

IMO 2020 - one year in

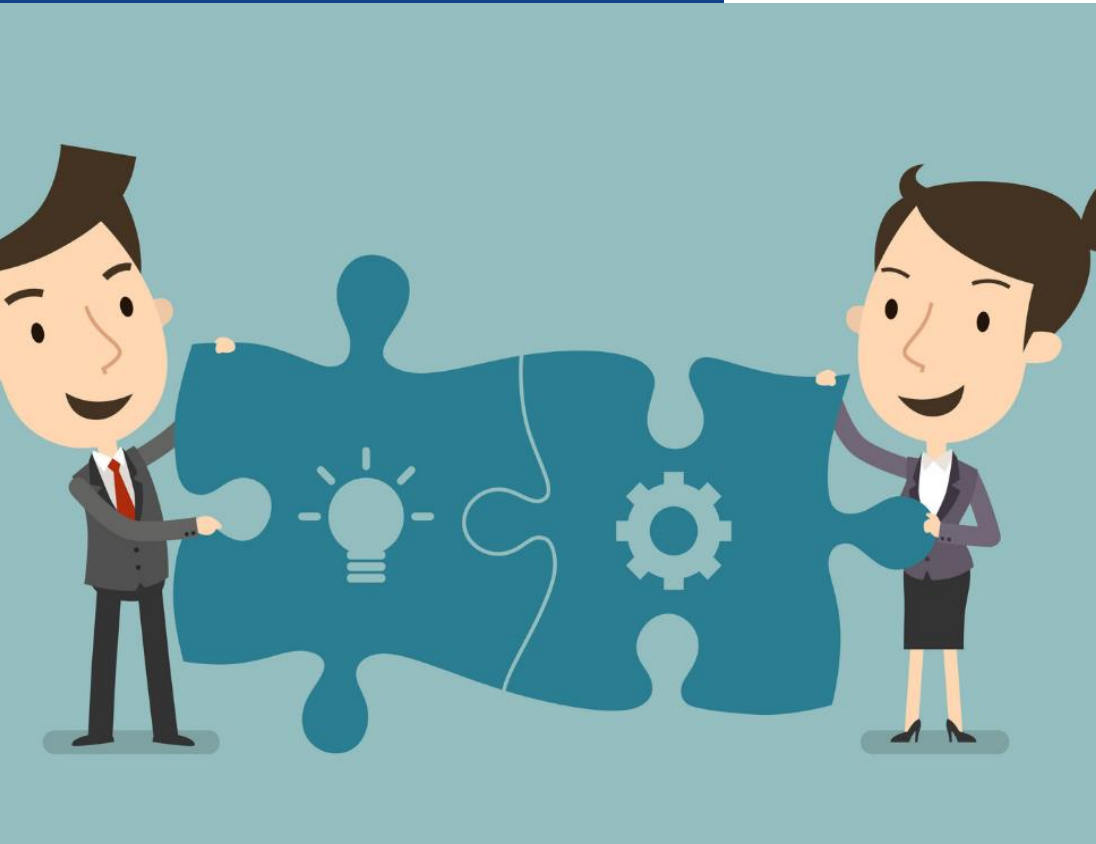
WAS IT AS BAD AS WE EXPECTED?

Lessons learnt..

