Experience in the use of new low-sulfur fuels Fuel quality management

Capt Samir Fernandez
St Petersburg Bunker Forum – 24th June 2021

MAERSK OIL TRADING

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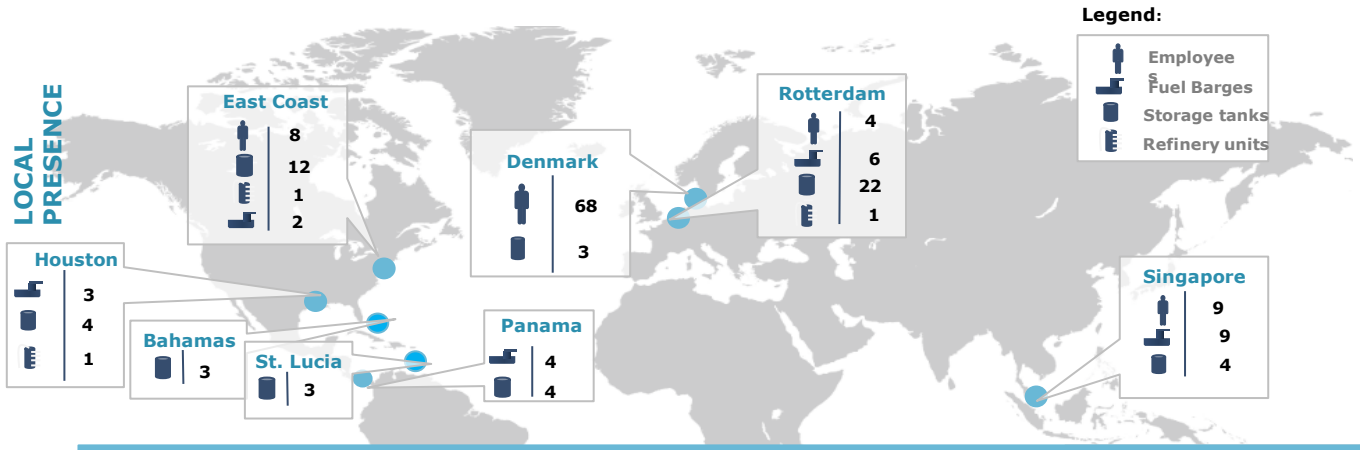
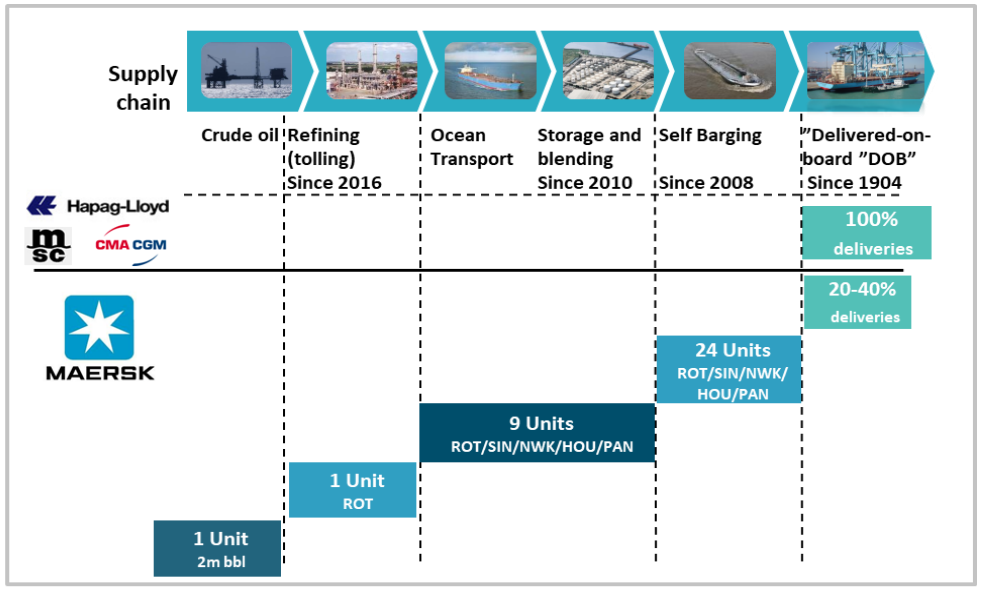
Maersk Oil Trading: Our Business & Purpose

