

EVALUATION OF THE MATHEMATICAL MODELS ADEQUACY OF NOM-10 VOLTAGE TRANSFORMER FOR THE FREQUENCIES OF THE FREE COMPONENT OF THE POWER SYSTEM INTERNAL OVERVOLTAGE

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The phenomenon of internal resonance under the influence of power system overvoltage is one of the main causes of transformers damages. The only way to study this phenomenon is to use mathematical modeling. This provides creating of electrical equipment models, which can recreate real physical processes under the influence of the overvoltage free component of different frequencies. Thus, the received results validity and specific recommendations for increasing working reliability of electrical equipment depend on the degree of mathematical model adequacy.

The considered object is a mathematical model of NOM-10 voltage transformer, which was created taking into account its real frequency characteristics. The model reproduces processes in voltage transformer, which is under the influence of the overvoltage free component of frequencies 50-100000 Hz.

Criterion of the mathematical model adequacy is the matching of frequency characteristics of the model elements with the frequency characteristics of the real object elements.

The comparison of frequency characteristics of model windings and insulation with data obtained experimentally reveals their absolute identity, which confirms the model adequacy.

Complex model assessment requires comparing of research data for real object, which were not used in developing of model, with similar results, received on model. Frequency characteristics, which were received from those additional experiments on the real object and its model, match as well, which proves the adequacy of designed mathematical model.