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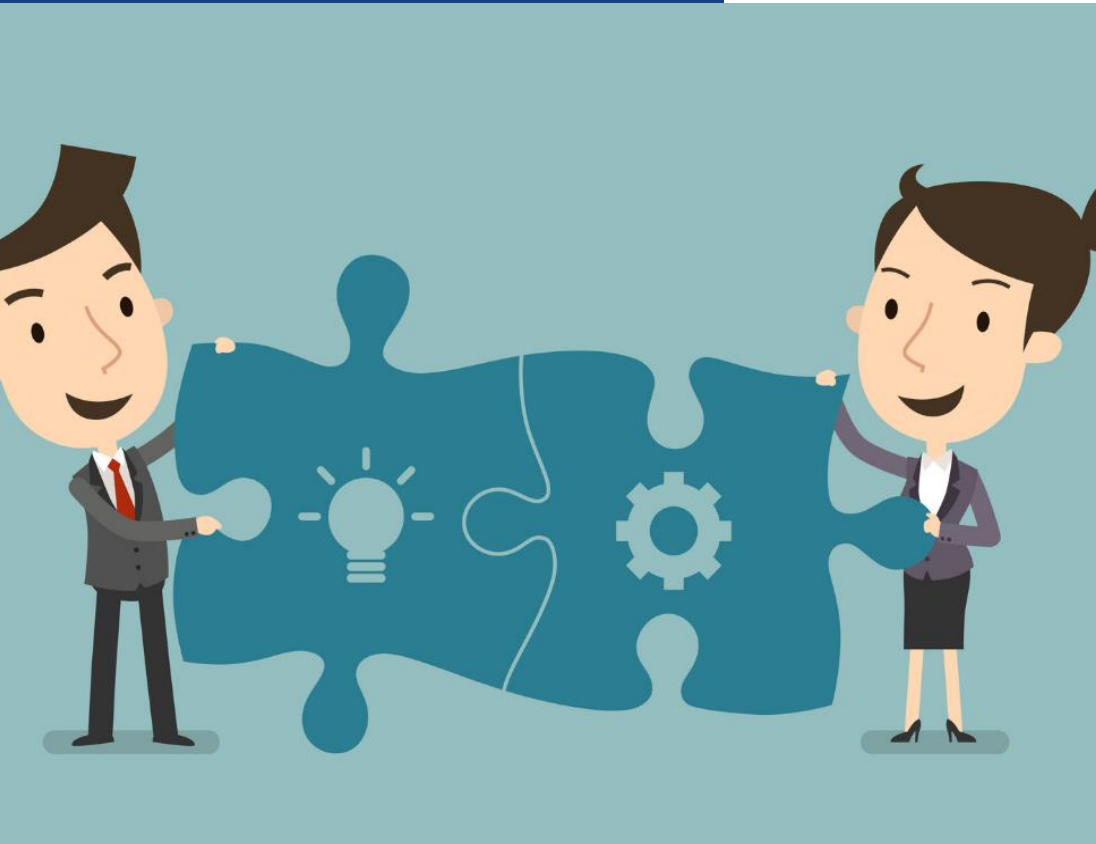


The Outline



- Introduction – 2019 Conclusions
- 2020 Cases – Our Experience & Lessons learnt
- Due Diligence and Recommendations
- Conclusions

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Last year's conclusions

Some conclusions and further food for thought...



1. Gas Oil versus New Very Low Sulphur Fuel Oil (0.5%)

- Big quality difference
- Currently moderate price difference
- Owners / Charterer will go for the less expensive
- Delicate handling required – New fuels still not categorized according to ISO 8217

2. Problems

- Cat Fines and extraordinary / accelerated wear
- Inappropriate onboard handling (combustion issues)
- Fires / explosions (flash point issues)
- Clogged injectors / pumps & engine stoppages (blends and comingling of fuels)

3. Remedies

- Nothing entirely new, however necessity for Ultra-Correct Onboard Fuel Management Plan
- Delicate Procedures and Every Mistake will HURT!!



