KISH P&I CLUB

Loss Prevention Circular KISHPNI-LP-08-2020
(Bunker Supplies & Important Contemplations)

►Introduction:
The IMO 2020 regulations concerning the low Sulphur fuels marked a milestone in the bunker supply activities. Yet still entering a bunker supply contract requires very delicate considerations & may involve further implications.
We have extracted an important table from the "Joint Industry Guidance on the supply and use of 0.50 sulphur marine fuel" concerning the key fuel characteristics and the significance of off-spec test results which is attached to this circular.

Apart from those, the following may be noteworthy points whilst entering a bunker supply contract:

1- Fuel specification: the contract should identify the correct specification of the fuel - for example by expressly stating the relevant ISO specification. For residual fuels, the most widely used specification is ISO 8217 Table 2. The Table 2 specification for sulphur content is stated as per "statutory requirements" and, since 1 January 2020, the global MARPOL sulphur limit is 0.50% with lower limits set for SECAs. ISO 8217 is periodically revised and the industry guidance recommends the most recent version, ISO 8217 2017.

2- Due diligence with respect to the fuel: consider information you need about the fuel and its origin. Are there any special parameters regarding storage, handling, treatment and use of the fuel on board? Do you require specific information in the Certificate of Quality?

3- Due diligence with respect to the seller: consider market reputation and financial standing of sellers, in terms of financial standing and insurance position and involvement in previous supply issues. Are they also a physical supplier or only an intermediary? How do they verify the quality of the fuel supplied? What are their supply chain quality management procedures, if any?

4- Sampling and quality testing: the contract should specify the agreed sampling and quality testing regime, including for sulphur content. Ideally, a sample from each of the bunker supplier and the vessel should be analyzed as opposed to only the supplier's sample. Consideration should also be given as to whether preferred accredited labs for testing should be identified in the contract. In the event there is a dispute about the quality or characteristic of the particular stem, inability to agree to a lab for testing may complicate and delay resolution.

5- Quality claims time bar: the contract should ideally include a quality claim time bar that allows sufficient time for quality testing to be performed, taking into consideration that testing might need to take place at an accredited lab located at a place other than the place of supply. It is recommended to link any time bar to 14 days after use of the bunkers or alternatively to have a much longer time bar period, for example 45 days.

6- Limitation of liability: standard bunker supply contracts usually include a low mutual limitation of liability figure (usually one or at most two times the invoiced value of the fuel). Consider negotiating increased limitation of liability sums to reflect the fact that losses arising from loading or consumption of off-specification fuel can be very high in value. It is suggested that at least twice the value of the fuel or more should be targeted where possible.

7- The "OW Bunkers" issue: if buying direct from a physical supplier there is less risk, but if purchasing via a broker or trader there is a risk they may not have paid their counterpart for the bunkers which could, in the event of their insolvency, lead to competing payment demands and ***the risk for the buyer of having to pay twice*****.**

Note: "OW Bunkers" was a Denmark-based bunker supply company which declared bankruptcy following the revelation of an alleged serious fraud within its Singapore subsidiary, Dynamic Oil Trading.

8- Insurance: sellers should ideally have insurance in place and should be required to produce evidence of this. Such insurance may for example include credit, professional indemnity and product liability insurance.

9- Local rules and regulations: most standard term contracts incorporate local rules and regulations into the bunker supply contracts. Local rules and regulations can bring about surprises that the parties to the contract might not be aware of at the time of contracting. Consideration is accordingly recommended to be given to the exclusion of local rules and regulations either in their entirety or to limit their applicability to fuel sampling only.

10- Uniform bunker supply terms: ideally the same supply terms should be used across the board with all suppliers so as to have certainty over the risk allocation and to avoid the use of ad hoc supplier friendly terms. In effect, have a framework agreement/standard terms agreed with major suppliers.

