

## EXECUTION STRATEGY FOR SCRUBBER RETROFITS

**Objective:** Scope of the paper is to make ship-owners aware of the requirements of SOx regulations and illustrate various strategies that can be adopted to ensure compliance. The paper will showcase the correct methodology for scrubber retrofits, identify the pitfalls in way of the retrofit process from equipment selection till commissioning, identify the prominent technologies in the market and discuss their suitability for various kind of vessels.

**Methods/Procedures/Process:** This paper has been prepared based on an exhaustive study of rules and regulations put in various flag states and regulatory bodies. Based on the comparative study, a detailed set of rules and regulations have been prepared and compliance strategies have been outlined. Also, the paper critic the existing technologies in the market and looks at their respective advantages and disadvantages in terms of technological feasibility and capital and operational costs.

**Results/Observation/Conclusions:** The paper will demonstrate that compliance with SOx convention can be achieved by various methodologies which may or may not involve installation of a scrubber. The paper shows that vessel owners have to take into account the universal guidelines put by IMO as well the local guidelines put by flag stage for SOx requirements and devise a strategy such that both compliances are achieved with minimum operational and structural changes. At the same time, the paper will also provide a framework for equipment selection taking various factors into account. The paper observes that there are various unique equipment available in the market and asset owners should take multiple factors into account for their decision making.

**Novel Information:** Newly approved SOx guidelines have rattled the marine community. The guidelines are clear for ocean going vessel such as bulk carrier, tankers, container ships etc. However, various coastal guidelines put by flag states complicate the matter further. This paper provides a comparative study of such guidelines and educates the asset owners on various requirement. Such kind of comparative study has not been done on such a scale and the paper will provide unique insights regarding this. Also, the paper provides a very good study of more than 10 types of equipment available in the market and provides a very useful and practical tool for selection of ballast water treatment equipment.

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