	Crude	Refinery/ processing	Product storage/ blending	Barging/ product freight	Broker/agency	Product procurement
MAERSK	✓	✓	✓	✓	✓	✓
Vitol	✓	✓	✓	✓	×	×
GLENCORE / TRAFIGURA	✓	×	✓	×	×	×
ExxonMobil	✓	✓	×	✓	×	×
Peninsula Petroleum / AEGEAN	×	×	✓	✓	×	×
BUNKER HOLDING GROUP / World Fuel Services	×	×	×	✓	✓	×
Hapag-Lloyd / COSCO SHIPPING / CMA CGM	×	×	×	×	×	✓

Total staff of 89 employees





FUNCTIONAL DIVISION

Business Structure

Manufacturing, Blending and Trading
Fuel production, pricing, quality and risk & exposure management

Governance and Business control
Daily trade- and risk control and performance measurement, Counterpart management, transaction execution, business controlling, credit and insurance

Physical Operations
Barge operations, quality bunker pilots and bunker optimization planning system (BOPS)

Maersk Oil Trading operates across the entire supply chain for marine fuel

KEY FACTS

Bunker fuel

Volume	13 mMT
Value	$7bn
Deliveries	+15.000
Ports	+300
Vessels	+1000
Stem size	808 MT (avg)
Stem range	5–12,000 MT

APMM customers
MAERSK LINE, SVITZER, MAERSK SUPPLY SERVICE, Safmarine, HAMBURG SÜD, SEALAND

3rd Party customers
MAERSK TANKERS, P&O FERRIES, msc, DFDS SEAWAYS, CMA CGM, MAERSK DRILLING

* In **Fit 4 Growth** initiative we reduced by 15 FTE

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What is VLSFO? Does it have a specification??

Characteristics		Unit	Limit	Category ISO-F-											Test method(s) and references
				RMA	RMB	RMD	RME	RMG				RMK			
				10	30	80	180	180	380	500	700	380	500	700	
Kinematic viscosity at 50 °C		mm^2/s[a]	Max	10,00	30,00	80,00	180,0	180,0	380,0	500,0	700,0	380,0	500,0	700,0	ISO 3104
Density at 15 °C		kg/m^3	Max	920,0	960,0	975,0	991,0	991,0				1010,0			ISO 3675 or ISO 12185; see 6.1
CCAI			Max	850	860	860	860	870				870			See 6.2
Sulfur[b]		mass %	Max	Statutory requirements											ISO 8754 or ISO 14596 or ASTM D4294; see 6.3
Flash point		°C	Min	60,0	60,0	60,0	60,0	60,0				60,0			ISO 2719; see 6.4
Hydrogen sulfide		mg/kg	Max	2,00	2,00	2,00	2,00	2,00				2,00			IP 570; see 6.5
Acid number[c]		mg KOH/g	Max	2,5	2,5	2,5	2,5	2,5				2,5			ASTM D664; see 6.6
Total sediment – Aged		mass %	Max	0,10	0,10	0,10	0,10	0,10				0,10			ISO 10307-2; see 6.9
Carbon residue – Micro method		mass %	Max	2,50	10,00	14,00	15,00	18,00				20,00			ISO 10370
Pour point (upper)[d]	winter	°C	Max	0	0	30	30	30				30			ISO 3016
	summer	°C	Max	6	6	30	30	30				30			
Water		volume %	Max	0,30	0,50	0,50	0,50	0,50				0,50			ISO 3733
Ash		mass %	Max	0,040	0,070	0,070	0,070	0,100				0,150			ISO 6245
Vanadium		mg/kg	Max	50	150	150	150	350				450			IP 501, IP 470 or ISO 14597; see 6.14

a 1 mm^2/s = 1 cSt.

b The purchaser shall define the maximum sulfur content in accordance with relevant statutory limitations. See Introduction.

c See Annex E.

d The purchaser should confirm that this pour point is suitable for the ship's intended area of operation.

