

Policy 1 – Generation Control and Performance

Version 2

Policy Subsections

A.	Control Performance Standard	<u>Standard 001</u>
B.	Disturbance Control Standard	<u>Standard 002</u>
C.	Frequency Response and Bias	<u>Standard 003</u>
D.	Time Control Standard	<u>Standard 004</u>
E.	Automatic Generation Control Standard	<u>Standard 005</u>
F.	Inadvertent Interchange Standard	<u>Standard 006</u>
G.	Surveys Standard	

Introduction

Each ~~CONTROL AREA~~BALANCING AUTHORITY shall have access to and/or operate resources to provide for a level of OPERATING RESERVE sufficient to account for frequency support, errors in load forecasting, generation loss, transmission unavailability, and regulating requirements. Sufficient OPERATING RESERVES is defined as the capacity required to meet the Control Performance Standard (Section A), Disturbance Control Standard (Section B), and Frequency Response Standard (Section C) of this Policy.

001. Control Performance Standard

[Appendix 1A, “Area Control Error (ACE) Equation”]
[“Performance Standard Reference Document”]

Introduction

The ~~CONTROL AREA~~BALANCING AUTHORITY balance between demand and supply (generation plus INTERCHANGE) is measured by its AREA CONTROL ERROR (ACE). Because supply and demand change unpredictably, there will often be a mismatch between them, resulting in non-zero ACE.

The Control Performance Standard (CPS) establishes the statistical boundaries for ACE magnitudes, ensuring that steady-state frequency is statistically bounded around its scheduled value. Each ~~CONTROL AREA~~BALANCING AUTHORITY must achieve at least the minimum performance required by the CPS. CPS1 defines the permissible distribution of all ~~CONTROL AREAS~~BALANCING AUTHORITIES’ ACEs in an INTERCONNECTION and is based on expected frequency performance within that individual INTERCONNECTION. CPS2 limits the magnitude of the impact that a ~~CONTROL AREA~~BALANCING AUTHORITY places on its respective INTERCONNECTION. Values controlling the effects of CPS are set by the ~~Resources Subcommittee~~Standards Developer.

1. **Monitoring.** Each ~~CONTROL AREA~~BALANCING AUTHORITY shall monitor its control performance against two Standards: CPS1 and CPS2.

Policy 1 – Generation Control and Performance

A. Control Performance Standard

001 – R1

- 1.1. **(001 – R1) Control Performance Standard (CPS1).** A Balancing Authority shall operate such that, on a rolling 12-month basis, the average of the clock-minute averages of the CONTROL AREA'S BALANCING AUTHORITY'S ACE divided by 10B (B is the clock-minute average of the CONTROL AREA'S BALANCING AUTHORITY'S frequency

$$AVG_{Period} \left[\left(\frac{ACE_i}{-10B_i} \right)_1 * \Delta F_1 \right] \leq \epsilon_1^2 \text{ or } \frac{AVG_{Period} \left[\left(\frac{ACE_i}{-10B_i} \right)_1 * \Delta F_1 \right]}{\epsilon_1^2} \leq 1$$

bias) times the corresponding clock-minute averages of the INTERCONNECTION'S FREQUENCY ERROR shall be less than a specific limit. This limit ϵ_1^2 is a constant derived from a targeted frequency bound (separately calculated for each INTERCONNECTION) reviewed and set as necessary by the NERC Operating Committee, the NERC Resources Subcommittee Standards Developer. [See the "Performance Standard Reference Document" for application for variable frequency bias.]

001 – R2

- 1.2. **(001 – R2) Control Performance Standard (CPS2).** Each Balancing Authority shall operate such that its average ACE for at least 90% of clock-ten-minute periods (6 non-overlapping periods per hour) during a calendar month must be within a specific limit, referred to as L_{10} . [See the "Performance Standard Reference Document," for the methods for calculating L_{10} .]

$$AVG_{10\text{-minute}} (ACE_i) \leq L_{10}$$

where:

$$L_{10} = 1.65 \epsilon_{10} \sqrt{(-10B_i)(-10B_s)}$$

ϵ_{10} is a constant derived from the targeted frequency bound. It is the targeted RMS of ten-minute average frequency error from schedule based on frequency performance over a given year. The bound, ϵ_{10} , is the same for every control area Balancing Authority within an

ϵ_{10} is a constant derived from the targeted frequency bound. It is the targeted RMS of ten-minute average frequency error from schedule based on frequency performance over a given year. The bound, ϵ_{10} , is the same for every Balancing Authority balancing area within an Interconnection,

and B_s is the sum of the frequency bias settings of the Balancing Authority balancing areas in the respective Interconnection. F_s ; for systems with variable bias, this is equal to the sum of the minimum frequency bias settings.

001 – M1

2. **(2. to 2.3-001- Measures1) Control Performance Standard (CPS) Compliance.** Each CONTROL AREA BALANCING AUTHORITY shall achieve, as a minimum, CPS1 compliance of 100% and CPS2 compliance of 90%

- 2.1. **Control Performance Standard 1 (CPS1).** CPS1 is calculated by converting a compliance ratio to a compliance percentage as follows:

$$CPS1 = (2 - CF) * 100\%$$

The frequency-related Compliance Factor, CF, is a ratio of all one-minute compliance parameters accumulated over 12 months divided by the Target Frequency Bound:

A. Control Performance Standard

$$CF = \frac{CF_{12\text{-month}}}{(\epsilon_1)^2}$$

where: $CF_{12\text{-month}}$ is defined in Section 2.1.1,
 ϵ_1 is defined in Section B.1.1.1.

2.1.1. $CF_{12\text{-month}}$ Calculation. The rating index is derived from 12 months of data. The basic unit of data comes from one-minute averages of ACE, frequency error and frequency bias settings.

2.1.1.1. Clock-minute average. A clock-minute average is the average of the reporting Balancing Authority's valid measured variable (i.e., for ACE and for frequency error for each sampling cycle during a given clock-minute).

$$\left(\frac{ACE}{-10B} \right)_{\text{clock-minute}} = \frac{\left(\frac{\sum ACE_{\text{sampling cycles in clock-minute}}}{n_{\text{sampling cycles in clock-minute}}} \right)}{-10B}$$

$$\Delta F_{\text{clock-minute}} = \frac{\sum \Delta F_{\text{sampling cycles in clock-minute}}}{n_{\text{sampling cycles in clock-minute}}}$$

The Balancing Authority's clock-minute Compliance Factor (CF) becomes:

$$CF_{\text{clock-minute}} = \left[\left(\frac{ACE}{-10B} \right)_{\text{clock-minute}} * \Delta F_{\text{clock-minute}} \right]$$

2.1.1.2. Hourly Average. Normally, sixty (60) clock-minute averages of the reporting area's ACE and of the respective Interconnection's frequency error will be used to compute the respective Hourly Average Compliance parameter.

$$CF_{\text{clock-hour}} = \frac{\sum CF_{\text{clock-minute}}}{n_{\text{clock-minute samples in hour}}}$$

2.1.1.3. Accumulated Averages. The reporting entity can recalculate and store each of the respective clock-hour averages ($CF_{\text{clock-hour average-month}}$) as well as the respective number of samples for each of the twenty-four (24) hours (one for each clock-hour, i.e., HE 0100, HE 0200, ..., HE 2400).

$$CF_{\text{clock-hour average-month}} = \frac{\sum_{\text{days-in-month}} [(CF_{\text{clock-hour}})(n_{\text{one-minute samples in clock-hour}})]}{\sum_{\text{days-in month}} [n_{\text{one-minute samples in clock-hour}}]}$$

$$CF_{\text{month}} = \frac{\sum_{\text{hours-in-day}} [(CF_{\text{clock-hour average-month}})(n_{\text{one-minute samples in clock-hour averages}})]}{\sum_{\text{hours-in day}} [n_{\text{one-minute samples in clock-hour averages}}]}$$

The 12-month Compliance Factor becomes:

$$CF_{12\text{-month}} = \frac{\sum_{i=1}^{12} (CF_{\text{month-}i})(n_{(\text{one-minute samples in month-}i)})}{\sum_{i=1}^{12} [n_{(\text{one-minute samples in month-}i)}]}$$

2.1.2. In order to ensure that the average ACE and Frequency Deviation calculated for any one-minute interval is representative of that one-minute interval, it is necessary that at least 50% of both ACE and Frequency Deviation samples during that one-minute interval be present. Should a sustained interruption in the recording of ACE or Frequency Deviation due to loss of telemetering or computer unavailability result in a one-minute interval not containing at least 50% of samples of both ACE and Frequency Deviation, that one-minute interval shall be excluded from the calculation of CPS1.

2.2. (001 – M2) Control Performance Standard 2 (CPS2). The second parameter in the Control Performance Rating relates to a bound on the ten-minute average of ACE. A compliance percentage is calculated as follows:

$$CPS2 = \left[1 - \frac{\text{Violations}_{\text{month}}}{(\text{Total Periods}_{\text{month}} - \text{Unavailable Periods}_{\text{month}})} \right] * 100$$

The Violations_{month} are a count of the number of periods that ACE_{clock-ten-minutes} exceeded L₁₀. ACE_{clock-ten-minutes} is the sum of valid ACE samples within a clock-ten-minute period divided by the number of valid samples.

$$\text{Violation}_{\text{clock-ten-minutes}} = 0 \text{ if } \left| \frac{\sum ACE}{n_{\text{samples in 10-minutes}}} \right| \leq L_{10}$$

001 – M1

001 – M2

$$= 1 \text{ if } \left| \frac{\sum ACE}{n_{\text{samples in 10-minutes}}} \right| > L_{10}$$

Each area shall report the total number of Violations and Unavailable Periods for the month. L_{10} is defined in Section B.1.1.2.

2.2.1. Determination of Total Periods_{month} and Violations_{month}. Since the CPS2 Criterion requires that ACE be averaged over a discrete time period, the same factors that limit Total Periods_{month} will limit Violations_{month}. The calculation of Total Periods_{month} and Violations_{month}, therefore, must be discussed jointly.

2.2.2. Condition that Impacts the Calculation of Total Periods_{month} and Violations_{month}. A condition may arise which may impact the normal calculation of Total Periods_{month} and Violations_{month}. This condition is a sustained interruption in the recording of ACE.

2.2.2.1. Interruption in the Recording of ACE. In order to ensure that the average ACE calculated for any ten-minute interval is representative of that ten-minute interval, it is necessary that at least half the ACE data samples are present for that interval. Should half or more of the ACE data be unavailable due to loss of telemetering or computer unavailability, that ten-minute interval is omitted from the calculation of CPS2.

2.3. ~~CONTROL AREAS~~BALANCING AUTHORITIES Participating in SUPPLEMENTAL REGULATION SERVICE.**** A ~~CONTROL AREA~~**BALANCING AUTHORITY** providing or receiving SUPPLEMENTAL REGULATION SERVICE through DYNAMIC TRANSFER shall continue to be evaluated on the characteristics of its own ACE with the SUPPLEMENTAL REGULATION SERVICE included.

2.4. (001-R4) ~~CONTROL AREAS~~BALANCING AUTHORITIES Providing OVERLAP REGULATION SERVICE.**** ~~A~~Each ~~CONTROL AREA~~**BALANCING AUTHORITY** providing OVERLAP REGULATION SERVICE shall evaluate CPS1 and CPS2 using the characteristics of the combined ~~CONTROL AREAS~~**BALANCING AUTHORITIES'** ACE and combined FREQUENCY BIAS SETTINGS.

2.5. (001-R5) ~~CONTROL AREAS~~BALANCING AUTHORITIES Receiving OVERLAP REGULATION SERVICE.**** ~~A~~Each ~~CONTROL AREA~~**BALANCING AUTHORITY** receiving OVERLAP REGULATION SERVICE shall not have its control performance evaluated (i.e. from a control performance perspective, the ~~CONTROL AREA~~**BALANCING AUTHORITY** has shifted all control requirements to the ~~CONTROL AREA~~**BALANCING AUTHORITY** providing overlap regulation).

001 - R4

001 - R5

002. Disturbance Control Standard

[Appendix 1A – Area Control Error Equation]

[Performance Standard Reference Document]

Introduction

The ~~CONTROL AREA~~BALANCING AUTHORITY demand-supply balance will quickly change following the sudden loss of load or generation failure. This results in a sudden change in the ~~CONTROL AREA'S~~BALANCING AUTHORITY'S ACE, and also a change in INTERCONNECTION frequency. The Disturbance Control Standard measures the ~~CONTROL AREA'S~~BALANCING AUTHORITY'S ability to utilize its CONTINGENCY RESERVES following a REPORTABLE DISTURBANCE. Because generator failures are far more common than significant losses of load and because CONTINGENCY RESERVE activation does not typically apply to the loss of load, the application of the Disturbance Control Standard is limited to the loss of supply and does not apply to the loss of load.

Each ~~CONTROL AREA~~BALANCING AUTHORITY shall have access to and/or operate resources to provide for a level of CONTINGENCY RESERVE sufficient to meet the DCS performance standards.

(002-R1) RESERVE SHARING GROUPS shall have the same responsibilities and meet the same obligations as individual ~~CONTROL AREAS~~BALANCING AUTHORITIES with regards to monitoring and meeting the Disturbance Control Standard.

Standards

1.2. (002-R1) **CONTINGENCY RESERVES.** Each ~~CONTROL AREA~~BALANCING AUTHORITY shall have access to and/or operate CONTINGENCY RESERVES to respond to DISTURBANCES. This CONTINGENCY RESERVE is that part of the OPERATING RESERVES that is available, following loss of resources by the ~~CONTROL AREA~~BALANCING AUTHORITY, to meet the Disturbance Control Standard (DCS). CONTINGENCY RESERVE may be supplied from generation, controllable load resources, or coordinated adjustments to INTERCHANGE SCHEDULES.

1.1.2.1. (002-R2) **CONTINGENCY RESERVE Accounting.** The same portion of RESOURCE CAPACITY shall not be counted by more than one ~~entity~~ Balancing Authority (e.g. reserves from jointly owned generation) as part of its CONTINGENCY RESERVES.

1.1.2.2. (002-R2) ~~REGION~~**REGIONAL RELIABILITY ORGANIZATIONAL CONTINGENCY RESERVE Policies.** Each ~~Region~~Regional Reliability Organization, sub~~Regional~~ Reliability Organization or RESERVE SHARING GROUP shall specify its CONTINGENCY RESERVE policies, including the minimum reserve requirement for the group, its allocation among members, the permissible mix of OPERATING RESERVE – SPINNING and OPERATING RESERVE – SUPPLEMENTAL ~~(NON-SPINNING)~~ that may be included in CONTINGENCY RESERVE, and the procedure for applying CONTINGENCY RESERVE in practice, and the limitations, if any, upon the amount of interruptible load that may be included.

2.3. (002-R3) **CONTINGENCY RESERVE to meet Disturbance Control Standard.** Each ~~CONTROL AREA~~BALANCING AUTHORITY or RESERVE SHARING GROUP shall activate sufficient CONTINGENCY RESERVE to comply with the NERC Disturbance Control Standard. As a minimum the ~~CONTROL AREA~~BALANCING AUTHORITY, or RESERVE SHARING GROUP, shall carry at least enough CONTINGENCY RESERVES to cover the MOST SEVERE SINGLE CONTINGENCY.

002 – R1

002 – R2

002 – R3

B. Disturbance Control Standard

002 – R3

2.1.3.1. (002-R3) Contingency review. All RESERVE SHARING GROUPS and ~~CONTROL AREAS~~BALANCING AUTHORITIES shall at least annually review their probable contingencies to determine their prospective most severe single contingencies.

002 – R4

2.2.3.2. (3.2 to 3.2.2 002-R4) Disturbance Control Standard Compliance. When a ~~CONTROL AREA~~BALANCING AUTHORITY or RESERVE SHARING GROUP experiences a REPORTABLE DISTURBANCE (SEE 2.4), it is compliant with the Disturbance Control Standard when the DISTURBANCE RECOVERY CRITERION is met within the DISTURBANCE RECOVERY PERIOD. Each ~~CONTROL AREA~~BALANCING AUTHORITY or RESERVE SHARING GROUP shall meet the Disturbance Control Standard (DCS) 100% of the time for REPORTABLE DISTURBANCES.

2.2.1.3.2.1. DISTURBANCE RECOVERY CRITERION. The ~~CONTROL AREA~~BALANCING AUTHORITY shall return its ACE to zero if its ACE just prior to the DISTURBANCE was positive or equal to zero. For negative initial ACE values just prior to the DISTURBANCE, the ACE must return to its pre-disturbance value. The default performance criterion described above may be adjusted to better suit the needs of an INTERCONNECTION based on analysis approved by the NERC ~~Resources Subcommittee and the NERC~~ Operating Committee.

2.2.2.3.2.2. DISTURBANCE RECOVERY PERIOD. The default DISTURBANCE RECOVERY PERIOD is 15 minutes after the start of a REPORTABLE DISTURBANCE. This period may be adjusted to better suit the needs of an INTERCONNECTION based on analysis approved by the NERC ~~Resources Subcommittee and the NERC~~ Operating Committee.

002 – R5

2.3.3.3. (3.3 TO 3.3.2 002-R5) RESERVE SHARING GROUP. Each RESERVE SHARING GROUP shall comply with the Disturbance Control Standard. A RESERVE SHARING GROUP shall be considered in a DISTURBANCE condition whenever a group member has experienced a REPORTABLE DISTURBANCE and calls for the activation of CONTINGENCY RESERVES from one or more other group members. (If a group member has experienced a REPORTABLE DISTURBANCE condition but does not call for reserve activation from other members of the RESERVE SHARING GROUP, then that member shall report as a single ~~CONTROL AREA~~BALANCING AUTHORITY.) Compliance may be demonstrated by either of the following two methods:

2.3.1.3.3.1. Group compliance to Disturbance Control Standard. The RESERVE SHARING GROUP reviews group ACE (or equivalent) and demonstrates compliance to the DCS. To be in compliance, the group ACE (or its equivalent) must meet the DISTURBANCE RECOVERY CRITERION after the schedule change(s) related to reserve sharing have been fully implemented, and within the DISTURBANCE RECOVERY PERIOD.

2.3.2.3.3.2. Group member compliance to Disturbance Control Standard. The RESERVE SHARING GROUP reviews each member's ACE in response to the activation of reserves. To be in compliance, a member's ACE (or its equivalent) must meet the DISTURBANCE RECOVERY CRITERION after the schedule change(s) related to reserve sharing have been fully implemented, and within the DISTURBANCE RECOVERY PERIOD. [See Requirement 2.2.2 above.]

2.4.3.4. Reportable Disturbances. REPORTABLE DISTURBANCES are contingencies that are greater than or equal to 80% of the MOST SEVERE SINGLE CONTINGENCY loss. ~~Region~~Regional Reliability Organizations ~~Region~~ may optionally reduce the 80% threshold, provided that normal operating characteristics are not being considered or

misrepresented as contingencies. Normal operating characteristics are excluded because DCS only measures the recovery from sudden, unanticipated losses of supply-side resources.

2.5.3.5. Treatment of Multiple Contingencies.

2.5.1.3.5.1. Simultaneous Contingencies. Multiple contingencies occurring within one minute or less of each other shall be treated as a single contingency. If the combined magnitude of the multiple contingencies exceeds the MOST SEVERE SINGLE CONTINGENCY, the loss shall be reported, but excluded from compliance evaluation.

2.5.2.3.5.2. Multiple Contingencies within the REPORTABLE DISTURBANCE period. Additional contingencies that occur after one minute of the start of a Reportable Disturbance but before the end of the DISTURBANCE RECOVERY PERIOD can be excluded from evaluation. The ~~CONTROL AREA BALANCING AUTHORITY~~ or RESERVE SHARING GROUP shall determine the DCS compliance of the initial REPORTABLE DISTURBANCE by performing a reasonable estimation of the response that would have occurred had the second and subsequent contingencies not occurred.

2.5.3.3.5.3. Multiple Contingencies within the CONTINGENCY RESERVE RESTORATION PERIOD. Additional Reportable Disturbances that occur after the end of the DISTURBANCE RECOVERY PERIOD but before the end of the CONTINGENCY RESERVE RESTORATION Period shall be reported and included in the compliance evaluation. However, the ~~CONTROL AREA BALANCING AUTHORITY~~ or RESERVE SHARING GROUP can request a waiver from the Resources Subcommittee for the event if the contingency reserves were rendered inadequate by prior contingencies and a good faith effort to replace contingency reserve can be shown.

3.4. (4. to 4.2 002-R6) Restoration of Reserves. Each ~~Control Area Balancing Authority~~ must fully restore its CONTINGENCY RESERVES within the CONTINGENCY RESERVE RESTORATION PERIOD for its INTERCONNECTION.

3.1.4.1. Start of CONTINGENCY RESERVE RESTORATION PERIOD. The CONTINGENCY RESERVE RESTORATION PERIOD begins at the end of the DISTURBANCE RECOVERY PERIOD.

3.2.4.2. CONTINGENCY RESERVE RESTORATION PERIOD. The ~~CONTROL AREA BALANCING AUTHORITY~~ or RESERVE SHARING GROUP shall restore its CONTINGENCY RESERVES within 90 minutes. This period may be adjusted to better suit the reliability targets of the INTERCONNECTION based on analysis approved by the NERC Resources Subcommittee.

4.5. (002 – Levels of Non Compliance) Disturbance Control Performance Adjustment. Each ~~CONTROL AREA BALANCING AUTHORITY~~ or RESERVE SHARING GROUP *not meeting the Disturbance Control Standard* during a given calendar quarter shall increase its CONTINGENCY RESERVE obligation for the calendar quarter (offset by one month) following the evaluation by the ~~Region NERC or Region Compliance Monitor -and/or the NERC Resources Subcommittee.~~ [e.g. For the first calendar quarter of the year, the penalty is applied for May, June, and July.] The increase shall be directly proportional to the non-compliance with the Disturbance Control Standard in the preceding quarter. This adjustment is not compounded across quarters, and is an additional percentage of reserve needed beyond the MOST SEVERE SINGLE CONTINGENCY. A RESERVE SHARING GROUP may choose an allocation method for increasing its CONTINGENCY RESERVE for the RESERVE SHARING GROUP provided that this increase is fully allocated

002 – R6

002 – Levels on Noncompliance

6. (All of section 6 001-Measures) Calculation of Compliance.. [See the “Performance Standard Reference Document,” Section C.]

