and explains the legislation governing this matter.

Questions regarding this Market Update Note should be directed to the Process Development department, EEEDF, at [LD@man-es.com](mailto:LD@man-es.com)

### Sulphur emission control areas



For more details:  
MAN Energy Solutions  
Tegholmegade 41  
2450 Copenhagen SV, Denmark  
Phone +45 33 85 11 00  
[www.marine.man-es.com](http://www.marine.man-es.com)

**MAN Energy Solutions**

To whom it may concern

Our ref: EEEDF/JUSV/PLB/DUN.28.2018

6 November 2018

## Dual fuel engines: Sulphur legislation requirements in pilot fuel

MAN Energy Solutions receives many questions about the legislation regarding the sulphur (S) content in pilot fuel for our dual fuel engines. Dual fuel engines, depending on the design, operate on a low-flashpoint fuel (LNG, ethane, methanol or LPG) and a pilot fuel; either residual (RM) or distillate (DM) fuels as defined in ISO 8217.

This letter gives a non-exhaustive overview of the legislation from IMO, European Union and USA governing this matter. References are given at the end of this letter, and important sections of Marpol Annex VI are included in Encl. 1.

### 1. Overview of SECA and IMO 2020 0.50% S regulations

All fuels bunkered for propulsion of a ship must comply with the sulphur regulation in force in the area in which the ship sails, see Encl. 1.

- Global waters:
  - today: max. 3.50% S fuel
  - 1 January 2020: Max. 0.50% S fuel
- SECA (sulphur emission controlled areas):
  - max. 0.10% S fuel

Mixing of, for example, a high-sulphur fuel and a low-sulphur fuel onboard or in the engine in order to obtain a certain sulphur content to meet the limit, is not allowed according to the legislation. On dual fuel engines, operating on low-flashpoint fuel and pilot fuel, this means that both fuels must comply with the sulphur limit, even though the amount of pilot fuel is small. Fig. 1 gives an overview of the compliant fuels for dual fuel engines.

**SECA – max. 0.10% S**

The sulphur content must not exceed 0.10%.

*ME-GI and ME-LGI engines:*

1. Low-flashpoint fuel + max. 0.10% S ULSFO (RM or DM)
2. Max. 0.10% ULSFO (RM or DM)

**IMO 2020 – max 0.50% S**

In order to be compliant, the sulphur content of the fuels must not exceed 0.50%.

*ME-GI and ME-LGI engines:*

1. Low flash point fuel + max. 0.50% S VLSFO (RM or DM)
2. Max. 0.50% VLSFO (RM or DM)

*Fig. 1: Compliant fuels for dual fuel engines*

**Marpol Annex VI, Equivalent - Regulation 4**

Regulation 4 states that any fitting, material, appliance or apparatus to be fitted on a ship, or procedures, alternative fuel oils or compliance methods used as an alternative to that required by Annex VI could be approved as an Equivalent means if they are shown to be at least as effective in emission reduction as required.

An exhaust gas scrubber is an example of an approved equivalent means to remove sulphur oxides in the exhaust. It has been tested and approved by the authorities. However, there is no approved Equivalent means that comply with IMO Regulation 4 as regards to dual fuel engines and pilot fuel. Accordingly, compliance can only be obtained by utilising the operating modes described in Fig. 1.

Tanks and associated equipment for 0.10% S fuel, 0.50% S fuel and, currently, high-sulphur residual fuels are therefore needed on the vessels.

**2. Common requirements for 0.10% SECA in Europe and in the US**

All fuel used for propulsion of a ship must comply with the sulphur regulation in the area in which the ship sails. For example, in 0.10% SECAs, the pilot fuel used should have a maximum S content of 0.10%.

The owner/operator should plan the voyage and ensure that there are sufficient compliant fuels on the vessel for the voyage ahead. Running out of gas while at the same time not being able to use another compliant fuel, will result in the vessel being out of compliance.

Temporary gas mode failures due to sudden damage to the fuel gas equipment can be considered as an emergency situation, and the vessel may still be compliant if the non-functional parts are repaired or exchanged as soon as possible.

### **3. European SECA ports: LNG carriers with dual fuel engines using boil-off gas**

While at berth, LNG carriers with a dual fuel engine using boil-off gas (BOG) can use a mixture of marine fuel and BOG as an alternative technological abatement method as long as:

1. The mixture of fuel and BOG produces sulphur emissions equal to or lower than emissions generated by a 0.10% S fuel.
2. The calculation criteria as set out in the Annex of the European Commission Decision, 13 Dec 2010, are used and complied with.
3. Monitoring and metering of BOG and marine fuel consumptions are carried out.

