Substation: Components, Testing and Interpretation

5 Days, 3.5 CEUs

Substation Maintenance is a major part of any utility or plant maintenance program. Equipment failures usually result in significant downtime because of long delays in equipment replacement. However, most of these failures can be detected and prevented. Equipment testing and maintenance is critical to the reliability of the equipment in a substation.

This course provides an overview of substation equipment, and equipment operations and maintenance based on ASTM, NETA and IEEE standards. This course is designed to provide an in-depth study to aid skilled qualified substation maintenance technicians in the safe performance of substation components preventive maintenance. Having skilled technicians in substation maintenance is essential to equipment reliability.

Learning Objectives

To receive 3.5 CEUs, participants must attend 5 days of virtual classes (35 contact hours) and attain a minimum grade of 80% on the final exam. Upon completion of this course the participants will demonstrate that they are able to:

- Describe configuration and function of the components found in a substation.
- Identify ASTM, NETA and IEEE electrical testing requirements.
- Explain electrical testing techniques and results.

SCOPE

Day 1* (7 contact hours)

I. Introduction

II. Safety for Technicians

III. Substation Overview
- A. Components of a Power System
- B. Switching Configurations
- C. Substation Components
- D. Metering
- E. Relaying

Day 2 (7 contact hours)

IV. Equipment Functions and Insulation Characteristics
- A. Switches
- B. Bus Structures
- C. Switchgear
- D. Circuit Breakers
- E. Transformers

Day 3 (7 contact hours)

V. Current Carrying Path
- A. Contact Erosion
- B. Contact Resistance
- C. Connector Resistance
- D. Winding Resistance
- E. Core Excitation
- F. Core Ground

Day 4 (7 contact hours)

VI. Specialty Testing
- A. Nameplate Data
- B. Transformer Turns Ratio
- C. Operation and Timing Tests
- D. Winding Resistance

Day 5 (7 contact hours)

VII. Substation Grounding and Earth Resistivity Test
- A. Function of Substation Grounding Systems
- B. Earth Resistivity
- C. Tests

VI. Conclusion
- A. Review
- B. Exam

*Class scheduling times may vary based on discussions and size of class

AVO Training Institute is accredited by the International Association for Continuing Education and Training (IACET) and is accredited to issue the IACET CEU