Class Description

The Grid Fundamentals class is a comprehensive introduction to the theory, operation, planning and regulation of Electric Power Systems.

The purpose of the 2 ½-day class is to explain how the electric power system works, how it is managed and why. This class will review the technology, operation and markets of a modern reliable power grid. Environmental issues and regulations that affect the electric power system will also be discussed.

In this workshop-style class, you will experience lecture, hands-on activities, and discussion resulting in a well-rounded understanding of Grid Fundamentals.

Class Topics

Electric Fundamentals
How does electricity work? This section gives a brief layman’s understanding of basic concepts including:

- Voltage and Current
- Power and energy
- Electromagnetics
- Circuit components
- Circuit analysis
- Alternating current

Regulation
This section covers the evolution of the electric power system, the history of regulation and how compliance applies in the Western Interconnection.

- Public vs. private vs. municipal utilities
- Power cost: rates, tariffs
- Regulatory agencies
- Evolution of the North American electric system
- Compliance

The Interconnected Power System
How does the grid connect to deliver power from the generators to the customers?

- Power transmission, transformers and substation equipment

Environment and the Grid
How does the environment and the grid get along? This section will look at the interaction between the two.

- Power Generator Emissions sources and impact
Grid Fundamentals

- Power generation
- Facility right-of-way and environment issues
- What is an interconnection?

**Power System Operations**

Operating the electric power system is a balance of generation and load, of buying and selling, and at the same time keeping it all at the correct frequency across the entire Western Interconnection. This section covers how this is all managed.

- Types of load
- Load characteristics
- Balancing authority overview
- Frequency and energy balance
- System operators
- System restoration

**Who Should Attend**

This class is designed for anyone new to the electric utility business, environmentalists, policy makers, legal personnel, managers/supervisors/executives, and anyone who is looking for a broader view of the grid.

**Skill Level**

New

**Prerequisite**

None

**Instructors**

Merrill Brimhall, WECC

Guest Speakers from the WECC Staff

**NERC CEH Credits**

None

**Class Duration**

2 ½ days

**Manual**

Participant Guide will be provided upon class check-in

**Meeting content:**

Merrill Brimhall at (801) 819-7668 or mbrimhall@wecc.org