



**EE174**

# **Power and Distribution Transformers Maintenance and Troubleshooting**

# Course Introduction:

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Electricity is high-grade energy. Working in the electrical substations needs to be able to deal with the power & distribution transformers. All staff managers, administrators, engineers or technicians need to understand the power & distribution rules and their applications also learn the requirements of power & distribution transformer maintenance and testing and be able to understand the protection system of power and distribution transformers

This course is designed to raise the level of electrical engineers deal with the power and distribution to provide specific guidance to those who must implement and follow the associated procedures.

# Course Objectives:

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**Upon successful completion of this course, the delegates will be able to:**

- Develop a thorough understanding of Electrical power transformer Rules and their application.
- Understand individual responsibilities for distribution and power transformers in Substations
- Understand trouble shooting of power transformers
- Learn the detailed procedures for testing of distribution and power transformers standards
- Understand the role of power transformers parallel operation
- Learn requirements for the maintenance of power & distribution transformers and how to carry out the maintenance
- Develop an understanding of the role of switchgear and associated protection in transformers
- Be able to identify key issues for the improvement of their company's power & distribution transformers operation

# Who Should Attend?

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- Engineers and Technicians from electricity supply industry
- Technical Management Professionals and Department Leaders
- Engineering Professionals from companies manufacturing and operating power and distribution transformers
- Engineers and Technical Personnel in power utilities, petrochemical plants, service professionals of large infrastructure projects.

# Course Outline:

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## Day 1

- Scope & service conditions of power transformer
- Preferred values of rated power and distribution transformers
- Transformer theory & transformer types
- Off circuit tapping and tapping range
- Over current conditions & short circuit tests
- Testing of transformers according to IEC 60 76
  - Routine tests
  - Type tests
  - Installation tests
  - Commissioning tests
- Examples and Case Studies

## Day 2

- Measurements of winding resistance
- No load loss and current
- Voltage ratio measurement and check of vector group
- Induced voltage withstand test
- Tests of temperature rise
- Examples and Case Studies

## Day 3

- Impulse voltage test
- Measurements of insulation resistance
- Mechanical requirements
- Information required with enquiry and order selection of level
- Details of transformer connection with general use
- Examples and Case Studies

## Day 4

- Parallel operation of three phase transformers
- Distribution transformers
- Protection of power transformers
- Grounding of transformers
- Maintenance of transformer
- Transformer oil testing

### Day 5

- Main causes of transformer failure
- Dissolved gas analysis
- Duval triangle
- Testing and quality assurance
- Ensuring transformer reliability
- Examples and Case Studies

## Course Methodology:

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**A variety of methodologies will be used during the course that includes:**

- (30%) Based on Case Studies
- (30%) Techniques
- (30%) Role Play
- (10%) Concepts
- Pre-test and Post-test
- Variety of Learning Methods
- Lectures
- Case Studies and Self Questionnaires
- Group Work
- Discussion
- Presentation

## Course Certificate:

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**International Center for Training & Development (ICTD)** will award an internationally recognized certificate(s) for each delegate on completion of training.

## Course Fees:

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**To be advised as per the course location.** This rate includes participant's manual, and-Outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

## Course Timings:

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### Daily Course Timings:

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|---------------|----------------------------|
| 08:00 - 08:20 | Morning Coffee / Tea       |
| 08:20 - 10:00 | First Session              |
| 10:00 - 10:20 | Coffee / Tea / Snacks      |
| 10:20 - 12:20 | Second Session             |
| 12:20 - 13:30 | Lunch Break & Prayer Break |
| 13:30 - 15:00 | Last Session               |