6.1. A Balancing Authority or Reserve Sharing Group must calculate and report compliance with the Disturbance Control Standard for all disturbances greater than or equal to 80% of the magnitude of the Balancing Authority’s or of the Reserve Sharing Group’s MOST SEVERE SINGLE CONTINGENCY loss. Regional Reliability Organizations Regions may, at their discretion, require a lower reporting threshold. Disturbance Control Standard is measured as the percentage recovery, Ri

For loss of generation:

if $ACE_A < 0$

then

$$R_i = \frac{MW_{Loss} - \max(0, ACE_A - ACE_M)}{MW_{Loss}} * 100\%$$

if $ACE_A \geq 0$

then

$$R_i = \frac{MW_{Loss} - \max(0, -ACE_M)}{MW_{Loss}} * 100\%$$

where:

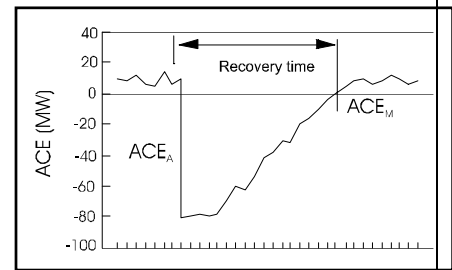
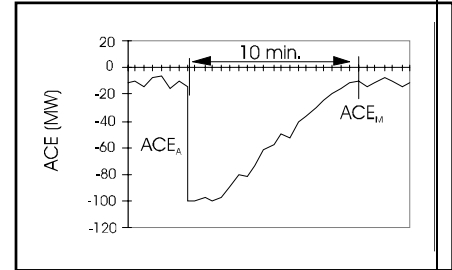
MW_{LOSS} is the MW size of the disturbance as measured at the beginning of the loss, ACE_A is the pre-disturbance ACE,

ACE_M is the maximum algebraic value of ACE measured within the fifteen minutes following the disturbance event. A Balancing Authority or reserve sharing group may, at their discretion, set $ACE_M = ACE_{15 \text{ min}}$, and

ACE_m is the minimum algebraic value of ACE measured within the fifteen minutes following the disturbance event. A Balancing Authority or reserve sharing group may, at their discretion, set $ACE_m = ACE_{15 \text{ min}}$.

6.1.1 Determination of MW_{Loss} :

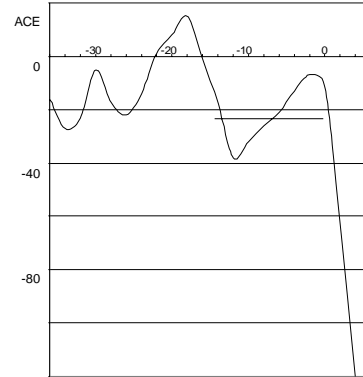
Record the MW_{LOSS} value as measured at the site of the loss to the extent possible. The value should not be measured as a change in ACE since governor response and AGC response may introduce error.



002 - M1

6.1.2 Determination of ACE_A .

Base the value for ACE_A on the average ACE over the period just prior to the start of the Δ Disturbance. Average over a period between 10 and 60 seconds prior and include at least 4 scans of ACE. In the illustration to the right, the horizontal line represents an averaging of ACE for 15 seconds prior to the start of the Δ Disturbance with a result of $ACE_A = -25$ MW.



6.1.3 Determination of ACE_M or ACE_m :

ACE_M is the maximum value of ACE measured within fifteen minutes following a given disturbance. At the discretion of the Balancing Authority or of the Reserve Sharing Group, compliance may be based on the ACE measured fifteen minutes following the Δ Disturbance, i.e., $ACE_M = ACE_{15 \text{ min}}$.

6.2. ACE_m is the minimum value of ACE measured within fifteen minutes following a given disturbance. At the discretion of the Balancing Authority or of the Reserve Sharing Group, compliance may be based on the ACE measured fifteen minutes following the Δ Disturbance, i.e., $ACE_m = ACE_{15 \text{ min}}$.

5.7. (002- Levels of Non- Compliance) Reserve Policy Compliance Documentation.

A representative from each ~~CONTROL AREA~~BALANCING AUTHORITY or RESERVE SHARING GROUP that was non-compliant in the calendar quarter most recently completed shall provide written documentation verifying that the ~~CONTROL AREA~~BALANCING AUTHORITY or RESERVE SHARING GROUP will apply the appropriate Disturbance Control Performance Adjustment beginning the first day of the succeeding month, and will continue to apply it for three months. The written documentation shall accompany the quarterly Disturbance Control Standard Report when a ~~CONTROL AREA~~BALANCING AUTHORITY or RESERVE SHARING GROUP is non-compliant.

G003. Frequency Response and Bias

[Appendix 1A – The Area Control Error (ACE) Equation]
 [Frequency Response Characteristic Survey Training Document]

Requirements (All of 1. to 003 R1)

1. **Bias setting review.** Each ~~CONTROL AREA~~**BALANCING AUTHORITY** shall review its FREQUENCY BIAS SETTINGS by January 1 of each year and recalculate its setting to reflect any change in area frequency response characteristic.

1.1. **Bias setting method.** The FREQUENCY BIAS SETTING, and the method used to determine the setting, may be changed whenever any of the factors used to determine the current bias value change.

1.2. **Bias setting reporting.** Each ~~CONTROL AREA~~**BALANCING AUTHORITY** shall report its FREQUENCY BIAS SETTING, and method for determining that setting, to the Performance Subcommittee.

1.3. **Bias setting verification.** Each ~~CONTROL AREA~~**BALANCING AUTHORITY** must be able to demonstrate and verify to the ~~Performance Subcommittee~~**Compliance Monitor** that its FREQUENCY BIAS SETTING closely matches or is greater than its system response.

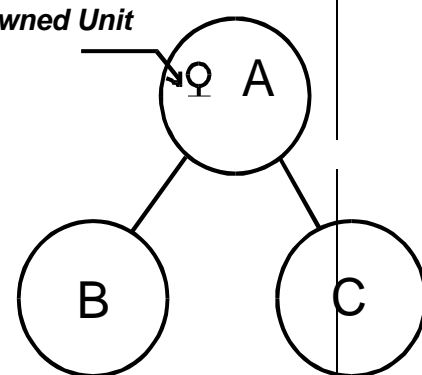
2. **(All of 2.1 to 2.1.2 -003-R2) Tie-line bias.** Each ~~Balancing Authority~~**Control Area** shall operate its AGC on tie-line frequency bias, unless such operation is adverse to system or Interconnection reliability. The Standards for tie-line bias control follow:

2.1. **Bias setting to match frequency response.** The Balancing Authority shall set its frequency bias (expressed in MW/0.1 Hz) as close as practical to the Balancing Authority's frequency response characteristic. Frequency bias may be calculated several ways:

2.1.1. **Fixed bias setting.** ~~A~~**The Balancing Authority may use a** fixed frequency bias value ~~may be used~~ which is based on a fixed, straight-line function of tie-line deviation versus frequency deviation. **The Balancing Authority shall determine the** fixed value ~~shall be determined~~ by observing and averaging the frequency response characteristic for several Disturbances during on-peak hours.

2.1.2. **Variable bias setting.** ~~The Balancing Authority may use a~~**A** variable (linear or non-linear) bias value ~~may be used~~ which is based on a variable function of tie-line deviation to frequency deviation. **The Balancing Authority shall determine the** variable frequency bias value ~~shall be determined~~ by analyzing frequency response as it varies with factors such as Load, generation, governor characteristics, and frequency.

2.2. **(003-R3) Bias and jointly owned generation.** ~~Balancing Authorities~~**Control Areas** that use Dynamic Scheduling or Pseudo-ties for jointly owned units ~~must~~**shall** reflect their respective share of the unit governor droop response ~~into in~~ their respective Frequency Bias Setting. Fixed schedules for Jointly owned Units mandate that the ~~Balancing Authority~~**Control Area** (A) that contains the Jointly owned Unit must incorporate the respective share of the unit governor droop response for any ~~Balancing Authorities~~**Control Areas** that have fixed



003 – R1

003 – R2

003 – R3

C. Frequency Response and Bias

003 – R3

schedules (B and C). The **Balancing Authorities** **Control Areas** that have a fixed schedule (B and C) but do not contain the Jointly owned Unit should not include their share of the governor droop response in their Frequency Bias Setting.

003 – R4

2.3. (003- R4) Minimum bias setting for **Control Areas** **Balancing Authorities** that serve native Load. The **Control Area's** **Balancing Authority's** monthly average Frequency Bias Setting **must shall** be at least 1% of the **Control Area's** **Balancing Authority's** estimated yearly peak demand per 0.1 Hz change ~~as described in the Frequency Response Characteristic Survey Training Document.~~

2.4. (003 R4) Minimum bias setting for **Control Areas** **Balancing Authorities** that do not serve native Load. The **Control Area's** **Balancing Authority's** monthly average Frequency Bias Setting **must shall** be at least 1% of its estimated maximum generation level in the coming year per 0.1 Hz change ~~as described in the Frequency Response Characteristic Survey Training Document.~~

003 – R3

2.5. (003-R5) Bias and overlap regulation. A **Control Area** **Balancing Authority** that is performing Overlap Regulation Service **will shall** increase its Frequency Bias Setting to match the frequency response of the entire area being controlled. A **Control Area** **Balancing Authority** that is performing Supplemental Regulation Service shall not change its Frequency Bias Setting.

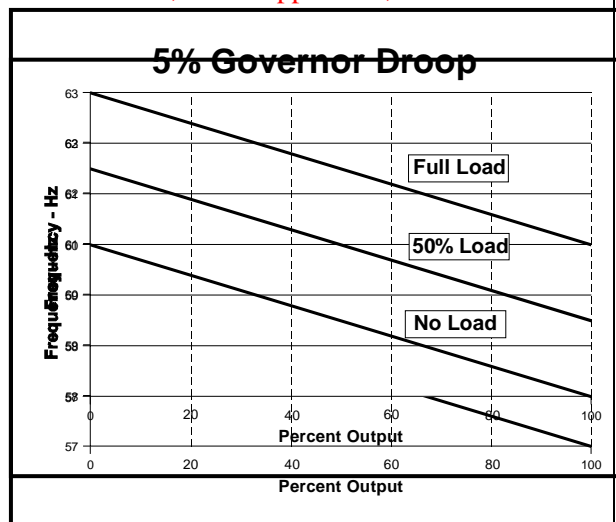
Guides

~~1. Governor installation. Generating units with nameplate ratings of 10 MW or greater should be equipped with governors operational for frequency response unless restricted by regulatory mandates~~

~~2. Governors free to respond. Turbine governors and HVDC controls, where applicable, should be allowed to respond to system frequency deviation, unless there is a temporary operating problem.~~

~~3. Governor droop. All turbine generators equipped with governors should be capable of providing immediate and sustained response to abnormal frequency excursions. Governors should provide a 5% droop characteristic. Governors should, as a minimum, be fully responsive to frequency deviations exceeding ± 0.036 Hz (± 36 mHz).~~

~~4. Governor limits. Turbine control systems that provide adjustable limits to governor valve movement (valve position limit or equivalent) should not restrict travel more than necessary to coordinate boiler and turbine response characteristics~~



D.004. Time Control Standard

[Appendix 1A — The Area Control Error Equation]

[Appendix 1D — Time Error Correction Procedures]

Introduction

INTERCONNECTION frequency is normally scheduled at 60.00 Hz and controlled to that value. The control is imperfect and over time the frequency will average slightly above or below 60.00 Hz resulting in electric clocks developing an error relative to true time. When the error exceeds pre-set limits, corrective action is taken by adjusting the scheduled frequency, a practice termed Time Error Correction. ~~(004-Purpose) Each CONTROL AREA shall participate in Interconnection Time Error Correction procedures unless it is operating asynchronously to its INTERCONNECTION.~~

~~CONTROL AREAS operating asynchronously may establish their own time error control bands, but must notify the NERC Resources Subcommittee of the bands being utilized, and also provide notification if they are changed.~~

~~The Operating Reliability Subcommittee shall designate, on February 1st of each year, a RELIABILITY COORDINATOR to act as the Interconnection Time Monitor to monitor time error for each of the INTERCONNECTIONS and to issue time error correction orders.~~

Standard

- ~~1. **Time error correction notice and commencement.** Time error corrections shall be conducted in accordance with Appendix 1D, "Time Error Correction Procedure."~~
- ~~2. **Time Error Initiation.** Time error corrections will start and end on the hour or half hour, and notice shall be given at least one hour before the time error correction is to start or stop. All CONTROL AREAS within an INTERCONNECTION shall make all Time Error corrections directed by the Interconnection Time Monitor for its INTERCONNECTION. All CONTROL AREAS within an INTERCONNECTION shall make Time Error Corrections at the same rate.~~

Requirements

- ~~1. **Interconnection Time Monitor.** Each Interconnection Time Monitor shall monitor time error and shall initiate or terminate corrective action orders according to the procedure specified in Appendix 1D, "Time Error Correction Procedure."~~
- ~~2. **Time Error Correction labeling.** Time error correction notifications shall be labeled alphabetically on a monthly basis (A-Z, AA-AZ, BA-BZ,...).~~
- ~~3. **Time correction offset.** The CONTROL AREA may participate in a Time Error Correction by either of the following two methods:
 - ~~3.1. **Frequency offset.** The Control Area may offset its frequency schedule by 0.02 Hz, leaving the FREQUENCY BIAS SETTING normal, or~~
 - ~~3.2. **Schedule offset.** If the frequency schedule cannot be offset, the CONTROL AREA may offset its net INTERCHANGE schedule (MW) by an amount equal to the computed bias contribution during a 0.02 Hz frequency deviation (i.e., 20% of the FREQUENCY BIAS SETTING).~~~~

Potential NAESB BPS

004 – RI

- Request for Termination or Halt of Scheduled Time Error Correction.** Any RELIABILITY ~~COORDINATOR-AUTHORITY~~ in an INTERCONNECTION ~~may request~~ shall have the authority to ~~terminate the termination of~~ a time error correction in progress for reliability considerations. Any RELIABILITY ~~COORDINATOR-AUTHORITY~~ may request the halt of a scheduled time error correction that has not begun. ~~CONTROL AREAs~~ BALANCING AUTHORITIES that have reliability concerns with the execution of a time error correction shall notify their RELIABILITY ~~COORDINATOR-AUTHORITY~~ and request the termination of a time error correction in progress. To enable NERC to track the results of the application of procedures relating to Time Control Standards, a RELIABILITY ~~COORDINATOR-AUTHORITY~~ requesting a termination or halt of a Time Error Correction shall forward an explanation for requesting the termination to the chairman of the Resources Subcommittee within 5 business days.

Potential NAESB BPS

~~**INTERCONNECTION time error notification.** The INTERCONNECTION Time Monitor shall on the first day of each month issue a notification of time error, accurate to within 0.01 second, to the other RELIABILITY COORDINATORS within the INTERCONNECTION to assure uniform calibration of time standards.~~

~~**Western INTERCONNECTION time error notification.** Within the Western INTERCONNECTION, the RELIABILITY COORDINATOR designated as the Interconnection Time Monitor shall provide the accumulated time error (accurate to within 0.001 second) to all CONTROL AREAS on a daily basis at 1400 PDT/PST using the WSCCNet. The alphabetic designator shall accompany time error notification if a time error correction is in progress.~~

~~**Time correction on reconnection.** When one or more CONTROL AREAS have been separated from the INTERCONNECTION, upon reconnection, they shall adjust their time error devices to coincide with the time error of the INTERCONNECTION. A notification of the adjustment to time error shall be passed through Time Notification Channels as soon as possible after reconnection.~~

~~**Leap seconds.** CONTROL AREAS using time error devices that are not capable of automatically adjusting for leap seconds shall arrange to receive advance notice of the leap second and make the necessary manual adjustment in a manner that will not introduce an improper INTERCHANGE SCHEDULE into their control system.~~

005. Automatic Generation Control Standard

[Appendix 1A – The Area Control Error (ACE) Equation]
 [Performance Standard Reference Document]

Introduction

~~CONTROL AREAS~~Balancing Authorities utilize AUTOMATIC GENERATION CONTROL (AGC) to automatically direct the loading of REGULATING RESERVE. AGC is used to limit the magnitude of AREA CONTROL ERROR (ACE) variations to the CPS bounds. This section contains Standards that apply to the ~~CONTROL AREA~~Balancing Authority AGC needed to calculate ACE and to routinely deploy the REGULATING RESERVE. (005-Purpose)

Requirements

005 – R1

1. (005-R1)CONTROL AREA BALANCING AUTHORITY components. All load, generation, and transmission operating in an INTERCONNECTION must be included within the metered boundaries of a ~~CONTROL AREA~~BALANCING AUTHORITY.

2. **Resource Requirements**

2.1.Regulating Reserves. An amount of Spinning Reserve responsive t AGC, which is sufficient to provide a normal regulating margin.

005 – R2

2.1. **Regulating capability.** Each ~~CONTROL AREA~~Balancing Authority shall maintain REGULATING RESERVES that can be controlled by AGC to meet the Control Performance Standard (CPS). (005-R+2)

2.2. **Regulation Service.**

005 – R3

2.2.1. **Equipment Requirements.** A ~~CONTROL AREA~~Balancing Authority providing REGULATION SERVICE shall ensure that adequate metering, communications and control equipment is employed to prevent such service from becoming a burden on the INTERCONNECTION or other ~~CONTROL AREAS~~Balancing Authorities. (005 R23)

005 – R4

2.2.2. **Failure Notification.** A ~~CONTROL AREA~~Balancing Authority providing REGULATION SERVICE shall notify the host ~~CONTROL AREA~~BALANCING AUTHORITY for whom it is controlling if it is unable to provide the service, as well as any INTERMEDIARY ~~CONTROL AREAS~~BALANCING AUTHORITIES. (005-R34)

005 – R5

2.2.3. **Backup.** A ~~CONTROL AREA~~Balancing Authority receiving REGULATION SERVICE shall ensure that backup plans are in place to provide replacement REGULATION SERVICE should the supplying ~~CONTROL AREA~~Balancing Authority no longer be able to provide this service. (005-R45)

3. **AUTOMATIC GENERATION CONTROL (AGC).** (ALL OF SECTION 3 – 005-R56)

005 – R6

3.1. **AGC calculation.** The ~~CONTROL AREA'S~~BALANCING AUTHORITY'S AUTOMATIC GENERATION CONTROL (AGC) shall compare total NET ACTUAL INTERCHANGE to total NET SCHEDULED INTERCHANGE plus frequency bias obligation to determine the ~~CONTROL AREA'S~~Balancing Authority's AREA CONTROL ERROR (ACE). Single ~~CONTROL AREAS~~BALANCING AUTHORITIES operating asynchronously may employ alternative ACE calculations such as (but not limited to) flat frequency control. If a

E. Automatic Generation Control Standard

005 – R6

~~CONTROL AREA BALANCING AUTHORITY~~ is unable to calculate ACE for more than 30 minutes it shall notify its RELIABILITY ~~COORDINATOR AUTHORITY~~.

3.2. **AGC operation.** ~~CONTROL AREA BALANCING AUTHORITY~~ AGC shall remain in operation unless such operation adversely impacts the reliability of the INTERCONNECTION.

3.3. **Manual control.** If AGC has become inoperative, the ~~CONTROL AREA BALANCING AUTHORITY~~ shall use manual control to adjust generation to maintain the NET SCHEDULED INTERCHANGE.

005 – R7

4. **Data Requirements.**

4.1. **Data scan rates for ACE.** The ~~Control Area Balancing Authority~~ shall ensure that data-acquisition for and calculation of ACE occur at least every six seconds. (005 R67)

4.2. **Frequency.** Each ~~CONTROL AREA Balancing Authority~~ shall provide redundant and independent frequency metering equipment that shall automatically activate upon detection of failure of the primary source. This overall installation shall provide a minimum availability of 99.95%. (005-R67)

4.3. **NET SCHEDULED INTERCHANGE.¹**

005 – R8

4.3.1. **Inclusion of Schedules.** The ~~CONTROL AREA BALANCING AUTHORITY~~ shall include all INTERCHANGE SCHEDULES with ADJACENT ~~CONTROL AREAS BALANCING AUTHORITIES~~ in the calculation of NET SCHEDULED INTERCHANGE for the AREA CONTROL ERROR (ACE) equation. (005-R78)

4.3.1.1. ~~CONTROL AREAS BALANCING AUTHORITIES~~ with an HVDC link to another ~~CONTROL AREA BALANCING AUTHORITY~~ connected asynchronously to their INTERCONNECTION may choose to omit the INTERCHANGE SCHEDULE related to the HVDC link from the ACE equation if it is modeled as internal generation or load. (005-R78)

4.3.1.2. This standard may not apply to ~~CONTROL AREAS BALANCING AUTHORITIES~~ operating asynchronously from their INTERCONNECTION.

005 – R9

4.3.2. **Dynamic Schedules.** The ~~CONTROL AREA BALANCING AUTHORITY~~ shall include all Dynamic Schedules in the calculation of NET SCHEDULED INTERCHANGE for the ACE equation. ~~(See Appendix 1A, “Area Control Error (ACE) Equation”).~~ (005-R89)

005 – R10

4.3.3. **Interchange Ramps.** ~~BALANCING AUTHORITIES shall use agreed upon ramp rates in the Scheduled Interchange values to calculate ACE. SCHEDULED INTERCHANGE values used in ACE shall include the effect of ramp rates, which are identical and agreed to between affected CONTROL AREAS Balancing Authorities. All such calculations shall conform to (005 R9) specifications in Policy 3 Standard XXX, “Interchange”, Section C, “Interchange Schedule Standards.”~~

4.4. **Actual Net Interchange.² (4.4.1 to 4.4.4 005-R101)**

¹ Interchange is *scheduled* between ADJACENT ~~CONTROL AREA BALANCING AUTHORITY THESE AREAS-~~ as explained in the “Interchange Reference Document.” ADJACENT ~~CONTROL AREAS BALANCING AUTHORITY AREAS ARE~~ may or may not be *physically* adjacent.

