

Generation Operation Short Course

Overview

This course is intended to provide system operators with necessary training to understand the concepts of controlling generation on the Bulk Electric System. This course is delivered over a 2-day period and includes a wide variety of aspects of operations. This particular course only covers markets from its influences in controlling generation and will also cover transmission from the perspective of utilizing generation for constraint mitigation.

Target Audience

The target audience includes:

- New operators to the system that will have the responsibility of generation control
- Transmission operators who want to expand their knowledge of generation control
- Individuals who desire the overall philosophy of controlling generation and its impacts to the Bulk Electric System

NERC Continuing Education Hours

16.0 CEHs – Total
2.0 CEHs – Standards
16.0 CEHs – Ops Topics
2.0 CEHs – Sim

NERC Emergency Training Requirement

16.0 hours of Emergency Operations

Course Delivery:

The class activities will include lecture, related exercises, group discussions, simulation demonstrations, and other content related activities. Quizzes will be given after each content area to measure the students' progress and effectiveness of the course delivery.

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Course Content

The course modules' content includes:

NERC Standards

The NERC Standards module reviews the following NERC Standards as related to generation and generation control: Standard BAL-001-0 — Real Power Balancing Control Performance, Standard BAL-002-0 — Disturbance Control Performance, Standard BAL-003-0 — Frequency Response and Bias, Standard BAL-004-0 — Time Error Correction, Standard BAL-005-0 — Automatic Generation Control, Standard BAL-006-0 — Inadvertent Interchange, and Standard EOP-002-0 — Capacity and Energy Emergencies.

Generation Equipment

The Generation Equipment module begins with describing the principles of electric power generation. The module then identifies the operation and major systems in power producing facilities. After identifying the different types of facilities, operating parameters and characteristics of each type are reviewed. The module then explores generator governor operation and identifies the principles of operation and components of generators. The module concludes with describing the factors that influence the generator capability for both real and reactive power.

Generation Control/Balancing Concepts

The Generation Control/Balancing Concepts module picks up where the Basic Electricity module ended. It begins by re-enforcing and then expanding on the Control Area Concepts and Area Control Error. The module then explores Regulation, Automatic Generation Control, and Generation Dispatch. After setting these foundations, NERC CPS and DCS Standards will be reviewed. Class demonstrations and exercises will utilize the EPRI Power Simulator. The module concludes with an overview to Locational Marginal Pricing Methodology and its influences in controlling the system.

Classroom Schedule:

Day 1 - 8:00 AM to 5:00 PM (Lunch provided)

Day 2 - 8:00 AM to 5:00 PM (Lunch provided)

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