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German Shipowners' Association

FAQ on Compliance with the 2020 Global Sulphur Cap

For further informations please refer to the ICS Provisional Guidance Document which is available at the following link on the ICS website under ***https://bit.ly/2x7B7tC***

Compliance with the 2020 'Global Sulphur Cap'

Outside ECA Operations 2020 - Maximum 0.50% Sulphur Limit Implementation

These FAQ are based on the Provisional Guidance to Shipping Companies and Crews on Preparing for Compliance with the 2020 Max 0.50% limit in Accordance with MARPOL Annex VI Regulation 14.1.3 published by International Chamber of Shipping (ICS) and available under ***https://bit.ly/2x7B7tC***.

The following questions and answers will not give detailed instructions how to proceed, however, attempts to draw the attention to the main decisions to take. Links to detailed information are given.

1. Why do we have to switch over to 0.5% Sulphur Fuel?

- Regulation 14.1.3 of MARPOL Annex VI requires that from 1 January 2020 the sulphur content of marine fuels shall not exceed 0.50% m/m for operations outside a designated Emission Control Areas.
- Regulation 4 of MARPOL Annex VI allows the use of "Equivalent" means of compliance (e.g. Exhaust Gas Cleaning Systems (EGCS)
- Amendments to regulation 14 of MARPOL Annex VI scheduled to enter into force on 1 March 2020 prohibits the carriage for use of non-compliant fuel oil on ships not fitted with equivalent means of compliance.

2. When must the changeover be completed?

- **Before** 1 January 2020, 0:00h
- **NO** period of grace

3. How can I comply?

Ships have the following 3 options for achieving compliance with the SOx emission requirements of regulation 14 of MARPOL Annex VI:

Burning Compliant Distillate Fuel

- Ships operating in ECAs already have considerable experience with the use of distillates, however it is estimated that over half of the worlds ocean going fleet have not entered an ECA before and therefore their preparations will need to emulate those carried out by ships prior 2015 switch from 1.0 % 0.10% sulphur content.
- Distillate fuels have a much lower viscosity compared to residual fuel blends and therefore do not normally require heating except where cold flow properties dictate, however in some cases these fuels might require cooling before injection to ensure the viscosity does not drop below prescribed engine limits. Contact engine and boiler manufacturers for any specific operational requirements and technical modifications that may be needed for the respective machinery fuel systems in preparation for extended operations on distillates.

Burning residual based fuel Fuel Oil

- Expect an increase in the type and variability of fuel viscosity grades and formulations being offered, some might be unfamiliar, in order to meet the primary target of 0.50% sulphur content. This is anticipated to result in an increase in incompatibility between bunker loaded from different sources.

- The industry is advised to consider sufficient segregation capability of bunker tanks is facilitated and that commingling of differently sourced is only carried out under the strictest of compatibility verification procedures when absolutely necessary.

- Shipowners and operators are recommended to ensure that ISO 8217:2017 is specified as the required standard when ordering 0.50% S max fuels. Contact engine and boiler manufacturers for any additional advice on specific requirements on the fuel specifications and or and required modifications to machinery components.

Utilising "Equivalent" means of compliance

- The use of HSFO in combination with an exhaust gas cleaning system (ECGS,) is an alternative solution to using compliant fuel on offer.
  This solution requires the availability of EGCS and shipyards for installation and the approval of Class Society. The use of open loop scrubber systems is prohibited in many areas.
- The use of LNG requires higher investment and complete exchange of the fuel system. Availability of engines and special fuel system equipment is necessary as well as a ship yard for installation.

4. What are the expected challenges with the properties of 0.50% el Oil and how can they be addressed?

Suppliers are commercially and legally required to meet the contractual terms of the ordering specification, to this extent it is recommended fuels are ordered against the ISO 8217 marine fuel standard.
The following are the key parameters of the fuel that need to be monitored specifically in view of the additional blending formulations that may be carried out by those formulating the compliant fuel

Stability

Stability is the ability of a fuel to keep the asphaltenes in suspension during storage and handling. When a fuel becomes unstable, it results in the precipitation of these asphaltenes which causes a high level of increased sludge formation inside the tanks, piping, filters and separators. If this is not prevented then once it occurs it not possible to reverse the condition; the continued use of an unstable fuel may lead, in worst cases, to loss of propulsion and power.
As fuel oil compliant with ISO 8217 is required to meet minimum stability requirements it is recommended that only fuels which meet the latest version of this standard are ordered.

