



Technical Diagnostic Services Training Institute

Substation Maintenance Seminar 36 Hours

Who Should Attend:

This course will be of benefit to supervisors, field engineers, plant engineers, technicians and others with the responsibility for the specification of the maintenance, testing and evaluation of the most common types of substation devices rated from 2.3kV to 230kV.

Course Description:

Participants will cover the maintenance and testing requirements for common substation devices, including power transformers, oil, air and vacuum circuit breakers, switchgear, ground grid systems, batteries, chargers and insulating liquids. This course focuses on what to do, when to do it and how to interpret the results from testing and maintenance.

Outline: 100% Lecture

I. Introduction

- A) Student introductions
- B) Pre-Test
- C) Safety

II. The Substation As A System

- A) Application
- B) Common problems
- C) Ratings

III. Circuit Breaker Maintenance

- A) Maintenance frequencies
- B) Inspection
- C) Testing
- D) Interpreting test results
- E) Devices covered
- F) Air circuit breakers
- G) Vacuum circuit breakers
- H) Oil circuit breakers

IV. Insulating Liquids

- A) Sampling
- B) Routine tests
- C) Dissolved-Gas Analysis (DGA)
- D) Testing
 - i) Color
 - ii) Dielectric breakdown voltage
 - iii) Interfacial tension
 - iv) Neutralization number
 - v) Moisture
 - vi) Visual
 - vii) Dissolved-Gas Analysis (DGA)
 - viii) Interpreting test results

I. Transformers

- E) Types
- F) Inspection
- G) Testing
- H) Insulation Resistance
- I) Winding Resistance
- J) Power factor tests
- K) Core excitation current
- L) Turns ration (TTR)
- M) Gas blanket tests

TDSTI

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V. Lightning Arrestors

- A) Types
- B) Inspection
- C) Maintenance
- D) Testing

VI. Protective Relays

- A) Application
- B) Instrument Transformers
- C) Inspection
- D) Testing
- E) Calibration

VII. Devices Covered

- A) Voltage
- B) Transformer Differential

VIII. Ground Grid Systems

- A) Purpose
- B) Grounding theory
- C) Types of test equipment
- D) Inspection
- E) Testing

IX. Batteries and Chargers

- A) Types of station batteries
- B) Battery systems
- C) Maintenance
- D) Inspection
- E) Testing

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