

## **AUTOMATIZATION OF DAMAGE SEARCH IN THE NETWORK OF ELECTRICAL SUPPLY BASED ON NONLITHUAL LOGIC**

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Currently, in Ukraine, overhead power lines have almost double the lifetime and require urgent reconstruction and modernization. Reliability of electrical systems is mainly determined by the trouble-free operation of transmission lines, the main part of which is the distribution networks 6-35 kV.

Despite the improvement of the design of electric power lines and electric vehicles, emergency damage in the power supply systems is inevitable. Damage to power lines leads to a violation of the operating modes of power units and to the fact that consumers do not receive the required amount of electricity.

The most common type of damage in distribution networks is single-phase ground faults, which end with the breakdown of insulation in its weakened areas. The damage occurs as a rule due to the aging of the insulation, therefore, until now, the actual task of ensuring an effective control of the state of isolation, as well as timely detection and elimination of defects remains relevant.

The purpose of the study is to evaluate the possibility of using fuzzy control methods for damage in the power supply network.

In connection with this goal, the problem was solved, which consisted in the development of an expert system that would be implemented as a fuzzy output system and would allow to determine the place of malfunction in the power supply network on the basis of data received from the hydro meteorological service.

To solve the problem, elements of the theory of fuzzy sets, the concept of a linguistic variable, fuzzy conclusions, methods of mathematical programming, and numerical methods of analysis with the use of computer technology were used.

The system provides additional information on the location of damage to the transmission lines, and also allows you to determine the optimal route of the operational-departure brigade, which reduces the time of finding damage and, accordingly, lack of electricity to consumers.

If a signal has been received about the breakdown of the transmission line, with what the protection device most often operates, indicating which line is damaged, then by entering the data received from the hydrometric center, it is possible to determine approximately at what stage it happened.

The application of fuzzy logic does not offer the complete refusal to use expensive means of determining the places of damage, but allows you to refine and speed up the search process without much cost to it.