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Optimal Production and Maintenance Policy for a Partially Observable Production System with Stochastic Demand

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Abstract : In this paper, the joint optimization of the economic manufacturing quantity (EMQ), safety stock level, and condition-based maintenance (CBM) is presented for a partially observable, deteriorating system subject to random failure. The demand is stochastic and it is described by a Poisson process. The stochastic model is developed and the optimization problem is formulated in the semi-Markov decision process framework. A modification of the policy iteration algorithm is developed to find the optimal policy. A numerical example is presented to compare the optimal policy with the policy considering zero safety stock.

Keywords : condition-based maintenance, economic manufacturing quantity, safety stock, stochastic demand
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