OES-NA Training Modules To Go

Restoration: Planning, Assessing and Implementing

ACTIVITY TITLE:	Restoration – Planning, Assessing, and Implementing
TARGET AUDIENCE:	☒ Transmission Operator ☒ Market Operator ☒ Reliability Operator ☒ Operations and Planning Eng ☒ Balancing & Interchange ☒ Supervisor/Manager/Support ☒ Generator Operator ☐ Other _____
NERC CEHs:	Operating Topics CE Hours: 16.0 NERC Standards CE Hours: 4.0 Simulation CE Hours: 13.0 Professional Related CE Hours: 16.0
NERC EMERGENCY TRAINING HOURS:	16.0 hours
ACTIVITY SUBJECT MATTER:	☒ Basic Concepts ☒ Power System Restoration ☒ Power Transfer ☐ Market Operations ☒ System Protection ☐ Tools ☒ Interconnected Operation ☒ Operator Awareness ☒ Emergency Operations ☐ Policies and Procedures
DELIVERY SCHEDULE:	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 each day. 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.

Educating System Operators in the New Millennium!

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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 system restoration. The participants will be required to utilize the basic elements of restoration and utilize them in a simulated environment. The activity is a combination of lecture and group activities with the majority of the class being comprised of group activities. The EPRI Generic Simulator is presented with specific elements of a real-life system. This would include: critical loads and under frequency protected circuits located throughout the entire system, Blackstart generation, generation start-up power requirements, etc.

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.

C. ACTIVITY OBJECTIVES

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

1. Describe the elements of and the development process for a system restoration plan.
2. Explain the process for assessing the system after a system disturbance that has caused a partial or complete system shutdown.
3. Identify key concepts to consider when restoring a system from a partial or complete system shutdown
4. Demonstrate the use of a simulator in restoring a generic system following a partial or complete system shutdown

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D. ACTIVITY CONTENT

Planning

Lecture – The elements of developing a Blackstart plan will be identified. This will include: critical loads, blackstart generation, underfrequency protected circuits, generation start-up power requirements, etc.

Group Exercise – The class will be broken into small workgroups. Each group is responsible for developing a Blackstart plan for the system that they are presented with. After completion of their plan, the class will re-convene and each group will be responsible to report on their plan with explanation of why they elected to utilize their particular strategy. The class will critique each plan to ensure that all elements of the restoration have been incorporated into the plan.

Assessing

Lecture – The elements related to assessing the system following a disturbance will be identified. The class will be required to utilize this knowledge in the group exercise.

Implementing

Lecture – Brief overview of restoration strategies, load pick-up guides, and frequency implications that should be utilized in the restoration process.

Group Exercise – The class will break into their groups and each group will be presented with a system of different configurations. Some may have generation and load that survived and others may be faced with a completely blacked out scenario with or without outside assistance available. In addition, there may be both generation and transmission facility damage incurred. The group will be responsible to assess their specific situation and establish their plan for restoration and to mitigate the differences from the classroom developed Blackstart Plan. The groups will then be responsible to restore their system using the EPRI Generic Simulator while experiencing additional events that may occur during the course of their restoration efforts (i.e. Lines tripping, generators tripping, emergency events that they must respond to).

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E. ASSESSMENT VEHICLE

The activity assessment is accomplished through a series of simulation and tabletop exercises imbedded in the classroom activities. The instructor will observe individual participation and completion of the assignments and document completion of the assignments utilizing an activity checklist. Attendees must successfully complete all of the activities in order to satisfy the assessment requirements.

F. MISCELLANEOUS ELEMENTS

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