May 2019

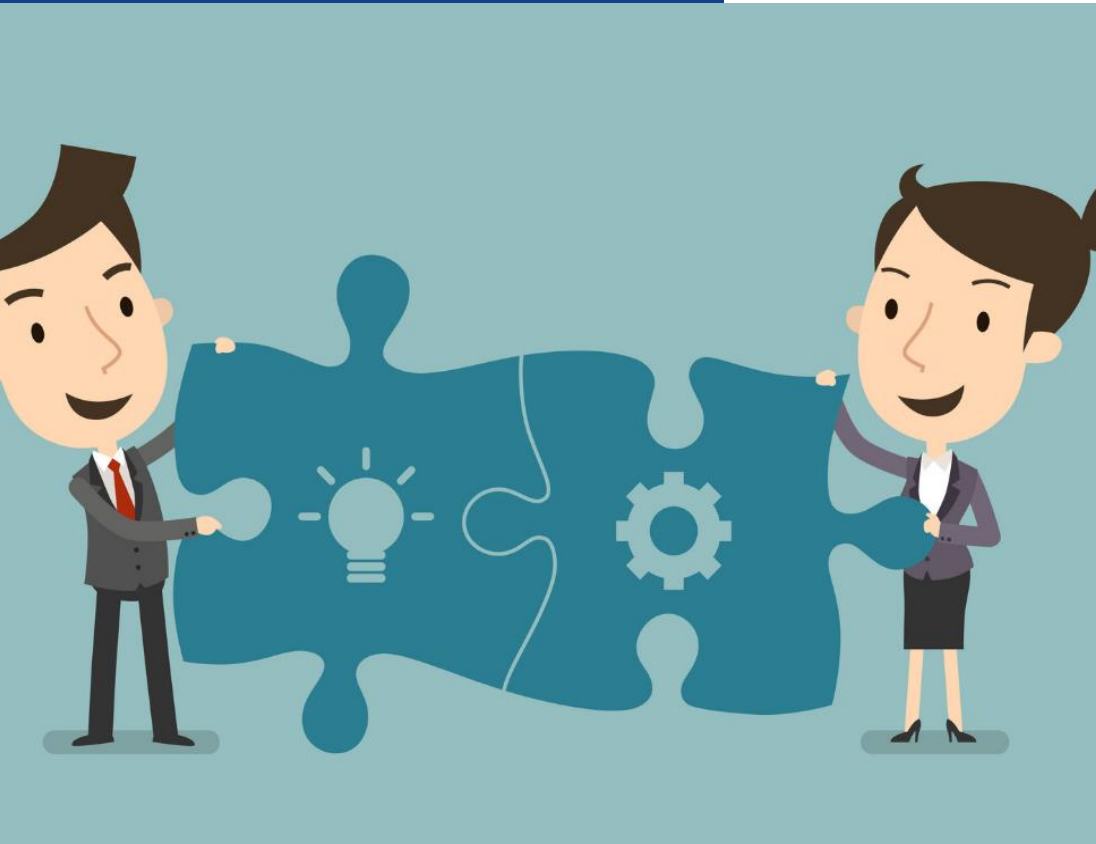
Some of the BIMCO survey conclusions

Feb – May 2020 / 192 responses

- 14%** of the respondents had not experienced any issues at the time of filling in the survey
- The first two most common out of spec parameters are the sulphur and total sediment
- 62%** of the respondents have to some extent experienced increased sludge deposits in the fuel oil system including the ship's separators.
- 32% of the respondents answered that they had experienced wax appearance in the fuel oil system
- 22% of the respondents answered that the fuel had been de-bunkered due to its properties
- 10%** of the respondents answered that they experienced loss of propulsion due to the fuel properties

But **ONLY 6%** answered that the fuel analysis indicated that the fuel was **off-spec** according to ISO 8217...

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Case 1: Variety of properties

Mainly significant deviation in viscosities

- ❖ Vessel bunkered VLSFO in Port A with viscosity 50cSt and few days later in Port B with viscosity 150cSt
 - **3 times larger** for the same fuel type!
- ❖ The required injection temperature of the first was 90°C whilst of the second 115°C!
- ❖ NO onboard Compatibility Test was carried out either!
- ❖ You know what happened...

*Careful study of the
CoQ and
instructions of the
laboratory is needed*

Case 2: Fuel commingling

- ✓ Comingling Awareness is now relatively high – Almost everyone knows by now!
- ✓ Usually mixing in the STORAGE tanks **can be and is avoided**

But what about the service and settling tanks? ?

