ON THE INTEGRATED PRODUCTION AND PREVENTIVE MAINTENANCE PROBLEM
IN MANUFACTURING SYSTEMS WITH BACKORDER

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ABSTRACT
The integrated production, inventory and preventive maintenance problem (PIPMP) is concerned with coordinating production, inventory and preventive maintenance operations in order to meet customer demand with the aim of minimizing costs. A unified framework is developed allowing production and preventive maintenance to be jointly considered using an age-dependent optimization model, itself based on the minimization of an overall cost function; this cost function for its part includes inventory holding, backlog, and preventive and corrective maintenance costs. We provide optimality conditions for more realistic manufacturing systems and use numerical methods to obtain the optimal preventive maintenance policy and the relevant age-dependent or multiple-threshold-levels production policy, which we refer to as the multiple threshold levels hedging point policy. Numerical examples are included to illustrate the importance and the effectiveness of the proposed methodology.

Keywords: Preventive maintenance, Buffer inventory, Backorder, Reliability theory, Manufacturing Systems.
REFERENCES