Intelligent Monitoring of Electricity Grids

The electricity grid delivers electrical energy from diverse generation sources to end users. It is a complex, continuously-evolving and dynamic system. Advances in sensing devices, digital technologies and communications make it possible to engineer systems for accurate, online, real-time monitoring of the grid and intelligent, automated control of its operation.

Competitive advantage

- Expertise in HV AC and DC transmission systems, equipment, components and devices
- Leaders in smart-grid monitoring systems with embedded intelligence,e.g. novel sensing devices, signal processing, data analytics, to provide on-line monitoring of power flow, power quality, losses/efficiency and network transients
- Novel diagnostic techniques for insulation assessment—e.g. ultra-high frequency detection of partial discharges, dielectric spectroscopy and frequency response analysis
- Expertise in novel dielectric materials for electro-technology—e.g. high-k dielectrics for energy storage capacitors, polymeric nanocomposites and biodegradable insulating liquids

Impact

- Making electricity supply systems more reliable and better managed

Successful applications

- Development of intelligent, robust online condition monitoring for electricity substations and other strategic assets of high-voltage electricity grids
- Online partial discharge monitoring in cables and transformers
- Distributed online monitoring of SWER networks and detection of high-impedance arcing faults

Capabilities and facilities

- High Voltage laboratory with various HV sources available for testing: impulse, 50 Hz AC, DC, VLF, variable frequency
- Wide range of state-of-the-art measurement instruments for dielectric insulation study—sensors, partial discharge, dielectric dissipation factor, space charge, time and frequency domain spectroscopy, thermal imaging, and fast data acquisition systems

More Information

Associate Professor Toan Phung

School of Electrical Engineering and Telecommunications

T: +61 (0) 2 9385 5407
E: toan.phung@unsw.edu.au

UNSW Knowledge Exchange

knowledge.exchange@unsw.edu.au

www.capabilities.unsw.edu.au

+61(2) 9385 5008