

A tool for the assessment of the electromagnetic forces in power distribution transformers

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Abstract-

This paper compares the estimated electromagnetic forces due to short circuits in power transformers using two computational models. The first model is based on approximate analytical expressions of the electromagnetic forces as they have been compiled in earlier versions of the IEC standard 60076-5. The second model is based on a finite element model of the transformer using the software FEMM (Finite Element Method Magnetics). The paper shows how valid the analytical model is for design purposes. Results have been obtained and compared from both models in a number of actual power distribution transformers. It is possible to conclude that the analytical formulation provides satisfactory results for the design of power transformers compared to detailed finite element models. A tool has been designed for this purpose and the main features of it will be described in the paper.

Index Terms- Electromagnetic forces, power transformer, short-circuit, IEC 60076-5.

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