

A New Mathematical Model for Scheduling Preventive Maintenance and Renewal Projects of Multi-Unit Systems; Application to Railway Track

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Abstract : We introduce the preventive maintenance and renewal scheduling problem for a multi-unit system over a finite and discretized time horizon. Given the latest possible time for carrying out the next maintenance and renewal projects after the previous ones and considering several common set-up costs, the introduced scheduling model tries to minimize the cost of projects by grouping them and simultaneously finding the optimal balance between doing maintenance and renewal. We present a 0-1 pure integer linear programming that determines which projects should be performed together on which location and in which period (e.g., week or month). We consider railway track as a case for our study and test the performance of the proposed model on a set of test problems. The experimental results show that the proposed approach performs well.

Keywords : maintenance, renewal, scheduling, mathematical programming model

Conference Title : ICMIMR 2015 : International Conference on Modelling in Industrial Maintenance and Reliability

Conference Location : Istanbul, Türkiye

Conference Dates : July 29-30, 2015