

The Preventive Signaling Maintenance Crew Scheduling Problem for European Railway Traffic Management system (ERTMS) - DTU Orbit (08/11/2017)

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A railway system is a large and complex infrastructure, which requires continuous maintenance in order to function correctly. Proper maintenance is critical but can also be costly. In this paper we consider the practical case of planning the preventive maintenance of railway signals in Jutland, the western part of Denmark. This case is particularly interesting, since the entire railway signalling system is currently being upgraded to the new European Railway Traffic Management System (ERTMS) standard. The new signals need continuous maintenance and in this article we plan the distribution of crew and also schedule their daily tasks. We formulate the problem as a multi depot vehicle routing problem with time windows and synchronization constraints, in a multi-day time schedule. We solve the problem for large realistic instances by introducing a constructive stage-wise algorithm. Experimental results indicate that the proposed approach can generate feasible initial solutions and schedule up to 1000 tasks for 8 crew members as a monthly plan, in an efficient computational time.

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