

"A SYSTEMATIC APPROACH TO NUCLEAR MICROSCOPY OF WATER TREES FOR A LARGE NUMBER OF FIELD-AGED HV CABLE SAMPLES"

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ABSTRACT

In order to perform micro-PIXE measurements on water trees in underground HV cables when a large number of cable samples are involved, a sequence of tests has been devised to minimize time and effort for sample preparation, water tree detection and analysis. These tests include electrical diagnostic tests to predict the possible presence of water trees, optical microscopy on cable insulation to detect water trees in the samples screened by the electrical tests, scanning electron microscopy for detailed surface topography of water trees, and nuclear microscopy for elemental composition and distribution maps of water trees. Correlations among the results of the four types of measurements are discussed to evaluate the usefulness of the methodology