

Insulation Deterioration and its Effects on Power System

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Abstract

Insulation deterioration occurs on power system when insulators are subjected to abnormal stresses. The overall effect is the failure or breakdown of power system. The research in this study is the investigation of the causes and effects of insulation deterioration in power system with particular reference to transformer mineral insulating oil. Fifteen samples of transformers insulating oils were collected from various sub-station distribution locations in Ilorin metropolis in Nigeria, through Power Holding Company of Nigeria (PHCN), Ilorin district office. Two major tests, dielectric and acidity tests were carried out on all the collected samples to assess their level of deterioration. The authentication of the results was determined by comparing the experimental values with American Society for Testing and Mineral (ASTM) and British Standard (BTA4705) pre-requisites. While only four of the fifteen samples failed acidity tests, about ten samples failed dielectric tests. The overall results indicated that the distribution sub-stations of Nigeria Electricity Supply System lacked adequate routine checks despite stresses being experienced by some of the transformers due to overloading.