

Maritime Issues - Internal regulation on gas emissions: Reflections on the IMO member states' and shipping industry's readiness to comply with the 2020 global sulphur limit

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【概要 : Summary】

While the shipping industry has already to comply with the 0.10% sulphur cap in designated Emission Control Areas (ECAs) since 2015, it will also have to deal with the new global 0.50% sulphur limit in marine fuel from 1 January 2020 onwards. SO_x emissions from ships are expected to decline considerably as the new global sulphur limit will be enforced, to the benefits for human health and the environment. However, the introduction represents a significant challenge for the shipping industry as well as for the port states and the refinery industry. The main challenges are related to the proper supply of compliant fuels with lower sulphur contents, law enforcement and control in port states. According to the International Maritime Organisation (IMO)'s Secretary-General Kitack Lim, collaboration among key stakeholders is essential for the smooth introduction of the new sulphur limit (IMO 2020). Currently, there are various degrees of readiness and preparation visible regarding the implementation of the new sulphur limit. With only two months left for the new global sulphur limit taking effect, all relevant parties, including port and flag states, bunker suppliers and ship owners need to prepare themselves urgently. It is anticipated that, at least initially, most ships will utilize new blends of fuel oil, which meet the new sulphur limit. This report will consider the current level of readiness of the shipping industry and port

states for the upcoming introduction of the new global sulphur limit as of 1 January 2020.

【記事 : Article】

1. Background of the 2020 sulphur limit and IMO's guidance for consistent implementation

About 90% of global trade is moved by approximately 51,000 ships of the world fleet and air pollution originating from maritime transport is of concern as most ships still use heavy fuel oils with high levels of emissions, including SO_x, particulate matter (PM), and nitrogen oxides (NO_x), but also GHG emissions. The standard bunker fuel, Heavy Fuel Oil (HFO), accounts for almost 90% of sulphur emissions globally. The IMO's "International Convention on the Prevention of Pollution from Ships", MARPOL 73/78, the 1997 MARPOL Protocol and the new Annex VI, intends to minimise the airborne emissions of SO_x, NO_x and PM in Sulphur Emission Control Areas (SECAs) and Emission Control Areas (ECAs). Besides the introduction of a sulphur limit of 0.10% of marine fuels in ECAs/SECAs as of 2015, the IMO also decided to limit sulphur content of bunker fuel to 0.50% m/m (mass by mass), at global level in areas outside ECAs as of 1 January 2020, down from currently 3.5%.

The IMO's Marine Environment Protection Committee (MEPC) 74 approved and adopted a comprehensive set of guidance and guidelines to support the consistent implementation of the lower 0.50% sulphur limit of

ships' fuel oil. The 2019 Guidelines were adopted by Resolution MEPC.320 (74), which contains the "2019 GUIDELINES FOR CONSISTENT IMPLEMENTATION OF THE 0.50% SULPHUR LIMIT UNDER MARPOL ANNEX VI". The 2019 Guidelines' main purpose is to ensure that administrations, port states, ship-owners, shipbuilders and fuel oil suppliers use these guidelines to ensure implementation of the 0.50% sulphur limit. The Resolution's appendices contain a standard reporting form for fuel oil non-availability ("Fuel Oil Non-Availability Report (FONAR)". It should be utilised if there is no compliant fuel oil available at a port for ships that have not been fitted with scrubbers, or are not equipped to use alternative fuel such as LNG. However, the submission of a FONAR does not render a ship compliant with the Regulations but rather is a factor that shall be taken into account by a port or flag state when determining what steps to take against a ship for non-compliance.

Furthermore, it is important to implement the sulphur testing and verification with a sensible and uniform approach in order to allow for a standardised treatment of ship operators and bunker suppliers in global maritime transport of all jurisdictions. Therefore, the IMO's 2019 Guidelines also aim at ensuring a consistent implementation of IMO 2020 across port and flag states. The enforcement, compliance and monitoring of the IMO 2020 sulphur limit is in the responsibility of the state parties that have ratified MARPOL and acceded to Annex VI. They are therefore obliged to give effect to, and enforce, its provisions. This includes both flag states, in whose registries ships are flagged, and port states. The port states must enforce the provisions of MARPOL by monitoring vessels within their territorial waters, reporting non-compliance to the relevant flag state, ensuring that there is adequate low sulphur compliant fuel available within their jurisdiction and providing shore-based facilities for the receipt and removal of scrubber waste. Specifically, port states should conduct initial inspections based on documents including Bunker Delivery Notes (BDN), as well as the use of

remote sensing and portable devices.

