Two-Stage Production with Unreliable Machine and Finite Working Hour Capacity

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Abstract

A mathematical model of the two-stage production plan with the considerations of finite obtainable working hour capacity and unreliable machines for each stage is proposed in this paper. It is useful to evaluate a firm's capability of accepting a new order or not. This study suggests that the due-date of the production, maintenance cost of an unreliable machine, and the order quantity should be taken into considerations. Sensitivity analysis for the key variables of optimal solution is also presented. This paper efficiently provides a dynamic updating tool capable of revising the production plan (rate) at any time for the production planner with profound insight.

Keywords: Production Plan, Working Hour Capacity, Unreliable Machines, Maintenance Cost, Production Rate.