

TRAINING

EXPERTS TEACHING FROM PRACTICAL EXPERIENCE



KINECTRICS

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TRAINING
COURSES

High Voltage (HV) Engineering

Overview

Power Engineering is undergoing a renaissance as utilities reassess equipment to upgrade existing, or build new infrastructures. There is a need to train engineers in the fundamentals of High Voltage (HV) technology, equipment, and laboratory test techniques. This course covers HV test system and measuring systems and analysis techniques as applied to power systems apparatus such as cables, insulators, transformers and generators. Hands-on lab work will be done in Kinectrics High Voltage lab, which is equipped with AC impulse and DC test equipment. The HV lab is used on a regular basis by national and international utilities for measuring and testing.

Course Outline:

Module 1 – Introduction to HV Engineering

Module 2 - Overview of HV Test Equipment

- DC
- Impulse generating equipment
- Measuring systems

Module 3 – HV Lab Test & Measurement Methods & Analysis of Results

- AC Testing
- Impulse Testing

Module 4 – Dielectric Breakdown

- Gases
- Solids
- Liquids

Module 5 – HV Insulators

- Glass/Porcelain
- Polymers
- Contamination Flashover
- Current field data
- Applications

Module 6 – Power System Over Voltages

- Origins
- Impact
- Insulation Coordination

Module 7 – Specialized Tests

- Dielectric Loss Measurements
- Corona Testing
- Partial Discharge

Labs – Kinectrics High Voltage Lab

- **Lab #1:** HV Impulse Generator and Standard Waveforms
- **Lab #2:** Breakdown of Sphere-Sphere gap vs. Rod-Rod gap under lightning impulse voltage; AC Corona on conductor above a ground plane and Van der Graaff generator
- **Lab #3:** Voltage distribution along a line insulator string and effects of surface contamination on ceramic insulation

Who Should Attend?

This course is designed for:

- Utility and power apparatus manufacturers
- Engineers who are involved with HV equipment and technology
- Engineers who work in HV testing

Key Benefits:

- Comprehend and assess HV technology and equipment
- Lab demonstrations and practice of HV test system & measuring systems
- HV test methods and analysis based on client projects

Price:

Five days - \$5,000 + GST

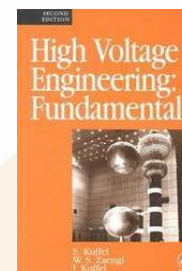
Complimentary lunch & coffee breaks

Instructor:



John Kuffel, Ph. D., IEEE

John is Chief Engineer, Transmission and Distribution at Kinectrics. In addition to his work at Kinectrics in the High Voltage Lab, he was formerly Head of Electrical & Computer Engineering at the University of Manitoba.



John Kuffel is a co-author of *High Voltage Engineering Fundamentals*, E. Kuffel, W.S. Zaengl, J. Kuffel, 2nd edition, Newnes, 2000.

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