

UNIVERSITI TEKNOLOGI MARA

**A DECISION MAKING MODEL FOR
ASSESSING THE INFLUENCE OF
STEAMING SPEED ON THE
REVENUE PERFORMANCE OF
TANKER ON TIME CHARTER**

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ABSTRACT

Transporting cargo by maritime transportation has been met with uncertain conditions that have influenced not only the movement volumes but also the expenditure cost and revenues. Therefore, speed reduction has been used as a strategy to solve this problem, particularly for the container and tanker sectors. Accordingly, studies related to speed reduction have increased rather vastly and have involved various pertinent aspects, such as the economic model and environmental impact. However, among these studies, none has looked into the benefits of speed reduction for small-sized vessel, particularly from time charter perspective and from the consideration of short-haul trading routes. The current study addresses this issue through a number of real-test cases and the Malaysian petrochemical industry was chosen as the subject matter. The objectives of this study are to (1) identify the factors that affect the revenue performance of tanker on time charter, (2) analyse the impact of the contributing factors on the revenue performance of tanker on time charter, (3) evaluate the impact of implementing speed reduction on the revenue performance of tanker on time charter, and (4) develop a decision-making model that is most suitable for tanker on time charter. In meeting the objectives, the Bayesian Networks (BN) was adopted to assess the revenue performance of tanker on time charter. The proposed framework, which was successfully evaluated, illustrates the dependency among the variables. A combination of various decision-making methods was applied; the Analytic Hierarchy Process (AHP) and the Technique for Order Performance by Similarity to Ideal Solution (TOPSIS) were adopted to determine the most suitable level of steaming speed. Results from the analyses indicated that the revenue performance of tanker on time charter performed better by sailing at low speed than in full speed. The developed decision-making model also showed that the Extra Slow Steaming Speed (ESSS) is an ideal strategy that can maximise the revenue performance of tanker on time charter. As a conclusion, the developed model can be used by industry practitioners as a tool and guideline that allows parameters to be added and dropped at any time without affecting the backbone of the model.

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