Design and Performance Analysis of Power Transformers Using the Finite Element Modeling

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Abstract

The thesis presents the application of the finite element method as a numerical method in the modeling of the power transformer. The "Ansys" finite element package was the software used to do the simulations. It was applied to model the transformer and analyze the design factors affecting its performance. The modeling included the investigation of the load losses (including the Ohmic losses, the eddy current losses in the windings, the tank losses), the no load losses and the leakage reactance for 25MVA, 66/11 KV power transformer. Three different designs of the transformer were modeled and the results of the finite elements were compared with the traditional design methods results and with the measured values. The conclusions on these results were clarified. A suggested future work for this thesis can be done in the design optimization.

Keywords

Power Transformers, Finite Element,