



SOUTH AFRICAN
MARITIME SAFETY
AUTHORITY

Implementing Sulphur Regulation – Issues, Challenges and Opportunities

Sobantu Tilayi

SAFE SHIPS • CLEAN SEAS



MARPOL Annex VI



- MARPOL Annex VI sets progressively stricter regulations in order to control emissions from ships, including sulphur oxides (SO_x) and nitrous oxides (NO_x) – all which present major risks to both the environment and human health.
- IMO Marine Environment Protection Committee (MEPC) confirmed that the implementation date for the 0.50% maximum sulphur fuel oil under Regulation 14.1.3 of MARPOL Annex VI, will be 01 January 2020.
- The limit for the fuel oils used in the ECA (Baltic, North Sea, North America and US Caribbean) zones remain 0.10% maximum sulphur content.

Global Sulphur Cap

GLOBAL SULPHUR CAP

Sulphur content of fuel permitted
outside Emission Control Areas



Available Compliance Options



Distillates	Distillate fuels such as Marine Gas Oil (MGO) / Marine Diesel Oil (MDO)
Hybrid Blends	<ul style="list-style-type: none">• Specially designed hybrids• Light residual / heavy distillate blends• Desulphurised or sweet heavy residual fuels
Emerging Fuels	<ul style="list-style-type: none">• Methanol• Liquefied Petroleum Gas (LPG)• Stored Energy Hydrogen Fuel Cells and batteries
LNG	<ul style="list-style-type: none">• Liquefied Natural Gas (LNG)• Composed mostly of methane• Vessels installed with gas engines or dual fuel (DF) engines
EGCS	<ul style="list-style-type: none">• Exhaust Gas Cleaning System (Scrubber)



Options & Challenges



OPTIONS	CHALLENGES
Scrubbers	<ul style="list-style-type: none">• Space On Ships• Fuel Cost Differential• Large Investment (capital expense, training cost, maintenance cost)• Waste Disposal
LNG	<ul style="list-style-type: none">• Space On Ships• Range/Route• Fuel Cost Differential• Large Investment• Availability Of Fuel
Low Sulphur	<ul style="list-style-type: none">• Refining Capacity• Value Upgrade• Crude Availability• Refinery Investment
Distillates Hybrid Blends Emerging Fuels	<ul style="list-style-type: none">• Investments• Fuel cost• Availability of Fuel

Options & Challenges



COST

- Retrofitting or installing alternative fuel engine - Between **\$3** million and **\$5** million
- Price differential between low compliant sulphur oil or marine gas oil is estimated to be between **\$200** and **\$600** per tonne more expensive than the heavy fuel oil (Drewry, March 2019).
- Economic and financial viability decision of scrubber installation depends to a great extent on the difference. The higher the difference, the more likely it is for the ship-owner to install a scrubber due to the resulting shorter payback period. It takes **6** to **8** weeks to retrofit vessels with scrubbers
- With the MGO being 55% more expensive than the normal bunker oil, shippers are at a risk of having an emergency bunker surcharge, estimated to be between 15 and 20% more.
- Time Charterers and Owners under Voyage Charter Parties will need to factor in their contracts the above costs, including amongst others, mark-up, levies that might be imposed by ports, cyber security and many factors necessary for compliance.
- It also imply that time charter parties contracts running over the enforcement date will need to be reviewed accordingly. Lastly, this also pose a challenge to vessel operators or owners in determining whether they have to undertake bunker fuel supply term contracts or source in the open spot market.



Options & Challenges



SERVICE DISRUPTION

- Booking a slot for retrofitting (Scrubbers / LNG Tanks) imply that the particular vessel lose at least 2 months of operations as layoff, which is generally a high cost to the ship owner or operator.
- This forces the carriers to reduce their capacity. The carrying capacity on vessels will reduced by almost 2%.
- It will result in an increased number of blank sailing (when a carrier cancels a particular sailing for a vessel).
- The adoption of slow steaming by many, which contributes to less fuel consumption, will increase the voyage times and crewing costs

Options & Challenges



HIGHER SHIPPING RATES AND CONSUMER PRICES

- It is estimated that the cost of shipping lines to comply with the new regulation will increase the freight rates by 10-20%.
- These costs will be transferred to and absorbed by the end user/ consumer. Higher prices will indeed drive inflation.

Options & Challenges



AVAILABILITY OF COMPLIANT FUELS

- Given the low appetite of the shipping companies to install scrubbers and taking into consideration the less developed alternative technology such as LNG, it does indicate that the majority of shipping companies will opt to burning the compliant low sulphur fuel oils.
- However, their dilemma has mostly been of the worldwide availability of these compliant fuels, which may cause service and operational disruptions.
- The above require more planning and organisation for those ships that will be engaging in longer voyages, thereby requiring them to consult suppliers and countries that they will be calling in to verify compliant fuel availability.
- According to McKinsey & Company, the next best source of low sulphur fuel which they expect many shippers to use is marine gasoil.



