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To whom it may concern

Winterthur, 7. June 2018

Statement: Ultra Low Sulphur Fuel Oils (ULSFO, 0.10 % sulphur, hybrid fuels)

Dear Sir/Madam,

Winterthur Gas & Diesel (WinGD) is aware that several fuel suppliers offer ultra low sulphur fuel oils (ULSFO, also referred to as hybrid fuels) as alternative to distillate fuels to cope with the existing maximum limit of 0.10 % sulphur in ECA areas since 1st of January 2015.

Many of these products fulfil the specifications of residual fuels as stated in ISO 8217:2017, but they differ from current heavy fuel oil (HFO) in sulphur content, compatibility, stability, viscosity, density and pour point. For WinGD fuel specifications and guidelines, check the Technical Bulletin "Diesel Engine Fuels". They must be treated like HFO in aspects like storage, heating and separation. For further information check the complete CIMAC position paper "New 0.10 % sulphur marine (ECA) fuels" or alternatively the corresponding summary on the next page. The change-over from HFO to ULSFO or back should be performed the same way as from HFO to distillate fuels or back due to the viscosity difference of the fuels. For further information of change-over procedure check the WinGD Technical Bulletin "Diesel Engine Fuels" (Chapter 2.2). A cylinder lubricating oil must be used as for other fuels with a sulphur content of 0.10 % or below, as well a piston underside drain oil monitoring is recommended according to WinGD Technical Bulletin "Lubricants" (Chapter 2.1.2.1, chapter 2.2 and chapter 2.3).

Such fuels can be used under the full responsibility of a vessel operator, but it is recommended to contact the respective fuel oil supplier for detailed recommendations on handling. WinGD has so far not received any negative feedback from operators using ULSFO.

Summary of important documents:

- WinGD Technical Bulletin "Diesel engine fuels"
https://www.wingd.com/media/2220/validated_fuel-qualities_for_wingd-engines.pdf
- WinGD Technical Bulletin "Lubricants"
https://www.wingd.com/media/2217/validated_cylinder-and-system-lo_for_wingd-engines.pdf
- CIMAC position paper "New 0.10 % sulphur marine (ECA) fuels"
https://www.cimac.com/cms/upload/workinggroups/WG7/CIMAC_WG07_2015_Jun_Position_sulphur_marine_ECA_fuels.pdf

Yours sincerely,



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Summary of the CIMAC position paper “New 0.10 % sulphur marine (ECA) fuels”

To meet the increased demand for 0.10% S marine fuel, several fuel suppliers have developed new fuel formulations that are claimed to be more cost effective than conventional distillate fuels. These fuels combine properties of both distillate and residual marine fuels and can be divided in the following categories.

- Ultra low Sulphur residual fuel oils (ULSFO); lower viscosity and density, better ignition and combustion properties compared with conventional residual marine fuels.
- Blends of a distillate fuel with small amount of residual fuel oil (DMB type)
- Heavy distillates; fuels with low metal content but with higher viscosity than conventional DMA

Every new 0.10% Sulphur fuel has its own unique formulation. Thus, the new 0.10% Sulphur fuels have their own specifics in terms of storing, handling and use.

Some common characteristics of the new 0.10% Sulphur fuels are:

- **Compatibility and stability:** ULSFO are more paraffinic and increase the risk incompatibility with conventional residual fuels, like DMA mixed with conventional residual fuels.
- **Viscosity:** The viscosity is lower than conventional residual fuels but higher than DMA. They may require heating. There may be a reduced risk of thermal shock during change over. (ensure that temperature gradient do not exceed the recommended max 2 °C / min)
- **Density:** The density is lower than conventional residual fuels. This may require adjustment of centrifuges to ensure adequate cleaning of the fuel.
- The new fuels generally have excellent **ignition quality**.
- **Pour point:** ULSFO fuels should be stored at min 10 °C above pour point. These fuels may have different cold flow characteristics than conventional fuels and considering only the pour point is not sufficient to ensure problem-free operation. Check the CIMAC guideline “Cold properties for Marine Fuel oils” https://www.cimac.com/cms/upload/workinggroups/WG7/CIMAC_WG7_2015_01_Guideline_Cold_Flow_Properties_Marine_Fuel_Oils_final.pdf
- **Cat fines and sediment content** are typically lower than that of conventional residual fuel, but in order to protect the engine it is recommended to use the ship’s residual fuel treatment system to clean the fuel.

Key technical considerations for ship owners and operators

- **Ship tank configuration and fuel system:** A fully segregated fuel system is recommended to avoid incompatibility and sludge formation during switch over from conventional residual fuel. Additionally, tank cleaning is recommended when bunkering these fuels.
- **Heating requirements** Due to their cold flow properties, permanent heating of the fuel may be necessary to minimize the risk of wax formation, also in storage (especially in colder regions).
- **Fuel treatment system** Follow the recommendations from OEM and fuel supplier. Avoid overheating.
- **Fuel change-over procedures HFO - ULSFO** are not different compared DMA - HFO; controlled change-over minimizes risk of component’s thermal shock and fuel incompatibility.
- **Lubrication:** Please refer to the OEM recommendations as mentioned on the first page of this letter (WinGD technical bulletin “Lubricants”).

Key commercial considerations for ship owners and operators

Fuel buyers should have a bunkering strategy considering tank capacity and configuration to the operating profile of the vessel. Some of the new fuels are only available in one specific region and cannot be sourced in other areas. ULSFO do not always fit fully into table 1 or table 2 of the ISO 8217:2017 specification. They can be divided in a predominant RM based blend product or a predominant DM blend product.

Conclusion

ULSFO offer an economically attractive alternative to conventional distillate fuels. Before purchasing a new fuel product, carefully consider the specific technical and operational challenges this fuel may have and the OEM recommendations to ensure safe operation.