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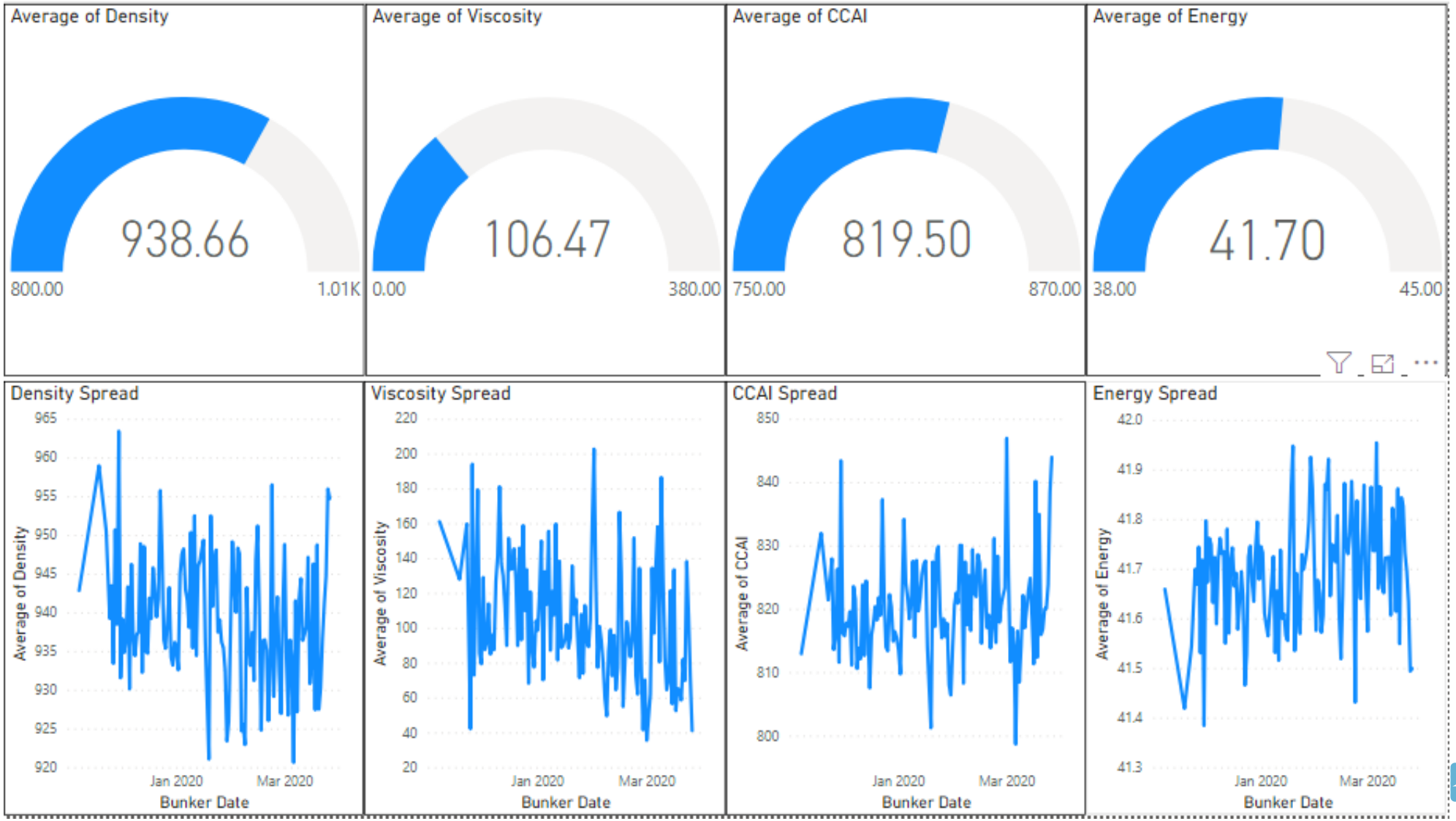
VLSFO PROPERTIES



