

Malinowski, P. Structure Proposed for the Evolutionary Algorithm Enabling Optimization of Pumping Costs for Water Distribution Networks. *Ochrona Srodowiska* 2011, Vol. 33, No. 2, pp. 59–63.

Abstract: A method is described, which enables the costs of pumping in water distribution networks (water-pipe network, heat distribution network) to be optimized effectively in economic terms under the operating conditions required. Considering the complexity of traditional optimization methods and the time-consuming computations involved, an evolutionary algorithm has been proposed to cope with this problem. With this algorithm a modified network model can be obtained, which differs from the input model in that it incorporates a given number of pumps and their technical characteristics. The defined pump installation points, as well as the technical characterization of the pumps, make it possible to reduce the feeding pressure required, without exceeding the limit values (minimal and maximal) of water pressure in the network. The analysis is presented taking a municipal heat supply system of choice as an example. The structure proposed for the evolutionary algorithm permits the optimal location of the pumps in the heating system to be determined. The calculated results substantiate the possibility of reducing the water pumping costs in a heat supply system.

Keywords: Water distribution network, heat distribution network, pumping costs, optimization.