Can it be avoided if a single set of such tanks is available for FO? ?

If it is unavoidable, what is the best practice? ?

- ❖ A vessel drained the settling tank **BUT** the service tank was 60% full of the previous bunkers!
- ❖ The new and the previous bunkers mixed in the service tank were incompatible → **sludge formulated** into the service tank which resulted to **machinery seizures**

Service tank should have contained the **minimum possible quantity for safety** prior introducing new bunkers!

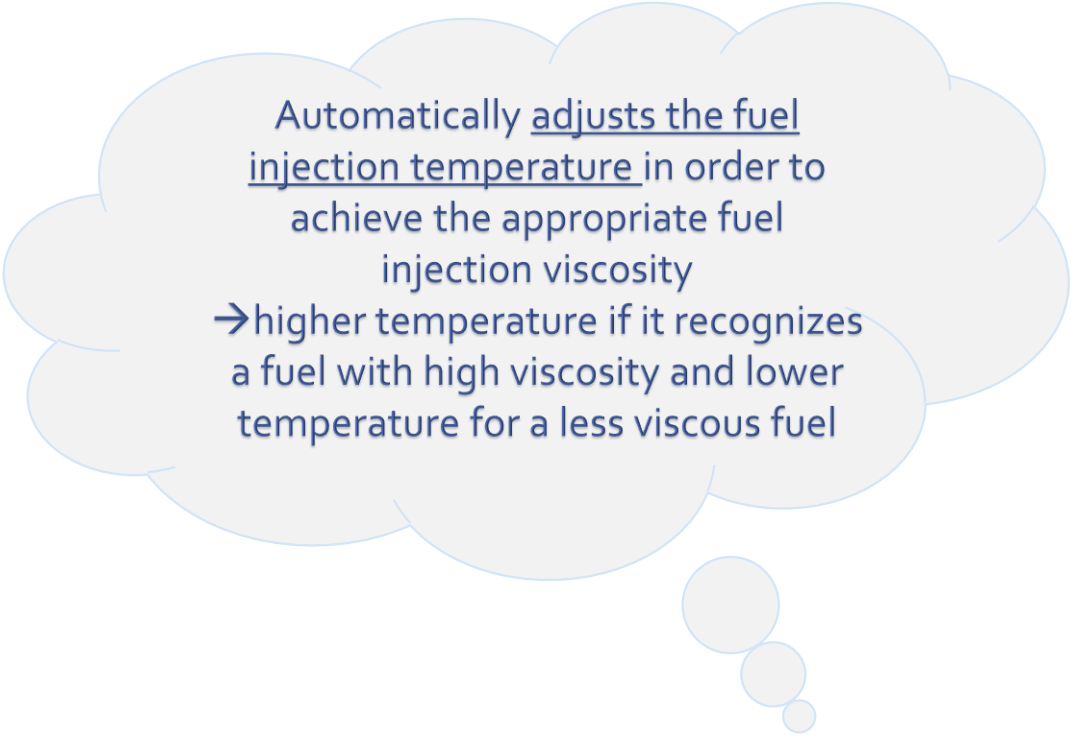
Case 3: Look at the viscosiometer!

A vessel's viscosiometer increased the injection temp. of the fuel to a greater temperature than the one expected as per the laboratory recommendations.

- ❖ The crew **ignored the "signs"** and considered that the viscosiometer was simply malfunctioning

So they by-passed it...

- ❖ **BUT** the viscosiometer was "recognizing" a high viscous fuel due to sludges that had started to formulate
- ❖ The crew did not read the early signs in order to mitigate the issue



Automatically adjusts the fuel injection temperature in order to achieve the appropriate fuel injection viscosity
→ higher temperature if it recognizes a fuel with high viscosity and lower temperature for a less viscous fuel

VISCOSIOMETER

Case 4: Limit the bunker batches

A vessel received bunkers from shore trucks... eight different trucks! 😊

→ The crew did not reject this process but **MOST IMPORTANTLY... did not** obtain a different sample for each different truck from the vessel manifold

So how could they trace what any out of the eight trucks contained?