Policy 1 – Generation Control and Performance

E. Automatic Generation Control Standard

005 – R11

- 4.4.1. Tie flows.** All tie-line flows between ADJACENT ~~CONTROL AREAS~~BALANCING AUTHORITY AREA shall be included in each ~~CONTROL AREA'S~~BALANCING AUTHORITY'S ACE calculation.
- 4.4.2. Tie-line metering.** ~~CONTROL AREA~~BALANCING AUTHORITY AREA tie-line MW metering shall be telemetered to both control centers, and shall emanate from a common, agreed-upon source using common primary metering equipment. MWh data shall be telemetered or reported at the end of each hour.
- 4.4.3. Data filtering.** The power flow and ACE signals that are utilized for calculation of ~~CONTROL AREA~~BALANCING AUTHORITY performance or that are transmitted for REGULATION SERVICE shall not be filtered prior to transmission except for anti-aliasing filtering of tie lines.
- 4.4.4. Metering for jointly owned generation.** Common metering equipment shall be installed where DYNAMIC SCHEDULES or PSEUDO-TIES are implemented between two or more ~~CONTROL AREAS~~BALANCING AUTHORITIES to deliver the output of JOINTLY OWNED UNITS or to serve remote LOAD.

005 – R12

- 4.5. Verification of Tie Flows (All 4.5 005-R12)**
- 4.5.1. Hourly verification of tie flows.** Each ~~CONTROL AREA~~Balancing Authority shall perform hourly error checks using tie-line MWh meters with common time synchronization to determine the accuracy of its control equipment.
- 4.5.2. Adjustments for equipment error.** The ~~CONTROL AREA~~BALANCING AUTHORITY shall adjust the component (e.g., tie line meter) of ACE that is in error (if known) or use the interchange meter error (I_{ME}) term of the ACE equation to compensate for any equipment error until repairs can be made.

005 – R13

- 4.6. Data Recording and Display. (All 4.6 -005-R123)**
- 4.6.1. Minimum data recording.** The ~~CONTROL AREA~~BALANCING AUTHORITY shall provide its SYSTEM OPERATORS with sufficient instrumentation and data recording equipment to facilitate monitoring of control performance, generation response, and after-the-fact analysis of area performance. As a minimum, the ~~CONTROL AREA~~BALANCING AUTHORITY must provide its SYSTEM OPERATORS with real-time values for AREA CONTROL ERROR (ACE), INTERCONNECTION frequency and NET ACTUAL INTERCHANGE with each ADJACENT ~~CONTROL AREA~~BALANCING AUTHORITY.
- 4.6.2. Backup power for data recording.** The ~~CONTROL AREA~~BALANCING AUTHORITY shall provide adequate and reliable backup power supplies and shall periodically test these supplies at the ~~CONTROL AREA'S~~BALANCING AUTHORITY'S control center and other critical locations to ensure continuous operation of AGC and vital data recording equipment during loss of the normal power supply.
- 4.7. Data Quality.** The ~~CONTROL AREA~~BALANCING AUTHORITY shall ensure data quality: (All 4.7 005-R13)

² Actual Interchange is always measured between PHYSICALLY ADJACENT ~~CONTROL AREAS~~BALANCING AUTHORITY AREAS as explained in the “Interchange Reference Document.”

005 – R14

- 4.7.1. **Data Integrity.** Data shall be sampled at least at the same periodicity with which ACE is calculated.
- 4.7.2. **Missing or bad data.** Missing or bad data shall be flagged for operator display and archival purposes.
- 4.7.3. **Coincident Data Sampling.** Collected data shall be coincident to the greatest practical extent; i.e., ACE, INTERCONNECTION frequency, ~~net interchange~~Net Actual Interchange, and other data (see section 4.8.1) shall all be sampled at the same time.
- 4.7.4. **Data Accuracy.** Control performance and reliable operation is affected by the accuracy of the measuring devices. The required minimum values for measuring devices are listed below:

<i>Device</i>	<i>Accuracy</i>	<i>Units</i>
Digital frequency transducer	≤ 0.001	Hz
MW, MVAR, and voltage transducer	≤ 0.25	% of full scale
Remote terminal unit	≤ 0.25	
Potential transformer	≤ 0.30	
Current transformer	≤ 0.50	

4.8. **Data Retention.** ~~(4.8.1 to 4.8.3.2 005-Data Retention~~Compliance Monitoring)

- 4.8.1. **Performance Standard Data.** Each ~~CONTROL AREA~~Balancing Authority shall retain its ACE, actual frequency, SCHEDULED FREQUENCY, NET ACTUAL INTERCHANGE, NET SCHEDULED INTERCHANGE, tie-line meter error correction and FREQUENCY BIAS SETTING data in digital format at the same scan rate at which the data is collected for at least one year.
- 4.8.2. **Disturbance Control Performance Data.** Each ~~CONTROL AREA~~Balancing Authority or RESERVE SHARING GROUP shall retain documentation of the magnitude of each REPORTABLE DISTURBANCE as well as the ACE charts and/or samples used to calculate the ~~CONTROL AREA'S~~BALANCING AUTHORITY'S or RESERVE SHARING GROUP'S disturbance recovery values. The data shall be retained for one year following the reporting quarter for which the data was recorded.
- 4.8.3. **Data Format.** ~~CONTROL AREAS~~BALANCING AUTHORITIES shall be prepared to supply data to NERC in the industry standard format (defined below):
 - 4.8.3.1. CPS source data in daily CSV files with time stamped one minute averages of: 1) ACE and 2) Frequency Deviation from Schedule, will be provided to NERC or the ~~Region~~Regional Reliability Organizations within one week upon request.
 - 4.8.3.2. DCS source data will be supplied in CSV files with time stamped scan rate values for: 1) ACE and 2) Frequency Deviation from Schedule for a

005 – Compliance Monitoring

Policy 1 – Generation Control and Performance

E. Automatic Generation Control Standard

005 – Compliance Monitoring

time period, from two minute prior to thirty minutes after the identified disturbance, will be provided to NERC or the ~~Region~~Regional Reliability Organizations within one week upon request.

4.8.3.3. (005- Supporting Notes) Other data (as defined in **Requirement 4.8.1, “Performance Standard Data”**) may be requested on an ad hoc basis by NERC and the ~~Region~~Regional Reliability Organizations~~Regions~~.

4.8.3.4. (005- Supporting Notes) A sample of the specific file format and naming convention required can be found on the NERC Resources Subcommittee web page.

005 – R15

5. (005- R14) **Calibration of measurement devices.** Each ~~CONTROL AREA~~BALANCING AUTHORITY shall at least annually check and calibrate its time error and frequency devices against a common reference.

F.006. Inadvertent Interchange Standard

[Appendix 1F, “Inadvertent Interchange Dispute Resolution Process and Error Adjustment Procedures”]

[“Inadvertent Interchange Accounting Training Document”]

[Policy 3, “Introduction”]

Introduction

~~INADVERTENT INTERCHANGE provides a measure of non-scheduled INTERCHANGE and bilaterally scheduled inadvertent payback is the difference between the Balancing Authority’s Net Actual Interchange and Net Scheduled Interchange. These transfers are caused by such factors as CONTROL AREA regulation and frequency response, metering errors in frequency and/or interchange measurements (either scheduled or actual), unilateral INADVERTENT INTERCHANGE payback and human errors.~~

~~The INADVERTENT INTERCHANGE Standard defines a process for monitoring CONTROL AREAS to help ensure that, over the long term, the CONTROL AREAS do not excessively depend on other CONTROL AREAS in the INTERCONNECTION for meeting their demand or INTERCHANGE obligations.~~

Each ~~CONTROL AREA~~BALANCING AUTHORITY shall, through daily INTERCHANGE SCHEDULE verification and the use of reliable metering equipment, accurately account for INADVERTENT INTERCHANGE. Each ~~CONTROL AREA~~BALANCING AUTHORITY shall actively prevent unintentional INADVERTENT INTERCHANGE accumulation due to poor control. Each ~~CONTROL AREA~~BALANCING AUTHORITY shall also be diligent in reducing accumulated inadvertent balances in accordance with Operating Policies. (006-Purpose)

Standards Requirements

006-R1

1. **INADVERTENT INTERCHANGE calculation.** INADVERTENT INTERCHANGE shall be calculated and recorded hourly. INADVERTENT INTERCHANGE may accumulate as energy into or out of the ~~CONTROL AREA~~BALANCING AUTHORITY AREA. (006-R1)

006-R2

2. **Including all interconnections.** Each ~~CONTROL AREA~~BALANCING AUTHORITY shall include all AC tie lines that connect to its physically ADJACENT ~~CONTROL AREAS~~BALANCING AUTHORITY AREAS in its INADVERTENT INTERCHANGE account. Interchange served through jointly owned facilities must be properly taken into account. (006-R2)

006-R3

3. **Metering requirements.** All ~~CONTROL AREA~~BALANCING AUTHORITY Area INTERCONNECTION points shall be equipped with common MWh meters, with readings provided hourly to the control centers of both ADJACENT ~~CONTROL AREAS~~BALANCING AUTHORITIES. (006-R3)

006-R4

4. **INADVERTENT INTERCHANGE Accounting.** ADJACENT ~~CONTROL AREAS~~BALANCING AUTHORITY Areas shall operate to a common NET INTERCHANGE SCHEDULE and ACTUAL NET INTERCHANGE value and shall record these hourly quantities, with like values but opposite sign. Each ~~CONTROL AREA~~BALANCING AUTHORITY shall compute its INADVERTENT INTERCHANGE based on the following: (All Section 4-006-R4)

4.1. **Daily accounting.** Each ~~CONTROL AREA~~BALANCING AUTHORITY, by the end of the next business day, shall agree with its adjacent ~~CONTROL AREAS~~BALANCING AUTHORITIES to:

4.1.1. The hourly values of NET INTERCHANGE SCHEDULE.

006 – R4

4.1.2. The hourly integrated MWh values of NET ACTUAL INTERCHANGE

- 4.2. **Monthly accounting.** Each ~~CONTROL AREA~~BALANCING AUTHORITY shall use the agreed-to Daily and Monthly accounting data to compile its monthly accumulated INADVERTENT INTERCHANGE for the On-Peak and Off-Peak hours of the month. **[Refer to “Inadvertent Interchange Accounting Training Document”]**
- 4.3. **After-the-Fact Corrections.** After-the-fact corrections to the agreed-to Daily and Monthly accounting data shall only be made to reflect actual operating conditions (e.g. a meter being used for control was sending bad data). Changes or corrections based on non-reliability considerations shall not be reflected in the ~~CONTROL AREA’s~~Balancing Authority’s INADVERTENT INTERCHANGE. After-the-fact corrections to scheduled or actual values will not be accepted without agreement of the ADJACENT ~~CONTROL AREA~~BALANCING AUTHORITY(s).

Potential NAESB BPS

~~5. INADVERTENT INTERCHANGE payback. Each CONTROL AREA shall be diligent in reducing accumulated inadvertent balances. INADVERTENT INTERCHANGE accumulations shall be paid back by either of the following methods: in accordance with the NAESB Inadvertent Interchange Payback Standards (006 R5)~~

~~5.1. (Deleted) Energy “in-kind” payback. INADVERTENT INTERCHANGE accumulated during “on-peak” hours shall only be paid back during “on-peak” hours. INADVERTENT INTERCHANGE accumulated during “off-peak” hours shall only be paid back during “off-peak” hours. [See Appendix 1F, “On-Peak and Off-Peak Periods.”]~~

~~5.1.1. Bilateral payback. INADVERTENT INTERCHANGE accumulations may be paid back via an INTERCHANGE SCHEDULE with another CONTROL AREA. [Refer to Policy 3, “Interchange” for Interchange Scheduling Requirements.]~~

~~5.1.1.1. Opposite balances. The SOURCE CONTROL AREA and SINK CONTROL AREA must have inadvertent accumulations in the opposite direction.~~

~~5.1.1.2. Agreement on schedule. The terms of the inadvertent payback INTERCHANGE SCHEDULE shall be agreed upon by all involved CONTROL AREAS and TRANSMISSION PROVIDERS in accordance with NERC operating Policy 3, “Interchange.”~~

~~5.1.2. Unilateral payback. If Inadvertent Interchange accumulations may be paid back unilaterally by controlling to a target of non-zero ACE. Controlling to a non-zero ACE ensures that the unilateral payback is accounted for in the CPS calculations. The unilateral payback control offset is limited to the CONTROL AREA’s Balancing Authority’s L10 limit and shall not burden the Interconnection.~~

~~5.2. Other payback methods. Upon agreement by all REGIONS within an INTERCONNECTION, other methods of INADVERTENT INTERCHANGE payback may be utilized.~~

006 – Compliance Monitoring

~~6.5. INADVERTENT INTERCHANGE summary. Each CONTROL AREA~~BALANCING AUTHORITY shall submit a monthly summary of INADVERTENT INTERCHANGE as detailed in **Appendix 1F, “Inadvertent Interchange Energy Accounting Practices and Dispute Resolution Process.”** These summaries shall not include any after-the-fact changes that were not agreed to by the SOURCE ~~CONTROL AREA~~BALANCING AUTHORITY, SINK ~~CONTROL AREA~~BALANCING AUTHORITY and all INTERMEDIARY ~~CONTROL AREA~~BALANCING AUTHORITY(s). (006-Compliance Monitoring Process)

~~6.1.5.1. Summary balances. INADVERTENT INTERCHANGE summaries shall include at least the previous accumulation, net accumulation for the month, and final net accumulation, for both the “on-peak” and “off-peak” periods. (006 –Compliance Monitoring Process)~~

F. Inadvertent Interchange Standard

006 – Compliance Monitoring

6.2.5.2. Summary submission. Each ~~CONTROL AREA~~**BALANCING AUTHORITY** shall submit its monthly summary report to its Resources Subcommittee Survey Contact by the 15th calendar day of the following month. The Resources Subcommittee Survey Contact will prepare a composite tabulation and submit that tabulation to the NERC staff by the 22nd calendar day of the month. (006 – Compliance Monitoring Process)

6.2.1.5.2.1. Failure to Report. A ~~CONTROL AREA~~**BALANCING AUTHORITY** that neither submits a report nor supplies a reason for not submitting the required data by the 20th calendar day of the following month shall be considered non-compliant. (006- Levels of Non Compliance)

6.2.2.5.2.2. (006- R6) Dispute Resolution. Adjacent ~~CONTROL AREAS~~**BALANCING AUTHORITIES** that cannot mutually agree upon their respective NET ACTUAL INTERCHANGE or NET SCHEDULED INTERCHANGE quantities by the 15th calendar day of the following month shall, for the purposes of dispute resolution, submit a report to their respective Resources Subcommittee Survey Contact. The report shall describe the nature and the cause of the dispute as well as a process for correcting the discrepancy. The Dispute Resolution Process is described in **Appendix 1F, “Inadvertent Interchange Dispute Resolution Process and Error Adjustment Procedures.”**

006 – R5

G-Surveys Standard

[Area Interchange Error Survey Training Document]

[Frequency Response Characteristic Survey Training Document]

[Performance Standard Reference Document]

Introduction

Periodic surveys of the control performance of the ~~CONTROL AREAS~~BALANCING AUTHORITIES are conducted to reveal control equipment malfunctions, telemetering errors, improper frequency bias settings, scheduling errors, inadequate generation under automatic control, general control performance deficiencies, or other factors contributing to inadequate control performance.

Requirements

1. **On-request Surveys.** Each ~~CONTROL AREA~~BALANCING AUTHORITY shall perform each of the following surveys, as described in the Performance Standard Reference Document, when called for by the Resources Subcommittee:
 - 1.1. **AIE survey.** Area Interchange Error survey to determine the ~~CONTROL AREAS~~BALANCING AUTHORITIES' INTERCHANGE error(s) due to equipment failures or improper SCHEDULING operations, or improper AGC performance.
 - 1.2. **FRC survey.** Frequency Response Characteristic survey to determine the ~~CONTROL AREAS~~BALANCING AUTHORITIES' response to INTERCONNECTION FREQUENCY DEVIATIONS.
2. **Ongoing Surveys.** Each ~~CONTROL AREA~~BALANCING AUTHORITY shall submit the following surveys on a regular basis as specified below:
 - 2.1. **CPS, DCS, and FRS Surveys.** Performance Standard surveys to monitor the ~~CONTROL AREAS~~BALANCING AUTHORITIES' control performance during normal and DISTURBANCE situations.
 - 2.1.1. **CPS Surveys.** Each ~~CONTROL AREA~~BALANCING AUTHORITY shall submit a CPS Survey to its Resources Subcommittee Survey Contact no later than the 10th day following the end of the month. The Resources Subcommittee Survey Contact shall submit the CPS survey to NERC no later than the 20th day following the end of the month.
 - 2.1.2. **DCS Surveys.** Each ~~CONTROL AREA~~BALANCING AUTHORITY or RESERVE SHARING GROUP shall submit one completed copy of DCS Form, "NERC Control Performance Standard Survey – All Interconnections" to its Resources Subcommittee Survey Contact no later than the 10th day following the end of the calendar quarter (i.e. April 10th, July 10th, October 10th, January 10th). The Resources Subcommittee Survey Contact shall submit the CPS survey to NERC no later than the 20th day following the end of the calendar quarter.
 - 2.1.3. ~~FRS Surveys. Each CONTROL AREA or RESERVE SHARING GROUP shall submit one completed copy of FRS Form, "NERC Frequency Response Standard Survey – All Interconnections" to its Resources Subcommittee Survey Contact no later than the 10th day following the end of the calendar month in which the survey was called. The Resources Subcommittee Survey~~

Section 2.1.3 is contingent upon approval of Section C, Version 2.

006 – CM

~~Contact shall submit the FRS survey to NERC no later than the 20th day of that same month.~~

- 2.2. **Inadvertent Interchange Summaries (surveys).** Each Region shall prepare an Inadvertent Interchange summary monthly to monitor the ~~CONTROL AREAS~~BALANCING AUTHORITIES' monthly Inadvertent Interchange and all-time accumulated Inadvertent Interchange. Each Region shall submit a monthly accounting to NERC by the 22nd day following the end of the month being summarized.

Policy 2 — Transmission

Policy Subsections

- A. Transmission Operations
- B. Voltage and Reactive Control

Introduction

This Policy specifies the requirements for operating the transmission system to maintain transmission security. ~~These~~ This requirements includes requirements for routine transmission operation (i.e. voltage and reactive control), re-establishment of operating security following a contingency or other event and the establishment of one or more RELIABILITY COORDINATORS/AUTHORITIES, and voltage and reactive control. (008007 – Purpose)

When an IROL or SOL is exceeded, the RELIABILITY Authority shall evaluate the impact both real-time and post-contingency on the Wide Area system and determine if the actions being taken are appropriate and sufficient to return the system to within IROL in thirty minutes.

If the actions being taken are not appropriate or sufficient, the Reliability Authority shall provide direction to the Transmission Operator to return the system to within limits

This policy lines out actions for transmission operations. Added for context on authorities from Standard template P2T2

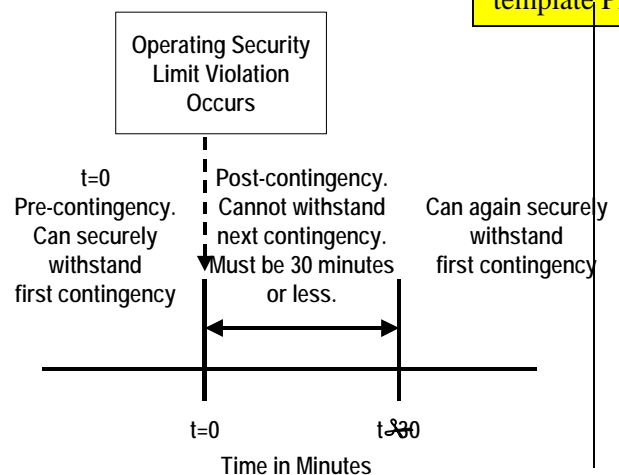
A. Transmission Operations

[Policy 4B – System Coordination – Operational Security Information]
[Policy 5C – Transmission System Relief]

Standards

007 – R1

1. (008007- R1) Basic reliability requirement regarding single contingencies. All ~~CONTROL TRANSMISSION OPERATORS AREAS~~ shall operate so that instability, uncontrolled separation, or cascading outages will not occur as a result of the most severe single contingency.



1.1.

007 – R2

(008007 –R2) Multiple outages. Multiple outages of a credible nature, as specified by Regional Reliability Council policy, shall also be examined and, when practical, the ~~CONTROL AREAS TRANSMISSION OPERATOR~~ shall operate to protect against instability, uncontrolled separation, or

It is recognised that the term "credible nature" is a vague statement. No attempt to clarify was made in an effort to maintain the appearance of no new requirements.

Policy 2 – Transmission

A. Transmission Operations

cascading outages resulting from these multiple outages.

1.2. ~~OPERATING SECURITY LIMITS. OPERATING SECURITY LIMITS define the acceptable operating boundaries.~~

Deleted, OSL replaced by IROL and SOL are defined terms in OLD-TF report and compliance templates

008 - R2

1.2. (009008 -R2) Return from INTERCONNECTED RELIABILITY OPERATING SECURITY LIMIT Violation. Following a contingency or other event that results in an INTERCONNECTED RELIABILITY OPERATING SECURITY LIMIT violation, the CONTROL AREA TRANSMISSION OPERATOR shall return its transmission system to within IROL OPERATING SECURITY LIMITS AS soon as possible, but no longer than 30 minutes.

2.1. 2.1. Reporting Non-compliance.

From Compliance template P2T1 Measuring Process to show process by which the RA receives the information

008 - R5

2.1.1. (010 R2) The Reliability Authority shall report Each IROL violation that exceeds 30 minutes in duration of this Standard shall be reported to the Regional Reliability Council and NERC Compliance Subcommittee within 72 hours.

008 - R1

(009008- R1) Transmission Operators shall report to its RELIABILITY COORDINATOR all occurrences in which an INTERCONNECTED RELIABILITY OPERATING LIMIT or System Operating Limit is exceeded.

