Modeling of 35 kV single-phase voltage transformers and investigation of the causes of their damage.

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In 6–35 kV distribution networks a significant proportion of failures are caused by arc, ferroresonance and switching overvoltages.

The article is devoted to modeling a voltage transformer based on its design information and determining the causes of damage to voltage transformers in 35 kV distribution networks. In the paper, a methodology of creating a computer model of a voltage transformer is described, the calculation of magnetic resistances of leakage is carried out, and the model is verified. Using the verified model, calculations of transients at certain values of network capacity were carried out, which led to modes with stable ferroresonance. In such modes, the currents in the windings of the voltage transformer are several times higher than the rated values, which can lead to damage to the insulation of the windings. Additionally, calculations were performed showing the effectiveness of using the resistive resistance of the neutral to eliminate ferroresonance and damage to voltage transformers.