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Planning helicopter logistics in disaster relief. (English) Zbl 1231.90281

Summary: This paper describes an efficient planning system for coordinating helicopter operations in disaster relief. This system can be used as a simulation tool in contingency planning for better disaster preparedness and helps to generate plans with estimated data. The proposed system consists of a mathematical model and a route management procedure (RMP) that post-processes the outputs of the model. The system is concerned with helicopter operations that involve last mile distribution and pickups for post-disaster medical care and injured evacuation. Delivering items such as medicine, vaccines, blood, i.v., etc. to affected locations, and evacuating injured persons from these locations comprise the transportation tasks to be performed by helicopters. The proposed modeling system accommodates the special aviation constraints of helicopters and it can handle large scale helicopter missions. The goal of the system is to minimize the total mission time required to complete the transportation task. The RMP enables the decision maker (DM) to specify either the mission completion time or the number of vehicles available for the mission. Respecting the limitations imposed by the DM, the RMP generates fuel and capacity feasible helicopter itineraries that complete within the specified mission completion time. A scenario that is based on the post-earthquake damage data provided by the Disaster Coordination Center of Istanbul is used for testing the method.

MSC:
90B90 Case-oriented studies in operations research
90B70 Theory of organizations, manpower planning in operations research

Keywords:
helicopter operations planning; disaster relief; last mile distribution and pickup; medical aid; evacuation

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References:


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