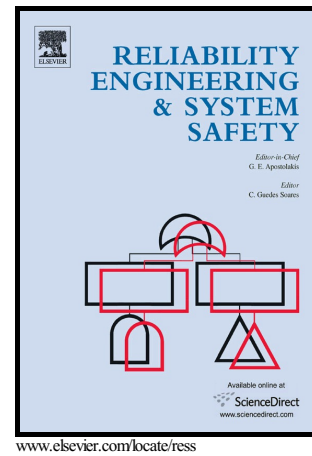


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# Optimal Repairable Spare-Parts Procurement Policy under Total Business Volume Discount Environment

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## Abstract

In asset intensive fields, where components are expensive and high system availability is required, spare parts procurement is often a critical issue. To gain competitiveness and market share is common for vendors to offer Total Business Volume Discounts (TBVD). Accordingly, companies must define the procurement and stocking policy of their spare parts in order to reduce procurement costs and increase asset availability. In response to those needs, this work presents an optimization model that maximizes the availability of the equipment under a TBVD environment, subject to a budget constraint. The model uses a single-echelon structure where parts can be repaired. It determines the optimal number of repairable spare parts to be stocked, giving emphasis on asset availability, procurement costs and service levels as the main decision criteria. A heuristic procedure that achieves high quality solutions in a fast and time-consistent way was implemented to improve the time required to obtain the model solution. Results show that using an optimal procurement policy of spare parts and accounting for TBVD produces better overall results and yields a better availability performance.

*Keywords:* Reliability, Repairable Spare Parts, Line Replaceable Units, Business Volume Discount, Inventory Policy

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