

Tchorzewska-Cieslak, B. A Fuzzy Model for Failure Risk in Water-pipe Networks Analysis. *Ochrona Srodowiska* 2011, Vol. 33, No. 1, pp. 35–40.

Abstract: To perform reliable risk analyses and assessments regarding failure modes and effects in water-pipe networks, it is necessary to have access to a comprehensive database. A major problem in failure risk analysis is the uncertainty of the operating data required both for statistical analysis and cause-and-effect assessment. This paper presents a model for the analysis of failure risk in a water-pipe network (according to the definition including the probability of failure occurrence and consequences). The data uncertainty problem was considered using the theory of fuzzy sets. Fuzzy modeling of risk enables the application of Adaptive Neuro-Fuzzy Inference Systems (ANFIS) and can be combined with conventional methods of risk analysis. Risk analysis using fuzzy logic is not a standard solution. The model proposed in this paper may constitute a part of a complex model for failure risk management of a water-pipe network, and may be of practical use to the operator of a water distribution system.

Keywords: Water-pipe network, risk, failure, fuzzy logic.