



# Generator Excitation Systems Course

## Venue Information

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**Venue:** London UK

**Place:**

**Start Date:** 2025-09-08

**End Date:** 2025-09-12

## Course Details

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**Net Fee:** £4750.00

**Duration:** 1 Week

**Category ID:** EAPET

**Course Code:** EAPET-27

## Syllabus

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### Course Description

The successful operation of any Generating Systems ultimately depends on how well the inspection, testing, maintenance and troubleshooting functions are carried out. Well-developed procedures and planning will in the long run result in reduced costs, equipment down time, parts requirements and troubleshooting complexity. Delegates are encouraged to participate by active involvement in group discussions, practical exercises and sharing experiences.

### Course Objectives

Following the attendance at this course, participants will return to their respective departments equipped with new or refreshed skills to ensure that electrical generating equipment and its control systems are inspected, tested, maintained and when necessary repaired using well planned troubleshooting procedures in a fashion that ensures reduced costs and/or down time plus identified faults or problems are repaired and the underlying causes are

- An improved capability in the use of test equipment
- A better understanding of failure modes and failure analysis
- A refreshed awareness of electrical safety concerns

## **Course Outlines**

### **Definitions**

- Generator systems (AC) and equipment
- Generator systems (DC) and equipment
- Operation, inspection, testing, control, maintenance and troubleshooting
- Control systems

### **Interpretation and Use of Drawings**

- Single-line electrical drawings
- Control schematics
- Wiring lists
- P&ID's
- Logic and standard symbols

### **Maintenance Planning**

- Developing schedules and procedures
- Define operation requirements for parts and labor
- Define maintenance requirements for parts and labor
- Regular, preventative, predictive and emergency maintenance

### **The Use of Test Equipment**

- Digital voltmeter (DVM)
- Oscilloscopes
- Megger
- Frequency meter
- Temperature probes/pyrometers
- Ammeters
- Power meters
- Load banks

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- Principles of electrical generation (AC, DC and Emergency)
  - Power supplies (battery chargers, rectifiers, inverters)
  - Batteries
  - Generator Drivers (gas/steam/water turbine, diesel/gas engine)
  - Governors (control systems)
  - Programmable logic controllers (PLC)
  - Synchronization
  - Power grid and network considerations

### **The Technology of Generators**

- Increasing or decreasing the voltage (transformers)
- Neutral ground resistors (NGR)
- Switchgear
- Motor control centers (MCC)
- Disconnect switches
- Power monitoring
- Control relays/timers/switches
- Generator protective devices

### **Inspection and Testing of Generators**

- Methods
- Terminology
- Principles
- Special techniques
- NEC check lists

### **Troubleshooting of Generators**

- Methods
- Terminology
- Principles
- Special techniques
- Case studies/examples
- Single line drawings
- Group exercises

• Necessary preparation

- Documentation
- Follow-up
- Safety considerations and training

## **A Review of Safety Requirements**

- Area classifications
- NEC electrical codes
- Safety information

## **The Identification and Repair of Problems/Failures**

- Common mode failures
- Phase imbalance
- Contact pitting/arcing
- Electronic component failure
- Fusing
- Generator windings/bearings/brushes
- Excitation circuits
- Battery cells
- Inverters/rectifiers/battery chargers
- Bushings
- Switches
- Control circuits
- Ground faults