Compatibility

Compatibility is the ability of two fuels when commingled to form a homogeneous and stable compound. Whilst every fuel should be manufactured with sufficient stability reserve to withstand the expected forces through normal on-board use, it does not necessarily follow that two stable fuels are compatible when blended or mixed together.
Incompatibility is the inability of two or more blend components to co-exist together without breaking down and precipitating sludge. Compliant fuel grades having the same sulphur content, but bunkered at different geographical locations and in some instances even in the same location but as separate stems, may not be compatible, even including fuels ordered from the same bunker supplier.
It is therefore important that these fuels are stored in segregated tanks and that there is minimal co-mingling between different grades of fuel oil within the fuel oil system.

Viscosity

The control of viscosity is important for optimum combustion efficiency. If the viscosity is too low, it may also lead to inadequate hydrodynamic lubrication of the fuel pump plungers and barrel arrangements. The expected variability (2 cSt to 380cSt viscosity supplied against a consistent order such as RMG380 Max 0.50% % Sulphur), will require particular attention to ensuring the correct temperatures are set for purification and injection.

Acid Number

Fuel oil with an elevated acid number over and above the norm in the area being supplied, may cause accelerated damage to various parts of the combustion unit including the fuel injection equipment.
If the fuel oil bunkered is identified as having a significantly high acid number, then it is recommended that the fuel testing service providers be contacted for guidance as to the root cause of the high Acid Number and consideration will be given as to the possibility as to whether this fuel may be used or not. In some case the outcome of the investigation has required de-bunkering of the fuel. If there is no other option and the fuel needs to be consumed, then close attention should be paid to the potential for accelerated deterioration and failure of fuel pumps and injection equipment.

Flashpoint

SOLAS Regulation II-2/4 requires that the minimum flashpoint of any fuel used by the vessel or carried in its tanks must not be less than 60°C. The flashpoint of a fuel supplied to the ship should therefore be properly verified by the supplier before bunkering. Included also in the ISO 8217 as a minimum 60C requirement.

Cat Fines

Excessive presence of catalyst particles of aluminium silicate (also known as cat fines) in fuel oil may lead to accelerated abrasive wear of engine fuel pumps, injectors and cylinder liners.

If the fuel bunkered is identified as having a significantly high value of cat fines, then it is recommended that the fuel testing service providers be contacted for guidance and the fuel disposed of at the earliest available opportunity if so required. If there is no other option and the fuel needs to be consumed, then consideration must be given to optimise the removal of the cat fines, putting suppliers on notice and giving close attention to the potential for accelerated wear and failure of combustion and cylinder liner/ piston components. In these situations, the following precautions are recommended to minimise these adverse effects:

- Maintain fuel oil storage, settling and service tanks at a sufficiently high temperature and ensure that settling and service tanks are drained of water at regular intervals;
- Closely observe the operation of fuel oil filters (especially auto backwash filters) to ensure that there is no rapid decrease in fuel pressure during the operation of engines. These filters should not be bypassed.; and
- Optimise the purification machinery plant setting such as operating two purifiers in parallel at the lowest practical throughput; check manufacturers guidance on other measures that can be taken such as elevating the throughput temperature, Information on handling these fuels
- Industry guidance from the International Council on Combustion Engines (CIMAC). The document can be accessed and downloaded at the following link: https://www.cimac.com/publications/recommendations410/cimac-recommendation-no.-25.html

5. What are the points to consider for preparing the ship specific implementation plan?

For each ship take into account economic (investment, fuel cost, etc.) as well as operational consequences. After each step refine your decision.

- Analyse the ship's expected operational area with regard to fuel compliance requirements
- Check the applicability of the option of fitting and using scrubbers to the individual ship taking into account factors such as the trading route, expected availability of HSFO, geographical restrictions on open loop technology etc. If Scrubbers are deemed to be the viable option, check availability of systems and yard capacity for installation. If not, then continue with the following considerations.
- Estimate the approximate fuel consumption per fuel grade in each area
- Estimate the expected number of fuel switch overs