2.2. Reporting format. The IROL report will be submitted on the NERC Preliminary Disturbance Report Form as found in Appendix 5F, "Reporting Requirements for Major Electric System Emergencies.

We need to get advice on whether Appendix 5F will remain or the IROL reporting form under the trial will be retained. Also need to determine if a corresponding reporting mechanism is required for TOP to RA.

Requirements

007 – R3

1. **(008007 – R3) Policies for dealing with transmission security.**
~~CONTROL AREAS~~ RELIABILITY AUTHORITIES AND TRANSMISSION OPERATORS, individually and jointly, shall develop, maintain, and implement formal policies and procedures to provide for transmission security. These policies and procedures shall address the execution and coordination of activities that impact inter- and intra-Regional security, including:

- Equipment ratings
- Monitoring and controlling voltage levels and real and reactive power flows
- Switching transmission elements
- Planned outages of transmission elements
- Development of Interconnected Reliability Operating Limits and System Operating ~~Security~~-Limits
- Responding to Interconnected Reliability Operating Limits and System OPERATING ~~SECURITY~~-LIMIT violations.

008 – R4

1.1. **(010-Responsibility for transmission security.** When an INTERCONNECTED RELIABILITY OPERATING ~~SECURITY~~ LIMIT violations occurs, or ~~are-is~~ expected to occur, the RELIABILITY AUTHORITY shall direct the impacted TRANSMISSION OPERATOR and/or the BALANCING AUTHORITY to implement the CONTROL AREAS affected by and the CONTROL AREAS contributing to these violations shall implement established joint actions to restore transmission security.

008 – R3

1.2. **(009008-R3) Action to keep transmission within limits.**

~~CONTROL AREAS~~ TRANSMISSION OPERATORS shall take all appropriate action up to and including shedding of firm load in order to comply with Standard 2.A.2.

2. **Security Coordination.** Every Region, subregion, or interregional coordinating group shall establish one or more RELIABILITY COORDINATORS ~~AUTHORITIES~~ to continuously assess transmission security and coordinate emergency operations among the ~~CONTROL AREAS~~ PLANNING AND OPERATING ENTITIES within the ~~Subregion~~, Region, subregion, and across the Regional boundaries

2.1.) ~~TRANSMISSION OPERATING ENTITIES~~ THE TRANSMISSION OPERATOR shall cooperate with their ~~HOST CONTROL AREAS~~ RELIABILITY AUTHORITY to ensure their operations support the reliability of the INTERCONNECTION.

A. Transmission Operations

3. (Needs to move – To a Policy 4 template) Coordinating transmission outages. Planned-The Transmission Operator shall provide maintenance schedules and forced outage data to its Planning Authorities and Reliability Authorities. The Planning Authority and Reliability Authority transmission outages shall be coordinated with any other system that operations planning studies show might be affected Planning Authority, Reliability Authority, Transmission Operators and Transmission Service Providers to ensure a reliable operating state can be maintained, initiate appropriate actions and derive correct ATC values etc.

- Additional information added to indicate possible actions
- Compliance template
P4T4 states " the control area or other ERRIS must co-ordinate scheduled generator and / or transmission outages with ... RC". Therefore this was not expanded to include Generator Operator via Balancing Authority to RA

B. Voltage and Reactive Control

Requirements

009 – R1

1. **(011009 – R1) Monitoring and controlling voltage and MVAR flows.** Each ~~CONTROL AREA~~TRANSMISSION OPERATOR AND RELIABILITY AUTHORITY, individually and jointly, shall ensure that formal policies and procedures are developed, maintained, and implemented for monitoring and controlling voltage levels and MVAR flows within ~~its-their boundaries~~ individual AREAS OF AUTHORITY and with neighboring ~~CONTROL AREA~~TRANSMISSION OPERATORS AND RELIABILITY AUTHORITIES.

008 – R2

2. **(011009 – R2) Providing reactive resources.** Each ~~CONTROL AREA~~TRANSMISSION OPERATOR shall ~~supply~~acquire sufficient reactive resources within its Operating Authority Area~~boundaries~~ to protect the voltage levels under normal and contingency conditions. This includes the ~~CONTROL AREA'S~~TRANSMISSION OPERATORS share of the reactive requirements of interconnecting transmission circuits.

• Should speak to Normal conditions as well

008 – R3

- 2.1. **(011009 – R3) Providing for reactive requirements.** Each PURCHASING-SELLING ENTITY shall arrange for (self-provide or purchase) reactive resources ~~for it~~to satisfy the reactive requirements identified by each BALANCING Authority and/or TRANSMISSION OPERATOR.

008 – R4

3. **(011009 – R4) Operating reactive resources.** Each TRANSMISSION OPERATOR AND CONTROL AREA shall operate their capacitive and inductive reactive resources within their Authority Areas to maintain system and INTERCONNECTION voltages within established limits.

008 – R5

- 3.1. **(011009 – R5) Actions.** Reactive generation scheduling, transmission line and reactive resource switching, etc., and load shedding, if necessary, shall be implemented through the actions authorized by the applicable RELIABILITY AUTHORITY and implemented by the TRANSMISSION OPERATOR to maintain these voltage levels.

A. Transmission Operations

008 – R6

3.2. ~~(011009- R6)~~ **Reactive resources.** Each TRANSMISSION OPERATOR CONTROL AREA shall maintain reactive resources to support its voltage under first contingency conditions.

008 – R7

3.2.1. ~~(011009 – R6)~~ **Location.** Reactive resources shall be dispersed and located electrically so that they can be applied effectively and quickly by the Transmission Operator when contingencies occur.

008 – R8

3.2.2. ~~(011009 – R7)~~ **Reactive restoration.** Security Limit Violations resulting from reactive resource deficiencies shall be corrected in accordance with Standard 2.A.1. and 2.A.2.

008 – R9

3. ~~4.~~ **Operator information.**

3.1. ~~(011009 – R9)~~ The ~~SYSTEM OPERATOR~~ TRANSMISSION OPERATOR shall ~~be provided~~ information on the status of all available generation and transmission reactive power resources, to its Reliability Authority.

008 – R8

3.2. ~~(011009 – R8)~~ The GENERATION OPERATOR shall provide information on the status of all generation reactive power resources, including the status of voltage regulators and power system stabilizers, to its Reliability Authority.

• Broke the requirement into two elements to clarify what each entity is responsible for

• Does the GOP report the to the RA via the BA or directly to report the reactive capability

008 – R10

4. ~~5.~~ **Preventing Voltage Collapse.**

4.1. ~~(011009 – R10)~~ The ~~SYSTEM OPERATOR~~ TRANSMISSION OPERATOR, BALANCING AUTHORITY AND / OR THE DISTRIBUTION OPERATOR shall take corrective action, ~~including load reduction,~~ necessary to prevent voltage collapse when reactive resources are insufficient.

008 – R11

6. ~~(011009 – R11)~~ **Voltage and reactive devices.** Devices used to regulate transmission voltage and reactive flow shall be available under the direction of the ~~SYSTEM OPERATOR~~ TRANSMISSION OPERATOR.

Guides~~(011009 – Supporting Notes)~~

1. ~~**Keeping lines in service.** Transmission lines should be kept in service as much as possible. They may be removed from service for voltage control only after studies indicate that system reliability will not be degraded below acceptable levels.~~
2. ~~**Keeping voltage and reactive control devices in service.** Devices used to regulate transmission voltage and reactive flow, including automatic voltage regulators and power system stabilizers on generators and synchronous condensers, should be kept in service as much of the time as possible.~~
3. ~~**Voltage and reactive devices.** Devices used to regulate transmission voltage and reactive flow should be switchable without de-energizing other facilities.~~
4. ~~**DC equipment.** Systems with dc transmission facilities should utilize reactive capabilities of converter terminal equipment for voltage control.~~
5. ~~**Reactive capability testing.** Generating units and other dynamic reactive resources should be tested periodically to determine achievable reactive capability limits.~~

Good Utility practices that **MUST** not be lost!! These guidelines should be included in supporting Reference Documents

Key:

Yellow Reliability Related

Notes

Blue NAESB

Version 5.2

[See also, “Interchange Reference Document”]

Policy Subsections

- A. Interchange Transaction Implementation**
 - B. Interchange Schedule Implementation**
 - C. Interchange Schedule Standards**
 - D. Interchange Transaction Modifications**
-

Introduction

This Policy addresses the following issues:

- Responsibilities of all PURCHASING-SELLING ENTITIES involved in INTERCHANGE TRANSACTIONS.
- Information requirements for INTERCHANGE TRANSACTIONS.
- Requirements of BALANCING AUTHORITY (BA) , RELIABILITY AUTHORITY (RA), AND TRANSMISSION SERVICE PROVIDER (TSP) to assess and confirm INTERCHANGE TRANSACTIONS.
- Accountability of BA for implementing all INTERCHANGE SCHEDULES in a manner that ensures the reliability of the INTERCONNECTIONS.
- Standards for INTERCHANGE SCHEDULES between Source and Sink BAs.
- Requirements for INTERCHANGE TRANSACTION Cancellation, Termination, and Curtailment.

A. Interchange Transaction Implementation

[Policy 2A, “Transmission—Transmission Operations”]

[Appendix 3A1, “Tag Submission and Response Timetables”]

[Appendix 3A2, “Tagging Across Interconnection Boundaries”]

[“E-Tag Spec”]

[“Transaction Tagging Process within ERCOT Reference Document”]

Introduction

This section specifies the PURCHASING-SELLING ENTITY’S requirements for tagging all INTERCHANGE TRANSACTIONS, the Balancing Authorities’ and TRANSMISSION SERVICE PROVIDERS’ obligations for accepting the tags, and the BA’S obligation for implementing the INTERCHANGE TRANSACTIONS. The tag data is integral for providing the BA , RA and TSP, and other operating entities the information they need to assess, confirm, approve or deny, implement, and curtail INTERCHANGE TRANSACTIONS as necessary to accommodate the marketplace and ensure the operational security of the INTERCONNECTION.

Requirements

1. INTERCHANGE TRANSACTION arrangements. The PURCHASING-SELLING ENTITY shall arrange for all Transmission Services, tagging, and contact personnel for each INTERCHANGE TRANSACTION to which it is a party.

1.1 Transmission services. The PURCHASING-SELLING ENTITY shall arrange the Transmission Services necessary for the receipt, transfer, and delivery of the TRANSACTION.

1.2 Tagging. The PURCHASING-SELLING ENTITY serving the load shall be responsible for providing the INTERCHANGE TRANSACTION tag. (Note: 1. Any PSE may provide the tag; however, the load-serving PSE is responsible for ensuring that a single tag is provided. 2. If a PSE is not involved in the TRANSACTION, such as delivery from a jointly owned generator, then the SINK BA is responsible for providing the tag. PSEs must provide tags for all INTERCHANGE TRANSACTIONS in accordance with Requirement 2 below)

1.3 Contact personnel. Each PURCHASING-SELLING ENTITY with title to an INTERCHANGE TRANSACTION must have, or arrange to have, personnel directly and immediately available for notification of INTERCHANGE TRANSACTION changes. These personnel shall be available from the time that title to the INTERCHANGE TRANSACTION is acquired until the INTERCHANGE TRANSACTION has been completed.

1.4 E-Tag monitoring. Each BA, RA, TSP, and PSE who are responsible for a tagged TRANSACTION shall have facilities to receive unsolicited notification from the Sink BA of changes in the status of a tag with which the user is a participant.

2.0 INTERCHANGE TRANSACTION tagging. Each INTERCHANGE TRANSACTION shall be tagged before implementation as required by each INTERCONNECTION as specified in the “E-Tag Spec” or “Transaction Tagging Process within ERCOT Reference Document.” In addition to providing necessary operating information, the INTERCHANGE TRANSACTION tag is the official request from the load-serving PURCHASING-SELLING ENTITY to the SINK BA to implement the INTERCHANGE TRANSACTION. The information that must be provided on the tag is listed in **Appendix 3A4**.

A. Interchange Transaction Implementation

010 – R1

013 – R4

2.1 Application to TRANSACTIONS. All INTERCHANGE TRANSACTIONS and certain INTERCHANGE SCHEDULES shall be tagged. In addition, intra-BA transfers using Point-to-Point Transmission Service¹ shall be tagged. This includes:

- INTERCHANGE TRANSACTIONS (those that are between BAs).
- TRANSACTIONS that are entirely within a BA.
- DYNAMIC INTERCHANGE SCHEDULES (tagged at the expected average MW profile for each hour). (Note: a change in the hourly energy profile of 25% or more requires a revised tag.)
- INTERCHANGE TRANSACTIONS for bilateral INADVERTENT INTERCHANGE payback (tagged by the Sink BA).
- INTERCHANGE TRANSACTIONS established to replace unexpected generation loss, such as through prearranged reserve sharing agreements or other arrangements, are exempt from tagging for 60 minutes from the time at which the INTERCHANGE TRANSACTION begins (tagged by Sink BA). [See also, Policy 1E2 and 2.1, “Disturbance Control Standard”]

011 – R1

2.2 Parties to whom the complete tag is provided. The tag, including all updates and notifications, shall be provided to the following entities:

- Purchasing-Selling Entities
- Balancing Authorities
- TRANSMISSION SERVICE PROVIDERS
- GENERATOR OWNERS
- LOAD-SERVING ENTITIES
- RELIABILITY AUTHORITIES
- Security Analysis Services

2.3 Method of transmitting the tag. The PURCHASING-SELLING ENTITY shall submit the INTERCHANGE TRANSACTION tag in the format established by each INTERCONNECTION. [“E-Tag Spec” or “Transaction Tagging Process within ERCOT Reference Document”]

2.3.1 Tags for INTERCHANGE TRANSACTIONS that cross INTERCONNECTION boundaries. Procedures are found in Appendix 3A2, “Tagging Across Interconnection Boundaries.”

010 – R4

2.4 INTERCHANGE TRANSACTION submission time. To provide adequate time for INTERCHANGE SCHEDULE implementation, INTERCHANGE TRANSACTIONS shall be submitted to the Sink BA and assessed by the RA, BA, TSP as specified in Appendix 3A1, “Tag Submission and Response Timetable.”

¹ This includes all “grandfathered” and other “non-888” Point-to-Point Transmission Service

Policy 3 – Interchange

A. Interchange Transaction Implementation

010 – R2

010 – R3

2.4.1 Exception for security reasons. Exception to the submission time requirements in Section 2.4 is allowed if immediate changes to the INTERCHANGE TRANSACTIONS are required to mitigate an OPERATING SECURITY LIMIT violation. The tag may be submitted after the emergency TRANSACTION has been implemented but no later than 60 minutes.

2.5 Confirmation of tag receipt. Confirmation of tag receipt shall be provided to the PURCHASING-SELLING ENTITY who submitted the tag in accordance with INTERCONNECTION tagging practices. [**“E-Tag Spec”**]

2.6 Tag acceptance. An INTERCHANGE TRANSACTION tag shall be accepted if all required information is valid and provided in accordance with the tagging specifications in Requirement 2.

3.0 INTERCHANGE TRANSACTION tag receipt verification. The SINK BA shall verify the receipt of each INTERCHANGE TRANSACTION tag with the Transmission Providers and Balancing Authorities before the INTERCHANGE TRANSACTION is implemented.

4.0 INTERCHANGE TRANSACTION assessment. All TRANSMISSION SERVICE PROVIDERS, LOAD SERVING ENTITIES, PURCHASING-SELLING ENTITIES and BALANCING AUTHORITIES involved in the transaction, and other operating entities responsible for operational security shall be responsible for assessing and “approving” or “denying” INTERCHANGE TRANSACTIONS as requested by the PSE based on established reliability criteria and adequacy of INTERCONNECTED OPERATIONS SERVICES and transmission rights as well as the reasonableness of the INTERCHANGE TRANSACTION tag. PURCHASING-SELLING ENTITIES and LOAD SERVING ENTITIES may elect to defer their approval responsibility to the Host BA. This assessment shall include the following:

NERC expects that Approval Entities have the proper resources to perform these assessments. Lack of these tools is not a reason to deny an Interchange Transaction. Resources include personnel and tools.

011 – R2 and R3

The BA assesses:

- TRANSACTION start and end time
- ENERGY PROFILE (ABILITY OF GENERATION MANEUVERABILITY TO ACCOMMODATE)
- SCHEDULING PATH (proper connectivity of ADJACENT BAs)

The TRANSMISSION PROVIDER assesses:

- Valid OASIS reservation number or transmission contract identifier
- Proper transmission priority
- Energy profile accommodation (does energy profile fit OASIS reservation?)
- OASIS reservation accommodation of all INTERCHANGE TRANSACTIONS
- Loss accounting

The PURCHASING-SELLING ENTITY and LOAD-SERVING ENTITY assess

- Transaction is valid representation of contractually agreed upon energy delivery.
- **Tag corrections.** During the BA’s and TSP’s assessment time, the PURCHASING-SELLING ENTITY who submitted the tag may elect to submit a tag correction. Tag corrections are changes to an existing tag that do not affect the reliability impacts of the INTERCHANGE

A. Interchange Transaction Implementation

TRANSACTION; therefore, tag corrections do not require the complete re-assessment of the tag by all BAS and TSPs on the Scheduling Path, or the completion and submission of a new tag by the PURCHASING-SELLING ENTITY. The SINK BA shall notify the BAS and TSPs, as to the changes and specifically alert those entities for which a correction has impact. Entities who are impacted by the correction will have an opportunity to reevaluate the tag status. The timing requirements for corrections are found in **Appendix 3A1, “Tag Submission and Response Timetable.”** Tag items that may be corrected are found in **Appendix 3A4, “Required Tag Data.”** A description of those entities who may correct an INTERCHANGE TRANSACTION tag is found in **Appendix 3D, “Transaction Tag Actions.”** [See **Appendix 3A1 Subsection C, Interchange Transaction Corrections.**]

011 – R5/R6

5.0 INTERCHANGE TRANSACTION approval or denial. Each BA and TSP involved in the transaction responsible for assessing and “approving” or “denying” the INTERCHANGE TRANSACTION shall notify the Sink BA as to the results of the assessment. The SINK BA in turn notifies the PURCHASING-SELLING ENTITY who submitted the INTERCHANGE TRANSACTION tag, plus all Balancing Authorities and TRANSMISSION PROVIDERS on the Scheduling Path. Assessment timing requirements are found in **Appendix 3A1, “Tag Submission and Response Timetable.”** A description of those entities who may approve or deny an INTERCHANGE TRANSACTION is found in **Appendix 3D, “Transaction Tag Actions.”**

5.1 INTERCHANGE TRANSACTION denial. If denied, this notification shall include the reason for the denial.

5.2 INTERCHANGE TRANSACTION approval. The INTERCHANGE TRANSACTION is considered approved if the PURCHASING-SELLING ENTITY who submitted the INTERCHANGE TRANSACTION tag has received confirmation of tag receipt and has not been notified that the transaction is denied.

6.0 Responsibility for INTERCHANGE TRANSACTION implementation. The SINK BA is responsible for initiating the implementation of each INTERCHANGE TRANSACTION as tagged in accordance with Policy 3.A. Requirement 2 (and its subparts). The INTERCHANGE TRANSACTION is incorporated into the INTERCHANGE SCHEDULE(S) of BALANCING AUTHORITIES ON THE SCHEDULING PATH in accordance with Policy 3B.

6.1 Tag requirements for INTERCHANGE TRANSACTION implementation. The BA shall implement only those INTERCHANGE TRANSACTIONS that:

- Have been tagged in accordance with Requirement 2 above, or,
- Are exempt from tagging in accordance with Requirement 2.1 above.

7. Tag requirements after curtailment has ended. After the curtailment of a TRANSACTION has ended, the INTERCHANGE TRANSACTION’S energy profile will return to the originally requested level unless otherwise specified by the PURCHASING-SELLING ENTITY. [See **Interchange Transaction Reallocation During TLR Levels 3a and 5a Reference Document, Version 1 Draft 6.**]

8.0 Confidentiality of information. RELIABILITY AUTHORITIES, BAs, TRANSMISSION PROVIDERS, PURCHASING-SELLING ENTITIES, and entities serving as tag agents or service providers as provided in the **“E-Tag Spec”** shall not disclose INTERCHANGE TRANSACTION information to any PURCHASING-SELLING ENTITY except as provided for in Requirement 2.2 above, **“Parties to whom the complete tag is provided.”**

B. Interchange Schedule Implementation

[Policy 2A, “Transmission—Transmission Operations”]

Introduction

This section explains CONTROL AREA requirements for implementing the INTERCHANGE SCHEDULES that result from the INTERCHANGE TRANSACTIONS tagged by the PURCHASING-SELLING ENTITIES in Section A.

Requirements

1. **BALANCING AUTHORITIES must be adjacent**. INTERCHANGE SCHEDULES shall only be implemented between ADJACENT BALANCING AUTHORITIES.
2. **Sharing INTERCHANGE SCHEDULES details**. The SENDING AND RECEIVING BAS must provide the details of their INTERCHANGE SCHEDULES via the Interregional Security Network as specified in Policy 4.B.
3. **Providing tags for approved TRANSACTIONS to the RELIABILITY AUTHORITY**. The SINK BA shall provide it’s RELIABILITY AUTHORITY the information from the INTERCHANGE TRANSACTION tag electronically for each Approved INTERCHANGE TRANSACTION.
4. **INTERCHANGE SCHEDULE confirmation and implementation**. The RECEIVING BA is responsible for initiating the confirmation and implementation of the INTERCHANGE SCHEDULE with the SENDING BA .

4.1. **INTERCHANGE SCHEDULE agreement**. The SENDING AND RECEIVING BA shall agree with each other on the:

- INTERCHANGE SCHEDULE start and end time
- Ramp start time and rate
- Energy profile

This agreement shall be made before either the SENDING OR RECEIVING BA makes any generation changes to implement the INTERCHANGE SCHEDULE.

4.1.1. **INTERCHANGE SCHEDULE standards**. The SENDING AND RECEIVING BA shall comply with the INTERCHANGE SCHEDULE Standards in **Policy 3C**, “Interchange – Schedule Standards.”

Reference only

4.1.2. **Operating reliability criteria**. BAs shall operate such that INTERCHANGE SCHEDULES or schedule changes do not knowingly cause any other systems to violate established operating reliability criteria.

