

Assignment of Airlines Technical Members under Disruption

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Abstract : The Crew Reserve Assignment Problem (CRAP) considers the assignment of the crew members to a set of reserve activities covering all the scheduled flights in order to ensure a continuous plan so that operations costs are minimized while its solution must meet hard constraints resulting from the safety regulations of Civil Aviation as well as from the airlines internal agreements. The problem considered in this study is of highest interest for airlines and may have important consequences on the service quality and on the economic return of the operations. In this communication, a new mathematical formulation for the CRAP is proposed which takes into account the regulations and the internal agreements. While current solutions make use of Artificial Intelligence techniques run on main frame computers, a low cost approach is proposed to provide on-line efficient solutions to face perturbed operating conditions. The proposed solution method uses a dynamic programming approach for the duties scheduling problem and when applied to the case of a medium airline while providing efficient solutions, shows good potential acceptability by the operations staff. This optimization scheme can then be considered as the core of an on-line Decision Support System for crew reserve assignment operations management.

Keywords : airlines operations management, combinatorial optimization, dynamic programming, crew scheduling

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