DESIGNING INVENTORY SHIP ROUTING PROBLEM MODEL WITH THE CONSIDERATION OF PRODUCT COMPATIBILITY AND COMPARTMENT WASHING BASED ON DISCRETE SIMULATION

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ABSTRACT

This research discusses inventory ship routing problem with the considerations of product compatibility and compartment washing to decide route and schedule for the tanker ship with several compartments. The goal of this research is to identify the impact of product compatibility and compartment washing towards ship route, product combination inside the compartments, travel time, and total cost incurred by keeping stock level inventory in each consumption station inside the planning horizon.

This research considers product compatibility and compartments washing. In this research, a ISRP model with 4 scenario is developed, which are Grouping Product Without Compatibility, Non Grouping Product Without Compatibility, Grouping Product With Compatibility, & Non Grouping Product With Compatibility. This model is developed using Arena 13.5 and VBA (Visual Basic Application) software.

From the numeric test, two conclusions were made. First, the model simulation of grouping product with compatibility and non grouping product with compatibility which was designed to fulfill compatibility limitations generates a lower total cost when compared with no compatibility and compartment washing. Second, with the washing compartment does not significantly influence the resulting costs, just allow only one compartment to fill different kinds of products in each shipment. The numeric test also informs that the visit time limitation causes increasing charter cost.

Keywords: Inventory Ship Routing Problem, Simulasi Diskret, Grouping Product Without Compatibility, Non Grouping Product Without Compatibility, Grouping Product with Compatibility, Non Grouping Product With Compatibility.
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