11- Lien: try and avoid provisions that give the sellers a lien over the vessel or any rights of action against third parties (for example the owner if the charterer is the buyer) as this can cause serious issues under the charter-party. A further point to consider, is to add an express provision that the sellers must hold the buyer harmless and indemnify the buyer in the event that a third party asserts a lien or encumbrance on the vessel in relation to the fuel purchased from the sellers. Similarly, a clause can also be included by which the sellers warrant that no third party has any right to claim against the buyer in relation to the fuel, or exercise any right of lien, charge, encumbrance or arrest over the vessel or any sister vessels in respect of the fuel.

12- Exclusions: consider whether you wish to exclude indirect or consequential loss (as this could extend to loss of time). Be careful of broad term exclusions that are usually found in bespoke sellers' contracts. Make sure that any exclusions apply mutually to both contractual parties if they are agreed.

Key fuel quality characteristics and the significance of off-specification test results are attached below for easier reference:

Key fuel quality characteristics and the significance of off-specification test results

The following table provides a brief on the potential significance of some of the key fuel characteristics mentioned in this document and also specified in ISO 8217:2017, Tables 1 and 2, along with the implications of being off-specification. It should be noted that this is not an exhaustive list but rather provides an indication of some of the possible outcomes of an off-specification product being supplied to a ship.

Distillate fuel—significance of the fuel characteristics listed in ISO 8217:2017, Table 1

Characteristic	Significance	Implications of off-specification
Viscosity at 40°C	Ease of flow	Values below the minimum limit are normally a concern for distillates: there is potential for insufficient dynamic lubrication under higher temperature conditions. There is increased tendency to flow through fine clearances, particularly under the high pressures of fuel injection pumps, especially where those clearances have increased due to wear, resulting in an inability to generate the required pressure/flow. Can also lead to a shortfall of spray penetration on injection. Receiving a distillate with a viscosity value above the maximum limit as ordered is extremely rare for a distillate; however, if this occurs it could compromise the injection spray pattern and lead to an increased mechanical load on fuel pumps and drive arrangements. Suitability is dependent on combustion machinery requirements. Response: apply cooling or heating, as applicable. Ensure that the bunker order has highlighted any minimum and/or maximum viscosity requirements.
Density at 15°C	Weight/volume relationship of a fuel	Reduced tendency for settling out of water and solids, although this is more of an issue for the higher-density residual fuels due to the naturally lower densities of distillates. As density is generally used to convert the delivered quantity (m^3) to the invoiced amount (tonnes), a value below that quoted on the bunker delivery note will result in a tonnage shortfall. The gravity disc selection for a purifier may need to be changed to match the density of the fuel.

Distillate fuel—significance of the fuel characteristics listed in ISO 8217:2017, Table 1 (continued)

Characteristic	Significance	Implications of off-specification
Sulphur	SO_x emission control. Controlled to limit SO_x and related particulate emissions for environmental protection. Precursor of post-combustion low temperature corrosion of susceptible components in the engine and exhaust duct.	Statutory issue. Non-compliance with MARPOL Annex VI, Regulation 14 (and/or local controls). For two-stroke engines, ensure that suitable cylinder liner oil is on board to address the anticipated sulphur content of the fuel to be used. Adjust feed rates as applicable.
Flashpoint	The temperature at which fuel vapour is ignited under specific closed-cup test conditions.	Statutory issue. Non-compliance with SOLAS. Values substantially below the minimum limit could indicate inclusion of particularly volatile components with potential for evolution of hydrocarbon-rich vapours. The SOLAS agreement specifies that the flashpoint for all fuels used on board ships should be a minimum of 60°C, except where: • allowed otherwise in SOLAS II-2, Regulation 4 which permits fuel oil with a minimum flashpoint of 43°C to be used in certain applications and under controlled conditions; or • a ship is certificated in accordance with the provisions of the *International Code of Safety for Ships Using Gases or Other Low-flashpoint Fuels* (IGF Code). If low flashpoint, report to Class or Flag and/or Flag Administration for guidance.
Acid number	Indicator of acidity; however, there is no direct correlation between acid number and corrosion risk.	See page 19 in this guidance document for more details on this parameter. Where unusual acid number readings are recorded, further investigative analysis may be carried out to determine the cause and whether naturally occurring or not.
Carbon residue (DMB)	Indicator of tendency for formation of post-combustion carbon deposition; significance depends on engine design and operating profile.	In cases of extreme exceedances, which are rare for distillates, there is a tendency for increased formation of post-combustion carbonaceous deposits in the engine, system lubricant, turbochargers and exhaust duct, particularly under low load or other non-optimum operating conditions. There is potential for cracking of fuel in uncooled injector tips, resulting in the formation of hard carbon deposits which compromise combustion by adversely affecting the injector spray pattern, resulting in further deposition. A point of note is that, for the most part, ships' machinery is designed to operate both on residual fuels and distillates, and can tolerate relatively high levels of carbon residue. Hence, this is rarely an issue today.

