



Since 1962

# Vivekanand Education Society's Institute of Technology

(Affiliated to University of Mumbai, Approved by AICTE & Recognized by Govt. of Maharashtra)

## Annexure

### **Title of project:**

Investigations and Characterization of Partial Discharge(PD) phenomena in High Voltage Equipment

As a part of research work, it is planned to develop instrumentation systems for characterization of PD pulses as well as for detection and analysis of PD.

#### **I. System for characterization of Partial Discharges:**

It is proposed to develop a system which generates PD pulses similar to the actual partial discharge pulses generated during degradation of insulation material subjected to high voltage. The system will incorporate hardware and software required to generate the pulses without the use of high voltage and insulation material. The system will be useful for research workers in the academic institutions and industries for hardware simulation and analysis of PD pulses.

Understanding the physics of PD pulses and software simulation will be carried out in IITB while the design, construction and testing of the actual hardware to simulate the pulses will be implemented in VESIT.

#### **II. System for detection and analysis of Partial Discharge pulses:**

It is required to develop a comprehensive system to detect and analyze PD pulses generated during degradation of insulation material subjected to high voltage. A system will be designed and constructed to measure and analyse the various parameters related to PD. The high computational ability of a computer will be utilized for analysis of the parameters measured. Efficient algorithms will be employed for analysis of parameters like amplitude distribution, time distribution, pulse shapes including rise time, fall time, width, etc. The analysis of partial discharge pulses made using this system will be helpful in finding out a parameter or a set of parameters or distributions that will be helpful in predicting the failure because of degradation of insulation material. Such parameters will be identified for reliable prediction of insulation failure using this system.

The instrumentation system required for this purpose will be designed, constructed and tested in VESIT. It will be utilized for testing of actual insulation material and the analysis in IITB laboratory. Inferences will be drawn regarding the failure of the insulator based on these experiments. Further, the enhancement and modification will be made in the system based on the experimentation results done in IITB. Such a PD analyser system will be useful for application in the industry for detection of insulation degradation.

It is planned to publish papers in international journals and conferences based on the above systems designed, constructed and tested at VESIT and on the applications and experimental investigations done in IITB.

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