012 – R3

011 – R5/R6

012 – R1

B. Interchange Schedule Implementation

This is the responsibility of the Transmission Provider prior to granting rights on the transmission system.

4.1.3. DC tie operator. SENDING AND RECEIVING BAS shall coordinate with any DC tie operators on the SCHEDULING PATH.

5. Maximum scheduled interchange. The maximum NET INTERCHANGE SCHEDULE between two BAS shall not exceed the lesser of the following:

5.1. Total capacity of facilities. The total capacity of both the owned and arranged-for transmission facilities in service for any transmission service provider along the path, or

5.2. Total Transfer Capability. The established network Total Transfer Capability (TTC) between BAS, which considers other transmission facilities available to them under specific arrangements, and the overall physical constraints of the transmission network. Total Transfer Capability is defined in *Available Transfer Capability Definitions and Determination*, NERC, June 1996.

This should be considered for incorporating into Policy 9 or Policy 2

C. Interchange Schedule Standards

Standards

1. **INTERCHANGE SCHEDULE start and end time.** INTERCHANGE SCHEDULES shall begin and end at a time agreed to by the SOURCE AND SINK BAS, AND THE INTERMEDIARY BAs.
2. **Ramp start times.** BALANCING AUTHORITIES shall ramp the INTERCHANGE equally across the start and end times of the schedule.
3. **Ramp duration.** BAS shall use the ramp duration established by their INTERCONNECTION as follows unless they agree otherwise:
 - 3.1 **INTERCHANGE SCHEDULES within the Eastern and ERCOT INTERCONNECTIONS.** ten-minute ramp duration.
 - 3.2 **INTERCHANGE SCHEDULES within the Western INTERCONNECTION.** 20-minute ramp duration.
 - 3.3 **INTERCHANGE SCHEDULES that cross an INTERCONNECTION boundary.** The BAs that implement INTERCHANGE SCHEDULES that cross an INTERCONNECTION boundary must use the same start time and ramp durations.
 - 3.4 **Exceptions for Compliance with Disturbance Control Standard and Line Load Relief.** Ramp durations for INTERCHANGE SCHEDULES implemented for compliance with NERC’s Disturbance Control Standard (recovery from a disturbance condition) and INTERCHANGE TRANSACTION curtailment in response to line loading relief procedures may be shorter, but must be identical for the SENDING AND RECEIVING BAS [See also Policy 1B, “Generation Control Performance – Disturbance Control Standard,” Requirement 2 and subsections on contingency reserve.]
- 4.0 **INTERCHANGE SCHEDULE accounting.** Block accounting shall be used.

012 – R1

D. Interchange Transaction Modifications

Introduction

This section specifies PURCHASING-SELLING ENTITY's, TRANSMISSION PROVIDER'S , and Balancing Authorities' rights and requirements for modifying an INTERCHANGE TRANSACTION tag after it has been approved and implemented as described in the preceding sections.

Requirements

- 1. INTERCHANGE TRANSACTION modification for market-related issues.** The PURCHASING-SELLING ENTITY that submitted an INTERCHANGE TRANSACTION tag may modify an INTERCHANGE TRANSACTION tag that is in progress or scheduled to be started. These modifications may be made due to changes in contracts, economic decisions, or other market-based influences. In cases where a market operator is serving as the source or sink for a TRANSACTION, then they shall have the right to effect changes to the energy flow as well (based on the results of the market clearing).
 - 1.1. Increases.** The INTERCHANGE TRANSACTION tag's energy and/or committed transmission reservation(s) profile may be increased to reflect a desire to flow more energy or commit more transmission than originally requested. Necessary transmission must be either available from the earlier TRANSACTION or provided with the increase.
 - 1.2. Extensions.** The INTERCHANGE TRANSACTION tag's energy profile may be extended to reflect a desire to flow energy during hours not previously specified. Necessary transmission capacity must be provided with the extension.
 - 1.3. Reductions.** The INTERCHANGE TRANSACTION tag's energy and/or committed transmission reservation(s) profile may be reduced to reflect a desire to flow less energy or commit less transmission than originally requested. Reductions are used to indicate cancellations and terminations, as well as partial decreases.
 - 1.4. Combinations of 1.1, 1.2, and 1.3 may be submitted concurrently.**
 - 1.5. Coordination responsibilities of the PURCHASING-SELLING ENTITY.** The modification must be provided by the PURCHASING-SELLING ENTITY to the following INTERCHANGE TRANSACTION participants:
 - PURCHASING-SELLING ENTITIES
 - Balancing Authorities OR THEIR SCHEDULING AGENTS
 - TRANSMISSION SERVICE PROVIDERS
 - RELIABILITY AUTHORITIES
 - LOAD-SERVING ENTITIES
 - GENERATOR OWNERS
 - Security Analysis Services
 - 1.6 INTERCHANGE TRANSACTION modification and evaluation time.** To provide adequate time for INTERCHANGE SCHEDULE implementation, INTERCHANGE TRANSACTION modifications shall be requested and evaluated as specified in Section D of **Appendix 3A1, "Tag Submission and Evaluation Timetable."**

FERC Orders 888, 889, 638, and a provider's OATT guide transmission requests. Tagging policy shall not supersede OASIS requirements.

2. INTERCHANGE TRANSACTION modification for reliability-related issues. A RELIABILITY AUTHORITY, TRANSMISSION PROVIDER, SOURCE OR SINK BA may modify an INTERCHANGE TRANSACTION tag that is in progress or scheduled to be started. These modifications may be made *only* due to TLR events (or other regional congestion management practices), Loss of Generation, or Loss of Load.

2.1. Assignment of coordination responsibilities during TLR events. At such times when TLR is required to ensure reliable operation of the electrical system, and the TLR requires holding or curtailing INTERCHANGE TRANSACTIONS, the SINK BA is responsible for coordinating the modifications to the appropriate INTERCHANGE TRANSACTION tags. See Policy 9, Appendix 9C1 “Transmission Loading Relief Procedure – Eastern Interconnection.”

2.1.1. Reductions. When a RELIABILITY AUTHORITY must curtail or hold an INTERCHANGE TRANSACTION to respect TRANSMISSION SERVICE reservation priorities or to mitigate potential or actual OPERATING SECURITY LIMIT violations, the RELIABILITY AUTHORITY shall inform the Sink BA listed on the INTERCHANGE TRANSACTION tag of the greatest reliable level at which the affected INTERCHANGE TRANSACTION may flow.

2.1.2. Reloads. At such time as the TLR event allows for the reloading of the transaction, the RELIABILITY AUTHORITY shall inform the Sink BA listed on the INTERCHANGE TRANSACTION tag of the releasing of the INTERCHANGE TRANSACTION’S limit.

2.2. Coordination when implementing other congestion management procedures. As a part of some local and regional congestion management and transmission line overload procedures, the TRANSMISSION SERVICE PROVIDER or BALANCING AUTHORITY is responsible for implementing curtailment of INTERCHANGE TRANSACTIONS. The TRANSMISSION PROVIDER or affected BALANCING AUTHORITY may adjust the INTERCHANGE TRANSACTION tags as required to implement those local and regional congestion management or transmission overload relief procedures that have been approved by the Region(s) or NERC.

2.2.1. Reductions. When a TRANSMISSION PROVIDER or BALANCING AUTHORITY experiences the need to invoke a congestion management or transmission line overload procedure, it may use the curtailment feature of E-Tag to inform the Source and Sink BAs listed on the INTERCHANGE TRANSACTION tag of the greatest reliability limit at which the affected INTERCHANGE TRANSACTION may flow.

2.2.2. Reloads. At such time as the need for the congestion management or transmission line overload relief procedure allows for the full or partial reloading of the transaction, the TRANSMISSION PROVIDER or BALANCING AUTHORITY may use the reload feature of E-Tag to inform the SOURCE AND SINK BA listed on the INTERCHANGE TRANSACTION tag that the INTERCHANGE TRANSACTION’S reliability limit has changed.

2.3. Assignment of coordination responsibilities during a loss of generation. At such times when a loss of generation necessitates curtailing INTERCHANGE TRANSACTIONS, the Source BA is responsible for coordinating the modifications to the appropriate INTERCHANGE TRANSACTION tags.

2.3.1. Reductions. When a generation operator experiences a full or partial loss of generation, it shall notify the HOST BA (the SOURCE BA for the INTERCHANGE TRANSACTION). The HOST BA contacts the PSE that is responsible for the generation. The PURCHASING-SELLING ENTITY providing Generation determines what schedule modifications need to be made and may request those modifications as market-based reductions, increases, or extensions (either via the PSE who submitted the tag, or directly if the entity is the PSE who submitted the tag or a market operator). If the PSE providing Generation does not resolve the condition, the HOST BA may at its discretion curtail INTERCHANGE TRANSACTIONS associated with the generation.

2.3.2. Reloads. Upon return of the generation, the generator operator shall notify the HOST BA (the SOURCE BA for the INTERCHANGE TRANSACTION). The HOST BA contacts the GENERATION PROVIDING ENTITY that is responsible for the generation. The PURCHASING-SELLING ENTITY providing generation determines what schedule modifications need to be made and may request those modifications as market-based reductions, increases, or extensions (either via the PSE who submitted the tag, or directly if the entity is PSE who submitted the tag or a market operator). The HOST BA must release the limits previously imposed on INTERCHANGE TRANSACTIONS associated with the generation (but not override any market-based reductions).

2.4. Assignment of coordination responsibilities during a loss of load. At such times when a loss of load necessitates curtailing INTERCHANGE TRANSACTIONS, the Sink BA is responsible for coordinating the modifications to the appropriate INTERCHANGE TRANSACTION tags.

2.4.1. Reductions. When a LOAD-SERVING ENTITY experiences a loss of load, it shall notify its HOST BA (the SINK BA for the INTERCHANGE TRANSACTION) and determine what schedule modifications need to be made. The LOAD-SERVING ENTITY may request those modifications as market-based reductions, increases, or extensions (via either the PSE who submitted the tag, or directly if the entity is the PSE who submitted the tag or a market operator). If the LOAD-SERVING ENTITY does not notify the HOST BA, the HOST BA may at its discretion curtail INTERCHANGE TRANSACTIONS associated with the load.

2.4.2. Reloads. Upon return of the load, THE LOAD-SERVING ENTITY shall notify its HOST BA (the SINK BA for the INTERCHANGE TRANSACTION) and determine what schedule modifications need to be made. The LOAD-SERVING ENTITY may request those modifications as market-based reductions, increases, or extensions (either via PSE who submitted the tag, or directly if the entity is PSE who submitted the tag or a market operator). If the LOAD-SERVING ENTITY does not notify the HOST BA, the HOST BA must release the limits previously imposed on INTERCHANGE TRANSACTIONS associated with the load (but not override any market-based reductions).

2.5. Coordination responsibilities for reliability-related issues. The modification must be provided by the requesting BALANCING AUTHORITY, TRANSMISSION PROVIDER, or SCHEDULING ENTITY to the following INTERCHANGE TRANSACTION participants:

- Purchasing Selling Entities
- Source OR SINK BA or their Scheduling Agent

- TRANSMISSION SERVICE PROVIDERS
- LOAD-SERVING ENTITY
- Security Analysis Services

INTERCHANGE TRANSACTION modification and evaluation time. To provide adequate time for INTERCHANGE SCHEDULE implementation, INTERCHANGE TRANSACTION modifications shall be requested and evaluated as specified in **Appendix 3A1, “Tag Submission and Evaluation Timetable”**.

Policy 4 — System Coordination

Policy Subsections

- A. Monitoring System Conditions
 - B. Operational ~~Security~~ Reliability Information
 - C. Maintenance Coordination
 - D. System Protection Coordination
-

A. Monitoring System Conditions

Requirements

1. ~~(02014 - R1)Resources.~~ Generator Operators and Transmission Operators shall inform the RELIABILITY AUTHORITIES, BALANCING AUTHORITIES and TRANSMISSION OPERATORS of all generation and transmission resources available for use.

~~The system operator shall be kept informed of all generation and transmission resources available for use.~~

2. ~~(02014 - R2)Transmission status and data.~~ System operators RELIABILITY AUTHORITIES, BALANCING AUTHORITIES and TRANSMISSION OPERATORS shall monitor transmission line status, MW and MVAR flows, voltage, LTC settings and status of rotating and static reactive resources.
3. ~~(02014 - R3)Protective relays.~~ Each RELIABILITY AUTHORITY, BALANCING AUTHORITY and TRANSMISSION OPERATOR shall provide appropriate technical information concerning protective relays to operating personnel shall be available in each system control center.
4. ~~(02014 - R4)Other information.~~ The RELIABILITY AUTHORITY, BALANCING AUTHORITY and TRANSMISSION OPERATOR shall have information, including weather forecasts and past load patterns, available to predict the system's near-term load pattern.
5. ~~(02014 - R5)Monitoring.~~ Monitoring equipment shall be used to bring to the attention of operating personnel important deviations in operating conditions and to indicate, if appropriate, the need for corrective action.
 - 5.1. ~~(02014 - R6)Metering.~~ Each BALANCING AUTHORITY AND TRANSMISSION OPERATOR shall use sufficient metering of suitable range, accuracy and sampling rate (if applicable) to ensure accurate and timely monitoring of operating conditions under both normal and emergency situations.
6. ~~(02014 - R7)System frequency.~~ RELIABILITY AUTHORITIES, BALANCING AUTHORITIES and TRANSMISSION OPERATORS shall monitor system frequency.

Guides (02014 - Supporting Notes)

1. ~~Instrumentation.~~ Reliable instrumentation, including voltage and frequency meters with sufficient range to cover probable contingencies, should be available in each generating plant control room.
2. ~~Recording devices.~~ Automatic oscillographs and other recording devices should be installed at key locations and set to standard time to aid in post-disturbance analysis.
3. ~~Separation.~~ Monitoring should be sufficient, so that in the event of system separation, both the existence of the separation and the boundaries of the separated areas can be determined.
 - 3.1. ~~Frequency information.~~ Because of possible system separation, frequency information from selected locations should be monitored at the control center.

Policy 4 – System Coordination

A. Monitoring System Conditions

- ~~4. **Transmission monitoring.** Transmission line monitoring should include a means of evaluating the effects of the loss of any significant transmission or generation facilities, both within and outside the control area BALANCING AUTHORITY AREA.~~
- ~~5. **Physical security monitoring.** Where practical, critical unmanned facilities should be monitored for physical security.~~
- ~~6. **Facility outages.** Scheduled outages of generation or transmission facilities should be considered in the monitoring scheme.~~
- ~~7. **Voltage coordination.** Voltage schedules should be coordinated from a central location within each BALANCING AUTHORITY AREA control area and coordinated with adjacent BALANCING AUTHORITY AREAS control area~~

B. Operational ~~Security~~ Reliability Information

[Appendix 4B, “Electric System Security Data”]

Requirements

1. **Use of Electric System Security Data.** The Electric System Security Data referred to in this Policy and received over the Interregional Security Network shall be used only for operational security analysis and shall not be made available to nor used by PURCHASING-SELLING ENTITIES in the wholesale merchant function. (~~021015-Supporting Notes~~)
2. (~~015-R2~~) **Data confidentiality.** All recipients of data from the Interregional Security Network (ISN) shall sign the NERC Confidentiality Agreement for Electric System Security Data. [~~Appendix 4B, Section B, “Confidentiality Agreement for Electric System Security Data”~~](~~021-R2~~)
3. (~~021015 – R1~~) **Uses alternative wording from P4T2 below) Data required from ~~Control Areas~~ BALANCING AUTHORITIES AND TRANSMISSION OPERATORS.** Each ~~CONTROL AREA~~ BALANCING AUTHORITY AND TRANSMISSION OPERATOR shall provide its RELIABILITY COORDINATOR AUTHORITY(S) with the ~~Electric System Security Data~~ operating data that is necessary to allow THE RELIABILITY COORDINATOR AUTHORITY(S) to perform its operational security assessments and coordinate reliable operations.

~~3.1.3.1.~~ Data. ~~BALANCING AUTHORITIES AND TRANSMISSION OPERATORS~~ CONTROL AREAS shall provide the types of data as listed in ~~Appendix 4B, “Electric System Security Data, Section Attachment A, Electric System Security Data”~~, unless otherwise agreed to by the ~~BALANCING AUTHORITIES AND TRANSMISSION OPERATORS~~ CONTROL AREAS and their RELIABILITY COORDINATOR AUTHORITY(S).

~~Alternative to section 3, using P4 T2, modified to reflect the functional model.~~

~~Each BALANCING AUTHORITY and TRANSMISSION OPERATOR shall provide its RELIABILITY AUTHORITY (RA)-with operating data that the RAReliability Authority requires to monitor system conditions within the RELIABILITY AUTHORITY Area. The RAReliability Authority will identify the data requirements from the list in Policy 4, Appendix 4B. The RAReliability Authority will identify any additional operating information requirements relating to the operation of the bulk power system and also, which data must be provided electronically.~~
4. (~~4. and 4.1 to 021015 R3~~) **Data exchange among ~~SECURITY COORDINATORS~~ RELIABILITY AUTHORITIES.** Upon request, RELIABILITY COORDINATORS ~~AUTHORITIES~~ shall, via the ISN, exchange with each other ~~Electric Security Data~~ operating data that is necessary to allow the RELIABILITY COORDINATORS ~~AUTHORITIES~~ to perform their operational ~~security-reliability~~ assessments and coordinate their reliable operations.
 - 4.1. **Data.** RELIABILITY COORDINATORS ~~AUTHORITIES~~ shall share with each other the types of data as listed in ~~Appendix 4B, “Electric System Security Data, Section A, Electric System Security Data”~~ Attachment A, unless otherwise agreed to.
5. (~~5. and 5.1 to 021015 R4~~) **Data exchange among BALANCING AUTHORITIES AND TRANSMISSION OPERATORS ~~Control Areas~~.** Upon request, Each BALANCING AUTHORITY AND TRANSMISSION OPERATOR ~~CONTROL AREA~~ and other entities ~~OPERATING AUTHORITIES~~ shall provide to ~~other~~ BALANCING AUTHORITIES AND TRANSMISSION OPERATORS ~~CONTROL AREAS~~ and other ~~OPERATING AUTHORITIES~~ entities with immediate responsibility for operational

Policy 4 X System Coordination

B. Operational Security Information

~~security reliability~~, the ~~Electric Security Data~~ operating data that ~~is~~ ~~are~~ necessary to allow the ~~BALANCING AUTHORITY AND TRANSMISSION OPERATOR CONTROL AREA~~ or other such ~~OPERATING AUTHORITY~~ entity to perform its operational ~~security reliability~~ assessment and to coordinate reliable operations.

- 5.1. **Data.** ~~BALANCING AUTHORITIES AND TRANSMISSION OPERATORS CONTROL AREAS~~ and other ~~OPERATING AUTHORITIES~~ entities shall provide the types of data as listed in Appendix 4B, “Electric System Security Data, Section A, Electric System Security Data” Addendum A, unless otherwise agreed to by the ~~BALANCING AUTHORITIES AND TRANSMISSION OPERATORS CONTROL AREAS~~ and other ~~OPERATING AUTHORITIES~~ entities with immediate responsibility for operational security.
6. ~~(021015 – R5)~~ **Information from PURCHASING-SELLING ENTITIES** ~~purchasing-selling entities~~. PURCHASING-SELLING ENTITIES shall provide information as requested by their host ~~BALANCING AUTHORITIES AND TRANSMISSION OPERATORS~~ ~~control areas~~ to enable ~~these~~ ~~them~~ ~~control areas~~ to conduct operational security assessments and coordinate reliable operations.

C. Maintenance Coordination

Requirements

- 1. 1. — 016 – R1 Generator and transmission outages.** Generator Operators and Transmission Operators shall plan and coordinate Sscheduled generator and transmission outages that may affect the reliability of interconnected operations ~~shall be planned and coordinated~~ among affected ~~OPERATING AUTHORITIES and RELIABILITY AUTHORITIES, BALANCING AUTHORITIES, AND TRANSMISSION OPERATOR~~systems and control areas. Special attention shall be given to results of pertinent studies.

Alternative language using P4 T4, modified to reflect the functional model.

(02216- Purpose) Scheduled generator and transmission outages that may affect the reliability of interconnected operations must be planned and coordinated among BALANCING AUTHORITIES, TRANSMISSION OPERATORS, and RELIABILITY AUTHORITIES.
- 2. (00216 R2) Voltage regulation equipment.** Generator Operators and Transmission Operators shall plan and coordinate Sscheduled outages of system voltage regulating equipment, such as automatic voltage regulators on generators, supplementary excitation control, synchronous condensers, shunt and series capacitors, reactors, etc., ~~shall be coordinated as required among affected Reliability Authorities, Balancing Authorities, and Transmission Operators as required.~~
- 3. (00216 – R3) Telemetry, control, and communications.** Reliability Authorities, Transmission Operators shall plan and coordinate Sscheduled outages of telemetry and control equipment and associated communication channels ~~shall be coordinated~~ between the affected areas.