What if the trucks carried incompatible between them products?

Eventually an **unstable product** was stemmed into the storage tank...

Case 5: Procedures are to be adhered to!

- ❖ A vessel received bunkers and obtained samples from the manifold as recommended



BUT...

- ❖ The crew did not include the seal number of the obtained samples in the BDNs
- In the subsequent dispute on the supplied fuel quality the **vessel's samples were rejected** as were not included in the signed BDNs!

The crew **did not evaluate** the importance of the **established procedures and paperwork**



Case 6: Fuel analysis BEFORE consumption

- ❖ You cannot just trust the CoQ provided by the supplier!
- ❖ A vessel **did not wait** to receive the VLSFO analysis results and burnt the fuel without confirming its parameters first...



Eventually they faced machinery seizures...



Case 7: GCMS analysis

Is the standard ISO 8217 Table 2 analysis sufficient?



- ✓ A vessel received a fuel oil analysis which was on spec as per ISO 8217 Table 2 ✓
- ✓ The crew also performed correct onboard fuel management ✓

However, the **filters were clogged** and **pumps, puncture/suction valves were stuck**

BUT WHY?



Chemical substances were contained in the fuel which could only be traced with a **GCMS analysis**

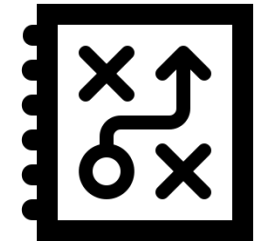
So our 2020 experience...



- ❑ **Variety** in properties and **viscosities**
- ❑ Inappropriate **fuel handling**
- ❑ **Combustion issues** if **temperatures** are not set right based on the specific fuel parameters
- ❑ **Incompatibility** of different fuels
- ❑ If the crew **mixes** incompatible fuels → **sludge** precipitation
- ❑ Usually not mixed in the fuel storage tanks but in the **service and settling tanks**

So our 2020 experience...

- ❑ Accumulation of sludge deposits and **purifiers fouling**
- ❑ Crew **does not “read” the early signs of the problem** such as increased injection temperature by the viscosity controller or abnormal accumulation of sludges in the purifiers
- ❑ Results in **clogged filters, stuck fuel pumps** and even **loss of power**
- ❑ **NO catastrophic damages** to the engines’ **major machinery** components
- ❑ **Loss of propulsion** mainly due to fuel pumps seizure (stuck due to sludge formation)