Options & Challenges



COMPATIBILITY, SAFETY AND QUALITY OF BLENDED LOW SULPHUR FUEL OIL (LSFO)

There are various factors that need to be carefully considered when assessing the safety and usability of the blended fuels oil.

Such properties include amongst others, stability, compatibility and viscosity, which if not properly considered may lead to loss of propulsion and power as well as poor combustion.

- **Stability** can be measured by laboratory analysis of the fuel in order to obtain its sediment potential.

Crew has to establish and verify fuel oil stability before they store or use it in the ship.

It is therefore recommended that only fuels meeting ISO 8217 should be used by ships.

- **Compatibility** is concerned with how two different fuels are able to mix without leading to adverse effects.

Whilst the two may be stable and conform to the ISO 8217, it is critical that they are stored in segregated tanks, thus ensuring minimum commingling.

- **Viscosity** plays a critical role in ensuring optimum combustion.



Options & Challenges



DECISIONS ON OPEN LOOP SCRUBBERS

- The decision by some ports to ban ships from discharging wash water from open loop scrubbing also create a dilemma for the ship owners in whether they should proceed with installing scrubbers or rather switch to the low fuel oil.
- For South Africa, the decision on whether to ban open loop or not, should be influenced by the country's capacity to provide compliant fuel, the availability of reception facilities within the ports and waste disposal. At this moment, it would not make sense to follow the route of those who have took a decision to ban open loop.

Options & Challenges



REFINERS AND SUPPLIERS

- With the transition to low sulphur fuel oil, the Lloyds Register estimate that Refineries, Storage Depots and Physical Suppliers are faced with the possibility of having a surplus, 150 million tonnes of high sulphur residual fuel oil.
- They are therefore faced with the challenge of having to make investment decisions in order to cater for the new dispensation.
- Available options could relate to either upgrading their refiners or look for a new market for their high sulphur content fuels. In the world that is beginning to take climate change seriously, it is unlikely that a new market will be found.
- Some refiners took a decision to invest in coking plants whilst others are monitoring the evolvement of the scrubbers.



Opportunities



- **Refinery Economics**

Refiners have to find the most cost effective way to produce low sulphur fuels, thus providing justification of the large amount of investments required. This requires building capacity in terms of infrastructure, technology and human to take advantage of the opportunity brought by the 2020 deadline. With the world striving for compliance and addressing the climate change targets, it does make business case for refiners to position themselves to deliver the required amounts of cleaner fuel.

- **Low Sulphur Fuel**

Maximising the production of fit for purpose 0.5% sulphur bunker fuels is a top priority to meet growing demands and capture value opportunities.

- **Meet specifications**

Ensuring that low sulphur fuels meet ISO 8217 and regional specification means fit for purpose sulphur fuels can be traded in the most attractive global markets.

- **Reliable Operability**

Keeping ships reliably on water for a longer period is essential, proven bunker fuels additives ensure trouble free ship operation-even at very low temperatures



Opportunities



- The cost of installing scrubbers, maintaining and expenses related to ballast water treatment system may render the older vessels unprofitable to maintain.
- Such costs could result in ship owners opting to renew their fleet with more energy efficient ships and an increased adoption of alternative fuels (LNG) and higher scrapping activities.

Alternative end users of High Sulphur Fuel oil (HSFO). Refiners will need to consider alternative end users, potentially in areas such as power generation and industrial. Some end uses—like substitution against direct crude burn and against coal—may currently be considering fuel oil as an option and could become viable should differentials widen significantly

Low sulphur fuel oil blending. There will be a growth of the 0.50% residual resulting in opportunities for segregating and aggregating material volumes as utilised in the conversion process. This will likely require new commercial agreements and some investment in tankage and logistics.

Refinery Investment. Whilst refinery upgrading is a costly exercise and does take time, much wider differentials should make the investment such as coking quite attractive.

The ship owners now have various options to choose from in dealing with the 2020 regulations. It is up to them to apply their decision making, considering their economic and financial status.



Opportunities



Impact on Insurance Premiums and Charter Parties

Insurers are more concerned about the potential risks that come with the regulation.

- How the alternative fuels will function is of great concern.
- Will the new alternative fuels not damage the ship engines or lead to loss of propulsion?
- Poor bunker quality may negatively affect the ships and create mechanical failures.
- Voyages might become longer or delayed in cases whereby the ship master is unable to get compatible fuel in the port visited.

Enforcement



To comply, there is a need to tackle the issues and challenges.

- Legislation
- Availability of compliant fuels
- Safety of alternative fuels
- Testing facilities
- Reception facilities



THANK YOU!!