



AESO Reliability Standards Monthly Report

November/December 2009

EOP-005-1 – System Restoration Plans

Purpose:

Request for Interpretation by the Florida Municipal Power Agency (FMPA)

Standard:

The standard was approved by the NERC Board of Trustees on May 2, 2006 and came into effect one year later.

Request:

FMPA asks:

- 1) What is meant by the phrase "verify the restoration procedure" and by the term "simulation" in requirement R7?
- 2) For a TOP without any blackstart facilities in its restoration plan, can exercises and tabletop drills be used to meet Requirement R7 by "verifying the restoration procedure" through tabletop "simulations?"

NERC Interpretation:

- 1) In the reference document that accompanied the operating guide used to develop this standard (Electric System Restoration Reference Document), the following are provided as necessary plan elements:

Actions required for system restoration include identifying resources that will likely be needed during restoration, determining their relationship with each other, and training personnel in their proper application. Actual testing of the use of the strategies is seldom practical. Simulation testing of plan elements, major plan sections, or the overall plan are essential preparations toward readiness for implementation on short notice.

Control area restoration plans include the following elements:

1. Philosophies and strategies for control area restoration
2. Selection of critical alarms from the alarm information available
3. Identification of the relationships and responsibilities of the personnel necessary to the restoration
4. Identification of blackstart resources including:
 - a. generating unit resources
 - b. sufficient fuel resources
 - c. transmission resources
 - d. communication resources and power supplies
 - e. mutual assistance arrangements
5. Contingency plans for failed resources
6. Identification of critical load requirements
7. Provisions for training of personnel
8. Provisions for simulating and, where practical, actual testing and verification of the resources and procedures
9. General instructions and guidelines for:
 - a. system operators
 - b. plant operators
 - c. communications personnel
 - d. transmission and distribution personnel
10. Provisions for public information

Verifying the restoration procedure means establishing that the restoration procedure is technically sound and can progress as planned. A restoration plan is typically broken down to its restoration levels, tasks, and basic operating actions (opening/closing breakers, raising/lowering transformer taps, adjusting voltage and frequency set points, starting motors, etc). Usually, some activities cannot begin until others have been completed, so the restoration



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procedure lists the predecessor of each activity. The purpose of verifying the restoration procedure is to determine that the entire plan is broken down into some logical order that reduces the risk of overlooking any essential operation.

Verifying Restoration by Simulation:

With each significant restoration action, concerns are with exceeding high/low operating limits. Various analytical tools are used to verify safe operations by engineers, operators, and instructors/trainees during different operating conditions, such as pre-disturbance condition, post-disturbance status, and actual emergency operating condition. These tools include power flow, transient stability, long-term dynamics, voltage transients, short circuit, electromagnetic transient programs, etc.

For a small TOP with no blackstart capability, the technical aspects of the smaller TOP's restoration plan may be incorporated into the plan of a larger TOP and may be included in the larger TOP's testing or simulation. The requirement does not state that every TOP has to physically perform simulation or testing; the requirement only mandates verifying the plan with simulation or testing. Another TOP, the Reliability Coordinator, or a contractor could perform testing or simulation on behalf of the smaller TOP.

2) Based on the reference document quoted above, the drafting team interprets that tabletop exercises can meet some of the requirements but cannot be used to meet the simulation requirements.

Applicability:

Transmission Operator, Balancing Authority

Current Status:

The interpretation is posted for pre-ballot review until January 05, 2010.

NERC Link:

[System Restoration Plans](#)