

Correlation between Fuel Consumption and Voyage Related Ship Operational Energy Efficiency Measures: An Analysis from Noon Data

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Abstract : Fuel saving has become one of the most important issue for shipping in terms of fuel economy and environmental impact. Lowering fuel consumption is possible for both new ships and existing ships through enhanced energy efficiency measures, technical and operational respectively. The limitations of applying technical measures due to the long payback duration raise the potential of operational changes for energy efficient ship operations. This study identifies operational energy efficiency measures related voyage performance management. We use 'noon' data to examine the correlation between fuel consumption and operational parameters- revolutions per minute (RPM), draft, trim, (beaufort number) BN and relative wind direction, which are used as measures of ship energy efficiency. The results of this study reveal that speed optimization is the most efficient method as fuel consumption depends heavily on RPM. In conclusion, this study will provide ship operators with the strategic approach for evaluating the priority of the operational energy efficiency measures against high fuel prices and carbon emissions.

Keywords : ship, voyage related operational energy Efficiency measures, fuel consumption, pearson's correlation coefficient

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