Joint optimization of condition based maintenance and spare part inventory for two component system

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Abstrak

ABSTRACT
The joint optimization of condition-based opportunistic maintenance and (0,1)-type spare part inventory policy is investigated for a two-component system. Deterioration state-space partitioning (DSSP) of the observed state and the spare part inventory state is developed to analyze all the possible maintenance requirements of the system and calculate the probabilities of the actual maintenance activities with the restriction of the inventory state, as well as the probabilities of ordering and holding of spare parts. An expression of the stationary law of the joint state and its numeric solution are deduced based on an analysis of all the possible transitions of the joint state during an inspection cycle. Further, an expected long-run cost rate model of the operation of the system under the proposed policy was developed to determine the optimal joint strategy which involved a semi-regenerative process theory. Finally, numerical experiments were performed.