D. System Protection Coordination

Requirements

1. **(02317 R1) Protection system familiarity.** ~~OPERATING-BALANCING AUTHORITIES~~
~~AUTHORITIES~~ TRANSMISSION OPERATORS, ~~and~~ RELIABILITY AUTHORITIES System operators shall be familiar with the purpose and limitations of protection system schemes.
2. **(02317 R2) Notification of failure and corrective action.** If a protective relay or equipment failure reduces system reliability, the ~~proper~~ affected ~~OPERATING-AUTHORITIES~~ BALANCING
AUTHORITIES, TRANSMISSION OPERATORS and RELIABILITY AUTHORITIES personnel shall be notified, and corrective action shall be undertaken as soon as possible.
3. **(02317 R3) Coordination when new or changed.** ~~Transmission Operators and Generator~~
~~Operators shall coordinate a~~ All new protective systems and all protective system changes ~~shall be~~
~~coordinated among with~~ affected ~~neighboring~~ ~~OPERATING-AUTHORITIES~~ BALANCING
AUTHORITIES, TRANSMISSION OPERATORS and RELIABILITY AUTHORITIES systems if the new or
changed protective systems affect neighboring ~~OPERATING-AUTHORITIES and~~ RELIABILITY
AUTHORITY systems areas.
4. **(02317 R4) Coordination.** Protection systems on major transmission lines and interconnections shall be coordinated with the interconnected ~~OPERATING-AUTHORITIES~~ BALANCING AUTHORITIES,
TRANSMISSION OPERATORS and RELIABILITY AUTHORITIES systems.
5. **(02317 R5) Notification of system changes.** ~~Each~~ Transmission Operator and Balancing
Authority shall notify its Reliability Authority and ~~n~~ Neighboring ~~OPERATING~~
AUTHORITIES BALANCING AUTHORITIES, AND TRANSMISSION OPERATORS and RELIABILITY
AUTHORITIES systems shall be notified in advance of changes in generating sources, transmission,
load, or operating conditions, which could require changes in their protection systems.
6. **(02317 R6) Monitoring SPS.** ~~The~~ Each BALANCING AUTHORITY SY AND TRANSMISSION
OPERATORS system operator shall monitor the status of each Special Protection System (SPS) and
shall notify all affected ~~OPERATING-AUTHORITIES~~ BALANCING AUTHORITIES, TRANSMISSION
OPERATORS and RELIABILITY AUTHORITIES systems of each change in status.

(023 – Supporting Notes) Guides

1. ~~Protection system design.~~ Protection system design and operations should consider the following:
 - 1.1. ~~Minimum complexity.~~ Protection systems should be of minimum complexity consistent with achieving their purpose.
 - 1.2. ~~Redundancy.~~ Protection systems should have redundancy to allow for their normal maintenance and calibration.
 - 1.3. ~~Proper operation.~~ Protection systems should not normally operate for minor system disturbances, brief overloads, or recoverable system power swings.
 - 1.4. ~~High-speed equipment.~~ High-speed relays, high-speed circuit breakers, and automatic reclosing should be used where studies indicate the application will enhance stability margins. Single-pole tripping or reclosing may be appropriate on some lines.
 - 1.5. ~~Automatic reclosing.~~ Automatic reclosing during out-of-step conditions should be prevented.
 - 1.6. ~~Underfrequency relays.~~ Underfrequency load-shedding relays should be coordinated with the generating plant off-frequency relays to assure preservation of system stability and integrity.

- ~~1.7. — **Reviewing applications.** Protection system applications, settings, and coordination should be reviewed periodically and whenever major changes in generating resources, transmission, load or operating conditions are anticipated.~~
- ~~1.8. — **Reviewing protection system adequacy and automated monitoring.** Adequacy of protection system communications channels should be reviewed periodically. Automated channel monitoring and failure alarms should be provided for protective system communications channels, which could cause loss of generation, loss of load, or cascading outages in the event of misoperation or failure.~~
- ~~2. — **Protection system implementation, operation, and maintenance.** Each OPERATING AUTHORITY system should implement protection system application, operation, and preventive maintenance procedures, which will enhance their system's reliability with the least adverse effect on the INTERCONNECTION. These protection system procedures should be provided to all appropriate system personnel and should provide for instruction and training where applicable. Each OPERATING AUTHORITY system should coordinate these procedures with any other OPERATING AUTHORITY systems that could be affected. These procedures should govern:~~
 - ~~2.1. — **Planning and application of protection systems.**~~
 - ~~2.2. — **Review of protection systems and settings.**~~
 - ~~2.3. — **Intended functioning.** Intended functioning of protection systems under normal, abnormal, and emergency conditions.~~
 - ~~2.4. — **Testing and maintenance.** Regularly scheduled testing and preventive maintenance of relays, vital system protection equipment, and associated components.~~
 - ~~2.4.1. — **Testing under actual conditions.** The operation of the complete protection system should be tested under conditions as close to actual operating conditions as possible, including actual circuit breaker operation where feasible.~~
 - ~~2.4.2. — **Testing communications.** Testing protection system communication channels between systems should be coordinated with test results recorded.~~
 - ~~2.5. — **Analysis.** Analysis of actual protection system operations.~~
- ~~3. — **Reviewing abnormal operation.** A prompt investigation should be made to determine the cause of abnormal protection system performance and correct any deficiencies in the protection scheme.~~
- ~~4. — **SPS testing.** SPS should be designed for periodic testing without affecting the integrity of the protected power system. They should normally achieve at least the same high level of reliability as that provided by normal protection systems.~~
- ~~5. — **SPS security.** SPS should be designed with inherent security to minimize the probability of an improper operation, even with the failure of a primary component.~~
- ~~6. — **SPS application review.** Each SPS should be reviewed frequently to determine if it is still required and will still perform the intended functions. Seasonal changes in power transfers may require changes in the SPS or its relay settings.~~
- ~~7. — **SPS operation review.** Each SPS operation should be reviewed and analyzed for correctness.~~
- ~~8. — **Correcting improper SPS operation.** Prompt action should be taken to correct the causes of an improper operation.~~

Policy 5 — Emergency Operations

Version ~~30~~ – Draft ~~72~~

For Board of Trustees consideration.

June 15, 2004

Policy Subsections

- A. Operating Authority Responsibilities
- B. Communications and Coordination
- C. Capacity and Energy Emergencies
- D. Transmission
- E. System Restoration
- F. Disturbance Reporting
- G. Sabotage Reporting

Reorganized sections A through D.

Global changes:

- Active voice
- References to SOL and IROL
- Relationships between Reliability ~~Coordinators~~ Authorities and operating authorities

Introduction

Operating emergencies on the BULK ELECTRIC SYSTEM may be minor in nature and require small, real-time system adjustments, or they may be major and require fast, preplanned action to avoid the cascading loss of generation or transmission lines, uncontrolled separation, equipment damage, and interruption of customer service.

Delete Intro

The integrity and reliability of the BULK ELECTRIC SYSTEM is of paramount importance, and will take precedence above all other aspects including commercial operations; therefore, all OPERATING AUTHORITIES and Reliability Authorities are expected to cooperate and take appropriate action to mitigate the severity or extent of any system emergency.

We needed to define "burden." Used a lot in Op Policies, but is very subjective term.

Terms

BURDEN. Operation of the BULK ELECTRIC SYSTEM that violates or is expected to violate a SOL or IROL in the INTERCONNECTION or that violates any other NERC, Regional, or local operating reliability policies or standards.

~~OPERATING AUTHORITY. An entity that:~~

- ~~1. Has ultimate accountability for a defined portion of the BULK ELECTRIC SYSTEM to meet one or more of three reliability objectives— generation/demand balance, transmission reliability, and/or emergency preparedness, and~~
- ~~2. Is accountable to NERC and its Regional Reliability Councils for complying with NERC and Regional Policies, and~~
- ~~3. Has the authority to control or direct the operation of generating resources, transmission facilities, or loads, to meet these Policies.~~

Deleted Operating Authority throughout Policy. This term is not valid under the NERC functional model

~~OPERATING AUTHORITIES include such entities as CONTROL AREAS, generation operators and TRANSMISSION OPERATING ENTITIES; it does not include RELIABILITY COORDINATORS.~~

~~OPERATING AUTHORITY AREA. That portion of the BULK ELECTRIC SYSTEM under the purview of the OPERATING AUTHORITY.~~

A. Responsibilities of Reliability Authorities, Balancing Authorities, and Transmission Operators Operating Authority Responsibilities

All these entities are responsible for addressing Emergency conditions

Requirements

1. **Operating within limits.** The RELIABILITY AUTHORITY and OPERATING TRANSMISSION OPERATOR AUTHORITY shall operate within the SYSTEM OPERATING LIMITS (SOLs) and INTERCONNECTION RELIABILITY OPERATING LIMITS (IROLs) and - SYSTEM OPERATING LIMITS (SOLs)

IROLs are responsibility of RA, SOLs are responsibility of TO

2. **018-R1 OPERATING RELIABILITY AUTHORITY, BALANCING AUTHORITY AND TRANSMISSION - OPERATOR and responsibility.** The RELIABILITY OPERATING AUTHORITY, BALANCING AUTHORITY AND TRANSMISSION - shall OPERATOR SHALL have the responsibility and clear decision-making authority to take whatever actions are needed to ensure the reliability of its respective OPERATING AUTHORITY AREA area and shall exercise specific authority to alleviate operating emergencies.

Reliability Authority, Balancing Authority, Transmission Operator are the major responsible entities

2.1. **018-R2 Mitigating emergencies.** The OPERATING AUTHORITY RELIABILITY AUTHORITY, BALANCING AUTHORITY, AND TRANSMISSION - shall OPERATOR SHALL take immediate actions to alleviate operating emergencies including curtailing transmission service or energy schedules, operating equipment (e.g., generators, phase shifters, breakers), shedding firm load, etc.

RA, BA, and TO address emergency. Does not address DPs role.

2.2. **018-R3 Complying with RELIABILITY Coordinator directives.** The BALANCING AUTHORITY AND TRANSMISSION OPERATOR OPERATING AUTHORITY shall comply with RELIABILITY COORDINATOR AUTHORITY directives unless such actions would violate safety, equipment, or regulatory or statutory requirements. Under these circumstances the BALANCING AUTHORITY AND TRANSMISSION OPERATOR OPERATING AUTHORITY must shall immediately inform the RELIABILITY COORDINATOR AUTHORITY of the inability to perform the directive so that the RELIABILITY COORDINATOR AUTHORITY can implement alternate remedial actions.

Addressed the responsibilities of all entities. Added Distribution Providers and Load Serving Entities.

2.2.1 The DISTRIBUTION PROVIDER will comply with all reliability directives issued by the TRANSMISSION OPERATOR

2.2.2 The LOAD SERVING ENTITY will assist the DISTRIBUTION PROVIDER under emergency conditions.

Inserted role of DP and LSE. May not be a requirement. This is to show everyones role in shedding of load

3. **Unknown operating states.** If the OPERATING RELIABILITY AUTHORITY, BALANCING AUTHORITY, OR TRANSMISSION PROVIDER enters an unknown operating state (i.e. any state for which valid

Policy 5 — Emergency Operations

A. Operating Authority Responsibilities

operating limits have not been determined), it will be considered to be in an emergency and shall restore operations to respect proven reliable power system limits within 30 minutes.

Does 30 minutes apply to RA, BA, and TO?

4. **018-R4 Information sharing.** To facilitate emergency assistance, the ~~RELIABILITY OPERATING AUTHORITY, BALANCING AUTHORITY, AND TRANSMISSION OPERATOR~~ shall inform other potentially affected ~~RELIABILITY AUTHORITIES, BALANCING AUTHORITIES, AND TRANSMISSION OPERATORS OPERATING AUTHORITIES and its RELIABILITY COORDINATOR~~ of real time or anticipated emergency conditions, and take actions to avoid when possible, or mitigate the emergency.

5. **018-R5 Rendering assistance.** The ~~RELIABILITY AUTHORITY, BALANCING AUTHORITY, AND TRANSMISSION OPERATOR OPERATING AUTHORITY~~ shall render all available emergency assistance requested, provided that the requesting ~~OPERATING AUTHORITY entity~~ has implemented its comparable emergency procedures, unless such actions would violate safety, equipment, or regulatory or statutory requirements.

Assistance is required by Distribution Providers and Load Serving Entities.

5.1 The Distribution Provider and Load Serving Entity will assist as requested by the appropriate responsible entity

6. **018-R6 Keeping facilities in service.** The ~~RELIABILITY AUTHORITY OR TRANSMISSION OPERATOR OPERATING AUTHORITY~~ shall not remove BULK ELECTRIC SYSTEM facilities from service if removing those facilities would BURDEN neighboring ~~systems OPERATING AUTHORITIES~~ unless:

6.1. **018-R6** The ~~OPERATING AUTHORITY~~ RELIABILITY AUTHORITY OR TRANSMISSION OPERATOR first notifies the adjacent ~~RELIABILITY AUTHORITY OR TRANSMISSION OPERATOR OPERATING AUTHORITIES~~ and coordinates the impact resulting from the removal of the BULK ELECTRIC SYSTEM facility or,

Does the BA belong here also?

6.2. **018-R6** When time does not permit such notification and coordination, or when immediate action is required to prevent a hazard to the public, lengthy customer service interruption, or damage to facilities, the ~~OPERATING RELIABILITY AUTHORITY OR TRANSMISSION OPERATOR~~ shall notify adjacent ~~OPERATING RELIABILITY AUTHORITIES~~ at the earliest possible time to ensure OPERATING AUTHORITY coordination.

7. **Remaining interconnected.** The ~~OPERATING RELIABILITY~~ AND TRANSMISSION OPERATOR shall make every effort to remain connected to the INTERCONNECTION. If the ~~OPERATING AUTHORITY~~ RELIABILITY AUTHORITY OR TRANSMISSION OPERATOR determines that by remaining interconnected, it is in imminent danger of violating System Operating Limits or Interconnected Reliability Operating Limits, the ~~OPERATING AUTHORITY~~ RELIABILITY AUTHORITY

From Policy 5D. ?????????????? ???

Policy 5 — Emergency Operations

A. Operating Authority Responsibilities

- ~~AND TRANSMISSION OPERATOR~~ may take such actions, as it deems necessary, to protect its ~~OPERATING AUTHORITY AREA RESPONSIBLE AREA~~.
8. **Complying with control performance standards.** The ~~OPERATING~~BALANCING AUTHORITY shall comply with Control Performance Standards and the Disturbance Control Standard [See Policy 1A, “Control Performance Standard”] during an emergency.
 9. **Coordinating interchange.** The ~~OPERATING~~ BALANCING AUTHORITY ~~AND TRANSMISSION PROVIDER~~ shall coordinate INTERCHANGE SCHEDULE changes in accordance with Policy 3, “Interchange,” during an emergency.
 10. **Keeping automatic generation control in service.** Each ~~CONTROL AREA~~BALANCING AUTHORITY shall maintain automatic generation control equipment operational and in service. [See Policy 1E, “Automatic Generation Control Standard”]
 11. **018-R7 Taking immediate action.** The ~~OPERATING~~ BALANCING AUTHORITY ~~AND TRANSMISSION OPERATOR~~ AUTHORITY shall immediately take action to restore the real and reactive power balance. If the ~~OPERATING~~BALANCING AUTHORITY ~~AND TRANSMISSION OPERATOR~~ is unable to restore its real and reactive power balance it shall request emergency assistance (from who). If corrective actions or emergency assistance is not adequate to mitigate the real and reactive power balance, then the ~~OPERATING~~RELIABILITY AUTHORITY, BALANCING AUTHORITY ~~AND TRANSMISSION OPERATOR~~ shall implement firm load shedding.
 12. **Reducing the effects of power flows.** The ~~OPERATING~~ RELIABILITY AUTHORITY ~~AND TRANSMISSION OPERATOR~~ AUTHORITY shall immediately reduce the effects of power flows through other ~~OPERATING~~ RELIABILITY ~~AUTHORITY~~ ~~AND TRANSMISSION PROVIDER~~ AREAS if those flows have been identified as contributing to an operating emergency (e.g., resulting in SOL or IROL violations) in those other ~~OPERATING~~RELIABILITY AUTHORITY ~~AND TRANSMISSION PROVIDER~~ AREAS.

Both Balancing Authority and Transmission Operator are responsible for real and reactive power

B. Communications and Coordination

[Appendix 7A – Instructions for Interregional Emergency Telephone Networks]

This section needs to be in line with appendix 7A

Requirements

1. **019-R1 Communications.** The ~~BALANCING AUTHORITY AND TRANSMISSION OPERATOR~~ ~~OPERATING AUTHORITY~~ shall have communications (voice and data links) to appropriate ~~RELIABILITY AUTHORITIES, BALANCING AUTHORITIES AND TRANSMISSION OPERATORS~~ entities within its OPERATING AUTHORITY AREA, which, which are staffed and available to act in addressing a real time emergency condition.
2. **019-R2 Notification.** The ~~OPERATING AUTHORITY~~ ~~BALANCING AUTHORITY AND TRANSMISSION OPERATOR~~ shall notify its ~~RELIABILITY COORDINATOR~~ ~~AUTHORITY~~ and all other potentially affected ~~OPERATING~~ ~~RELIABILITY AUTHORITIES, BALANCING AUTHORITIES, AND TRANSMISSION OPERATORS~~ ~~AUTHORITIES~~ through predetermined communication paths of any condition that could threaten the reliability of its responsible OPERATING AUTHORITY AREA.
 - 2.1. **Using the Interconnection-wide telecommunications system.** When a condition is identified that could threaten the reliability of the INTERCONNECTION or when firm load shedding is anticipated, the affected ~~OPERATING-BALANCING~~ ~~AUTHORITY OR TRANSMISSION OPERATOR~~, via its ~~RELIABILITY COORDINATOR~~ ~~AUTHORITY~~, shall utilize the INTERCONNECTION-wide telecommunications network in accordance with **Appendix 7A — Regional and Interregional Telecommunication, Subsection A, “NERC Hotline,”** to convey the following information to others in the INTERCONNECTION:
 - 2.1.1. **Insufficient resources.** The ~~OPERATING-BALANCING~~ AUTHORITY is unable to purchase capacity or energy to meet its demand and reserve requirements on a day-ahead or hour-by-hour basis.
 - 2.1.2. **IROL violation.** The ~~OPERATING~~ ~~RELIABILITY~~ AUTHORITY recognizes that potential or actual line loadings, and voltage or reactive levels are such that a single CONTINGENCY could threaten the reliability of the INTERCONNECTION. (Once a single CONTINGENCY occurs, the ~~OPERATING~~ ~~RELIABILITY~~ AUTHORITY ~~must~~ shall prepare for the next CONTINGENCY.)
 - 2.1.3. **Implementation of emergency actions.** The ~~OPERATING~~ ~~BALANCING~~ AUTHORITY ~~OR~~ ~~TRANSMISSION~~ ~~-anticipates~~ ~~OPERATOR~~ anticipates initiating a 3% or greater voltage reduction, public appeals for load curtailments, or firm load shedding for other than local problems.

The assumption for this section is that the RA is at the top and everyone communicates to it.

Should we put in Generator Operators and Transmission Providers?

Do we need to recognize SOL violations?

B. Communications and Coordination

2.1.4. **Sabotage incident.** The ~~OPERATING~~BALANCING AUTHORITY, TRANSMISSION PROVIDER, OR TRANSMISSION SERVICE PROVIDER AUTHORITY suspects or has identified a multi-site sabotage occurrence, or single-site sabotage of a critical facility.

2.2. **019-R3 Protocols.** The ~~OPERATING~~RELIABILITY AUTHORITY shall issue directives in a clear, concise, definitive manner. The ~~OPERATING~~BALANCING AUTHORITY, TRANSMISSION OPERATOR, AND TRANSMISSION SERVICE PROVIDER AUTHORITY shall receive a response from the person receiving the directive who will repeat the information given. All entities~~The OPERATING AUTHORITY~~ shall acknowledge the statement as correct or repeat the original statement to resolve misunderstandings.

Important new requirements to avoid confusion.

C. Capacity and Energy Emergencies

[Appendix 5C – Energy Emergency Alerts]

Introduction

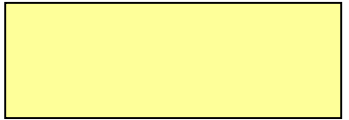
020-R1 During a system emergency, the OPERATING BALANCING AUTHORITY ~~must~~shall continue to comply with NERC Control Performance and Disturbance Control Standards as explained in Policy 1, “Generation Control and Performance,” regardless of costs. In other words, the OPERATING BALANCING AUTHORITY may not rely on the frequency bias of the other CONTROL AREAS BALANCING AUTHORITIES in the INTERCONNECTION to provide energy during the emergency because doing so reduces the INTERCONNECTION’S ability to recover its frequency following additional generator failures.

If the OPERATING BALANCING AUTHORITY cannot comply with the Control Performance and Disturbance Control Standards, then it ~~must~~shall immediately implement remedies to do so. These remedies include, but are not limited to:

1. Requesting assistance from other CONTROL AREAS BALANCING AUTHORITIES
2. Declaring an ENERGY EMERGENCY through its RELIABILITY COORDINATOR AUTHORITY
3. Reducing load, through procedures such as public appeals, voltage reductions, curtailing interruptible loads and firm loads.

Requirements

1. **020-R4 Anticipating capacity or energy emergency.** A CONTROL AREA BALANCING AUTHORITY anticipating an operating capacity or energy emergency shall perform all actions necessary including bringing on all available generation, postponing equipment maintenance, scheduling interchange purchases in advance, and being prepared to reduce firm load.
2. **020-R5 Returning ACE to Acceptable Levels.** In the event of a capacity or energy emergency, generation and transmission facilities shall be used to the fullest extent practicable to comply with the CPS and DCS as defined in Policy 1A, “Control Performance Standard.” Using bias variables to “cover up” energy emergency problems is prohibited.
 - 2.1. **Mitigating an energy emergency.** Once the control areas BALANCING AUTHORITY has exhausted the following steps:
 - All available generating capacity is loaded, and
 - All operating reserve is utilized, and
 - All interruptible load and interruptible exports have been interrupted, and



Was Now Appendix 9B, but it **is now 5C** -really applies more to this Policy.

Delete Intro

This section pertains to the BA function

Policy 5 — Emergency Operations

C. Insufficient Generating Capacity

- All emergency assistance from other ~~control areas~~ BALANCING AUTHORITIES is fully utilized, and
- Its ACE is negative and cannot be returned to zero in the next fifteen minutes, then
 - 2.1.1. The ~~CONTROL AREA~~BALANCING AUTHORITY shall manually shed firm load without delay to return its ACE to zero.
 - 2.1.2. The deficient ~~CONTROL AREA~~BALANCING AUTHORITY shall declare an EMERGENCY ENERGY Alert in accordance with Appendix 5C.
- 2.2. **Using INTERCONNECTION’S bias.** The deficient ~~CONTROL AREA~~BALANCING AUTHORITY may only use the assistance provided by the INTERCONNECTION’S frequency bias for the time needed to implement corrective actions.

