



Emission Control Areas – Ultra Low Sulphur Fuel Oil Change-over Procedures

Introduction

From 1 January 2015, for ships without an approved and effective exhaust gas scrubber operating within an Emission Control Area (ECA), the sulphur content of fuel oil used should not exceed 0.10% by mass (10 ppm). All main and auxiliary engines and boilers are affected by the Regulation, meaning that vessels using heavy fuel oil must have completed the change-over process and operate on ultra-low sulphur fuel upon entering an ECA.

(Note: Prior to 1 January 2020, the sulphur content limit of fuel oil shall not apply to ships operating in the North American ECA or the United States Caribbean Sea area that were built on or before 1 August 2011 and are powered by propulsion boilers that were not originally designed for continued operation on marine distillate fuel or natural gas.)

Ships operating within the European ECA have become familiar with existing European legislation where the maximum sulphur content of fuels used by ships at berth has not been allowed to exceed 0.10% by mass in EU ports since the 1 January 2010 unless the vessel was:

- Due to be at berth in a port that lies outside of the ECA for less than two hours;
- Planned to use only a shore based power supply.

From January 2015 Members choosing to continue to trade within an ECA and who have not fitted an exhaust gas scrubber will have to consider important factors including, the calorific value, decreased viscosity and lower flash point of distillate fuel such as MGO in comparison to IFO.



Fuel Storage

Before January 2015, Ultra Low Sulphur Fuel (ULS-MGO/MDO) was only used for auxiliary engines and boilers when at berth in ECAs, and only a limited amount of such fuel was needed. When ULS-MGO/MDO is also required for the main engine, vessels travelling in and out of ECAs will have to consider their consumption and be sure to have a sufficient amount of ULS fuel on board. For vessels without a scrubber that spend all of their time in ECA operation, using 0.1% sulphur content fuel is mandatory, and fuel tanks must therefore be properly prepared. Simply emptying the tanks and filling them with the new fuel may not be effective.

It is very important that any 0.1% sulphur content fuels are not mixed with HFO. Supplies of ULS fuel will be very close to the 0.1% limit, so even a little high-sulphur fuel mixed in may render the new fuel non-compliant. The supplier is responsible for seeing that the fuel sulphur level complies when delivered, but if the sample taken during bunkering shows sulphur content compliance and the sample taken at the engine inlet shows non-compliance, it will become the vessel that is held responsible.

Switching Fuels

Switching from one type of fuel to another is an operation that does have risks. Therefore, vessels trading between areas with different sulphur limitations are required by MARPOL to have detailed change-over procedures readily available on-board the vessel. The crew needs to be well trained and aware of any risks associated with the change-over – otherwise they risk engine failure, power loss or even blackout. A full Risk Assessment should be conducted by all involved in the procedure. www.steamshipmutual.com/Risk-Alerts/RA40RiskAssessment0514.pdf

Members should be aware that new 'lighter' fuel will have a solvent-like effect on tanks, lines, pumps and filters and may tend to dislodge any accumulated residues. Not only could this impair the outcome of sampling to indicate non-compliance, but could also lead to leakages at pumps and seals, even sometime following change-over. The engine manufacturer should be consulted for any guidance.

MGO/MDO is prone to bacterial growth and an inspection should be made following tank cleaning to ensure that water does not enter the storage tanks.



Risk Alert



Suggestions/Recommendations

The manufacturers of the engines, boilers and/or control system should be consulted regarding possible modification. Modern boilers may not have been originally designed to burn lighter fuel types such as MGO and may need modification of the burners and control systems requiring, if applicable, approval of the class society.



If the Member is satisfied that, modifications to the vessels' installed equipment and systems are not required then evidence of such an evaluation should be carried on-board to satisfy the safety requirements of ISM, Port State Control and possibly Charterers. Considerations in such an evaluation may include, but are not limited to the following;

- Boilers cannot sustain use of MGO during normal operation to meet the normal demand without modifications.
- Explosion can take place due to incorrect operations such as improper purging before ignition.
- Following flame failure fuel may fall on hot surfaces leading to explosion. All possible causes of flame failure, including actual change-over of fuel types should be considered.
- Steam atomisation may not be suitable leading to flame instability, improper combustion, and possibly flame failure.
- Use of MGO may cause coke deposits on rotary cup types of burners. Protective heat shields may be necessary to prevent coke build up.
- Existing burners may have to be modified or burner assemblies suitable for both HFO and MGO may need to be fitted.
- Existing piping used for heated HFO from the pump to the boiler may not be suitable for MGO.
- Where a boiler is designed to burn HFO instead of MGO, a flame failure may occur when the fuel is changed over to MGO.
- HFO is more viscous than MGO and existing pumps may have difficulties with suction of the lighter oil. As HFO has better lubrication properties than MGO, overheating of pumps could occur.

All equipment manufacturers concerned should be consulted to determine the necessary safeguards. A detailed fuel change-over operation manual should be readily available for the operating crew on board.

For further information on this or other Loss Prevention topics please contact the Loss Prevention Department, Steamship Insurance Management Services Ltd.

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