

Details Page 4

ELECTRICAL TRANSFORMER TRAINING

VANCOUVER, BC
February 12-13, 2007

EDMONTON, AB
February 13-14, 2007

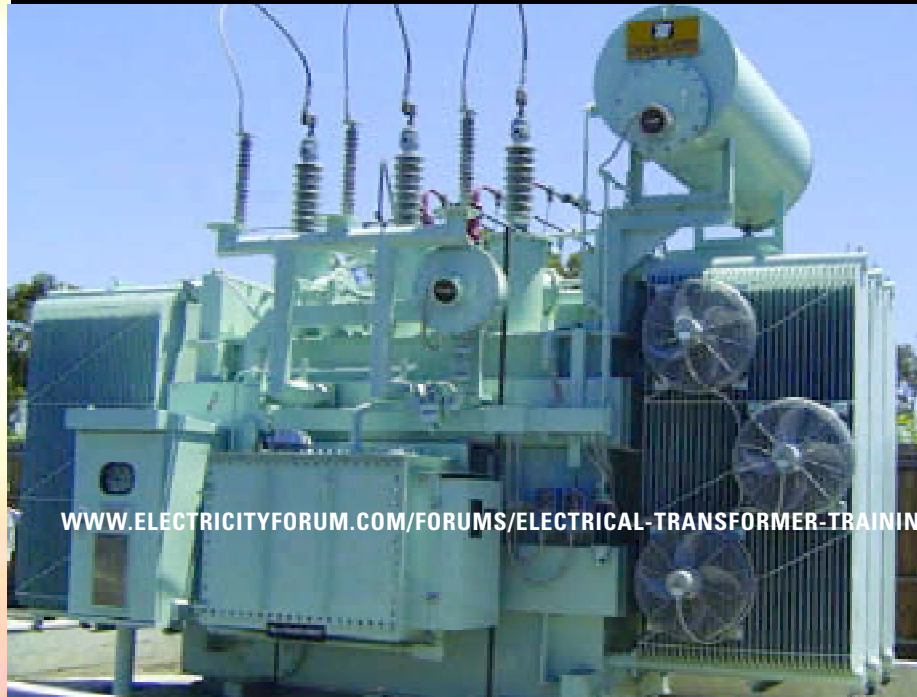
TORONTO, ON
February 19-20, 2007

OTTAWA, ON
February 20-21, 2007

SAINT JOHN, NB
April 18-19, 2007

SASKATOON, SK
April 24-25, 2007

NEW AND IMPROVED PROGRAM CONTENT



WWW.ELECTRICITYFORUM.COM/FORUMS/ELECTRICAL-TRANSFORMER-TRAINING-2007.HTML

YOU WILL LEARN:

- Understand the basic theory and construction of a transformer.
- Understand turns ratios and calculate terminal voltage and current.
- Understand terminal markings and various single phase and three phase wiring schemes. (WYE vs DELTA).
- Understand transformer operation, aging and failure
- Understand transformer life cycle and maintenance planning

YOU WILL RECEIVE:

- BRCE Standard Transformer 2 Page Testing and Quality Assurance (Value \$35.00)
- BRCE Standard electrical testing 2076 tests performed by transformer suppliers (insulation resistance testing, excitation 1.4 and power factor testing) (CEU) Credits
- BRCE Magnet transformer (Value \$60.00) techniques
- BRCE standard various steps performed on insulating oil.
- Register Three, Get One FREE (Details Page 4)



Earn Continuing Education Units (CEUs)

Details
ON-SITE TRAINING
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More than 25,000 Satisfied Students

ELECTRICAL TRANSFORMER TRAINING

Day 1

Khaled Nigim, P.Eng, University of Waterloo

PART 1

Participants will be introduced to the different types of single and three-phase transformers construction, various types of core material, windings layout, connection, tap changers, voltage classifications and transformer applications.

1. Transformers types

- Single and three phases
- Power and distribution transformers
- Voltage (VT) and current transformers (CTs)
- Auto-transformer
- Phase shifting

2. Voltage classes and applications and connections

3. Load taps changers (LTCs)

- Resistance and Reactance types
- Tap position indication
- Ratings and selection criteria
- LTC with power factor correction capacitor

4. Connections

- Polarity and angular displacement
- Y – Y, Δ – Δ , Y – Δ and Δ – Y connections
- Interconnected Y and grounding
- Phase shifting
- 3phase to 6 phase connection

5. Temperature monitoring and cooling methods and accessories

6. Paralleling transformers

PART 2

This part introduces the fundamental theory behind voltage and current transformation, winding resistance and impedance calculation, voltage regulation, losses and output efficiency estimation for both power and distribution transformers.