QA 2020 – 3 Lines of defence

Crude slate + Blend Components

Hand Blend (Expected blend result)

Shore Tank

Tank COQ - 2017 spec

Blend target

Sulphur ≤0.47

TSA/TSE ≤0.07

COQ should match the hand blend within reasonable limits

1

Barge Pre-Test

COQ Parameter	Difference
Visc 20-100 cSt	+/- 10 cSt
Visc 100–400 cSt	+/- 25 cSt
Visc above 400cSt	+/- 50 cSt
Density	+/- 2 kg/m3
Sulphur	+0,03 %m/m
Flashpoint	+/- 10 C
TSA / TSE	+0,02 %m/m

2

Vessel Post Test

3

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So have we eliminated all problems?

The most important lesson learnt during 2020 is that VLSFO as a fuel is far more “delicate” as compared to HSFO.

VLSFO needs to be blended with care and most importantly it needs to be handled correctly on board the vessel.

Inappropriate handling (comingling / incorrect temperature management can cause the fuel to become unstable and cause clogging of filters and/or separators.

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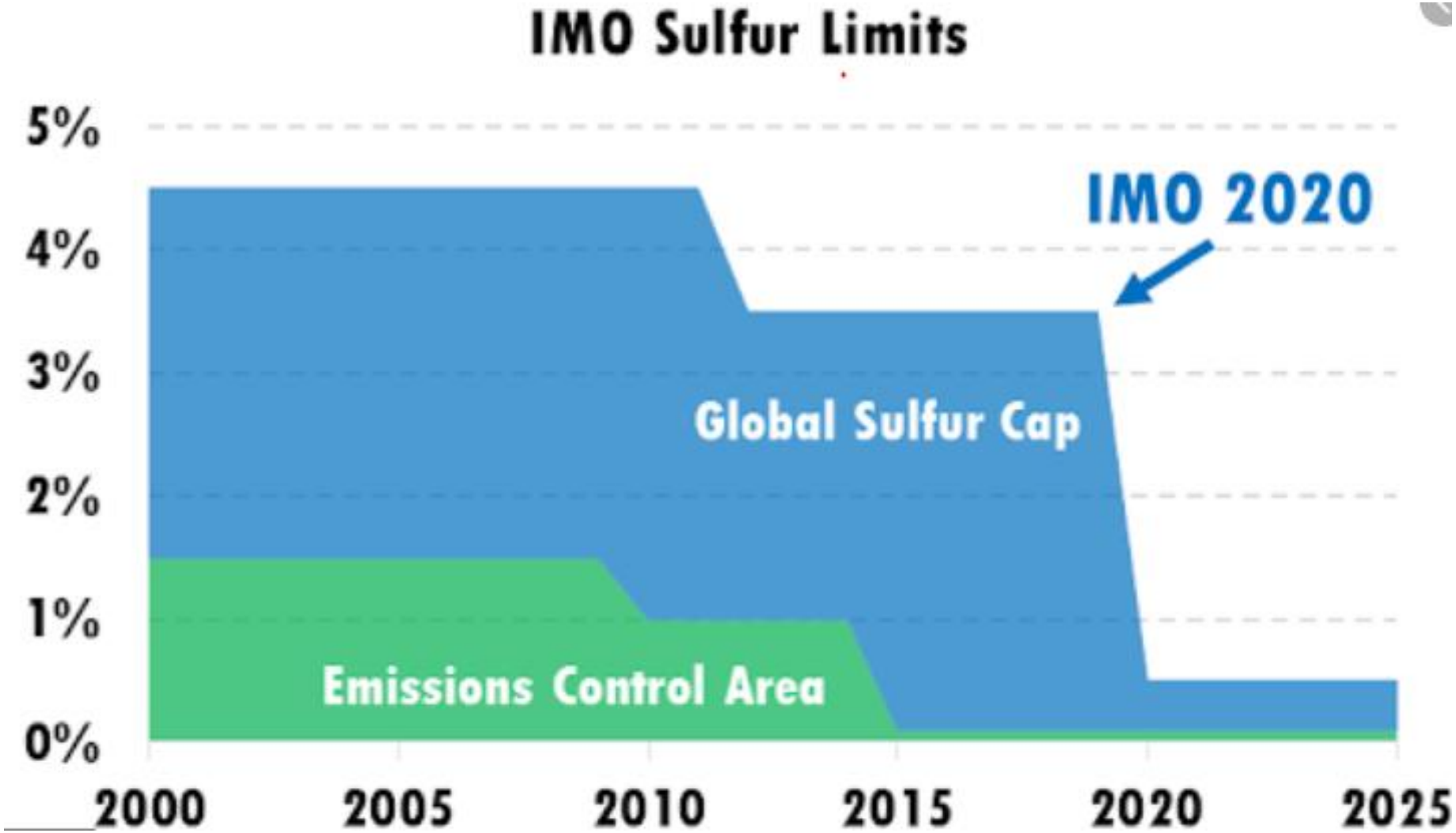
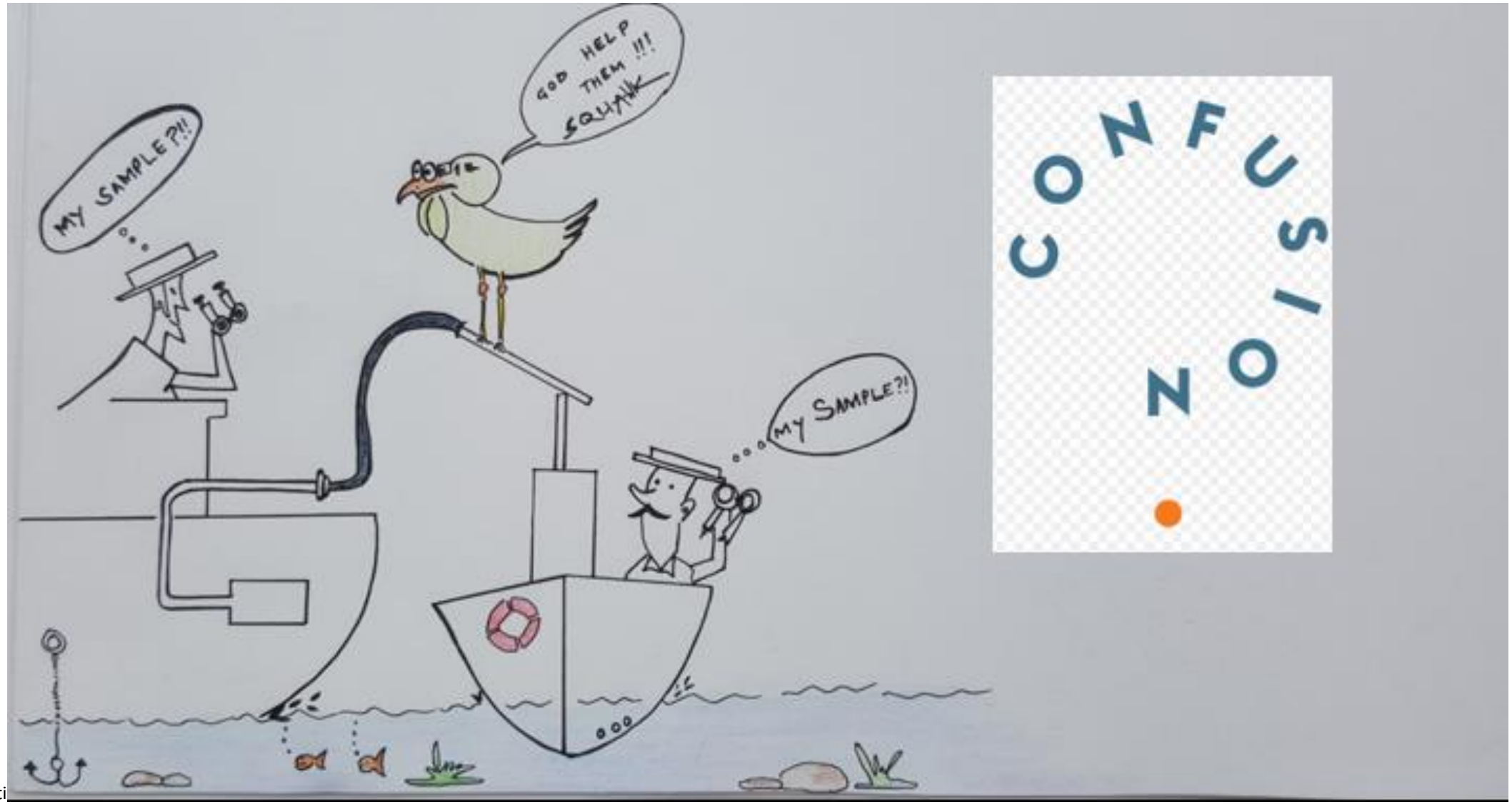
The Sulphur Claim – Don’t mess with it!