... in pictures



Stuck fuel pumps
with sludge



Fouled purifiers



... in pictures



Combustion issues

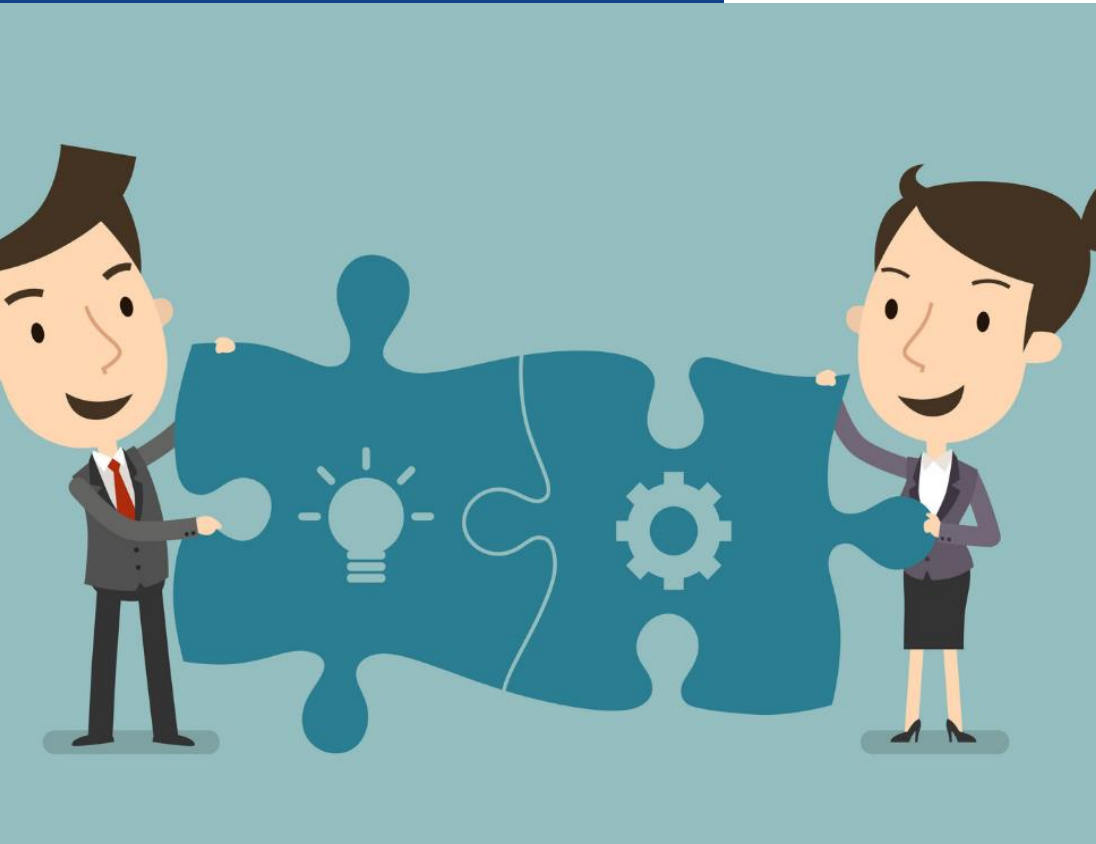
Filters clogged



Sludge in fuel tanks



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Bunkering

- ✓ **Avoid** receiving bunkers from **different land trucks or barges** but if you do so make sure to obtain representative samples from the vessel's manifold from each different batch of fuel
- ✓ **Make sure** to mention the **seal number** of all obtained samples from the vessel's manifold in the respective **BDN**
- ✓ **Frequent bunkering of small quantities** of fuel in vessels with one service/settling tank for the VLSFO may cause **sludge accumulation** due the different fuels' incompatibilities and eventual filters and pumps clogging

