Power Transformer Tap Changers - Design, Maintenance & Retrofit

2 Day CPD Advanced Course
27 – 28 June 2018
The University of Queensland
St Lucia Campus, Brisbane
Sir Llew Edwards Bldg, Room 217

Who Should Attend?

- Procurement, Asset Strategists, maintenance managers and engineers.
- Generation, transmission and distribution personnel.
- Consultants, designers and operations staff in the renewables, manufacturing, mining, industrial and infrastructure organisations.

Course numbers are LIMITED.

Book NOW to secure a place.

REGISTER ONLINE AT:
http://www.itee.uq.edu.au/TIC-cpd
Registrations close 15/6/18
(Unless all places filled earlier)
COURSE OUTLINE - Tap Changers

DAY 1 — 27 June 2018

Tap Changer Principles
- Basic switching principle of On-Load Tap-Changers, Design principles of oil type OLTCs, Vacuum switching technology in OLTCs, OLTCs and alternative insulation liquids.

Tap changer Design and Applications
- Basic arrangements of regulating windings, Examples of commonly used winding schemes, Vacuum vs Oil Diverters, benefits and issues
- Considerations for the renewables.

Tap Changer Specification from an end-customer perspective
- Application based specification, Bolt-on or in-tank?
- Oil-or vacuum technology? Understanding failure mechanisms, case studies.

Tap Changer Designs and Applications
- Practical differences between diverter type and selector type. Protective devices for tap changers.
- Key standards/guidelines. How are tap changers tested in the factory and what site acceptance tests/inspections should be carried out? Loading capability of OLTC’s vs Transformer. The effects on transformer windings during operation of OLTC.

Maintenance of OLTCs - Manufacturers Recommendations
- What are key items to consider? Steps to take for high moisture content in tap changer diverters. Extent of tap changer maintenance for oil and vacuum type tap changers.
- Cost-benefit analysis / Case studies.

Forum - OLTC fault finding and restoration
- What steps to take when an OLTC has failed? During a system emergency can the transformer be returned to service with a faulty OLTC (fixed-tap)?
- What options must be considered for OLTC repairs?

DAY 2 — 28 June 2018

Retrofit Options for Tap Changers during Tx mid-life refurbishments
- Technical options for MR/ABB OLTC’s, Justification and Benefits, Project examples for replacing oil type diverter with vacuum diverters

Tap Changer Field Testing
- What are the benefits of dynamic resistance measurements, including case studies.
- Condition assessment of tap-changers using acoustic measurements?
- Signal processing techniques used. Results from field trials. Case study

Implementing Life cycle Oriented Maintenance - Utility Experience
- Life cycle management – Utility Companies perspective
- Silver Sulphide Encounters, DGA assessment of OLTCs including high moisture, maintenance testing & anomalies, maintenance strategies— time based or condition based? OLTC Retrofit examples during mid-life refurb

Group sharing experiences/questions
- Participants share how their organisation is implementing tap changer life cycle management: what are key issues, case studies, questions.
- Time based maintenance or condition based maintenance?

KEY LEARNING OUTCOMES:

- Understand the basic principles of tap changers, including oil, vacuum.
- Learn the basic arrangement of regulating windings, benefits and issues of oil and vacuum diverters. Tap changer considerations for renewables and grid integration.
- Understand key tap changer specification considerations.
- Under tape changer designs and applications, differences between diverter and selector type, Loading capability, the effects on transformer windings.
- Become familiar with OLTC maintenance for oil and vacuum types. Understand key items of diverter maintenance, steps to take for high diverter moisture content.
- Participate in a forum for OLTC fault investigation and supply restoration.
- Understand MR & ABB retrofit options where oil diverters are replaced by vacuum type diverters.
- Understand the benefits of dynamic resistance tests.
- Be informed of innovative condition assessment of tap-changers using acoustic measurements, signal processing techniques used and results from field trials, case study.
- Be exposed to how some utilities are implementing life cycle oriented maintenance of tap changers.
- Learn about high moisture issues in diverters, DGA assessment, life extension.
- Learn about OLTC failures due to silver sulphide formation.

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Registrations close 5/2/18 (Unless all places filled earlier)
INDUSTRY & ACADEMIC EXPERTS

Dr. Thomas Smolka
Managing Director
Reinhausen Australia

Alan Brown
Senior Service Engineer
Reinhausen Australia

Rob Milledge
Technology Manager and Application Engineer
South East Asia Region
ABB Australia

Anders Hakansson
Asia Pacific Sales and Marketing Manager Transformer Insulation and Components
ABB Singapore

Dr. Wenyu Guo
Field Application Engineer
OMICRON Australia

Dr. Hui Ma
Research Specialist
University of Queensland

Dr. Dan Russell
Network Operations Standards Manager
Energy Queensland

Mike Elms
Principal Engineering Technician
Substations
Western Power

Ross Kempnich
Technical Operations Manager
Essential Energy

Thomas is a specialist in grid planning, grid integration of dispersed generation units based on renewable energies. Thomas has been responsible for the business development of voltage regulation distribution transformers (VRDT).

Alan joined Reinhausen Australia in 1999 and for the last 18 years has been an integral part of the service division, being MR’s most experienced OLTC technical specialist.

Rob has had over 40 years experience in Power Transformer electrical and mechanical design, manufacturing, test for voltages to 550kV and ratings to 1,125MVA.

Rob is the Chair of EL/8 Committee Standards Australia and a member of CIGRE committee – AP A2 Panel.

Anders has worked in various positions with On-Load Tap-Changers and High Voltage bushings in Sweden for more than 15 years. Since 2015, he is based in Singapore to support the customers in the region.

Anders graduated from Lunds Institute of Technology with a master’s of science in Mechanical Engineering.

Wenyu Guo has been with OMICRON Australia as a Field Application Engineer since 2012. He is also the Asia-Pacific Regional Application Specialist for power transformers testing.

Research Specialist in condition monitoring, diagnostics, HV Engineering & Insulation and machine learning.

Industry experience in power transformer & tap changer maintenance, testing & failure investigations.

Mike Elms has been employed with Western Power / predecessors for 34 years. Mike has extensive network field experience, including maintenance/ network response of transmission and distribution HV

Ross is the Technical Operations Manager for Essential Energy. He has worked for 36 years in this utility. He has “hands on” experience with tap changers. His is involved in the testing, maintenance, and condition assessment of HV Plant.

Pricing

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1 Platinum Attendee Complimentary (Conditions Apply)
Additional Platinum Member Attendees $1300 pp.
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Member Attendees $1500 pp.

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One Attendee $1650 pp.
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All prices are inclusive of GST.

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