The EU Commission decision only applies for LNG carriers using BOG and not any other vessel with a dual fuel engine. If the LNG carrier switches over to liquid fuel only in a SECA at berth, the compliant fuel in that case would be a max 0.10% S fuel. Refer to European Commission Decision, 13 Dec 2010 for complete information. Two-stroke main engines are usually not utilised at berth.

### **4. North American and US Caribbean Sea SECAs**

All fuels used for propulsion of a ship must comply with the sulphur regulation in the area where the ship sails. Within the US parts of the North American and the US Caribbean Sea SECAs, the pilot fuel must meet the 0.10 % fuel sulphur limit.

An operator can request a Regulation 4 Equivalency approval for the use of LNG and pilot fuel with a sulphur content that is higher than 0.10% S. Required actions:

1. The operator must apply to the U.S. Coast Guard who will consider requests on a case-by-case basis.
2. If approved, the approval may be conditional on a commitment to continuously monitor the sulphur level in the exhaust to confirm that the fueling rate and the pilot fuel sulphur concentration during any operation within SECA boundaries do not exceed the 0.10 %S standard.
3. If a vessel with a Regulation 4 Equivalency approval switches over to running on liquid fuel only in SECA, the compliant fuel would in that case be a max 0.10% S fuel.

**5. References**

- Directive (EU) 2016/802, 11 May 2016, Relating to a reduction in sulphur content of certain liquid fuels, (Official Journal of the EU, L132/58)
- EU Commission Decision, 13 Dec 2010, on the establishment of criteria for the use by liquefied natural gas carriers..., (Official Journal of the EU, L 328/15)
- Guidance on LNG – BOG monitoring, 23 May 2017, European Commission Directorate general Climate Action, <https://ec.europa.eu/clima/>
- IMO, Marpol Annex VI, sulphur oxides (SOx) – Regulation 14,
- IMO, Marpol Annex VI, Equivalent - Regulation 4
- North America and U.S. Caribbean Sea ECA – understanding compliance issues. FAQ. EPA, EPA-420-F-16-05
- <http://emsa.europa.eu/main/air-pollution/emission-abatement-methods.html>

Questions regarding the content of this letter should be directed to our Process Development department, EEEDF, at [LD@man-es.com](mailto:LD@man-es.com).

Best regards  
MAN Energy Solutions

  
Mikael C. Jensen

  
Niels Kjemtrup

**Encl. 1**

Please note that the below parts are short sections cut out from of IMO Marpol Annex VI, Regulation 14 and Regulation 4. For complete information see IMO Revised Marpol Annex VI.

**IMO: Revised Marpol Annex VI. SOx - Regulation 14**

Note: “the sulphur content of fuel oil used on board ships.”

**Regulation 14**  
***Sulphur oxides (SO<sub>x</sub>) and particulate matter***

**Requirements within emission control areas**

4 While ships are operating within an emission control area, the sulphur content of fuel oil used on board ships shall not exceed the following limits:

- .1 1.50% m/m prior to 1 July 2010;
- .2 1.00% m/m on and after 1 July 2010; and
- .3 0.10% m/m on and after 1 January 2015.

**IMO: Revised Marpol Annex VI. Equivalent - Regulation 4**

Note: “methods at least as effective in terms of emission reductions as that required by this Annex”.

**Regulation 4**  
***Equivalents***

1 The Administration of a Party may allow any fitting, material, appliance or apparatus to be fitted in a ship or other procedures, alternative fuel oils, or compliance methods used as an alternative to that required by this Annex if such fitting, material, appliance or apparatus or other procedures, alternative fuel oils, or compliance methods are at least as effective in terms of emissions reductions as that required by this Annex, including any of the standards set forth in regulations 13 and 14.

2 The Administration of a Party that allows a fitting, material, appliance or apparatus or other procedures, alternative fuel oils, or compliance methods used as an alternative to that required by this Annex shall communicate to the Organization for circulation to the Parties particulars thereof, for their information and appropriate action, if any.

3 The Administration of a Party should take into account any relevant guidelines developed by the Organization pertaining to the equivalents provided for in this regulation.

4 The Administration of a Party that allows the use of an equivalent as set forth in paragraph 1 of this regulation shall endeavour not to impair or damage its environment, human health, property, or resources, or those of other States.