1. Name plate rating - Volt Amp Vs Watt

2. Transformer testing

- Classes and sequence
- Turns ratio
- Polarity
- Insulation and impulse
- Control devices

3. Performance tests

- No load and excitation
- Load losses and impedance measurement
- Winding resistance and short circuit test
- Heat run test
- Winding resistance and impedance calculation

4. Performance characteristics, loading, regulation and efficiency

- Transformer loading requirements

PART 3

Issues such as the influence of saturation, harmonics and power electronic devices on transformer performance will also be addressed. Day 1 will wrap up by showing how to select transformers for various types of measurement and power transformation including the design ratio calculation.

1. Magnetizing, inrush and over excitation

2. Transformers for drives and harmonics influence on performance

- Secondary current distortion due to semiconductor devices load
- Total harmonic distortion
- Reactors and Filters

3. Transformer de-rating and what K-ratings means

4. Standards and day 1 conclusion

Day 2

Peter Zhao, P.Eng, SMIEEE, Equipment Engineer - Specialist Hydro One

PART 1 General Knowledge

1. Transformer Classification

- Application
- MVA and Voltage Class

2. Performance and Characteristics

- General
- Magnetic Field
- Electrical Circuit
- Losses and Thermal Behavior
- High Voltage and Insulation Design
- Mechanical Requirements

3. Transformer Constructions

- General
- Windings
- Cores
- Mineral Insulation Fluids
- Bushings
- Tap Changers
- Tanks
- Transformer Accessories

4. Transformer Quality Assurance and Factory Tests

- Quality Assurance
- Factory Tests

5. Transformer Standards

- Industry Standards
- Your Specifications

6. Condition Assessment

- Operation
- Ageing
- Failures

IN ELECTRICAL TRAINING

7. Diagnostic Tests

- General
- Diagnostic Techniques
- On-Line Monitoring

8. Safety Operation and Test

- General
- Safety Code
- Transformer Field Diagnostics Tests and Techniques

PART 2 Field Diagnostics Tests and Techniques

1. Transformer Windings

- Winding Resistance Measurement
- Ratio/Polarity/Phase Test
- Exciting Current and Measurement
- Short Circuit Impedance
- Insulation Resistance Test
- Capacitance and Power Factor
- Induced Voltage Test
- PD Detection
- FRA Test

2. Transformer Cores

- General
- Insulation Resistance Measurement
- Grounding Check

3. Mineral Insulating Oil

- General
- Dielectric Strength
- Power Factor
- Water Content
- Dissolved Gases
- Color and Visual Inspection
- PCB Content

4. Bushings

- General
- Oil Level
- Visual Inspection
- Capacitance and PF Measurement
- Leakage Current Test
- PD Measurement

5. Tap Changers

- General
- DETC Inspection and Test
- ULTC Inspection and Test

6. Transformer Tanks

- General
- Cooling Systems
- Conservators
- Gaskets

7. Transformer Accessories

- Pressure Relief Devices
- Gas Detect Relay
- Temperature Gauges

More than 50 million electrical distribution transformers are located on utility poles and cement pads across the United States and Canada. Improper use, maintenance and neglect can cause heavy losses to businesses as well as to the environment. This electrical transformer training course introduces basic safe operational and field diagnostics of transformers with the focus on safe operation, testing and maintenance of the distribution transformers normally installed in substations and on poles.

ON-SITE TRAINING AVAILABLE

We can produce this or any other electrical training program (see: www.electricityforum.com/forums/upcoming_courses.htm for a full list) directly to your company. Our on-site training courses are tailored to meet your company's specific requirements and conducted on your own premises for your employees. Save the cost of travel and hotels and save on our regular public enrollment registration fees. Plus, our instructors can work with you in advance to determine the level of electrical training and experience of your employees and the specific applications that you would like covered. Electrical on-site training courses are best because they are delivered using the equipment your electrical technicians use every day. This maximizes the educational value of your electrical training investment.