- Check the necessity for tank cleaning based on the following considerations:
  - History of bunkers in tank and last cleaned date.
  - The expected types and grades of compliant fuel to be bunkered;
  - Type of charter;
  - Trade routes;
  - Bunkering arrangements;
  - Current fuel; Decide whether the cleaning is to be done in service or at anchorage/yard. Make sure adequate resources such as manpower and yard capacity if applicable is available.
- Check the availability of compliant fuels, contact your fuel supplier(s), ask for relevant fuel characteristics (para 4). Ensure that the latest version of ISO 8217 is specified as the required standard.
- Having identified the type of compliant fuel that is envisaged to be used and having considered and identified possible needs for segregating fuels bunkered, including modifications to fuel tanks and associated pumping and piping, consult equipment manufacturers and classification societies in order to discuss the changes to the fuel system implementation plans to ensure they are appropriate and complete, as well as identifying any approval requirements.
  Details can be found in International Association of Classification Societies (IACS) – Rec 151: Recommendation for petroleum fuel treatment systems for marine diesel engines. http://www.iacs.org.uk/publications/recommendations/141-160/
- Check operational consequences based on switchover experiences and CIMAC guidance (para 4.6). Identify any specific training needs for ship's crew related to fuel switchover.
- Plan the beginning of tank cleaning, modifications of the fuel system and fuel change over. Be aware that non-compliant fuel has to be disposed of although there is a period of grace of three months for this requirement, during which time however it may not be used
- Plan the bunkering of compliant fuel well in advance of the changeover date. Delaying the changeover until the last minute might make economic sense, however this is a significant step change for the crew and planning a phased switch over will provide a welcomed period of trials and settling down to a new fuel operational environment. However ships are advised to start earlier to address any technical, operational and supply issues. Analyse the fuel consumption and schedule of the ship and then decide on the most appropriate date and location for economic bunkering of conventional and compliant fuel. 0.50 Fuels may be more susceptible to stratification over extended periods, it is recommended that bunker management for the switch over should take this into account when ordering fuels. Viscosity controller should be fully serviceable and operating on auto viscosity mode and crew attentive to any unexpected fuel temperature changes that might indicate stratification occurring, taking note on engine combustion performance

6. Why and how should we document the implementation process?

IMO is recommending that ships put together a ship implementation plan in view of the significant this change will have on the ship to adapt to the change operationally as well as technically. This will not only ensure the ship is fully compliant on 01 Jan 2020 but it will demonstrate to inspection authorities the ship/companies sincere intent to comply. There is no statutory requirement for ships to have an implementation plan, however IMO has agreed that Administrations and Port State Control authorities may take into account the Implementation Plan when verifying compliance with the 0.50% sulphur limit requirement. Shipping companies are therefore recommended to approach the ship's flag State and classification society for reviewing its implementation plan.
Based on the considerations detailed in section 5, produce the ship specific implementation plans as per the IMO template provided in Annex I of the ICS Guidance. Document the ship specific considerations, decisions and detailed planning in the implementation plan and keep on board for prospective inspections post 1 January 2020.

7. What are the considerations for reporting Fuel Oil Non-Availability?

Whenever compliant fuel is not available for bunkering or available compliant fuels are not suitable, this should be reported to the ship's flag State and the relevant port of destination using a Fuel Oil Non-Availability Report (FONAR). IMO is developing a standard format for reporting fuel oil non-availability. Ships are, however, required to make every best effort to obtain compliant fuel.

Before bunkering non-compliant fuels you should consider:

- The higher cost of compliant fuel (including 0.1% distillates if these are the only fuels available) will not be considered as a valid basis for claiming non-availability.
- If the decision to bunker non-compliant fuel oil is based on a valid reason, ensure there is adequate documentary evidence of communication between the ship and the fuel supplier.
- Regulation 14.1.3 of MARPOL Annex VI prohibits the carriage of non-compliant fuel oil. Consequently, any non-compliant fuel not used must be disposed of and the relevant tank may require cleaning.
- The non-compliant fuel might be incompatible with the remaining fuel on board.

8. Conclusions

- Start planning and make preparation **now**.
- Carryout a fuel change risk assessment and define the ship specific implementation plan to include actions needed to be compliant ready
- Start discussions with your charterer about agreeing on a Regulation 14 compliance strategy and amend the bunker clause as appropriate.
- Consider the various compliant fuel options your ship may be offered and ensure your ship is adaptable.
- Consult equipment manufacturers and classification societies where applicable in order to discuss your plans to ensure they are appropriate and complete, as well as identifying any approval requirements.
- Contact shipyards or suitable companies to arrange for planned modifications and arrange tank cleaning if considered necessary
- Document results and evidence in the ship specific implementation plan
- Decide on first bunkering of compliant fuel