

**Training Title**

**Electrical Equipment Inspection, Testing and Troubleshooting**

**Training Duration**

**5 days**

**Training Venue and Dates**

REF EE047	Electrical Equipment Inspection, Testing & Troubleshooting	5	01-05 Jul 2024	\$5,500	Dubai, UAE
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In any of 5 star hotel. Exact venue will be informed once finalized

**Training Fees**

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

**Training Certificate**

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

Language: English

**TRAINING OVERVIEW**

**TRAINING DESCRIPTION**

Electrical equipment and devices are vital in all electrical installations to ensure continuity and efficient operations. Equipment like transformers, motors, variable frequency drives, uninterruptible power supplies and batteries are today's common components in most electrical installations. Safe operations are essential as they are protected by modern and sophisticated relays and protection devices.

Attendees will have Practical illustrations of Electrical Equipment and Control systems which will help engineers and technicians to identify, prevent and fix common faults. Beside Protection systems which are installed to prevent faults from damaging electrical plants and to initiate isolation of faulted sections to maintain continuity of supply elsewhere on the system. Recent changes in technology, together with changes in the manner in which Utilities and Industrial organizations operate, has greatly emphasized the development of integrated protection and control.

**TRAINING OBJECTIVES**

When attendees complete this course, they will be able to understand the following:

- Understand the operations and characteristics of transformers and motors.
- Better understand the design and functionality of variable speed drives, UPS and batteries.
- Utilize single-line diagrams and schematics for troubleshooting.
- Understand standard work practices plus be able to develop job plans and maintenance strategies.
- Show a refreshed knowledge when using testing and measuring instruments.
- Able to troubleshoot AC motors problems.

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### WHO SHOULD ATTEND

- Electrical Engineers
- Electrical Supervisors
- Maintenance Technicians
- Managers in-charge of Electrical Installations
- Project Engineers

### 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 motivate 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 the multiple-choice type will be made available on a 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

### TRAINING OUTCOME

By the end of this course the participants will gain the following:

- Understand the operations and characteristics of transformers and motors.
- Better understand the design and functionality of variable speed drives, UPS and batteries.
- Utilize single-line diagrams and schematics for troubleshooting.
- Understand standard work practices plus be able to develop job plans and maintenance strategies.
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### COURSE OUTLINE

#### Day 1: The Technology of Electrical Equipment and Devices

- Power Transformers.
- Power Supplies (UPS) and Batteries.
- Generators - Switchgear - Disconnect Switches.
- Motor Control Centers (MCC).
- Variable Frequency / Speed Drives (VFD/VSD).
- Protection and Numerical Relays Functionalities.
- Motor and Feeder Protection.

#### Day 2: Transformer Tests and Analysis of Test Results

- Functional Tests for Transformer.
- Site Acceptance Tests.
- Transformer Cooling.
- Transformer Vector Groups Selection.
- Transformer Maintenance.

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- Sweep frequency response analysis for transformer diagnostics.
- Ester base oil for new power and distribution transformers.

**Day 3: The Use of Test Equipment and Interpretation of Results**

- Degradation of Solid and Liquid Insulation in Switchgears.
- Digital Multimeter.
- Insulation Resistance Tester.
- Temperature Probes and Pyrometers.
- Resistance Temperature Detection and Sensors.
- Digital Hydrometers.
- Cable Fault Locators.

**Day 4: The Interpretation of Electrical Drawings and Motor Control Systems**

- Importance of Electrical Diagrams.
- Single-line Diagrams Symbols and Interpretation.
- Types of Control Circuits.
- Methods of Starting AC motors.
- Soft Starters.
- Maintenance of AC motors.
- Troubleshooting of AC motors.
- Induction motors vs. Synchronous Motors.

**Day 5: Maintenance Strategies and Conditioned Based Maintenance**

- Importance of Maintenance.
- Maintenance Strategies.
- Thermal Imaging.
- Partial Discharge.
- Variable Speed Drives Maintenance.
- UPS Maintenance.
- Battery Charging and Maintenance.

**NOTE:**

**Pre & Post Tests will be conducted.**

**Case Studies, Group Exercises, Group Discussions, Last Day Review & Assessments will be carried out.**