

A One-Day Technical Seminar on

Power Transformer Fundamentals

- From a User's Perspective



Organised By :



CPD INTERNATIONAL PTY LTD

Overview

This 1-day course will provide an introduction to the information that a transformer user needs to know to:

- Specify and purchase a transformer that meets their technical requirements
- Minimises the life cycle costs over the life of the asset
- Understand existing transformers on their system and the ability of these units to meet their requirements
- Manage transformers over their life, and understand what issues need to be considered when deciding to repair, refurbish or replace a transformer.

Attendees will also gain an understanding of some of the alternate technologies available and the advantages of these technologies. Much of the information will be based on the presenter's years of experience working with transformers and associated equipment.

Seminar Content

1. Transformer Basics

- Basic Principles of Operation
- Basic Equations
- Sizes and Type

2. What I need to know to specify a Transformer

- Introduction to Australian Standards
- Winding Types and Connections
- Cooling Systems
- Transformer Ratings
- Emergency Rating, and overload
- Tapping Range
- Impedance
- Cost of Losses
- Transformer Sound Level
- Testing
- Other information to consider

3. Transformer Components

- Tap Changers
- Bushings

- Breathers
- Pressure Relief Device
- Buchholz & Oil Surge Relay
- Fibre Optics
- Instruments
- Oil Preservation System

4. Life Management of Transformers

- What Kills a Transformer
- Transformer Dry outs
- DGA & Oil Testing
- Bushing Monitoring
- On Line monitoring
- Transformer Management systems
- Repair Replace or Refurbish
- Tips for Repair or Refurbishment

5. Alternate Transformer Types and Technologies

- Gas Insulated Transformer
- Dry Type Transformers
- Alternatives to new mineral oil

Peter Cole

- *Manager Plant Engineering, Plant Engineering & Procurement Branch, Ausgrid*
- *Convenor, CIGRE Australian Panel A2 -Transformers*

Peter Cole gained his degree in Electrical Engineering from the University of Technology, Sydney, in 1987 and has over 25 years experience with Ausgrid, formerly EnergyAustralia.

Peter has been involved with the specifying and procurement of both power transformers and distribution transformers. This has involved factory inspections of all Australian transformer manufacturing facilities. He has also travelled to Asia and Europe to inspect the factories of international suppliers. He has been an integral part of the team that has managed a partnership with a major transformer manufacturer that has supplied approximately 200 power transformers to EnergyAustralia over the last 7 years, and has worked with the supplier's electrical and mechanical designers to ensure that the transformers supplied meet Ausgrid's requirements.

Peter has been involved with the assessment of aged and failed transformers and assisted with the decisions to repair, refurbish or replace these large items of

plant. He has worked closely with the transformer repairers to determine the most appropriate technical and economic solutions when repairs and refurbishments are undertaken.



During his career, Peter has developed tap changer control schemes for parallel operating transformers using PLCs and digital relays, including a scheme that involves coordinated tap changer and capacitor switching. He is currently part of a team investigating Gas Insulated Transformers and alternate insulating fluids. Other recent projects for his team include the purchase of large dry type transformers and the assessment of re-refined mineral oil.

Peter has presented papers at D2003 and EESA conferences, and has chaired panel sessions and presented at Techcon Asia Pacific. He is currently the Convenor of the CIGRE Australian Panel A2 on Transformers.

Who Should Attend

Engineers, Managers, Planners, Designers and Operators from Electric Utilities and Electrical Manufacturers, Consultants involved in specification, installation, operation, asset management, condition monitoring, inspection and testing of high voltage power transformers.

CPD Recognition

This technical seminar is designed to meet the Continuing Professional Development (CPD) needs of participants. A Certificate of Attendance will be awarded at the end of the program. This serves as evidence of your personal and professional commitment to your career.