

# HIGH VOLTAGE RESEARCH LABORATORY

NUST is planning to establish a high voltage engineering laboratory adjoining to the current USPCASE Building in NUST H-12. The lab was selected among various options due to the fact that high voltage is the most important aspect of a power system program without this lab a power program cannot teach the practical aspects of distribution and transmission of electrical power without which electrical grids do not exist. The lab shall serve for the academic and human resource training purposes however the commercial aspect of the lab cannot be ignored as there are only a few labs of its kind in the whole country making it a prime location for testing of equipment and training of relevant people at technical and managerial levels resultantly adding to the sustenance of the research area in the country.

## LAB MISSION

The experts in the field are also numbered in the whole country and they have all provided with their input for the equipment which has been selected for the lab. It is the best utilization of the resources available. The lab shall support various MS/PHD programs testing and research activities not only in USPCASE but also on national level which is expected to support industry for commercial services also.

## RESEARCH PORTFOLIO

Insulation research, transmission system research, distribution systems research, transformers, Environmental Protection, high voltage systems and high voltage generators.



## RESEARCH EQUIPMENT

Equipment	Description	Specification
Dielectric Breakdown Tester	Unit is equipped with a microprocessor-based control system that is internally programmed to perform the ASTM D149 Solid dielectrics' short-time test, step-by-step test and slow rate-of-rise test.	Up to 50 kV (RMS)
Hipot Tester	It is designed for ac dielectric tests, dc dielectric tests and insulation resistance measurements with direct mega ohmmeter readings at 500V DC output.	Bench top AC and DC Output AC (0-5 kV) DC (0-6 kV)
Precision Oil and Solid Dielectric Analyzer	It incorporates a fast and highly advanced procedure to measure relative resistivity, Capacitance, tan $\delta$ of liquid or permittivity of solid insulating materials. A simple one-time connection system together with resistivity measurement according to pre-selected standards drastically reduces measuring time.	ACV : 5-2.5k 50Hz 5mA DCV : 250-2.5k
Oil Tester	Liquid Dielectric Tester accurately and reliably tests the dielectric strength of insulating liquids used in a wide variety of electrical apparatus. The rugged, lightweight, and portable design ensures years of safe and trouble-free operation both in the field and in the laboratory.	Digital Automatic Controls, USB, Digital Interface Setup upto 60kV
Automatic capacitance and tan $\delta$ dielectric loss analyzing system	The High-Precision Dielectric-Loss Analyzing System 2823-REF is designed for measurement of very low dielectric losses and impedances (Dissipation Factor and Power Factor) of high-voltage apparatus (e.g. extruded insulation on power cables).	$\pm 5 \times 10^{-5}$ for determining impedance and dielectric losses of high-voltage equipment, including: 1. One test object measuring channel (Cx) and one nominal measuring channel. 2. Accuracy tan $\delta$ : $\pm 5 \times 10^{-5}$ ; C: $\pm 0.05\%$ . 3. Windows based Control Software 4. Mains cable, Fiber optic cable, Fiber Optic / USB adaptor
Impulse Voltage Test System 400kV, 20 kJ	SGVA impulse test systems can be used generate impulse voltages simulating lightning strokes and switching surges. The total charging voltage ranges from 400 kV with a per-stage energy of 10 to 20 kJ.	Including: LGR 100-40, CS 600, MAFS 600, GC 223 350'000