

High Voltage Engineering: Safety, Maintenance & Testing Techniques

COURSE OVERVIEW

This detailed course provides a comprehensive understanding of high-voltage systems design, insulation coordination, electrical stress analysis, maintenance practices, and testing methodologies that underpin modern power infrastructure. Participants will gain practical and theoretical knowledge of high-voltage generation, measurement, and testing including both AC and DC systems, while learning how to detect insulation breakdown, partial discharge, corona effects, and other degradation mechanisms that impact system longevity. Through real-world case studies, delegates will explore preventive and predictive maintenance approaches, advanced testing tools, and the integration of digital diagnostics in high-voltage asset management.

WHO SHOULD ATTEND?

This course is designed for electrical engineers, maintenance supervisors, high-voltage testing specialists, substation engineers, safety officers, and field technicians seeking to enhance their understanding of high-voltage phenomena, testing technologies, and preventive maintenance techniques. It is equally valuable for design engineers, project managers, technical inspectors, and consultants involved in power transmission and distribution projects.

COURSE OUTCOMES

Delegates will gain the skills and knowledge to:

- Identify and analyze electrical stresses and insulation coordination challenges in HV systems.
- Apply international safety standards and best practices in high-voltage operations.
- Conduct high-voltage testing, measurement, and diagnostic procedures accurately.
- Detect and evaluate insulation breakdown, corona discharge, and partial discharge activity.
- Implement preventive and predictive maintenance techniques for HV assets.
- Utilize advanced tools for condition monitoring and diagnostics in substations.

KEY COURSE HIGHLIGHTS

At the end of the course, you will understand;

- The principles and field behavior of high-voltage insulation and dielectric materials.
- The generation and measurement methods of high-voltage AC, DC, and impulse voltages.
- How to identify and mitigate corona discharge, leakage currents, and insulation faults.
- How to conduct high-voltage tests including withstand, breakdown, and partial discharge testing.
- How to apply IEC, IEEE, and ANSI standards in system design and maintenance.
- The use of condition monitoring tools such as tan delta, PD analyzers, and thermal imaging.
- Strategies for data-driven maintenance and reliability improvement in HV networks.

All our courses are dual-certificate courses. At the end of the training, the delegates will receive two certificates.

1. A GTC end-of-course certificate.
2. Continuing Professional Development (CPD) Certificate of completion with earned credits awarded.