

A Study on the Regulation and Countermeasure of Sulfur Content in Marine Fuel Oil

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Key Words : Eco-Friendly Fuel Oil, Low Sulphur Fuel, SOx, SOx Scrubber, SECA, Eco Friendly Ship.

1. Introduction and Objective

The International Maritime Organization (IMO) has decided to adopt an eco-friendly regulation that will reduce the sulfur oxides (SOx) emission ceiling of vessels from the current 3.5% to 0.5% by 2020.

In order to comply with these strengthened regulations, shipping companies must use eco-friendly fuels such as low-sulfur diesel or install additional sulfur reduction equipment in the ship, which leads to an increase in cost.

In this research, as a countermeasure accompanying regulation of discharge of sulfur oxides of ships, We analyzed that the problems caused based on the use of environmentally friendly fuel oil and sulfur oxide reduction equipment and examined effective countermeasures.

2. Method of Study

In this study, we investigated and analyzed the ship accident report provided in each country's classification concerning the definitions and attributes of environmentally friendly fuel, and the problem of fuel oil used in the current ship.

In addition, Recent data on trend of SOx emission control area (SECA) through the recent trend of IMO was analyzed through systematic review.

3. Results and Discussion

Low sulfur fuel oil is typically used as a fuel that is environmentally friendly and can minimize environmental pollution caused by the exhaust emitted from the ship. However, even when low sulfur fuel oil is used from ships, problems arise due to fluid properties such as low lubricity, flash point, ignition delay, etc. In order to solve these problems, it is inevitable to install equipment in the ship but, the initial cost is

quiet high. In addition, low sulfur fuel oil itself is more than twice as expensive as high sulfur fuel oil, and it is proved to be problematic in use. Another concept to reduce sulfur oxides is to install SCRUBBER to reduce SOx emissions from high sulfur fuel oil. Also there is a method of introducing a ship of LNG propulsion, but it was also found that there was a limit in initial installation cost. After 2020, the control of sulfur oxides in the general seas is limited to 0.5% m / m. There are SECA and ECA areas in typical sulfur oxide control areas to which more enhanced standards are applied, and the concentration of sulfur oxides in the exhaust gas here is limited to 0.1% m / m. At present, China and Korea Pusan Port are also devised new regulations on sulfur oxide control. Therefore, we need to prepare countermeasures for this immediately.

As described above, several methods for reducing the amount of sulfur oxides in the exhaust gas caused by the ship have been proposed and used. But In the case of large shipping company such as MAERSK, it was analyzed that the use of low sulfur fuel oil was the most frequently chosen considering the cost aspect of these methods.

4. Conclusion

The results of this research seems to be useful for grasping the scale of country support for initial costs for shipping company should be borne by the enhanced sulfur oxide regulation. In addition, it is supposed that it can be used as a basic material for revising domestic related laws that require amendment compared to the strict international standards.

It is also expected to be useful for research on eco-friendly ships such as electric propulsion ships, P.H.E.S. (Plug-in Hybrid Electric Ship), and LNG carriers, which are discussed as substantive countermeasures in the future environmental policy.

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