
Departmental Seminar

Seminar Title	: Aging State Recognition of a Crosslinked Polyethylene Power Cable Insulation using Machine Learning and Fourier Transform Infrared Spectroscopy
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Venue	: Seminar Room (EE-205)
Date and Time	: 06 Sep 2024 (4:00 PM)
Abstract	: Electrical aging is one of the primary contributors to the insulation degradation of a power cable, along with the initiation and progression of partial discharge. Henceforth, the study of partial discharge is an important indicator to evaluate the degree of degradation of the insulation. In this work, a XLPE insulation sample was electrically aged for a total of 80 hours at 28 kV, and PD signals were collected at two distinct instants, i.e., after 40 and 80 hours. From the collected signals, a total of nine statistical features were extracted to train different machine learning techniques like Logistic Regression, K-Nearest Neighbors, Decision Tree, and XgBoost for the classification of the moderately and highly aged condition of the XLPE cable insulation. Furthermore, FTIR was used to investigate the insulation's material characterization. The experimental findings indicated that the XgBoost method showed effectiveness as compared to others, with an accuracy of 93.33%. FTIR results indicated an increase in the oxidative degradation with the progression of aging.