

# Fundamentals of Substations for Non-Engineers Agenda

Day One | Wednesday, June 9, 2021

**8:30 AM - 4:30 PM**

Introduction to Substations

- Electric Utility System Overview
- Substation Types and Differences
- Components and Equipment of Substations (Including Function and Purpose):
  - Substation Steel
  - Disconnect Switches
  - Main Power Transformer
  - Circuit Breakers
  - Control House
  - Substation Foundations
  - Ground Grid
  - Minor Equipment, (i.e., Insulators, Surge Arresters)
  - Measuring Devices, (i.e., Current transformers, Voltage transformers, Metering)
  - Overhead Bus/Cable
  - Cable Trench and Underground Cable (Power and Control)
- Examples of Non-Substation Equipment
  - Padmount Equipment/Switchgear
  - Solar Inverters
  - Wind Turbines
  - Energy Storage
- Substation Faults
  - Causes
  - Remedies
- Safety in Substations
  - Hazards and Safety Practices
  - Electrical Safety: Zones of Clearance
  - Chemical Safety
  - Proper PPE
  - Examples of Dangerous Situations

Day Two | Thursday, June 10, 2021

**9:00 AM - 12:00 PM**

- Basic Substation Drawings and Diagrams
- Sample Substation Designs
- One-line Diagrams
- Basic Equipment Symbols
- Managing Substation Construction Projects

- General Process
- Project Schedule
- Project Groups and Tasks
  - Project Development
  - Engineering
  - Procurement
  - Construction
  - Testing and Commissioning
  - Asset Management / O&M