

Operation Simulation Workshops

Background

This 2 ½ -day Workshop 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, balancing and control, breaker failure schemes, geomagnetic disturbances, distributed energy resources and renewables, restoration, wildfires and flooding, and cold weather events. Primary focus is on simulation activities that provide the attendees with extensive opportunity to implement actions on the simulator and observe the impacts of their 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

Total - 20.0 CEHs
Standards - 2.0 CEHs
Simulation – 18.0 CEHs
Operations Topics – 20.0 CEHs

NERC Emergency Training Requirement

16.0 hours of Emergency Operations

Class Content

The course modules' content includes:

Voltage Control and Mitigation Techniques - The segment explores the concepts of voltage control, in addition to equipment utilized to address high and low voltage conditions. Participants will then utilize a power system simulator to identify and mitigate various voltage control situations.



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Congestion Management - The segment addresses various types of limits on the power system and actions available to mitigate these situations. It will then explore the equipment and concepts utilized and the mitigating techniques to control congestion on the transmission system. This will include the use of distribution/generation shift factors, generation resources, interchange adjustments, non-cost solutions, and market solutions. Participants' actions are then implemented on a power system simulator.

Balancing - The segment identifies the elements for consideration in maintaining generation-load balancing on the power system. It discusses topics including area control error, inadvertent, and frequency control. Additional content includes resources utilized to maintain balance including generation, interchange, and load. Actions are then required to be implemented on a simulator during various system events to maintain system balance.

Breaker Failure Schemes - The segment discusses the reasons for breaker failure schemes and how they are designed and implemented. It also discusses the issues and concerns with breaker failure scheme activations. Breaker failure schemes are then presented to participants on a simulation and participants are required to evaluate the breaker operations and then implement steps to return available equipment to service.

Geomagnetic Disturbances - The segment addresses the cause of geomagnetic disturbances, potential impact on the power system, and actions implemented to mitigate the GMD impacts. Participants are required to implement actions related to a GMD plan on a simulated system.

DER/Renewables - The segment discusses DERs, what they are, their implications to the reliable operation of the BES, and the results of the NERC DER Report, in addition to the impacts of renewable generation resources. The segment includes the utilization of a simulator in presenting participants with a system condition that demonstrates the implication that DERs and renewables can have on the power system. Participants are required to recognize the impacts and implement actions to mitigate the DER/Renewable impacts.

Restoration – In this segment, participants are required to assess a generic system following a disturbance that caused a major system disruption and partial system shutdown. They must then develop and implement a plan to restore the system to normal. The plan must then be implemented on a simulator while considering frequency and voltage control in addition to the impacts of load restoration.

Wildfires/Flooding - The segment discusses the impacts that wildfires and flooding can have on the security of the power system. Programs and responses of electric utilities to mitigate impacts of these events are explored and identified. Participants are required to implement actions on a pre-emptive basis to limit the uncontrolled impacts that these events can cause. Participants will have to address both the de-energization and re-energization concerns.

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Cold Weather Events - The segment reviews cold weather events that have impacted the power system and identifies what the various impacts are. The actions that can be implemented to assist in mitigating these situation is identified and participants are required to implement these action in a simulated environment.

Classroom Schedule

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

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

Day 3 - 8:00 AM to 12:00 PM

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

