

Optimal location for storing electrical generators to provide effective crisis management

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Abstract— The inner regions in the Republic of Slovenia are often affected by sleet and freezing rain. Natural disaster from 2014 shows huge natural and social damage that amounted up to millions of euros. Electrical issues and other damages encouraged EU members to send electrical generators and perform aid to damaged regions. Generators were sent to a warehouse in Logatec, which represented a spot for further distribution to crisis areas. In the contribution the aim is to find the optimal location for a warehouse that will support distribution during natural disasters. Furthermore with the optimal location we would like to achieve timely efficient distribution and therefore provide an effective crisis management with the aim to prevent loss of life and resources. Modelling approach considers the geographical positions of affected municipalities and by the use of multidimensional optimization methods, i.e. Hook Jeeves method and Nelder-Mead simplex method, seeks for the optimal location, where the distance travelled or time spend to reach the affected area is minimized. Furthermore two heuristics for solving travelling salesman problem, i.e. Nearest neighbor and Arbitrary insertion, are used to compare the results of used Euclidean distances and road distances between the observed municipalities. We expect that optimal location will be in the vicinity of Postojna, hence it is placed in the center of affected and analyzed area.

Key words— location problem, effective crisis management, timely efficient distribution, multidimensional optimization method.

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