Northern Canada Section
IAS-PES Chapter

Distribution and Power Transformers up to 30 MVA

Mr. Guillermo Rodriguez, Distinguished Lecturer

This 3 day course (Sept 27-29) will provide a comprehensive overview of distribution and power transformers up to 30 MVA. The course will cover standards, theoretical, and practical aspects of transformers for several applications. The first day will also include a tour at ABB Power Services transformer shop.

Course Outline:

1. Introduction - basic transformers theory
2. Transformer Standards
3. Pole mounted Transformers
4. Underground Distribution
5. Padmounted Transformers
6. Submersible Transformers
7. Distribution Transformer Accessories
8. Transformer Tests
9. Dry Transformers
10. Small Power transformers (up to 30 MVA)
11. Transformer Loss evaluation
12. Transformer Maintenance
13. Why transformers fail?

Seating and registration is limited. See below for a detailed course agenda.

This course qualifies for Continuing Professional Development activity, and provides 24 Professional Development Hours (PDHs). Participants who successfully complete the course will receive a PDH certificate from IEEE within 14 business days of completion.

Location: ATCO Centre – Assembly Hall #2 (3rd floor)
10035 105 street, Edmonton, Alberta

Date: Wednesday, September 27, 2017 to Friday, September 29, 2017

Time: 8:30AM to 4:30PM (MST)

Cost:

IEEE Members	$300
Non Members	$600
ATCO Employees	$500
Full-time IEEE students (must be professor sponsored)	$150

Funding Opportunity: Alberta employers may qualify for the "Canada-Alberta Job Grant" training incentive program, where the government reimburses employers up to 2/3 of the training costs. See: http://www.AlbertaCanada.com/JobGrant

Register at: https://events.vtools.ieee.org/m/45365
Registration closes September 15.

Presenter:

Guillermo Rodriguez

Mr. Rodríguez obtained his degree of Electrical Engineer at the National University of Colombia in Bogotá in February 1972, his M.Sc. degree in Power Systems and Electric Machines in January 1977 from the University of London (Queen Mary College). He worked at Telecom Colombia from 1972 to 1973; At the Colombian Institute of Electrical Energy from 1973 to 1980. He taught the courses of Transmission Lines and Distribution Networks and Topics of Distribution Systems at the National University of Colombia from 1974 to 1987 as a part-time professor. From 1980 he worked as an Engineer in Westinghouse of Colombia and in 1988 was transferred to Miami as an expert in Distribution Systems. In December 1989 Westinghouse was acquired by ABB. From 1990 until 2007 he worked with ABB USA in different positions, being the last one as Director of Exports of ABB Transmission and Distribution Division of ABB USA. In 2008 he was appointed President of ABB Central America and the Caribbean. He retired in January 2014. He was a member of Carilec's Board of Directors from 2009 to 2013. Engineer Rodríguez has taught many courses at the IEEE on Transmission and Distribution topics in Mexico, El Salvador, Bolivia, Belize, Costa Rica, Panama, Honduras and Guatemala. Mr. Rodriguez has taught courses in Transformers and Distribution Systems at Carilec. He is a member of the IEEE Distinguished Lecturers Program. He is Senior Life Member of the IEEE.

Tour facilitator:

Ed teNyenhuis

Ed teNyenhuis is currently working for ABB Transformer Service as Operations & Technical Manager in Brampton Canada. Ed has worked in other past positions as transformer design engineer, research engineer, engineering manager and quality manager at ABB locations in Sweden, US and Canada. Ed is Chair of the IEEE Transformer Committee Performance Characteristics Subcommittee, Canadian Chairman of the IEC TC 14 and a member of the CIGRE A2.49 & A2.59 working groups. Ed has published over technical 10 papers. Ed received his BASc. in Electrical Engineering from University of Waterloo in Canada and his M.Eng. from North Carolina State University. He is a professional engineer with the province of Ontario.

Please contact Alex Nassif [nassif@ieee.org] or Carl Lam [carllam@ieee.org] if you have any requests or questions regarding course registration.

Day 1

1. Introduction – Basic Transformer theory
History
Transformer types
Transformer materials
Transformer basic theory
Transformer heating

2. Transformer standards
Definitions
ANSI Standard C57.12.00
BIL
Transformer Impedance
Short Circuit
Energy Conservation Standards

3. Pole mounted transformers
ANSI C57.12.20
Pole Mounted transformer construction
Accessories
CSP transformers

4. Tour at ABB Power Services:
Facility tour of transformer shop, ABB Power Services, which includes a Transformer Maintenance Presentation.
Please bring safety glasses and safety boots for the facility tour and arrange your own transportation to the facility.
Tour is located at: 9604 - 31 Avenue, Edmonton, Alberta, T6N 1C4

Day 2

5. Underground Distribution
Comparison with Overhead Distribution
Topology
Components

6. Padmounted transformers
ANSI C57.12.22
ANSI C57.12.26
Enclosure Integrity
Loop, radial types

7. Submersible transformers
Enclosure integrity
Single phase and three phase submersible transformers

8. Distribution transformer accessories
Terminations
Bushings
Elbows
Junctions
Switches

9. Transformer tests
ANSI C57.12.90
Routine tests
Design tests
Short circuit tests

Day 3

10. Small Power transformers (up to 30 MVA)
ANSI C57.12.90
Substation type
Primary substation type
Construction details
Accessories
Insulating oils

11. Transformer Loss evaluation
Transformer losses
Transformer efficiency
Total owning cost
Loss evaluation formula

12. Transformer Maintenance
ANSI C57.93
Insulating oil analysis
Gas Chromatography

13. Why transformers fail?
Transport
Operation