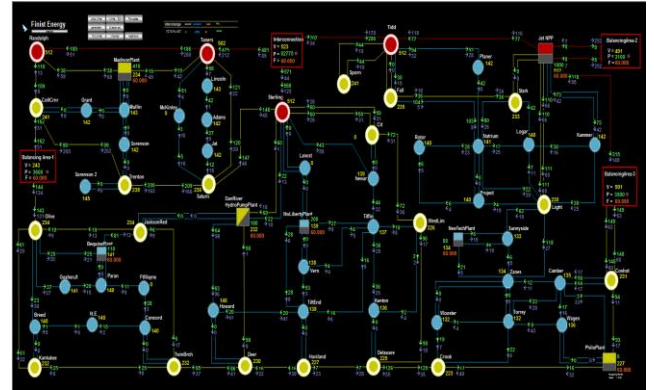


Operations Through Simulation

Background

This 2-day class is designed for real-time System Operating Personnel, Generating Plant personnel, and Operations Support personnel. The class reviews various concepts related to voltage control, congestion management, response to relay operations that include UVLS, UFLS, and SPS/RAS, and restoration. It consists primarily of simulation activities that provide the attendees with extensive opportunity to implement actions on the simulator and see the system response to those actions.



Target Audience

This course is intended for real-time System Operators, Support Personnel, and Generating Plant Personnel operating on the Bulk Electric System who wish to expand their knowledge and to enhance their skills associated with mitigating system conditions that pose reliability risks to the system. The goal is to provide attendees with the training and hands-on activity through simulation technology the opportunity to better understand operating concepts and to mitigate various operational conditions. The simulation provides a first-hand perspective of the implications to and response of the system when actions are implemented by System Personnel.

NERC Continuing Education Hours

16.0 CEHs – Total
0.0 CEHs – Standards
16.0 CEHs – Ops Topics
15.0 CEHs – Sim

NERC Emergency Training Requirement

16.0 hours of Emergency Operations



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Operations Through Simulation

Class Content

The course modules' content includes:

Voltage Control and Mitigation Techniques - The module covers the concepts of voltage control. It will step through the causes of low voltage and high voltage conditions, as well as the effects that each condition has on equipment and the reliable operation of the electric system. The class will then step through the use of voltage control equipment as a means for controlling system voltages. The module will then review the equipment utilized and the mitigating techniques to control congestion on the transmission system.

System Operator Actions - The module addresses the actions available to the System Operator for utilization in maintaining system voltage control. Operator actions will be identified and students will demonstrate these actions in a series of simulator scenarios that will require the mitigation of both high and low voltage conditions and will culminate with a demonstration of mitigation of wide-spread system voltage problems.

Transfer Limitations - The module covers the recognition of power flow or power transfer limits. It will then define the various types of limits: thermal, angle stability, and voltage limits. The module will then explore the actions required to maintain the system within those power transfer limits and students will demonstrate this ability on a generic simulator.

UVLS - The segment reviews the actions of an UVLS relay scheme. The function and application of the UVLS relay scheme is explored and then identifies the implication of the scheme operation and explore the actions required following scheme activation. Students will participate in simulation activities on a generic simulator to return a system to normal following UVLS activation.

UFLS - The segment reviews the actions of an UFLS relay scheme. The function and application of the UFLS relay scheme is explored and then identifies the implication of the scheme operation and explore the actions required following scheme activation. Students will participate in simulation activities on a generic simulator to return a system to normal following UFLS activation.

SPS/RAS - The segment reviews the actions of a SPS relay schemes. The function and application of the SPS/RAS relay schemes is explored and then identifies the implication of the scheme operation and explore the actions required following scheme activation. Students will participate in simulation activities on a generic simulator to return a system to normal following SPS/RAS activation.

System Restoration Implementation Exercise - Participants are required to assess a generic system following a disturbance that caused a major system shutdown and develop and implement a plan to restore the system to normal. The plan implementation will be demonstrated on a Generic Simulator.

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Classroom Schedule

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

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

Attendee Requirements

Attendees must sign-in for the training activity in accordance with the attendance verification process stated:

- Attendees are required to sign-in on the course sign-in sheet
- Attendees are required to provide their NERC SO Certification # on the sign-in sheet, if applicable
- Attendees are required to provide a photo ID as proof of identity
- Attendees must participate in all course activities
- Attendees must successfully complete the activity assessment
- Attendees must submit a course evaluation form

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