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This paper presents typical results for the non-linear low frequency transients following the energization of power transformers. The three operating conditions of no-load, full-load and internal faults are considered. A direct analytical procedure is applied for solving the corresponding set of differential equations describing the transformers equivalent circuit. The core representation is based on the use of curve fitting applied to their magnetization curves. The results include plots versus time for the supply current, the core flux, the magnetizing current as well as the internal induced voltage. Moreover, graphs for the hysteresis loops relating the instantaneous values of both the excitation current and the core flux are given. An approach is also presented for the numerical determination of the amplitudes of the different harmonics existing in any of these signals utilizing the corresponding equidistant samples...



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