

Improvement of the 3D Finite Element Analysis of High Voltage Power Transformer Defects in Time Domain

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Abstract : The high voltage power transformer is the most essential part of the electrical power utilities. Reliability on the transformers is the utmost concern, and any failure of the transformers can lead to catastrophic losses in electric power utility. The causes of transformer failure include insulation failure by partial discharge, core and tank failure, cooling unit failure, current transformer failure, etc. For the study of power transformer defects, finite element analysis (FEA) can provide valuable information on the severity of defects. FEA provides a more accurate representation of complex geometries because they consider thermal, electrical, and environmental influences on the insulation models to obtain basic characteristics of the insulation system during normal and partial discharge conditions. The purpose of this paper is the time domain analysis of defects 3D model of high voltage power transformer using FEA to study the electric field distribution at different points on the defects.

Keywords : power transformer, finite element analysis, dielectric response, partial discharge, insulation

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