2. The international shipping industry's propulsion and fuel options

With electric and alternative fuel-ready propulsion systems being still rare or in the early adaptation phase in maritime transport, the new global sulphur limit will put the ship owners and operators at a challenge to choose a compliant propulsion and fuel as of 1 January 2020. The international shipping industry has mainly three choices to lower the sulphur emissions. While a small portion of the 51,000 ships in the global fleet already burns compliant fuel, the remainder will have basically four viable options. The shipping industry will have to choose between continuing using high-sulphur fuel oil (HSFO) at the cost of retrofitting the vessels with an exhaust gas cleaning system (EGCS), e.g. scrubbers, to clean their vessels' emissions on board. Another option would be to switch to using LNG-powered vessels or to retrofit the existing ships with LNG power systems, which might be less viable. The shipping industry could also switch to the utilisation of the more expensive very low-sulphur fuel oil (VLSFO). The final, but only temporary, option could be to obtain a waivers/non-compliance form, Fuel Oil Non-Availability Report (FONAR), in a situation where compliant fuel is not available. However, a FONAR does not render a ship compliant but rather is taken into account by a port or flag state when determining penalties against a ship for non-compliance. Therefore, this is no option to avoid compliance with the new IMO 2020 sulphur limit.

The number of ships with EGCS installed is expected to exceed 4,000 during 2020. In mid 2019, the rate of scrubber installations was at low level, with only 4% of all vessels being scrubber-fitted and ready to be in operation at the beginning of July 2019. However, this figure is expected to rise to 11% and 15% by the end of 2019 and 2020, respectively. Scrubbers are considered being a solution primarily for large ships and the retrofitting costs are estimated between \$2 million and \$6 million for each ship. Although the

retrofitting costs for installing scrubbers are rather high, according to Gibson Shipbrokers, the installation costs in case of very large crude carriers (VLCC) would be repaid in less than one year if the spread between HSF0 and VLSFO is \$350/mt., or in less than 18 months if the spread was \$200/mt. The advantage of EGCS is that scrubber installed vessels are unlikely to be involved in compliance avoidance. Regarding EGCS or scrubbers, there exist open-loop scrubbers, which use seawater to remove chemicals and particulates and the waste is then treated before being discharged into the sea. In closed-loop systems, the water is recycled back into the scrubber. Hybrid scrubbers are a combination of open and closed-loop systems. The IMO regulations do not determine the type of scrubbers to be used but some jurisdictions already banned the use of open-loop scrubbers within their territorial waters, like China, Singapore and Fujairah. Another problem could arise in small or distant ports as these could restrict the availability of HSF0, which would make the utilisation of scrubbers also problematic. It is also uncertain how refineries will reduce their production of such fuels and global supply of HSF0 is expected to shrink.

The most desirable solution seems to be to switching to very low-sulphur fuel oil (VLSFO) that meet the new standard, but in addition to the availability question of VLSFO fuel, some vessel operators have raised concerns over their ship's engines performance when the higher and lower-sulphur fuels are mixed. The IMO is working on providing guidance aimed at proper fuel management practices. In case of VLSFO utilisation, challenges include rising costs as the increased price of fuel as of 2020. The world's two biggest container shipping lines, Denmark's Maersk and Swiss headquartered MSC, stated they face annual extra costs of more than \$2 billion each. Some companies are converting their existing vessel fleet, such as Hapag-Lloyd, which stated it planned to convert 17 vessels to LNG. Maersk also seems to consider to converting existing ships. In mid to long term, it can be expected that the purchase of

LNG-fuelled ships will be an increasingly popular option when end-of life ships need to be replaced by new ships.

According to the Head of Air Pollution and Energy Efficiency at the IMO, Edmund Hughes, the IMO expects that the majority of ships of around 96% of the global fleet, which are flagged by parties from MARPOL Annex VI, will comply with the new requirement. In any case, the ship owners will have to make a strategic choice regarding the utilisation of marine fuel or other alternatives, considering the age of their vessels, trading routes and locational availability of low-sulphur fuels, among others.