Distillate fuel—significance of the fuel characteristics listed in ISO 8217:2017, Table 1 (continued)

Characteristic	Significance	Implications of off-specification
Cloud point	The temperature at which wax crystals are first evident on cooling.	If operating at temperatures where a proportion of the wax in a fuel begins to form as crystals, albeit they may be dispersed, this may tend to lead to the choking of filters and other fine clearances. Ensuring that the system has enough warming capability, or an anticipated return to warmer ambient conditions, will prevent any adverse outcomes or difficulties associated with emergency engine starts. Any ship constraints should be made clear in the fuel order specification.
Cold filter plugging point (CFPP)	The highest temperature at which a given volume of fuel fails to pass through a standardized filtration device in a specified time when cooled under standardized conditions (applicable only for distillate fuels).	See on *Cold flow properties* on page 16 of this guidance document.
Pour point	The lowest temperature at which fuel is still fluid under test conditions.	If a fuel essentially solidifies it becomes unpumpable and is not readily brought back to a liquid condition by heating due to its poor heat transfer characteristic. If it is not possible to await return to warmer ambient conditions, the fuel may literally have to be dug or steam lanced out of the tanks and transfer lines, which will need to be physically rodded through/dissembled to remove the solidified fuel. Fuel in tanks with surfaces exposed to ambient (water or air) temperatures below the pour point may form a solid mass on that surface, which can grow to the point where it breaks away to fall through the liquid phase as a solid mass and choke suction connections. See *Cold flow properties* on page 16 of this guidance document. This issue is addressed in greater detail in the CIMAC Guideline on *Cold flow properties of marine fuel oils* (https://www.cimac.com/cms/upload/workinggroups/WG7/CIMAC_WG7_2015_01_Guideline_Cold__Flow_Properties_Marine_Fuel_Oils_final.pdf). Maintain storage and handling temperatures at 10°C above the pour point to avoid risk of solidification. Any constraints due to cold ambient conditions/winter zones should be determined.

Residual fuel—significance of the fuel characteristics listed in ISO 8217:2017, Table 2

Characteristic	Significance	Implications of off-specification
Viscosity at 50°C	Ease of flow	Higher than expected temperatures required for transfer and injection; however, due to the viscosity/temperature relationship, values significantly higher than the limit value result only in limited increases in required temperatures (i.e. viscosities of 500 cSt and 380 cSt increase the transfer and injection temperatures by around 3°C and 6°C, respectively). If the pre-heat is insufficient, the viscosity may rise above the engine manufacturer's recommended injection viscosity, which may then result in poor atomization and overloading of fuel injection feed pipes.
Density at 15°C	Weight/volume relationship of a fuel	Decrease in the density differential, which is the basis for cleaning by settling or purification/separation. Conventional purifiers with a nominal density limit of 991 kg/m^3 should be able to function with slight exceedances, albeit less efficiently, taking into account test precision. Modern separators, without a conventional gravity disc can, however, operate up to density values of around 1,010 kg/m^3. As density is generally used to convert the delivered quantity (m^3) to the invoiced amount (tonnes), a value below the quoted bunker delivery note value will result in a tonnage shortfall.
Calculated Carbon Aromaticity Index (CCAI)	Principally included to control the fuel's viscosity/density relationship, and hence preclude unconventional blends. Also an empirical indicator of ignition performance.	Tendency to indicate ignition delay problems, which will be more pronounced with lower-viscosity fuels; however, low-speed and most medium-speed engines are not generally oversensitive to such issues. For some higher-viscosity grades this may be a factor which sets blending limits. High values result from an atypical viscosity/density relationship which, for the lower viscosity fuels in particular, may indicate the use of unusual blend components. For further details and recommendations, see the CIMAC guidance document, *Fuel Quality Guide—Ignition and Combustion* (https://www.cimac.com/publications/wg-publications/cimac-wg07-fuel-quality-guide-ignition-and-combustion.html).
Sulphur	Precursor of post-combustion low-temperature corrosion of susceptible components in the engine and exhaust duct. Controlled to limit SO_x and related particulate emissions for environmental protection.	Statutory non-compliance with MARPOL Annex VI, Regulation 14 (and/or local controls). Increased tendency to cause cold corrosion. For two-stroke engines, ensure that suitable cylinder liner oil is on board to address the anticipated sulphur content of the fuel to be used. Adjust feed rates as applicable.

