عنوان مقاله:

Comprehensive Analysis and Accurate Modeling of Transformer Electromagnetic Forces

محل انتشار:

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خلاصه مقاله:

The interaction of leakage fluxes and the current flowing through power transformer windings produce electromagnetic (EM) forces. Thereby, power transformers vibrate and experience harmonic loads as a result of these forces. The ability to precisely compute EM forces is critical for transformer designers to limit the transformer vibration. In this context, it is important to study in-depth the mechanism of the generation of EM forces and to fully grasp the leakage magnetic field. This paper aims to accurately model the EM forces in power transformer windings. Due to flexibility in dealing with magnetic boundaries, this paper is mainly based on the finite element method (FEM) to study the parameters that influence the analysis of EM forces. Finally, the results of a series of FEM models and some conclusions about the behavior of the calculated EM forces are described. This paper can be used as a starting point for engineers to create comparable models of transformers to lessen the cost of field tests.

کلمات کلیدی:

Electromagnetic forces; finite element method; magnetic flux; power transformer