QA 2020 – Bunker Sampling – Ship owners BEWARE!!



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QA 2020 – Fuel Testing and GCMS

ISO 8217:2017(E)

Annex B
(informative)

Deleterious materials

This document precludes the incorporation of any material at a concentration that causes the fuel to be unacceptable for use as stipulated in Clause 5.

Identifying and determining the concentration of a material that causes the fuel to be unacceptable for use can be difficult given that

a) each fuel is a unique, complex blend of hydrocarbon species,

b) a wide range of materials from different sources can enter the marine supply chain from the production, handling and transport systems,

c) various analytical techniques are used to detect specific chemical species with no standardized approach, and

d) in most cases, sufficient data are not available with respect to the effects of any one specific material, or combinations thereof, on the variety of marine machinery systems in service, on personnel or on the environment.

It is therefore not practical to require detailed chemical analysis for each delivery of fuels beyond the requirements listed in Table 1 or Table 2. Instead, a refinery, fuel terminal or any other supply facility, including supply barges and truck deliveries, should have in place adequate quality assurance and management of change procedures to ensure that the resultant fuel is compliant with the requirements of Clause 5.

NOTE The marine industry continues to build on its understanding of the impact of specific chemical species and the respective critical concentrations at which detrimental effects are observed on the operational characteristics of marine fuels in use.

CIMAC

CIMAC Working Group Fuels – WG7

To whom it may concern.

Subject: 2018 marine fuel incidents

The CIMAC Fuels working group consists of experienced stakeholders representing refiners, suppliers, OEMs, ship operators, fuel testing labs, classification societies etc. as listed below.

This statement has been made to update the marine industry on how we, as specialists, see the recent marine fuel incidents that occurred earlier this year.