Do's and Don'ts

Fuel Analysis

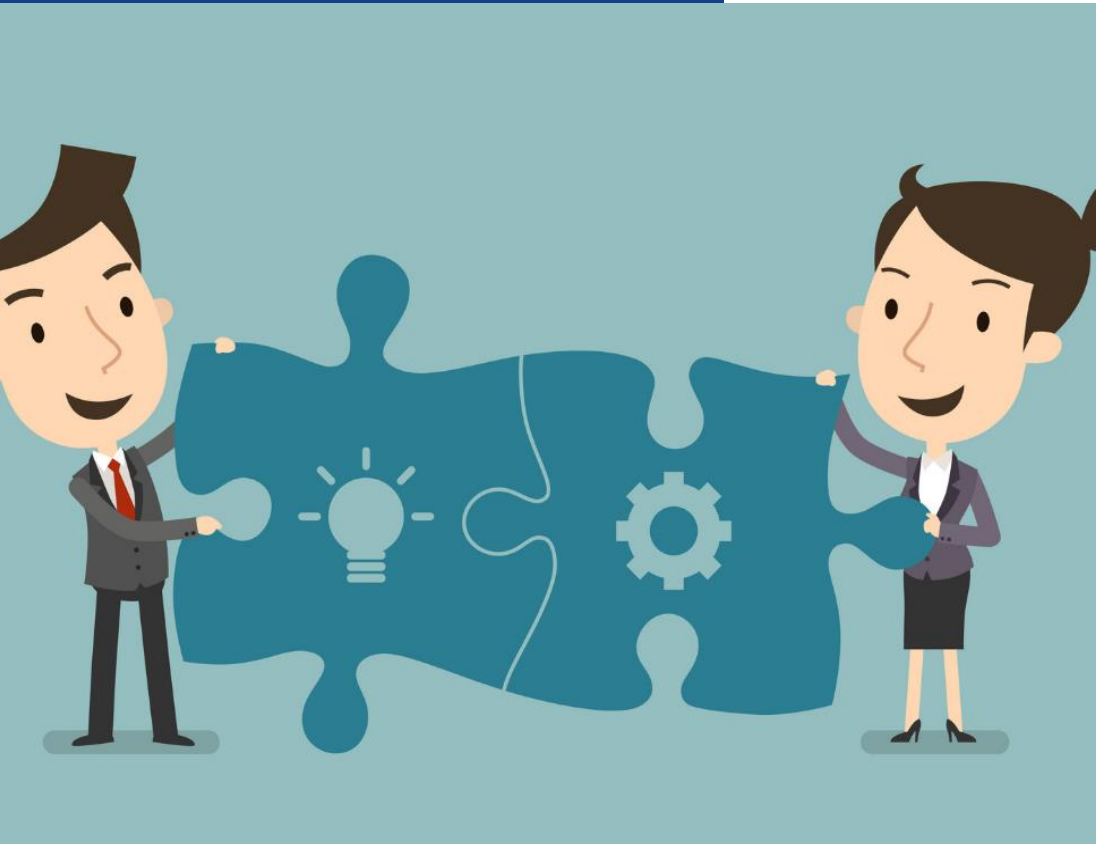
- ✓ **Always** obtain samples from the vessel's manifold and dispatch same for analysis **BEFORE** burning the fuel
- ✓ If inevitable to commingle a new bunker with bunkers already on board, **determine** their **compatibility by instant testing onboard (spot test kit)**
- ✓ **Take** samples analysis **before and after the purifiers** at least every 6 months
- ✓ **Study** carefully the **Certificate of Quality (COQ)** provided by the supplier
- ✓ **Look** for any **"suspicious" results** in the analysis, like the TSP levels, even if same appears to be within spec
- ✓ **Remember** that even if a problematic fuel meets the ISO 8217 Table 2 parameters, a **GCMS analysis** can reveal that the fuel is actually in breach of other ISO 8217 requirements.

Do's and Don'ts

Onboard fuel handling

- ✓ **Avoid mixing** fuels from different suppliers – always check compatibility before doing so!
- ✓ If the vessel is fitted with a single service/settling tank → **drain the settling tank** & keep the **service tank** with the **minimum quantity** of previous fuel **for safety reasons** before start transferring the new bunkers.
- ✓ **Monitor** carefully the **viscosity and injection temperature** regulated by the viscosimeter onboard (service / calibrate the viscosimeter more frequently)
- ✓ **Allow** settling/service tanks **frequent inspection / drain / cleaning**
- ✓ **Ensure efficient purification** at correct temperatures / feed rate / purifier disc – based on fuel properties WHICH CAN VARY!
- ✓ **Implement** a **minimum feed rate** through the purifiers if sludges are observed to increase its performance
- ✓ **Careful** monitoring of **fuel filters**

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Conclusions – From May 2019 to January 2021

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Conclusions in January 2021

- ☞ Sludge, Sludge, Sludge
- ☞ Incompatibilities
- ☞ Not much Off - Spec Bunkers
- ☞ Widespread minor damages / malfunctions
- ☞ NO catastrophic damages
- ☞ Care on Bunkering Procedures and Paperwork
- ☞ Purifiers AND Viscosimeter

Nothing entirely new, however necessity for Ultra-Correct Onboard Fuel Management

IUMI WEBINAR
27 JANUARY 2021



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Thank you!