
Practical

POWER TRANSFORMERS - OPERATION AND MAINTENANCE



YOU WILL LEARN:

- An understanding of the fundamental theory and principles of the operation of power transformers
- An insight into the identification and application of transformers' types
- An understanding of the power transformers components and their construction
- Knowledge of power transformer protection
- An understanding of power transformers oil and oil tests and interpretation of results
- Knowledge of the most effective power transformer electrical tests
- Skills in how to manage power transformer breakdowns to ensure a minimum disruption

WHO SHOULD ATTEND:

- Power System Engineers
- Electrical Engineers
- Consulting Engineers
- Project Engineers
- Power System Technicians
- Electrical Contractors
- Electrical Technicians
- Tradesman Electricians
- Electrical Inspectors
- Utility Engineers



Technology Training that Works

THE WORKSHOP

Installation of high voltage distribution and transmission equipment has increased significantly over the years due to ongoing global demand for power. As a result, the need to ensure the reliability of operation of power systems is paramount.

Power transformers are among the most important and most expensive components of power systems, their failure can impose extraordinarily high costs on plants, factories and utilities of all descriptions.

It is critical that all personnel operating and working with such equipment have a sound knowledge of their operational requirements and maintenance.

This practical workshop provides knowledge on both the theory and operation of Power Transformers. The course will develop and enhance an understanding of what is involved in the maintenance of these essential components of the power systems, through the tips and tricks learnt and developed by some of the World's pre-eminent electrical engineers.

PRE-REQUISITES

Some basic knowledge of electrical engineering and general knowledge of nature and operation of transformers is required. However participants do not need specific knowledge on transformers and the course will start from the basic theory of transformers.

ON-SITE TRAINING

— contact us for a proposal today

IDC Technologies unique on-site training delivery service can save your company up to 50%, or more, off the total per-head costs associated with delegates attending a public workshop. One of our qualified and experienced Instructors can discuss the content with you, then come to your venue and present a workshop designed to your own specifications!

Why not call or e-mail and ask about having components from a number of courses combined together? It's affordable, effective, convenient and much easier than you may have thought.

"Technology Training that Works" we mean it! Try us soon and see the difference. For more information, or a customized proposal to run any of our practical workshops at your own venue, contact your nearest business development manager for manager (see page 32).

THE PROGRAM

DAY ONE

TRANSFORMERS MAIN FUNCTIONS AND CLASSIFICATION

- Construction (Shell Type, Core Type)
- Classification and Type in relation to Insulation, Windings, Core, Cooling Systems, Voltage level, Sizing, Tank, Breathing action
- Transformer parts

POWER TRANSFORMERS AND SAFETY

- How to install, operate and work with High Voltage Power Transformers safely
- Earthing of HV Transformers

TRANSFORMER THEORY

- Electrical values and their definition in a power transformer - Voltage, Current, Number of turns, Impedance and their interrelation

OPERATION OF POWER TRANSFORMERS IN A POWER SYSTEM

- Thermal performance, loading, paralleling, tap-changing, Connections and Vector groups

POWER TRANSFORMER PROTECTION

- Surge protection
- Protective relaying (Differential, Over-current, Earth fault)
- Buchholz relay, Pressure relief relay
- Thermal devices and instruments (Oil temperature Alarm and Trip, Winding temperature Alarm and Trip)

AUTO-TRANSFORMERS

- Design criteria
- Specifications

GENERATOR TRANSFORMERS

- Design criteria
- Specifications

UNIT TRANSFORMERS

- Design criteria
- Specifications

STATION TRANSFORMERS

- Design criteria
- Specifications

DAY TWO

POWER TRANSFORMER OIL AND OIL QUALITY

- Oil contents: Water, Acidity, Dissolved gas
- Oil tests: Dielectric breakdown, Moisture, Resistivity, Interfacial tension, Specific gravity, Power factor, Furan analysis.
- Recovery Voltage Measurement test

POWER TRANSFORMER ELECTRICAL TESTS:

- ac Tests:
 - Power factor tests (Insulation, Oil, and Bushings)
 - Single Phase Excitation Current Test
 - Transformer Turns Ratio Test
- dc Tests:
 - Insulation Resistance Test
 - Dielectric Absorption Test
 - Polarisation Index Test
 - Step Voltage Test
 - Hi-Pot Test

PREVENTATIVE MAINTENANCE ON POWER TRANSFORMERS

- Techniques to improve life expectancy

SUMMARY, OPEN FORUM & CLOSING