3. Elevating Transmission Service Priority within the Eastern INTERCONNECTION. When a TRANSMISSION PROVIDER expects to elevate the transmission service priority of an INTERCHANGE TRANSACTION from Priority 6 (Network Integration Transmission Service from Non-designated Resources) to Priority 7 (Network Integration Transmission Service from designated Network Resources) as permitted in its transmission tariff [See **Appendix 9C1, “Transmission Loading Relief Procedure”** for explanation of Transmission Service Priorities];

Will this go to NAESB???
????

4. Energy Emergency Alerts. Alerts shall be initiated only by a RELIABILITY AUTHORITY at 1) the RELIABILITY AUTHORITIES own request or, 2) upon the request of a BALANCING AUTHORITY, or 3) upon the request of a LOAD SERVING ENTITY. These alerts shall be posted on the NERC Web site. [See **Appendix 5C, “Energy Emergency Alerts”**]

Inserted new section that better reflects appendix 5C.

~~3.1.4.1. The LOAD SERVING ENTITY served by the CONTROL AREA or TRANSMISSION PROVIDER must request its RELIABILITY COORDINATOR to initiate an ENERGY EMERGENCY ALERT. [See Appendix 5C, “Energy Emergency Alerts”]~~

~~3.1.4.1.1. This Alert must be posted on the NERC Web site, and include the expected total MW that may have its TRANSMISSION SERVICE priority changed.~~

~~3.2.4.2. EEA 1 will be used to alert that available resources are in use, forecast the change of the priority of TRANSMISSION SERVICE of an INTERCHANGE TRANSACTION on the system from Priority 6 to Priority 7.~~

~~3.3.4.3. EEA 2 will be used to alert that load management procedures are in effect, announce the change of the priority of TRANSMISSION~~

Policy 5 — Emergency Operations

C. Insufficient Generating Capacity

SERVICE of an INTERCHANGE TRANSACTION on the system from Priority 6 to Priority 7.

4.4. EEA 3 will be used to alert that firm load interruption is eminent or in progress.

4.5. EEA 0 will be used to alert a state of termination

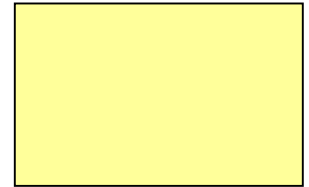
4.5. Unilateral action. The ~~OPERATING BALANCING~~ AUTHORITY shall not unilaterally adjust generation in an attempt to return INTERCONNECTION frequency to normal beyond that supplied through frequency bias action and INTERCHANGE SCHEDULE changes. Such unilateral adjustment may overload transmission facilities.

D. Transmission

Introduction

This policy:

1. Summarizes the authority, information and tools required by ~~SYSTEM OPERATORS~~ OPERATING AUTHORITIES responsible for the reliability of the INTERCONNECTIONS.
2. Identifies the accountability for developing and implementing procedures to alleviate SYSTEM OPERATING LIMIT (SOL) and INTERCONNECTED RELIABILITY OPERATING LIMIT (IROL) violations.
3. Describes the requirement to develop procedures for the curtailment and restoration of transmission service.

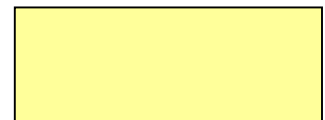


Delete
Intro

Requirements

1. **021-R1 Mitigating SOL and IROL violations.** The ~~OPERATING RELIABILITY AUTHORITY AND TRANSMISSION OPERATOR~~ experiencing or contributing to an SOL or IROL violation shall take immediate steps to relieve the condition, which may include firm load shedding.
2. **021-R2 ~~OPERATING AUTHORITIES~~ BALANCING AUTHORITIES and Transmission Operators shall not BURDEN others.** The Balancing Authority and Transmission Operator ~~OPERATING AUTHORITY~~ shall ensure ~~they~~ operate to prevent the likelihood that a disturbance, action, or non-action will result in a SOL or IROL violation in its OPERATING AUTHORITY AREA or another area of the INTERCONNECTION. In instances where there is a difference in derived operating limits, the BULK ELECTRIC SYSTEM shall always be operated to the most limiting parameter.
3. **021-R3** The ~~OPERATING~~ BALANCING AUTHORITY OR TRANSMISSION OPERATOR AUTHORITY shall disconnect the affected facility if the overload on a transmission facility or abnormal voltage or reactive condition persists and equipment is endangered.
4. **021-R3** Neighboring ~~OPERATING AUTHORITIES and~~ RELIABILITY COORDINATORS ~~AUTHORITIES, BALANCING AUTHORITIES, AND TRANSMISSION OPERATORS~~ impacted by the disconnection shall be notified prior to switching, if time permits, otherwise, immediately thereafter.
5. **021-R4** The ~~OPERATING~~ TRANSMISSION OPERATOR AUTHORITY shall have sufficient information and analysis tools to determine the cause(s) of SOL violations. This analysis shall be conducted in all operating timeframes. The ~~OPERATING AUTHORITY~~ TRANSMISSION OPERATOR shall use the results of these analyses to immediately mitigate the SOL violation.

New. Repeated in
Policy 9C1.3.



E. System Restoration

[Policy 6D – Operations Planning–System Restoration]
[Electric System Restoration Reference Document]

Introduction

After a system collapse, restoration shall begin when the RELIABILITY COORDINATOR AUTHORITY and its affected OPERATING AUTHORITY(IES) determine that they can proceed in an orderly and secure manner. RELIABILITY COORDINATORS AUTHORITIES and affected OPERATING AUTHORITIES shall coordinate their restoration actions. Restoration priority shall be given to the station supply of power plants and the transmission system. Even though the restoration is to be expeditious, OPERATING AUTHORITIES shall avoid premature action to prevent a re-collapse of the BULK ELECTRIC SYSTEM.

Delete intro

Customer load shall be restored as generation and transmission equipment becomes available, recognizing that load and generation ~~must~~ shall remain in balance at normal frequency as the BULK ELECTRIC SYSTEM is restored.

Requirements

1. **Returning to normal operations.** Following a disturbance in which one or more OPERATING RELIABILITY AUTHORITY AREAS or Balancing Authority Areas become isolated, steps shall begin immediately to return the BULK ELECTRIC SYSTEM to normal:
 - 1.1. **Extent of isolated BULK ELECTRIC SYSTEM.** The OPERATING AUTHORITY RELIABILITY AUTHORITY working in conjunction with its Balancing Authorities, Transmission Operators, and Transmission Service Providers RELIABILITY COORDINATOR AUTHORITY shall determine the extent and condition of the isolated area(s).
 - 1.2. **Frequency restoration.** The OPERATING RELIABILITY AUTHORITY shall then take the necessary action to restore BULK ELECTRIC SYSTEM frequency to normal, including adjusting generation, placing additional generators on line, or load shedding.
 - 1.3. **INTERCHANGE SCHEDULE review.** The RELIABILITY COORDINATOR AUTHORITY and affected CONTROL AREAS BALANCING AUTHORITIES shall immediately review the INTERCHANGE SCHEDULES between those CONTROL AREAS BALANCING AUTHORITIES or fragments of those CONTROL AREAS BALANCING AUTHORITIES within the separated area and make adjustments as needed to facilitate the restoration. -The affected Control Areas BALANCING AUTHORITIES shall make all attempts to maintain the adjusted INTERCHANGE SCHEDULES whether generation control is manual or automatic.
 - 1.4. **Resynchronizing Desynchronizing.** When voltage, frequency, and phase angle permit, the OPERATING

This may need to be reworded. It does not flow.

E. System Restoration

~~AUTHORITY~~TRANSMISSION OPERATOR may resynchronize the isolated area(s) with the surrounding area(s), upon notifying its ~~RELIABILITY COORDINATOR~~AUTHORITY and adjacent Transmission Operators OPERATING AUTHORITIES, and considering the size of the area being reconnected and the capacity of the transmission lines effecting the reconnection. (The Transmission Operators OPERATING AUTHORITY'S restoration plan should consider the number of synchronizing points across the system.)

- 1.5. **Off-site supply for nuclear plants.** The ~~OPERATING~~TRANSMISSION OPERATOR-AUTHORITY shall give high priority to restoration of off-site power to nuclear stations.
- 1.6. **Load Shedding.** Load shall be shed in neighboring Reliability Authorities or Balancing Authorities OPERATING AUTHORITY areas, where required, to permit successful interconnected system restoration.

F. Disturbance Reporting

[Appendix 5F – Reporting Requirements for Major Electric System Emergencies]

Introduction

Disturbances or unusual occurrences that jeopardize the operation of the BULK ELECTRIC SYSTEM, and result, or could result, in system equipment damage, or customer interruptions, ~~must~~ shall be studied in sufficient depth to increase industry knowledge of electrical interconnection mechanics to minimize the likelihood of similar events in the future. It is important that the facts surrounding a disturbance shall be made available to RELIABILITY ~~COORDINATORS~~ AUTHORITIES, ~~and~~ OPERATING AUTHORITIES, TRANSMISSION OPERATORS, Regional Councils, NERC, and regulatory agencies entitled to the information.

Delete intro

Requirements

1. **022-R1 Regional Council Reporting Procedures.** Each Regional Council shall establish and maintain a Regional reporting procedure to facilitate preparation of preliminary and final disturbance reports.
2. **022-R2 Analyzing disturbances.** BULK ELECTRIC SYSTEM disturbances shall be promptly analyzed by the affected ~~OPERATING AUTHORITIES~~ RELIABILITY AUTHORITIES, BALANCING AUTHORITIES, AND SYSTEM OPERATORS.
3. **022-R3 Disturbance reports.** Based on the NERC and DOE disturbance reporting requirements, those ~~OPERATING RELIABILITY AUTHORITIES, BALANCING AUTHORITIES, AND TRANSMISSION~~ responsible ~~OPERATORS~~ responsible for investigating the incident shall provide a preliminary written report to their Regional Council and NERC.
 - 3.1. **Preliminary written reports.** Either a copy of the report submitted to DOE, or, if no DOE report is required, a copy of the NERC Interconnected Reliability Operating Limit and Preliminary Disturbance Report form shall be submitted by the affected RELIABILITY AUTHORITIES, BALANCING AUTHORITIES, AND SYSTEM OPERATORS ~~OPERATING AUTHORITY~~ within 24 hours of the disturbance or unusual occurrence. Certain events (e.g. near misses) may not be identified until some time after they occur. Events such as these should be reported within 24 hours of being recognized.
 - 3.2. **Preliminary reporting during adverse conditions.** Under certain adverse conditions, e.g. severe weather, it may not be possible to assess the damage caused by a disturbance and issue a written Interconnected Reliability Operating Limit and Preliminary Disturbance Report within 24 hours. In such cases, the affected RELIABILITY AUTHORITIES, BALANCING AUTHORITIES, AND SYSTEM OPERATORS ~~OPERATING~~

Can we replace reference to RA, BA, and TO by the use of 'RESPONSIBLE ENTITY'?

F. Disturbance Reporting

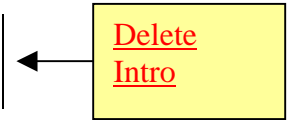
~~AUTHORITY~~ shall notify its Regional Council(s) and NERC promptly and verbally provide as much information as is available at that time. The affected RELIABILITY AUTHORITIES, BALANCING AUTHORITIES, AND SYSTEM OPERATORS ~~OPERATING AUTHORITY~~ shall then provide timely, periodic verbal updates until adequate information is available to issue a written Preliminary Disturbance Report.

- 3.3. **Final written reports.** If in the judgment of the Regional Council, after consultation with the RELIABILITY AUTHORITIES, BALANCING AUTHORITIES, AND SYSTEM OPERATORS ~~OPERATING AUTHORITY~~ in which a disturbance occurred, a final report is required, the affected RELIABILITY AUTHORITIES, BALANCING AUTHORITIES, AND SYSTEM OPERATORS ~~OPERATING AUTHORITY~~ shall prepare this report within 60 days. As a minimum, the final report shall have a discussion of the events and its cause, the conclusions reached, and recommendations to prevent recurrence of this type of event. The report shall be subject to Regional Council approval.
4. **Notifying NERC.** The NERC Disturbance Reporting Requirements, shown in **Appendix 5F, Sections A and B**, are the minimum requirements for reporting disturbances, unusual occurrences, and voltage excursions to NERC.
5. **Notifying DOE.** The U.S. Department of Energy's most recent Emergency Incident and Disturbance Reporting Requirements, outlined in **Appendix 5F, Section C**, are the minimum requirements for U.S. utilities and other entities subject to Section 13(b) of the Federal Energy Administration Act of 1974. Copies of these reports shall be submitted to NERC at the same time they are submitted to DOE.
6. **022-R4 Assistance from NERC Operating Committee (OC) and the Disturbance Analysis Working Group (DAWG).** When a BULK ELECTRIC SYSTEM disturbance occurs, the Regional Council's OC and DAWG representatives shall make themselves available to the OPERATING AUTHORITY RELIABILITY AUTHORITIES, BALANCING AUTHORITIES, AND SYSTEM OPERATORS immediately affected to provide any needed assistance in the investigation and to assist in the preparation of a final report.
7. **022-R5 Final report recommendations.** The Regional Council shall track and review the status of all final report recommendations at least twice each year to ensure they are being acted upon in a timely manner. If any recommendation has not been acted on within two years, or if Regional Council tracking and review indicates at any time that any recommendation is not being acted on with sufficient diligence, the Regional Council shall notify the NERC Planning Committee and Operating Committee of the status of the recommendation(s) and the steps the Regional Council has taken to accelerate implementation.

G. Sabotage Reporting

Introduction

Disturbances or unusual occurrences, suspected or determined to be caused by sabotage, shall be reported to the appropriate systems, governmental agencies, and regulatory bodies.



Requirements

1. **023-R1 Recognizing sabotage.** Each RELIABILITY AUTHORITY, BALANCING AUTHORITY, AND SYSTEM OPERATOR OPERATING AUTHORITY shall have procedures for the recognition of and for making its SYSTEM OPERATORS aware of sabotage events on its facilities and multi-site sabotage affecting larger portions of the INTERCONNECTION. Procedures shall also be established for the communication of information concerning sabotage events to ~~appropriate parties other~~ RELIABILITY AUTHORITIES, BALANCING AUTHORITIES, AND SYSTEM OPERATORS in the INTERCONNECTION.
2. **023-R2 Reporting guidelines.** SYSTEM OPERATORS shall be provided with guidelines including lists of utility contact personnel, for reporting disturbances due to sabotage events.
3. **023-R3 Contact with FBI and RCMP.** ~~OPERATING AUTHORITIES~~ RELIABILITY AUTHORITIES, BALANCING AUTHORITIES, AND SYSTEM OPERATORS shall establish communications contacts with local Federal Bureau of Investigation (FBI) or Royal Canadian Mounted Police (RCMP) officials and develop reporting procedures as appropriate to their circumstances.

Guides

1. ~~Information to media. OPERATING AUTHORITIES should establish procedures for supplying sabotage related information to the media. Release of this information must be coordinated with the appropriate FBI or RCMP personnel.~~

Policy 6 – Operations Planning

Standard Version 02, Draft 17

Policy Subsections

- A. Normal Operations
- B. Emergency Operations
- C. Load Shedding
- D. System Restoration
- E. Continuity of Operations

Introduction

024-R1: Each ~~OPERATING AUTHORITY~~ RA,BA,Top,Gop shall maintain a set of current plans that are designed to evaluate options and set procedures for reliable operation through a reasonable future time period. In addition, each ~~OPERATING AUTHORITY~~ RA,BA,Top,Gop is responsible for using available personnel and system equipment to implement these plans to assure that interconnected systems reliability will be maintained.

024-R2: SYSTEM OPERATORS shall participate in the system planning and design study processes so that these studies will contain the SYSTEM OPERATORS' perspective and the SYSTEM OPERATORS will know the intended planning purpose.

Steve and I included Ras were we thought operating Authority or Control Area should include them. The RCWG seems to have left them out altogether assuming all RA requirements are in Policy 9. Which is correct?

Move R1 to become requirement 1 under A. Normal Operations

Move R2 to item 3 under A. Normal Operations.

A. Normal Operations

Requirements

1. **024-R3 Operations planning coordination.** Each ~~OPERATING AUTHORITY~~ RA, TOP, BA shall plan its current-day, next-day, and seasonal operations in coordination ~~(where confidentiality agreements allow)~~ with neighboring ~~OPERATING AUTHORITIES~~ RA, TOP, BA so that normal INTERCONNECTION operation will proceed in an orderly and consistent manner.
 - 1.1. **024-R4** Each ~~transmission and generation owner~~ LSE, TSP, GOp shall coordinate ~~(where confidentiality agreements allow)~~ its current-day, next-day, and seasonal operations with its host CONTROL AREA BALANCING AUTHORITY (IES). Each BA, TO, GOp shall coordinate its current-day, next-day, and seasonal operations with its host Top.
 - 1.2. **024-R5** Each BALANCING AUTHORITY AND TOP CONTROL AREA shall coordinate ~~(where confidentiality agreements allow)~~ its current-day, next-day, and seasonal operations with neighboring BALANCING AUTHORITIES AND TOP CONTROL AREAS and with its RELIABILITY COORDINATOR AUTHORITY.
2. **Operations planning objectives.** Each ~~OPERATING AUTHORITY~~ shall plan to meet:
 - 2.1. **024-R6** Each RA, BA, Top shall plan to meet ~~P~~planned changes in system configuration, generation dispatch, interchange scheduling and demand patterns.
 - 2.2. **024-R7** Each RA, BA, Top shall plan to meet ~~U~~unplanned changes in system configuration and generation dispatch (at a minimum N-1 CONTINGENCY planning) in accordance with NERC, Regional, and local reliability requirements.
 - 2.3. **024-R8** Each RA, BA shall plan to meet ~~C~~capacity and energy reserve requirements, including the deliverability/capability for any single CONTINGENCY.
 - 2.4. **024-R9** Each RA, BA, Top shall plan to respect ~~V~~voltage and/or reactive limits, including the deliverability/capability for any single CONTINGENCY.
 - 2.5. **024-R10** Each BA shall plan to meet INTERCHANGE SCHEDULES. All ~~generator-GENERATOR owners-OPERATORS~~ shall operate their plant so as to adhere to ramp schedules.
 - 2.6. **024-R11** Each RA, BA, Top shall plan to respect all SYSTEM OPERATING LIMITS.

The Functional Model is missing the responsibility of the BA to supply Load and Generation schedules to the Transmission Operator to do reliability analysis

Does the use of Operating Authority in Requirement 2 too broad. Does Requirement 2 apply only to the BA? Or TOP?

A. Normal Operations

3. **024-R12 BULK ELECTRIC SYSTEM studies.** The ~~CONTROL AREA~~RA and TRANSMISSION OPERATOR shall perform seasonal, next-day, and current-day BULK ELECTRIC SYSTEM studies to determine SYSTEM OPERATING LIMITS. Neighboring RA and TRANSMISSION OPERATORS~~CONTROL AREAS~~ shall utilize identical SYSTEM OPERATING LIMITS for common facilities. These BULK ELECTRIC SYSTEM studies shall be updated as necessary to reflect current system conditions. The results of BULK ELECTRIC SYSTEM studies shall be made available to the TRANSMISSION OPERATOR'S and BALANCING AUTHORITY'S SYSTEM OPERATORS~~CONTROL AREA operators~~ and to its RELIABILITY COORDINATOR~~AUTHORITY~~.
4. **024-R13 Total Transfer Capability or Available Transfer Capability and transmission coordination.** The TRANSMISSION SERVICE PROVIDER~~CONTROL AREA~~ shall include known SOLs or IROLs within its area and neighboring areas in the determination of transfer capabilities, in accordance with filed tariffs and/or regional TTC/ATC calculation processes.
5. **024-R14 Generator capability.** At the request of the RA or BA or TRANSMISSION OPERATOR~~CONTROL AREA~~, GENERATOR-GENERATOR OPERATORS-OPERATORS shall perform generating real or reactive capability verification that shall include, among other variables, weather, ambient air and water conditions, and fuel quality and quantity, and provide the results to the RA, BA and TRANSMISSION OPERATOR'S~~CONTROL AREA SYSTEM~~ OPERATOR as requested. (See also Planning Standard II.B.S1)
6. **Communication of facility status.** (Note: in the following Requirements, the term "immediately" shall be defined as "without any intentional time delay.")
 - 6.1. **024-R15** GENERATOR OPERATORS shall immediately notify their ~~CONTROL AREA~~BALANCING AUTHORITY'S, TRANSMISSION OPERATOR'S, and RA'S SYSTEM OPERATORS operators of changes in capabilities and characteristics including but not limited to:
 - 6.1.1. Changes in real and reactive output capabilities,
 - 6.1.2. Automatic Voltage Regulator status and mode setting
 - 6.2. **024-R16** GENERATION OPERATORS shall provide a forecast of expected real power output to their RA, BALANCING AUTHORITY AND TRANSMISSION OPERATOR~~CONTROL AREAS~~ to assist in operations planning at the RA, BALANCING AUTHORITY'S AND TRANSMISSION OPERATOR'S~~CONTROL AREA'S~~ request (e.g. a seven-day forecast of real output).
 - 6.3. **024-R17** TRANSMISSION OPERATORS shall immediately notify their RA and BALANCING AUTHORITY~~CONTROL AREA operators~~

Planning Standard ref may change. Should it be included or the Std's words?

6.1 is missing System Stabilizer status. Probably needs adding in Version 1

Policy 6 – Operations Planning

A. Normal Operations

of changes in capabilities and characteristics including but not limited to:

6.3.1. Changes in transmission facility status

6.3.2. Changes in transmission facility rating

6.4. ~~024-R18~~CONTROL AREA BALANCING AUTHORITIES AND TRANSMISSION OPERATORS shall immediately communicate the above information to their RELIABILITY COORDINATOR AUTHORITY.

6.5. 024-R19 **Uniform line identifiers.** Neighboring OPERATING AUTHORITIES RAs, BAs, Tops, Gops, TOs, GOs, TSPs, and LSEs shall use uniform line identifiers when referring to transmission facilities of an interconnected network.

7. 024-R20 **Computer models.** The ~~CONTROL AREA RA, BALANCING AUTHORITY and TRANSMISSION OPERATOR~~ shall maintain accurate computer models utilized for analyzing and planning system operations.

