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Simulation of initial voltage distribution in layer type transformer winding

Abstracts

Power transformers are subjected to lightning overvoltages during exploitation. These overvoltages risk external and internal insulation system of transformers and may lead to device failure. Internal overvoltages in the windings are particularly dangerous and have direct impact on condition of the winding insulation system. Overvoltage risk of the winding insulation during lightning stroke is determined by initial voltage distribution along the transformer winding. This distribution depends on the series and ground capacitance of the winding. Increasing the series and decreasing the ground capacitance make this distribution more uniform, what helps to reduce electrical stresses on critical parts of the winding insulation. One of the methods of increasing the series capacitance of the winding is based on application of electrostatic shields to the winding terminals. In this paper, the influence of electrostatic shielding on initial voltage distribution along layer type winding of power transformer is presented based on FEM simulations. The influence of application of electrostatic shields and their distance to the winding layers is analysed in this paper. The calculation results are compared to results of measurements on experimental layer type transformer winding.

More Informations :

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