For more information, contact:

Randy Hurst, President, The Electricity Forum
randy@electricityforum.com

INFORMATION ON THE SPEAKER

Peter D Zhao, Peter worked in the transformer industry from 1983 to 2003 in areas of engineering design, R&D, testing and QA. From 2004, he started his electrical utility career in Hydro One as an equipment engineer.

He has been an active member on the IEEE Transformer Committee for the past ten years in development of transformer standards.

His education includes a BSc in EE Eng, a M.Sc in Transformer Eng., and a M.Eng in High Voltage and Insulation.

Khaled Nigim, Khaled is a registered professional engineer in Ontario, Canada, senior member of the IEEE, has Ph. D. in Electrical Engineering from the University of Leicester, England UK in electric drives and wind energy recovery systems. He has taught numerous graduate, undergraduate courses and professional development seminars. He has more than 24 years of experience in project management, decision-making, design and assembly of industrial units that incorporate PLCs, intelligent sensors, VSDs, series regulators and transformers. He is currently the coordinator of the Master of Engineering professional development graduate program offered on-line at the University of Waterloo, E&CE department.

REGISTRATION

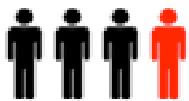
Act Now! Limited Seating! Register Today!

REGISTRATION FEES

The registration fee to attend the forum is \$699.00 + \$41.94 GST. The fee includes forum participation, a forum materials package, FREE 120-page Electrical Transformer Handbook (Value \$35), Magazine subscription, Electricity Forum \$100 coupon and refreshments. Lunch is not included with this course. (GST #R105219976).

Save \$50 by early bird registration!

Register and prepay 8 days before forum date and receive an early bird registration fee of \$649.00 + \$38.94 GST per delegate.



Register 3 Delegates At Full Price, THE 4TH REGISTRATIUN IS FREE

www.electricityforum.com/forums/electrical-transformer-training-2007.html

WHEN AND WHERE

(Please check the location where you want to attend the course)

Vancouver, BC - February 12-13, 2007

Best Western Hotel & Conference Centre
7551 Westminster Highway, Richmond, BC
Tel: 604-273-7878

Edmonton, AB - February 13-14, 2007

Coast Terrace Inn
4440 Gateway Blvd.
Tel: 780-437-6010

Toronto, ON - February 19-20, 2007

Park Plaza Airport Hotel
33 Carlson Court
Tel: 416-675-1234

Ottawa, ON - February 20-21, 2007

Chimo Hotel
1199 Joseph Cyr Street
Tel: 613-744-1060

Halifax, NS - April 16-17, 2007

Citadel Halifax Hotel
1960 Brunswick Street
Tel: 902-422-1391

Saint John, NB - April 18-19, 2007

Delta Brunswick Hotel
39 King Street
Tel: 506-648-1981

Saskatoon, SK - April 24-25, 2007

Saskatoon Inn
2002 Airport Drive
Tel: 306-242-1440

Winnipeg, MB - April 26-27, 2007

Hilton Suites Winnipeg Airport
1800 Wellington Avenue
Tel: 204-793-1700



Ways to register:

PHONE

(905) 686-1040

FAX:

(905) 686-1078

MAIL:

Canadian
Electricity Forum
Unit 215
1885 Clements Road
Pickering, ON
L1W 3V4

ON-LINE:

YES, Register me now for the Electrical Transformer Training Course. Registration Fee: \$699.00 + \$41.94 GST

ATTENDEE INFORMATION

Name _____

Title _____

Company _____

Address _____

City _____ Province _____ Postal Code _____

E-mail _____

Tel:() _____ Fax:() _____

METHOD OF PAYMENT

Cheque enclosed

Invoice me under PO#: _____

Send invoice attention: _____

Bill my credit card:

AMEX

VISA

MasterCard

Card # _____

Exp. Date _____

Signature _____

Card Holder name _____

(if not registrant)

CANCELLATION AND REFUND POLICY: Registration fees are refundable only upon receipt of written notification 10 days prior to the conference date, less a 10 per cent service charge. Substitution of participants is permissible up to and including the day of the forum. The Canadian Electricity Forum reserves the right to cancel any conference it deems necessary and will, in such event, make a full refund of the registration fees.