



**Training Program:**

**Transformer Life Time, Operation & Maintenance**

[www.btsconsultant.com](http://www.btsconsultant.com)

## Introduction:

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

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

## Who Should Attend?

Electrical power engineers and advanced operating staff of substations, factories, electrical distribution networks and transmission.

## Methodology

This interactive Training will be highly interactive, with opportunities to advance your opinions and ideas and will include;

- Lectures
- Workshop & Work Presentation
- Case Studies and Practical Exercise
- Videos and General Discussions

## Accreditation:

**BTS** attendance certificate will be issued to all attendees completing a minimum of 80% of the total course duration.

## Course Objectives:

- Develop a thorough understanding of Electrical power transformer Rules and their application.
- Understand individual responsibilities for distribution transformers in Substations
- Learn the detailed procedures for testing of power transformers standards
- Understand the role of power transformers parallel operation
- Learn requirements for the maintenance of power & distribution transformers
- 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 transformers operation

## Course Outline

- Scope & service conditions of the transformer
- Electrical safety in industrial plants
- Components and indicators
- Inspection and maintenance

- Transformer commissioning
- Preferred values of rated power transformers
- Transformer theory & transformer types
- Off circuit tapping and tapping range
- Over current conditions & short circuit tests
- Checking I.R. value
- Checking dielectric strength of oil
- Tap Changer inspection
- Testing of transformers according to IEC 60 76
  - Routine tests
  - Type tests
  - Installation tests
  - Commissioning tests

### **Examples and Case Studies**

- AC and DC testing of transformers
- No load loss and current
- Voltage ratio measurement and check of vector group
- Induced voltage withstand test
- Tests of temperature rise
- Transformer insulating liquid testing

- Impulse voltage test
- Measurements of insulation resistance
- Checking fan operations
- Preventive maintenance (Annual or stated otherwise)
- Information required with enquiry and order selection of level
- Details of transformer connection with general use
- Parallel operation of three phase transformers
- Protection of power transformers
- Grounding of transformers
- Maintenance of transformer
- Transformer oil testing
- Vacuum and hot oil dry out
- Other common drying methods
- Checking leakages
- Replacing or reactivating silica gel when required
- Checking buchholz relay
- Checking of tightness of all connections
- Main causes of transformer failure
- Dissolved gas analysis
- Duval triangle

- Testing and quality assurance
- Ensuring transformer reliability
- Examples and Case Studies
- Cleaning and re greasing