

TRAINING TRACK

Revised February 5, 2010

The Training Track classes will be held at the Westin Copley Hotel in the America North Ballroom.

TRAINING: POWER FACTOR AND APPARATUS TESTING

Monday, March 22nd

Theory, 7:30am - 9:15am

Keith Hill, Doble Engineering Company

Bushings, 10:30am - 12:00pm

Don Prien, Doble Engineering Company

Transformers 1:30pm - 4:30pm

Jill Duplessis, Doble Engineering Company

Circuit Breakers and Instrument Transformers, 4:30 - 6:00pm

Gary Heuston, Doble Engineering Company

The classes on power factor testing continue to be popular. To begin, the fundamentals of why the power factor tests are so valuable will be covered in the theory portion of this series of classes. The application of these tests will be explained for transformers, bushings, circuit breakers and instrument transformers. Case studies are included to show how apparatus problems have been found by applying the fundamentals of the theory.

TRAINING: DTAWeb

Tuesday, March 23rd

7:30 - 9:45am

Marshall Turley, Doble Engineering Company

Doble Engineering has implemented a system where Clients may store Doble Test Assistant data sets in a Doble Engineering database called DTAWeb. This system allows controlled access to the stored information over the World Wide Web. This system of data storage has become very popular. At this time, there are over 700,000 tests for more than 300,000 apparatus from the Doble Client companies using the system. In this class the user of the system learn the benefits of this new system and how to maximize the features of DTAWeb.

TRAINING: SWEEP FREQUENCY RESPONSE ANALYSIS

Tuesday, March 23rd

10:00am - 12:00pm

Long Pong, Doble Engineering Company

This year there will be training on the use of the Sweep Frequency Response Analysis technique. A review of the fundamentals will be covered and examples of apparatus problems will be shown.

TRAINING: PARTIAL DISCHARGE TESTING

Tuesday, March 23rd

2:45 – 5:30 pm

Matt Kennedy, Doble Engineering Company

Ala Wilson, Doble PowerTest

Introduction to the basics- what are partial discharges why are they important?

- Partial discharges, causes, consequences
- Examples of failures concentrating on Transformers, Machines, GIS, Cables

How a partial discharge develops physical changes that allow detection

- Indirect methods using heat, light, sound, vibration, chemical changes and radiated electromagnetic waves

Applications of PD techniques

- Measuring the electrical signals on line- using traveling waves and capacitance coupling in cables, machines and transformers and using electromagnetic probes to detect UHF radiation in transformers and GIS.
- Off-line techniques used in the field

TRAINING: FUNDAMENTALS AND DIAGNOSTICS OF TRANSFORMER LOAD TAP CHANGERS

Wednesday, March 34th

1:30 – 5:00 pm

Steve Larson, Manager

Snohomish Public Utility District

The Load Tap Changer (LTC) Fundamentals class will aid the participant in understanding how LTC's are constructed and operate. Components of the LTC such as moving/stationary contacts, reversing switch, collector ring, preventive autotransformer, leads and barrier board are identified and discussed. The various designs, such as arcing tap switch reactive & resistive, diverter switch resistive, transfer switch reactive, and vacuum bottle will also be explained, as well as comparing high and low side LTC configurations and series transformer types. Tap changer diagnostic testing (both on-line and off-line) and maintenance of LTC's will be discussed. This class will also describe how LTC controllers work, the meaning of settings, how to choose appropriate settings, test and troubleshoot them.

TRAINING: BASIC PROTECTIVE RELAYING

Thursday, March 25th

7:30am – 12:00pm, 1:30pm – 5:00pm

Ed Khan, Doble Engineering Company

The Basic Protection Relaying course is geared towards entry level engineers making their way into the field of relay protection and for technicians who like to obtain the theory and practices of protective relaying. The course is intended to provide a conceptual level of knowledge without the vigorous mathematical details.

The course will cover the following topics:

- Introduction to Relays.
- Differences between Electro-Mechanical, Solid State and Microprocessor Relays.
- Current and Voltage Transformers
- Basic Overcurrent Protection
- Distance Protection
- Transformer Protection.
- Basics of Communication Assisted Protection
- Reclosing of Circuits
- Remote and Local Backup Protection