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**Technical Brochures**

Title:

**High-Frequency Transformer and Reactor Models for Network Studies - Part A: White-Box Models**

The reliable and safe operation of the transformer requires that the dielectric stresses imposed by transient overvoltages are kept within acceptable limits. White-box models are detailed models of the transformer which permit to calculate the internal voltages in the transformer. Such models are used by the transformer manufacturers to ensure that the transformer will withstand the standard lightning impulse voltage test. CIGRE JWG A2/C4.52 has reviewed the various white-box models with consideration to parameter determination, accuracy, and possible inclusion in electromagnetic transient simulation programs for use in general transient studies. The daily-use models by manufacturers are normally lumped-parameter type models whose parameters are calculated by analytical formulae. The most common calculation procedures and model formulations are reviewed by the JWG. Comparison with measurements shows that the models can give substantial errors in the transient waveforms, although the maximum internal stresses are well represented. The accuracy is improved by introduction of empirical damping factors, while the most accurate result is achieved when calculating the model's parameters using the finite element method, with the branch impedance matrix represented by a rational model that is calculated from discrete frequency samples. The manufacturers may be reluctant to sharing their models. This TB is one of five TBs from the JWG.

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More Informations :

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