

Identification of Transformer Core Vibrations and the Effect of Third Harmonic in the Electricity Grid

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Abstract : In this work, an experimental technique is applied for the measurements of the vibrations and deformation of a test transformer core. Since the grid voltage contains some higher harmonics, in addition to a purely sinusoidal magnetisation of the core the presence of third harmonic is also studied. The vibrations of the transformer core for points as well as the surface scan of the leg show more deformation in the corners of the leg than the middle of the leg. The influence of the higher harmonic of the magnetisation on the core deformation is also more significant in the corners of the leg. The core deformation shape under a sinusoidal magnetisation with a higher harmonic is more wavy and fluctuating than that under a purely sinusoidal magnetisation.

Keywords : vibrations and noise, transformer, vibration measurements, laser vibrometer, higher harmonic

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