Experimental Investigation for Reducing Emissions in Maritime Industry

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Abstract: Shipping transportation is the foremost imperative mode of transportation in universal coordination. At display, more than 2/3 of the full worldwide exchange volume accounts for shipping transportation. Ships are utilized as an implies of marine transportation, introducing large-power diesel motors with exhaust containing nitrogen oxide NOx, sulfur oxide SOx, carbo di-oxide CO₂, particular matter PM10, hydrocarbon HC and carbon mono-oxide CO which are the most dangerous contaminants found in exhaust gas from ships. Ships radiating a large amount of exhaust gases have become a significant cause of pollution in the air in coastal areas, harbors and oceans. Therefore, IMO (the International Maritime Organization) has established rules to reduce this emission. This experiment shows the measurement of the exhaust gases emitted from the Aida IV ship's main engine using marine diesel oil fuel (MDO). The measurement is taken by the Sensonic2000 device on 85% load, which is the main sailing load. Moreover, the paper studies different emission reduction technologies as an alternative fuel, which as liquefied natural gas (LNG) applied to the system and reduction technology which is represented as selective catalytic reduction technology added to the marine diesel oil system (MDO+SCR). The experiment calculated the amount of nitrogen oxide NOx, sulfur oxide SOx, carbon-di-oxide CO₂, particular matter PM10, hydrocarbon HC and carbon mono-oxide CO because they have the most effect on the environment. The reduction technologies are applied on the same ship engine with the same load. Finally, the study found that MDO+SCR is the more efficient technology for the Aida IV ship as a training and supply ship due to low consumption and no need to modify the engine. Just add the SCR system to the exhaust line, which is easy and cheapest. Moreover, the differences between them in the emission are not so big.

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