

## **Emergency Identification and Mitigation**

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<b>ACTIVITY TITLE:</b>	Emergency Identification and Mitigation	
<b>TARGET AUDIENCE:</b>	<input checked="" type="checkbox"/> Transmission Operator <input checked="" type="checkbox"/> Market Operator <input checked="" type="checkbox"/> Reliability Operator <input checked="" type="checkbox"/> Operations and Planning Eng <input checked="" type="checkbox"/> Balancing & Interchange <input checked="" type="checkbox"/> Supervisor/Manager/Support <input checked="" type="checkbox"/> Generator Operator <input type="checkbox"/> Other _____	
<b>NERC CEHs:</b>	Operating Topics CE Hours: 16.0 NERC Standards CE Hours: 3.0 Simulation CE Hours: 3.0 Professional Related CE Hours: 16.0	
<b>NERC EMERGENCY TRAINING HOURS:</b>	16.0 hours	
<b>ACTIVITY SUBJECT MATTER:</b>	<input checked="" type="checkbox"/> Basic Concepts <input checked="" type="checkbox"/> Power System Restoration <input checked="" type="checkbox"/> Power Transfer <input type="checkbox"/> Market Operations <input checked="" type="checkbox"/> System Protection <input type="checkbox"/> Tools <input checked="" type="checkbox"/> Interconnected Operation <input checked="" type="checkbox"/> Operator Awareness <input checked="" type="checkbox"/> Emergency Operations <input checked="" type="checkbox"/> Policies and Procedures	
<b>DELIVERY SCHEDULE:</b>	Activity is expected to be delivered over a 2-day period. This 2-day period is expected to consist of two 9-hour days with 1 hour allotted for lunch. In accordance with NERC CEP criteria, a 10-minute break every hour can be accommodated. The activity assessment does not require any additional time allotment.	

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### **A. ACTIVITY OVERVIEW**

This course is intended for real-time system operators and support personnel operating on the Bulk Electric System who wish to expand their knowledge and to enhance their skills related to the identification and mitigation of emergency situations. The activity begins with the review of NERC Standards related to emergencies. It then explores the concepts of critical thinking and its application to problems in system operations. The activity culminates with the identification and mitigation of system conditions that involve Voltage Collapse, VAR flow and its effects, MW Line Loading, Generation, System Protection, and Voltage Schedules.

### **B. METHOD OF INSTRUCTION**

The activity is expected to be delivered in an Instructor Led environment. The activity is expected to be delivered utilizing a PowerPoint presentation in conjunction with the various exercises that are integrated into the material. The activity also includes individual exercises on operational problems that must be solved using the processes identified in the lecture and the EPRI Generic Simulator.

### **C. ACTIVITY OBJECTIVES**

Upon completion of this training activity, the trainee shall be able to:

1. State the actions that a System Operator can take to mitigate emergencies associated with Transmission Loading, Generation, Voltage, Geomagnetic Disturbances, and System Protection
2. State operating authority responsibilities
3. Identify NERC and DOE disturbance and sabotage reporting
4. Identify critical thinker personality traits and critical thinking thought process
5. Identify the critical thinking actions and describe information quality checks
6. Identify the keys for prioritizing
7. Define an emergency and identify the different types of emergencies
8. Describe the key elements for identifying that an emergency exists with regards to Transmission Loading, Generation, Voltage, Geomagnetic Disturbances, and System Protection
9. Describe NERC Standards with regards to Emergency Operations
10. Identify the actions to take for relieving abnormal system conditions
11. Define the reporting requirements in the event of an emergency

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### **D. ACTIVITY CONTENT**

#### NERC Standards:

The NERC Standards module provides an overview to the following standards related to system emergencies: EOP-001 Emergency Operations Planning, EOP-002 Capacity and Energy Emergencies, EOP-003 Load Shedding Plans, EOP-004 Disturbance Reporting, EOP-005 System Restoration Plans, EOP-006 Reliability Coordination – System Restoration, EOP-007 Establish, Maintain, and Document a Regional Blackstart Capability Plan, EOP-008 Plans for Loss of Control Center Functionality, EOP-009 Documentation of Blackstart Generating Unit Test Results, and CIP-001 Sabotage Reporting.

#### Critical Concepts:

The Critical Concepts module reviews the concepts of critical thinking and its application to problems in system operations. The process is used in identifying, verifying, and mitigating emergency situations when operating on the bulk electric system.

#### Emergency Identification and Mitigation:

The Emergency Identification and Mitigation module steps thru the process of identifying emergency situations in system operations related to:

- Voltage Collapse – what it is, what are the causes, how to identify, and actions to prevent
- VAR flow and its effects
- MW Line Loading - What are the causes of excess loading, types of loading problems, how to identify, and actions to prevent
- Generation - what types of emergencies occur, what are the causes, how to identify, and actions to mitigate
- System Protection - what is it, what purpose does it serve, and failures that occur
- Voltage Schedules - what are they, impacts of not maintaining, and actions to maintain

This module will utilize a system simulator to demonstrate identification and monitoring the impacts of actions implemented.

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### **E. ASSESSMENT VEHICLE**

The activity assessments consist of individual and group exercises that occur during the classroom activities and are re-enforced with a multiple-choice question written exam at the end of the program that address the objectives of the activity.

### **F. MISCELLANEOUS ELEMENTS**

Many of the exercises included in this activity require the utilization of the EPRI Generic Simulator.

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