

Optimization and coordination of hangar maintenance activities for airlines in MRO industry

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Abstract

Periodic aircraft maintenance overhaul and repair (MRO) ensures the airworthiness and safety in aviation industry. The rapid growth of air transport and the increasing trends of outsourcing MRO create more challenges to MRO industries. Airline companies start to outsource their aircraft heavy MRO operations to independent aircraft maintenance providers to maintain a minimal overall maintenance cost while conforming to the maintenance requirements regulated by the aviation authorities. From the perspective of maintenance service provider, efficiently fulfilling the maintenance requests initiated from different airlines is a critical operation issue. Hangar space and licensed engineers are two significant maintenance resources in carrying out the maintenance planning. To develop a maintenance schedule, the planner needs to specify the service time; respective parking position; and respective licensed engineers for each aircraft. The overall objective of this research project is to develop a maintenance planning decision support methodology aims to deliver an integrated solution from the Operations Research's aspect. While modelling the optimization problem, the impact of aircraft's irregular shapes; and the effects of blocking in assigning parking position shall be taken into considerations. This keynote speech introduces the methodology of problem modelling in two stages, including the modelling of irregular aircraft shapes to utilize the hangar space; and movement blocking by parking position assignment. Moreover, how the iterative amendments of mathematical models manage to align with the realistic operations by practitioners will also be discussed afterwards.

Keywords: Aircraft maintenance scheduling, hangar parking layout planning, movement operations, aircraft heavy maintenance.