The Issue

Based on the results of the extensive fuel analyses performed by the various fuel testing labs represented in CIMAC Fuels, ***no final and concrete conclusion can be made as to what specifically in the fuel formulation may have caused these incidents***

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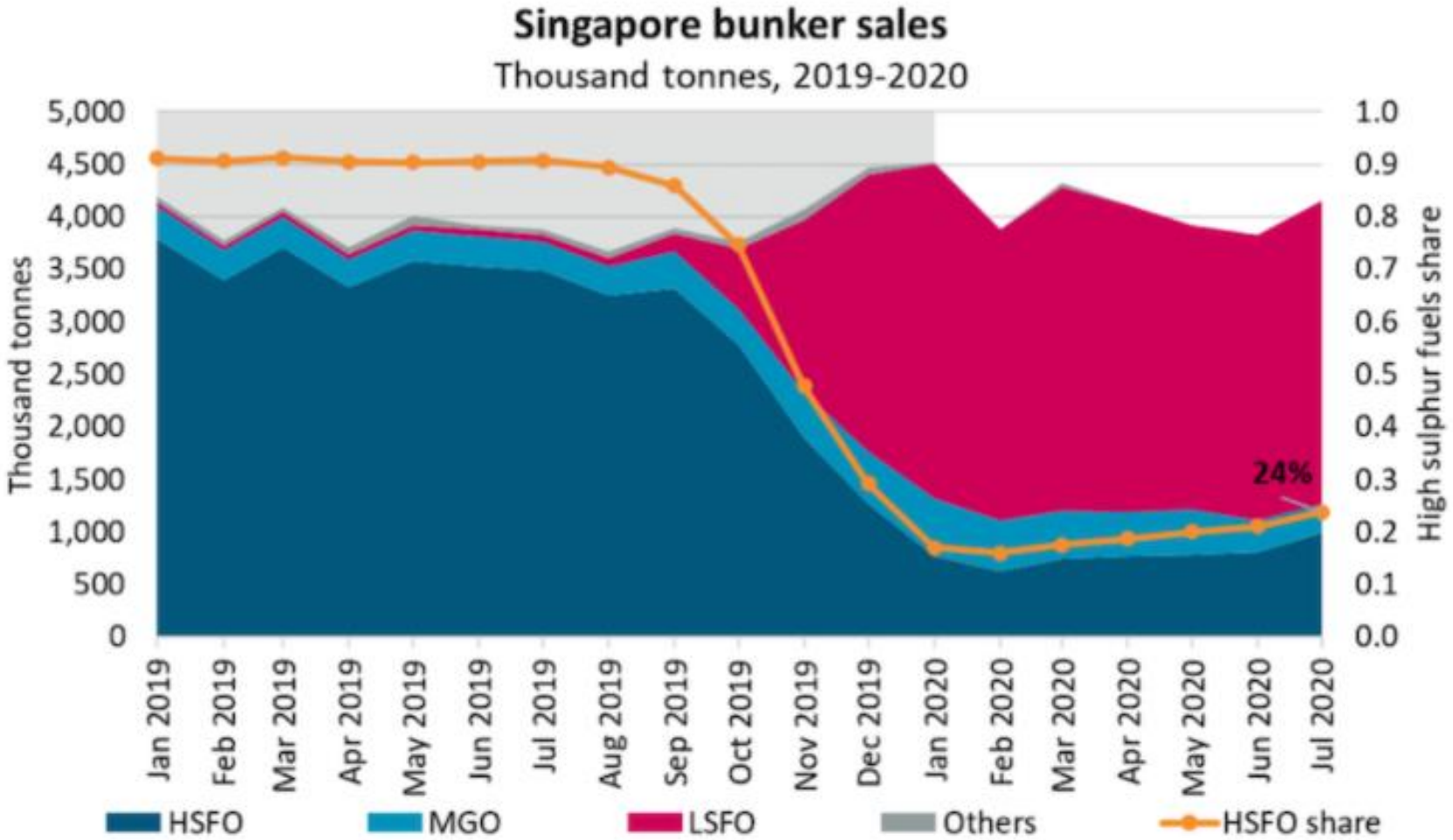
CONCLUSION



Note: July is a preliminary estimate.

Source: BIMCO, Maritime and Port Authority of Singapore

Thank You

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We are one of the largest actors in the bunker fuel and lubricants markets, and with strategic offices across the globe we have a finger on the market pulse every hour of every day.