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A Two Stage Stochastic Mathematical Model for the Tramp Ship Routing with Time Windows Problem

Authors : Amin Jamili

Abstract : Nowadays, the majority of international trade in goods is carried by sea, and especially by ships deployed in the industrial and tramp segments. This paper addresses routing the tramp ships and determining the schedules including the arrival times to the ports, berthing times at the ports, and the departure times in an operational planning level. In the operational planning level, the weather can be almost exactly forecasted, however in some routes some uncertainties may remain. In this paper, the voyaging times between some of the ports are considered to be uncertain. To that end, a two-stage stochastic mathematical model is proposed. Moreover, a case study is tested with the presented model. The computational results show that this mathematical model is promising and can represent acceptable solutions.

Keywords : routing, scheduling, tram ships, two stage stochastic model, uncertainty
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