3. IMO symposium for considering further preparations for sulphur limit change

The IMO's symposium on the new 2020 global sulphur limit and Alternative Fuels on 17 and 18 October 2019 brought together representatives from member governments, shipping, refineries, fuel oil suppliers and legal professionals, highlighting the need of preparedness of all stakeholders. The symposium aimed at taking stock of the preparations for the new IMO 2020 rule, and to discuss the role of alternative fuels in the decarbonisation of international shipping. The representatives discussed in panel discussions the availability and quality of compliant fuel oil, the shipping industry preparation and guidance and the use of scrubbers and LNG to comply with the 0.50% requirement, among others. According to IMO Secretary-General Kitack Lim, the collaboration among key stakeholders is essential when introducing the new global sulphur limit. Representatives of some member states, including Denmark, Japan, Marshall Islands and Singapore, underlined their flag and port states' readiness to implement and enforce the sulphur 2020 limit. Regarding the supply of the new fuel oil needed to meet the 2020 limit, representatives from IPIECA, the global oil and gas industry association representing the oil and gas industry, and IBIA, the International Bunker Industry Association representing the bunker industry, confirmed that supply of the low sulphur

fuel oil was expected to be readily available in most locations and is already available in some countries, as many ships will be looking to load compliant fuel oil well before the end of 2019. However, there was an expectation of price volatility and supply and demand would have to find a new balance, which could take time. A representative from the International Standardization Organization (ISO) outlined the recently issued standard ISO/PAS 23263:2019, which addresses quality considerations that apply to marine fuels in view of the implementation of the sulphur 2020 limit and the range of marine fuels that will be placed on the market. The IMO's Director of Marine Environment Division Hiroyuki Yamada reiterated the importance of cooperation among all stakeholders and encouraged member governments, shipping, refinery, fuel oil supply and relevant industries, as well as charterers, to finalize their preparations for IMO 2020.

The International Chamber of Shipping (ICS)'s Deputy Secretary-General Simon Bennett stated that the ship owner organisation was confident that IMO 2020 would be a success, despite the enormity of such a regulatory change, which has never been attempted before on a global scale. ICS Guidance is intended to help shipping companies to prepare, including ship specific Implementation Plans, Port State Control should apply a "common sense" approach during the early stage of the IMO 2020 implementation.

4. Jurisdictional approaches and the states' enforcement efforts

A number of countries have not ratified MARPOL Annex VI including Argentina, Bahrain, Colombia, Ecuador, Egypt, Hungary, Israel, Mexico, Oman, Pakistan, Qatar, Thailand and Venezuela. Instead, other countries that have ratified Annex VI have not yet adopted appropriate legislation to give effect to their obligations.

China has already implemented a 0.50% sulphur cap within its designated emission control areas and ships can use closed-loop scrubbers or other alternative means to meet the emission control

requirements. From 1 January 2020, oceangoing ships will be required to use low sulphur content fuel not exceeding 0.1% m/m when entering China's inland water ECA and stricter sulphur limits will also be imposed on ships entering other Chinese ECAs over the next few years. Furthermore, the United States has already implemented a 0.1% sulphur cap within its ECA and accordingly ships calling at US ports should already be accustomed to a significantly stricter sulphur limit than the new global IMO 2020. The Maritime and Port Authority of Singapore (MPA) has indicated that Singaporean and foreign-registered ships calling at Singapore will be selected for inspection based on a risk matrix that takes into account the compliance option of the ship and whether a FONAR has been submitted. As a signatory to MARPOL and Annex VI, also Indonesia stated to enforce IMO 2020 limits in respect of both Indonesian and foreign-flagged ships.

