

Power Transformers Insulation Material Investigations: Partial Discharge

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Abstract : There is a great problem in testing and investigations the reliability of different type of transformers insulation materials. It summarized in how to create and simulate the real conditions of working transformer and testing its insulation materials for Partial Discharge PD, typically as in the working mode. A lot of tests may give untrue results as the physical behavior of the insulation material differs under tests from its working condition. In this work, the real working conditions were simulated, and a large number of specimens have been tested. The investigations first stage, begin with choosing samples of different types of insulation materials (papers, pressboards, etc.). The second stage, the samples were dried in ovens at 105 C^{>0} and 0.01bar for 48 hours, and then impregnated with dried and gasless oil (the water content less than 6 ppm.) at 105 C^{>0} and 0.01bar for 48 hours, after so specimen cooling at room pressure and temperature for 24 hours. The third stage is investigating PD for the samples using ICM PD measuring device. After that, a continuous test on oil-impregnated insulation materials (paper, pressboards) was developed, and the phase resolved partial discharge pattern of PD signals was measured. The important of this work in providing the industrial sector with trusted high accurate measuring results based on real simulated working conditions. All the PD patterns (results) associated with a discharge produced in well-controlled laboratory condition. They compared with other previous and other laboratory results. In addition, the influence of different temperatures condition on the partial discharge activities was studied.</sup></sup>

Keywords : transformers, insulation materials, voids, partial discharge

Conference Title : ICPCE 2015 : International Conference on Power and Control Engineering

Conference Location : Istanbul, Türkiye

Conference Dates : November 27-28, 2015