Residual fuel—significance of the fuel characteristics listed in ISO 8217:2017, Table 2 (continued)

Characteristic	Significance	Implications of off-specification
Flashpoint	Temperature at which fuel vapour is ignited under specific closed-cup test conditions.	Statutory issue. Non-compliance with SOLAS. Values substantially below the minimum limit could indicate inclusion of particularly volatile components with potential for evolution of hydrocarbon-rich vapours.
Acid number	Indicator of acidity; however there is no direct correlation between acid number and corrosion risk.	See Page 19 in this guidance document for more details on this parameter. Where unusual acid number readings are recorded, further investigative analysis may be carried out to determine the cause and whether naturally occurring or not.
Total sediment—aged	Quantification of filterable material present. Indicator of whether a fuel is a blend of compatible components and/or whether it will remain in a stable condition over time or on heating.	Test method has a relatively high 95% confidence margin relative to the limit value (0.10% m/m). In addition, off-specification values are often found to be due to toluene insoluble material and hence, in those instances, are not indicative of asphaltene instability. As a straight filtration test, it is indicative of possible increased sediment in tanks (particularly settling tanks) and during treatment (purification and filtering). However, if fuel is not stable, the resulting asphaltenic sludge precipitated will have a serious adverse effect on treatment effectiveness, resulting in excessive sludge precipitation and, hence, choking of the purifier and filters. Coke formation on heater elements restricts heat transfer, and it may therefore not be possible to achieve the required injection temperature. On injection, the sludge will not be sufficiently atomized, resulting in impingement on liners and, hence, cracking and heavy fouling which can impede the action of piston rings and lead to choking of turbocharger turbine blades.
Carbon residue	Indicator of tendency to post-combustion carbon deposition.	Exceedances for residual fuels are rare; however, with elevated levels, there is potential for an increase in post-combustion carbonaceous deposits in the engine, system lubricant, turbochargers and exhaust duct, particularly under low load or other non-optimum operating conditions. Any system constraints should be made clear in the fuel order specification.
Pour point	The lowest temperature at which a fuel is still fluid under test conditions.	Since most residual fuels require heating (30–40°C) to achieve the required transfer viscosities, there is usually capability for tank heating to address this issue. If a fuel solidifies it becomes unpumpable; furthermore, it is not readily brought back to a liquid condition by subsequent heating due to its poor heat transfer characteristic. With engines now deregulated, and ships often running on slow steaming to reduce fuel consumption and emissions, it is necessary to ensure that the steam capacity from the exhaust boiler can still be maintained to keep the temperature of the fuel above the pour point.

Residual fuel—significance of the fuel characteristics listed in ISO 8217:2017, Table 2 (continued)

Characteristic	Significance	Implications of off-specification
Aluminium + silicon	Indicator of abrasive catalytic fine material being present.	High levels of aluminium + silicon (catalyst fines) are not easily reduced during normal on-board treatment, and can therefore pass through to the engine fuel system where rapid wear of injection system components (fuel pumps, injectors), liners and piston rings may occur. Worn piston rings can eventually break, and the resulting debris can cause further extensive damage to combustion chamber components and the turbocharger turbine.