Regarding the states introducing the IMO 2020, they have to be prepared to control the compliance of the fuel used on ships. Some member states, including Denmark, Japan, Marshall Islands and Singapore, underlined their readiness as flag and port states readiness to implement and enforce the sulphur 2020 limit. The port states have to investigate reports of non-availability and to report non-availability of compliant fuel oils and terminals to the IMO. The IMO 2020 states must determine what civil and possibly criminal penalties will be imposed on non-compliant ships. Ships that have been fitted with open-loop scrubbers need to be aware of the risk that they may not be permitted to operate these within the territorial waters of certain port states, while flag and port states must ensure adequate publication of their specific requirements so that ships can ensure timely compliance. Furthermore, they will need to ensure that they will be able to procure compliant bunkers in those jurisdictions, while port states will need to ensure that they have adequate inspection and testing protocols in place and port facilities to receive scrubber waste residues. State parties that have not yet adopted legislation to meet their IMO 2020 obligations might need to act rapidly.

5. Fuel suppliers prepare for increased VLSFO demand

Supply of very low sulphur fuel oil meeting the 0.50% sulphur limit (VLSFO) has been announced with increasing frequency, in particular since late September 2019. Meanwhile, the BP and Royal Dutch Shell announced to have begun producing IMO 2020 compliant fuels. Furthermore, the Finnish refiner Neste has partnered with German bunker firm BMT for the sale and distribution of Neste's new 0.5% sulphur marine fuel from Bremerhaven, northern Germany. The IBIA, representing the bunker industry, expects other large European ports such as Piraeus and Kali Limenes in Greece and Genoa, Italy to follow with more production toward the end of 2019.

IBIA's Director, Unni Einemo, stated that the "IMO 2020 effect" is now causing market disruption as the bunker industry prepares for the global low sulphur rule. VLSFO is already available in various locations across Asia, Middle East, Africa and the Americas as of mid-October with more and more becoming available, either during October or during November/December 2019. Most regions have 0.5% fuel oil on offer in at least some ports, and 0.1% sulphur marine gasoil (MGO) is available almost everywhere. According to IBIA, the market disruption caused by the transition to IMO 2020 is evident and the supply of high sulphur fuel oil (HSFO) is reduced while preparations for storing low sulphur fuels increase. Moreover, barges that have been carrying HSFO are being readied for supplying VLSFO or marine gasoil (MGO). Most suppliers have focused on providing VLSFO to meet demand for compliant fuels in 2020, but explained that some suppliers and locations will only offer MGO, which is a product typically meeting the 0.10% sulphur limit that applies in ECAs.

According to IBIA, IMO-compliant fuel is increasingly selling in Singapore and Fujairah, the two biggest bunkering ports, and at smaller ports in China, Japan, South Korea, Columbia and Brazil. In northwest Europe, 0.5% fuel oil is available in the Amsterdam-Rotterdam-Antwerp (ARA) hub, at Skaw in Denmark, at Gothenburg in Sweden, at Hamburg in

Germany, in the Baltic Sea and at English Channel ports. In southern Europe, Las Palmas, Algeciras and Barcelona in Spain, Gibraltar and Malta, some Italian ports, Istanbul and Novorossiysk have also a supply of 0.5% sulphur limit compliant fuel oil. Between 5-15% of marine fuel demand is now for 0.5% sulphur product in certain ports. However, actual VLSFO demand has so far not been as high as anticipated. Suppliers think this is because ship operators who initially signalled that they wanted to start bunkering VLSFO from October are now postponing their purchases into November/December. Furthermore, the reduced supply capacity for HSFO comes at a time when shipping still needs this fuel type and this has caused a tightening of prompt supply of HSFO in some markets. Although IBIA expects a continuation of HSFO supply in major ports, a few locations will have limited to no availability of HSFO. Accordingly, for some time, these changes in the market will cause disruption and more volatility than usual and the availability of both compliant fuels and HSFO could be rather unpredictable, as the transition to IMO 2020 continues.

6. Conclusion

The new sulphur standards were adopted by the IMO by setting the global sulphur limit of 3.5% in 2012, and 0.5% in 2020. Since the international shipping will soon have to fully comply with the new 0.5% sulphur limit or face fines, all preparations should be at their conclusion right now, as the "transition" period in reality will end on 31 December 2019. As recommended by IMO, it is particularly important that shipping companies prepare their ships, while fuel suppliers need to prepare for an increasing demand of VLSFO while HSFO supply still plays a role, as currently shipping still needs a rather high supply of this fuel type until the end of the year. The transition period could be challenging as the changes in the market might cause some bottlenecks in the supply of the one or the other fuel type, while full compliance to the new sulphur limit will be obligatory from 1 January 2020.

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