TRAINING TITLE
ELECTRICAL PLANT FAULT DIAGNOSIS

Training Duration
5 day

Training Venue and Dates

Ref. No. EE177	**Electrical Plant Fault Diagnosis**	**5**	**21-25 July 2025**	**$5,500**	**DUBAI, UAE**

In any of the 4 or 5-star hotels. The exact venue will be informed later.

Training Fees

- **$5,500 per participant for Public Training includes Materials/Handouts, tea/coffee breaks, refreshments & Lunch**

Training Certificate
Define Management Consultants Certificate of course completion will be issued to all attendees.

TRAINING DESCRIPTION
This course is designed to provide participants with the knowledge and practical skills required for diagnosing faults in electrical plants and systems. Fault diagnosis is crucial for minimizing downtime, improving plant reliability, and ensuring safety. This course covers the methods, tools, and techniques used to identify, troubleshoot, and resolve electrical faults in industrial power systems, including generators, motors, transformers, switchgear, and distribution systems. Participants will also learn how to apply best practices in fault management and preventative maintenance to ensure the efficient operation of electrical plants.

TRAINING OBJECTIVES

By the end of the course, participants will be able to understand

- Understand the common types of faults that occur in electrical plants.
- Utilize diagnostic tools and techniques to identify and troubleshoot electrical faults.
- Perform fault diagnosis on various electrical plant equipment, including generators, transformers, motors, and switchgear.
- Apply fault detection methods, including visual inspection, electrical testing, and data analysis.

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- Implement corrective actions and develop preventive maintenance strategies to reduce fault occurrence.
- Ensure compliance with safety standards and industry best practices during fault diagnosis and repair.

WHO SHOULD ATTEND?

- Electrical engineers, technicians, and maintenance personnel working in power generation plants, industrial facilities, or utilities.
- Plant operators and supervisors involved in the operation of electrical equipment.
- Professionals responsible for troubleshooting and maintaining electrical systems in plants.
- Safety officers and quality inspectors overseeing plant maintenance and operations.
- Engineers involved in commissioning, testing, and fault management of electrical plants.

TRAINING METHODOLOGY

A highly interactive combination of lectures and discussion sessions will be managed to maximize the amount and quality of information and knowledge transfer. The sessions will start by raising the most relevant questions and motivating everybody to find the right answers. You will also be encouraged to raise your own questions and to share in the development of the right answers using your own analysis and experiences. Tests of multiple-choice type will be made available on daily basis to examine the effectiveness of delivering the course.
Very useful Course Materials will be given.

- 30% Lectures
- 30% Workshops and work presentation
- 20% Group Work& Practical Exercises
- 20% Videos& General Discussions

COURSE PROGRAM:

Day 1: Introduction to Electrical Plant Fault Diagnosis

- Overview of electrical plant systems and their components (generators, transformers, motors, switchgear, etc.)
- Common types of electrical faults in plants: short circuits, ground faults, open circuits, overloads, and insulation failures.
- Fault classification: permanent vs. transient faults, primary vs. secondary faults.

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- Overview of fault detection and diagnosis methods.
- Understanding the role of protective devices (circuit breakers, fuses, relays) in fault management.

Day 2: Fault Diagnosis Tools and Techniques

- Introduction to diagnostic tools and instruments:
  - Multimeters, insulation resistance testers, clamp meters, and power quality analyzers.
  - Vibration analysis, thermal imaging, and ultrasound for motor and equipment diagnostics.
- Understanding electrical measurements: voltage, current, resistance, power factor, frequency, and harmonics.
- Practical use of test equipment for diagnosing faults in electrical circuits and components.
- How to read and interpret electrical diagrams, schematics, and system layouts during fault diagnosis.

Day 3: Diagnosing Faults in Rotating Machines (Motors, Generators, and Transformers)

- Common faults in motors (e.g., winding faults, bearing failures, overloads) and diagnostic methods.
- Fault diagnosis in electrical generators: stator and rotor faults, excitation system issues, voltage regulation problems.
- Diagnosing transformer faults: core faults, insulation breakdown, oil degradation, and tap changer issues.
- Practical hands-on exercises on fault finding in rotating machines using diagnostic tools.
- Vibration analysis and thermal imaging for detecting motor and generator faults.

Day 4: Diagnosing Faults in Switchgear and Electrical Distribution Systems

- Faults in switchgear: contact wear, arc faults, protection device malfunctions, and mechanical failures.
- Diagnosing issues in protection relays and circuit breakers.
- Identifying faults in distribution systems: overloaded circuits, voltage sags, and unbalanced loads.

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- Troubleshooting electrical connections: loose connections, poor contacts, and wiring defects.
- Using data from SCADA and monitoring systems to assist in fault diagnosis.
- Case studies and troubleshooting scenarios on distribution and switchgear faults.

Day 5: Fault Management, Preventive Maintenance, and Safety Protocols

- Best practices in fault management: identifying root causes and corrective actions.
- Preventive maintenance strategies to minimize the occurrence of faults in electrical systems.
- Implementing condition-based monitoring (CBM) and predictive maintenance techniques.
- Safety protocols during fault diagnosis and maintenance activities: lockout/tagout (LOTO), PPE, and arc flash safety.
- Ensuring compliance with safety regulations and electrical standards (e.g., IEC, NEC).
- Developing documentation and reporting systems for fault diagnosis and resolution.

NOTE:
Pre-& Post Tests will be conducted.
Case Studies, Group Exercises, Group Discussions, Last Day reviews, and assessments will be carried out.

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