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Analysis of Electrical Safety Conditions Taking into Account Soil Conductivity Determined on the Basis of Fuzzy Logic

Автор:: Manusov, VZ (Manuzov, V. Z.)^[1]; Zaytseva, NM (Zaytseva, N. M.)^[2]**PROBLEMELE ENERGETICII REGIONALE****Выпуск:** 2 **Стр.:** 52-62**Опубликовано:** 2017**Тип документа:** Article**Аннотация**

The goal of this work is to prove a possibility of determining soil parameters that influence its conductivity being the basis of grounding, step voltage and touch voltage calculation. This in its turn increases the safety level of electric equipment operation. The article is devoted to development of new, no conventional models of soil conductivity using the theory of fuzzy sets and fuzzy logic. The description of the solution includes the following sections: fuzzy models of specific electrical resistance of different soil types depending on their salinity and moisture content at positive temperatures; dependences between. and negative temperature values for different types of soil and different moisture contents; fuzzy climatic soil models for a specific location in order to determine soil. deep into the earth throughout the year. Uncertainty of soil properties is a reason why calculations of grounding devices are very liberal with plenty to spare, and calculations of touch voltages and step voltages in the period of active snow melting or abundant rains give erroneous results. Since soil parameters are described by linguistic variables: humidity, salinity, and temperature etc., soil layers should be considered as overlapping fuzzy sets. Membership functions of the main components of the "soil conductivity" concept were formed on this basis. The new scientific result we obtained makes it possible to formalize natural language of the experts in the field of climatic factors influence on soil resistivity in order to represent this information with the help of computer algorithms for optimum design of energy supply security and step voltage and touch voltage calculation.

Ключевые слова

Ключевые слова автора: [electrical safety specific](#); [soil resistivity](#); [modeling](#); [fuzzy logic](#); [membership functions](#); [multi-parameter dependence](#); [touch voltage](#); [step-by-step pressure](#)

KeyWords Plus: [GROUNDING RESISTANCE](#); [GRIDS](#); [SETS](#); [SUBSTATION](#); [SYSTEMS](#)

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