6.3 is missing transmission facility configuration changes. A Version 1 change?

Should 6.4 be deleted since we included Ras were appropriate above?

B. Emergency Operations

Introduction

Each OPERATING AUTHORITY Top, BA, and Ra shall develop, maintain, and implement a set of plans consistent with NERC Operating Policies to mitigate operating emergencies. These plans shall be coordinated with other OPERATING AUTHORITIES, CONTROL AREAS, BAs, TOPs and RELIABILITY COORDINATORS AUTHORITIES as appropriate.

Inserted the 1st sentence in Plan types below. 2nd sentence is covered by requirement 7

Requirements

1. **025-R1 Agreements for emergency assistance.** ~~CONTROL AREAS~~ BALANCING AUTHORITIES shall have operating agreements with adjacent BALANCING AUTHORITIES ~~CONTROL AREAS~~ that shall, at a minimum, contain provisions for emergency assistance, including provisions to obtain emergency assistance from remote BALANCING AUTHORITIES ~~CONTROL AREAS~~.
2. **025-R2 Staffing and training.** The BALANCING AUTHORITY, TOP, AND RA ~~CONTROL AREA~~ shall be staffed with adequately trained operating personnel. Training for SYSTEM OPERATORS shall meet or exceed a minimum of 5 days per year of training and drills using realistic simulations of system emergencies, in addition to other training required to maintain qualified operating personnel.
3. **025-R3 Load shedding to prevent separation.** The OPERATING AUTHORITY RA, BA, and Top shall have an emergency load reduction plan for all identified IROLs. The plan shall include the details on how the OPERATING AUTHORITY RA, BA AND TOP will implement load reduction in sufficient amount and time to mitigate the IROL violation before system separation or collapse would occur. The load reduction plan must be capable of being implemented within 30 minutes.
4. **025-R4 Emergency plan types.** The entities indicated ~~OPERATING AUTHORITY~~ shall have emergency plans that address the following:
 - 4.1. Each OPERATING AUTHORITY TOP, BA, and RA shall develop, maintain, and implement a set of plans consistent with NERC Standards Operating Policies to mitigate operating emergencies for Insufficient Generating Capacity
 - 4.2. Each OPERATING AUTHORITY TOP, BA, and RA shall develop, maintain, and implement a set of plans consistent with NERC Standards Operating Policies to mitigate operating emergencies on the Transmission System.
 - 4.3. Each OPERATING AUTHORITY, TOP, BA, and RA shall develop, maintain, and implement a set of plans consistent with NERC Standards Operating Policies to mitigate operating emergencies for Load Shedding

B. Emergency Operations

- 4.4. Each OPERATING AUTHORITY TOP, BA, and RA shall develop, maintain, and implement a set of plans consistent with NERC Standards Operating Policies to mitigate operating emergencies for System Restoration
5. **025-R5 Emergency plan elements.** Each ~~CONTROL AREA, RA, BALANCING AUTHORITY and TRANSMISSION OPERATOR~~ shall have emergency plans that will enable it to mitigate operating emergencies. At a minimum, the RA, BALANCING AUTHORITY'S and TRANSMISSION OPERATOR'S CONTROL AREA'S emergency plans shall include:
 - 5.1. **Communications.** Communications protocols to be used during emergencies.
 - 5.2. **Controlling Actions.** List of controlling actions to resolve the emergency. Load reduction, in sufficient quantity to resolve the emergency within NERC established timelines, shall be one of the controlling actions.
 - 5.3. **Coordinating Tasks.** The tasks to be coordinated with and among adjacent RAs, BALANCING AUTHORITYIES and TRANSMISSION OPERATORS CONTROL AREAS and ~~OPERATING AUTHORITIES~~ Tops, BAs within the ~~CONTROL AREA~~ RA, BALANCING AUTHORITY OR TRANSMISSION OPERATOR.
 - 5.4. **Staffing.** Staffing levels for the emergency.
6. **025-R6 Emergency plan review and update.** The ~~OPERATING AUTHORITY~~ TOP, BA and RA shall annually review and update each emergency plan. The ~~OPERATING AUTHORITY~~ BAs and TOPs shall provide a copy of its updated emergency plans to neighboring ~~OPERATING AUTHORITIES~~ BA and Top and to its ~~RELIABILITY COORDINATOR AUTHORITY.~~ Ras shall provide a copy of its updated emergency plans to its neighboring Ras.
7. **025-R7 Emergency Plan Coordination.** The ~~OPERATING AUTHORITY~~ BA, TOP, and RA shall coordinate its emergency plans with other ~~OPERATING AUTHORITIES~~ BA and TOP, CONTROL AREAS, and ~~RELIABILITY COORDINATORS~~ AUTHORITIES as appropriate. This coordination includes the following steps:
 - 7.1. **Communications.** Establish and maintain reliable communications between interconnected systems.
 - 7.2. **Interchange agreements.** Arrange new interchange agreements to provide for emergency capacity or energy transfers if existing agreements cannot be used.
 - 7.3. **Maintenance coordination.** Coordinate transmission and generator maintenance schedules to maximize capacity or

B. Emergency Operations

conserve the fuel in short supply. (This includes water for hydro generators.)

- 7.4. Energy deliveries.** Arrange deliveries of electrical energy or fuel from remote systems through normal operating channels.

Guides

Emergency plans should consider the following items:

1. **Fuel supply and inventory.** An adequate fuel supply and inventory plan which recognizes reasonable delays or problems in the delivery or production of fuel.
2. **Fuel switching.** Fuel switching plans for units for which fuel supply shortages may occur, e.g., gas and light oil.
3. **Environmental constraints.** Plans to seek removal of environmental constraints for generating units and plants.
4. **System energy use.** The reduction of the system’s own energy use to a minimum.
5. **Public appeals.** Appeals to the public through all media for voluntary load reductions and energy conservation including educational messages on how to accomplish such load reduction and conservation.
6. **Load management.** Implementation of load management and voltage reductions, if appropriate.
7. **Optimize fuel supply.** The operation of all generating sources to optimize the availability.
8. **Appeals to customers to use alternate fuels.** In a fuel emergency, appeals to large industrial and commercial customers to reduce non-essential energy use and maximize the use of customer-owned generation that rely on fuels other than the one in short supply.
9. **Interruptible and curtailable loads.** Use of interruptible and curtailable customer load to reduce capacity requirements or to conserve the fuel in short supply.
10. **Maximizing generator output and availability.** The operation of all generating sources to maximize output and availability. This should include plans to winterize units and plants during extreme cold weather.
11. **Notifying IPPs.** Notification of cogeneration and independent power producers to maximize output and availability.
12. **Requests of government.** Requests to appropriate government agencies to implement programs to achieve necessary energy reductions.

P6T1 includes guides 1,2,3,4,5,6,8,9,10,11,13,14 as requirements. What happens to guides 7,15,16,17, 18,19.and 20?

B. Emergency Operations

13. **Load curtailment.** A mandatory load curtailment plan to use as a last resort. This plan should address the needs of critical loads essential to the health, safety, and welfare of the community. Address firm load curtailment.
14. **Notification of government agencies.** Notification of appropriate government agencies as the various steps of the emergency plan are implemented.
15. **Utilization of Energy Emergency Alert procedures as specified in Appendix 5C.**
16. **Generation redispatch options.**
17. **Transmission reconfiguration options.**
18. **Utilization of Special Protection Schemes.**
19. **Local or INTERCONNECTION-wide transmission loading relief procedures.**
20. **Reserve sharing.**

C. Load Shedding

Introduction

026-R1 After taking all other remedial steps, an ~~OPERATING AUTHORITY or CONTROL AREA RA, BALANCING AUTHORITY and TRANSMISSION OPERATOR~~ whose integrity is in jeopardy due to operating with insufficient generation or transmission capacity shall shed customer load rather than risk an uncontrolled failure of components or cascading outages of the INTERCONNECTION.

Move this down to become a requirement 1 below and renumber the remaining requirements

Requirements

1. **026-R2 Plans for automatic load shedding.** Each BALANCING AUTHORITY and TRANSMISSION OPERATOR~~OPERATING AUTHORITY~~ shall establish plans for automatic load shedding.
 - 1.1. **026-R3 Coordination.** Load shedding plans shall be coordinated among the interconnected BALANCING AUTHORITY and TRANSMISSION OPERATOR~~OPERATING AUTHORITY~~ AREAS.
 - 1.2. **026-R4 Frequency or voltage level.** Automatic load shedding shall be initiated at the time the system frequency or voltage has declined to an agreed-to level.
 - 1.2.1. **026-R4 Load shedding steps.** Automatic load shedding shall be in steps related to one or more of the following: frequency, rate of frequency decay, voltage level, rate of voltage decay or power flow levels.
 - 1.2.2. **026-R5 Minimizing risk.** The load shed in each step shall be established to minimize the risk of further uncontrolled separation, loss of generation, or system shutdown.
 - 1.2.3. **026-R6 Underfrequency load shedding on separation.** After a ~~an~~ BALANCING AUTHORITY AREA and TRANSMISSION OPERATOR AREA~~OPERATING AUTHORITY AREA or CONTROL AREA~~ separates from the INTERCONNECTION, if there is insufficient generating capacity to restore system frequency following automatic underfrequency load shedding, the BALANCING AUTHORITY or TRANSMISSION OPERATOR~~OPERATING AUTHORITY or CONTROL AREA~~ shall shed additional load.
 - 1.2.4. **026-R7 Coordination with generator, et al, tripping.** The BA or Top shall coordinate ~~Automatic load shedding shall be coordinated~~ throughout their BALANCING AUTHORITY or TRANSMISSION OPERATOR~~OPERATING AUTHORITY~~ AREAS with underfrequency isolation of generating units, tripping of shunt capacitors, and other automatic actions which will

C. Load Shedding

occur under abnormal frequency, voltage, or power flow conditions.

2. **026-R8 Plans for manual load shedding.** Each BALANCING AUTHORITY or TRANSMISSION OPERATOR~~OPERATING AUTHORITY~~ or ~~CONTROL AREA~~ shall have plans for SYSTEM-SYSTEM OPERATOR~~OPERATOR~~-controlled manual load shedding to respond to real-time emergencies. The manual load shedding shall be capable of being implemented in a timeframe to adequately respond to the emergency.

Guides

1. **Load shedding studies.** Automatic load shedding plans should be based on studies of system dynamic performance, simulating the greatest probable imbalance between load and generation.
 - 1.1. **Unacceptable results.** Plans to shed load automatically should be examined to determine if unacceptable overfrequency, overvoltage, or transmission overloads might result.
 - 1.1.1. **Action on overfrequency.** If overfrequency is likely, the amount of load shed should be reduced or automatic overfrequency load restoration should be provided.
 - 1.1.2. **Action on overvoltage.** If overvoltages are likely, the load-shedding program should be modified to minimize that probability.
 2. **Local area considerations.** When scheduling load to be shed automatically, the system should consider its local area requirements and transmission capabilities between areas.
 3. **Automatic isolation plan.** A generation-deficient CONTROL AREABALANCING AUTHORITY may establish an automatic isolation plan in lieu of automatic load shedding, if by doing so it removes the BURDEN it has imposed on the INTERCONNECTION. This isolation plan may be used only with the consent of neighboring systems, and if it leaves the remaining BULK ELECTRIC SYSTEM intact.

What do we recommend to be done with these guides?

D. System Restoration

[Policy 5E – Emergency Operations–System Restoration]
[Electric System Restoration Reference Document]

Introduction

027-R1 Each ~~OPERATING AUTHORITY~~ RA, BALANCING AUTHORITY and TRANSMISSION OPERATOR shall have and periodically update a logical plan to reestablish its electric system in a stable and orderly manner in the event of a partial or total shutdown of ~~the its~~ system. This plan shall be coordinated with other RA, BALANCING AUTHORITIES and TRANSMISSION OPERATORS ~~OPERATING AUTHORITIES~~ in the INTERCONNECTION to assure a consistent INTERCONNECTION restoration plan.

A reliable and adequate source of startup power for generating units shall be provided. Where sources are remote from the generating unit, instructions shall be issued to expedite availability. Generation restoration steps shall be verified by actual testing whenever possible.

System restoration procedures shall be verified by actual testing or by simulation.

Requirements

1. **027-R2 Restoration plan.** Each RA, BALANCING AUTHORITY and TRANSMISSION OPERATOR ~~OPERATING AUTHORITY~~ shall have a restoration plan to reestablish its electric system in a stable and orderly manner in the event of a partial or total shutdown of its system. with necessary operating instructions and procedures to cover emergency conditions, including the loss of vital telecommunications channels.
 - 1.1. **027-R3 Restoration plan update.** The RA, BALANCING AUTHORITY and TRANSMISSION OPERATOR ~~OPERATING AUTHORITY~~ shall review and update its restoration plan at least annually, and whenever it makes changes in the power system network, and to correct deficiencies found during the simulated restoration exercises.
 - 1.2. **027-R4 Restoring the INTERCONNECTION.** The RA's ~~BALANCING AUTHORITY'S and TRANSMISSION OPERATOR'S~~ OPERATING AUTHORITY'S restoration plans ~~must~~ shall be developed with the intent of restoring the integrity of the INTERCONNECTION.
 - 1.3. **027-R5 Coordination.** The RA, BALANCING AUTHORITY and TRANSMISSION OPERATOR ~~OPERATING AUTHORITY~~ shall coordinate its restoration plans with neighboring BALANCING AUTHORITIES and TRANSMISSION OPERATORS ~~OPERATING AUTHORITIES~~.
 - 1.4. **027-R6 Testing telecommunications.** The RA, BALANCING AUTHORITY and TRANSMISSION OPERATOR ~~OPERATING~~

Delete 1st paragraph after moving part of the first sentence into requirement

Delete 2nd paragraph since its included in requirement 3 and 4 below.

Delete the last sentence since it is included in Req 3 below

D. System Restoration

~~AUTHORITY~~ will periodically test its telecommunication facilities needed to implement the restoration plan.

2. **027-R7 SYSTEM OPERATOR training.** The ~~RA,BALANCING AUTHORITY and TRANSMISSION OPERATOR OPERATING AUTHORITY~~ shall train its operating personnel in the implementation of the restoration plan. Such training shall include simulated exercises, if practicable.
3. **027-R8 Procedure testing.** The ~~RA,BALANCING AUTHORITY and TRANSMISSION OPERATOR OPERATING AUTHORITY~~ shall verify its restoration procedures by actual testing or by simulation.
4. **027-R9 Blackstart capability.** The ~~RA,BALANCING AUTHORITY and TRANSMISSION OPERATOR OPERATING AUTHORITY~~ shall ensure the availability and location of Blackstart capability within its respective RA,BALANCING AUTHORITY or TRANSMISSION OPERATOR OPERATING AUTHORITY AREA to meet the needs of the restoration plan.

New requirement.

Guides

1. **Operation at abnormal voltage and frequency.** Generators and their auxiliaries should be able to operate reliably at abnormal voltages and frequencies.
2. **Generator shutdown and restart.** Emergency sources of power should be available to facilitate safe shutdown, enable turning gear operation, minimize the likelihood of damage to either generating units or their auxiliaries, maintain communications, and expedite restarting.
3. **Emergency power source.** Each generating plant should have a source of emergency power to expedite restarting.
 - 3.1. Hydroelectric plants should have internal provisions for restarting.
 - 3.2. Station service busses. Where station service generators are used in parallel with the system, station auxiliary busses should be separated automatically from the system before the frequency has decayed sufficiently to adversely affect the station service units.
 - 3.3. Station service and area security. The effect of station service generators on area security should be considered before they are shut down for economy.
 - 3.4. Outside startup power source. Where an outside source of power is necessary for generating unit startup, switching procedures should be prearranged and periodically reviewed with SYSTEM OPERATORS and other operating personnel.

There is a reference document that may include these items . Someone needs to

D. System Restoration

4. **Startup and shutdown plans.** Each ~~CONTROL AREA~~BALANCING AUTHORITY should have written plans for orderly start-up and shutdown of the generating units.
 - 4.1. **Updates.** These plans should be updated when required.
 - 4.2. **Drills.** Drills should be held periodically to assure that plant operators are familiar with the plans.
5. **Blackstart testing.** Periodic tests should be made to verify blackstart capability.
6. **Synchroscope calibration.** All synchrosopes should be calibrated in degrees, and phase angle differences at interconnection points should be communicated in degrees.
7. **Synchronizing locations and procedures.** SYSTEM OPERATORS should know the preplanned synchronizing locations and procedures. Procedures should provide for alternative action to be taken in case of lack of information or loss of communication channels that would affect resynchronizing.
8. **Protection systems.** Proper protection systems should be considered in the restoration sequence. Relay polarization sources should be maintained during the process.
9. **Telecommunications considerations.** Backup voice telecommunications facilities, including emergency power supplies and alternate telecommunications channels, should be provided to assure coordinated control of operations during the restoration process.
10. **Master trip points.** Control centers using SCADA systems should consider providing master trip points for each station to expedite the restoration process.

E. Continuity of Operations

[Backup Control Center Reference Document]

Requirement

~~CONTROL AREAS~~BALANCING AUTHORITIES, TRANSMISSION OPERATORS and RELIABILITY ~~COORDINATORS~~AUTHORITIES shall have a plan to continue reliability operations in the event its control center becomes inoperable.

Guides

1. **Must not BURDEN the INTERCONNECTION.** The standards of Policy 1, “Generation Control and Performance,” should be considered when developing the plan to continue operation so that the ~~CONTROL AREA~~BALANCING AUTHORITY will not be a BURDEN to the INTERCONNECTION if its own control center becomes inoperable.
 - 1.1. **Location of backup center.** If the ~~CONTROL AREA~~BALANCING AUTHORITY, TRANSMISSION OPERATOR, OR RELIABILITY AUTHORITY has a backup control center, it should be remote from the primary control center site.

Policy 7 — Telecommunications

Standard Version 04b Draft 1

(038 – Referenced in Supporting Notes) [Geomagnetic Disturbance Reference Document]

Policy Subsections

- A. Facilities
- B. System Operator Telecommunication Procedures
- C. Loss of Telecommunications
- D. Security

A. Facilities

(038 – Referenced in Supporting Notes) Appendix 7A — Telecommunications Between TRANSMISSION SERVICE PROVIDERS, TRANSMISSION OPERATORS, PARTICIPATING ENTITIES OPERATING BALANCING AUTHORITIES, INTERCHANGE AUTHORITIES, -and RELIABILITY AUTHORITIES] *{Comment: Agree with Larry that we should specify the appropriate FM entities in lieu of using the term Operating Authorities. On a general note, I interpret this policy to extend beyond the ISN. Is this a correct interpretation? I think the answer impacts what entities we're talking about here.}*

Requirements

1. **Reliable and Secure Telecommunications Networks.** (03829 – R1) Each Participating Entity TRANSMISSION SERVICE PROVIDER, TRANSMISSION OPERATOR, BALANCING AUTHORITY, INTERCHANGE AUTHORITY, OPERATING AUTHORITY and RELIABILITY AUTHORITY¹ shall provide adequate and reliable telecommunications facilities² internally and with other OPERATING AUTHORITY TRANSMISSION SERVICE PROVIDERS, TRANSMISSION OPERATORS, BALANCING AUTHORITIES, INTERCHANGE AUTHORITIES and RELIABILITY AUTHORITIES Participating Entities to assure for the exchange of INTERCONNECTION and operating information necessary to maintain reliability. Where applicable, these facilities shall be redundant and diversely routed.

(038 – R2) The NERC Telecommunications Manager and the Operating Reliability Subcommittee shall determine if each applicant complies with the Adequacy, redundancy, reliability and applicability are determined by each application's requirements. *{Think the added language helps to clarify, but not sure that it goes far enough to ensure the necessary transparency. However, it may be tough to get there without “changing” the policy intent.}*

2. **(This is covered in Standards from Policy 4 and 9 Interregional Security Network.** All RELIABILITY AUTHORITY AUTHORITIES, AREAS and Participating ENTITIES TRANSMISSION OPERATORS, and BALANCING OPERATING AUTHORITIES shall participate in the Interregional Security Network as described in Appendix 7A, Section B, “Interregional Security Network,” and provide the Operational Security Information as explained in Policy 4B, “Required Data Exchange.” {Isn't this limited to RAs, BAs, and TOs?}

¹ “Participating entity” refers to any system, operating, market or regional entity responsible for ensuring reliable and adequate system operations subject to NERC Operating Policy.

² “Telecommunications facilities” refers to all voice and data, wire and wireless facilities used for the exchange of information.

3. **(03829 – R2) Reliability of Telecommunications Facilities.** Vital telecommunications facilities shall be managed, alarmed, tested and/or actively monitored. Special attention shall be given to emergency telecommunications facilities and equipment not used for routine communications.

B. System Operator Telecommunication Procedures

Requirements

1. **Telecommunications coordination.** ~~(0329 – R13)~~ EACH TRANSMISSION SERVICE PROVIDER, TRANSMISSION OPERATOR, BALANCING AUTHORITY, INTERCHANGE OPERATING AUTHORITY, and RELIABILITY AUTHORITY ~~Participating Entity~~ shall provide a means to coordinate telecommunications among the systems in the interconnected region ~~that area~~. This coordination shall include the ability to investigate and recommend solutions to telecommunications problems within the ~~area~~ region and with other ~~regions~~ areas. *{It's unclear what "Area" is being referenced here. Is it the Reliability Authority Area? The Balancing Authority Area? The Interconnection?}*
2. **(0329- R2) English language standard.** Unless agreed to otherwise, English shall be the language for all communications between and among SYSTEM OPERATORS and SYSTEM PERSONNEL responsible for the real-time generation control and operation of the interconnected BULK ELECTRIC SYSTEM. Operations internal to ~~the OPERATING AUTHORITY a~~ TRANSMISSION SERVICE PROVIDERS, TRANSMISSION OPERATORS, BALANCING AUTHORITIES, INTERCHANGE AUTHORITIES ~~BALANCING AUTHORITY AREA~~ may use an alternate language.

C. Loss of Telecommunications

Requirements

1. **(04029 – R15) Written instructions.** Each TRANSMISSION SERVICE PROVIDER, TRANSMISSION OPERATOR, BALANCING AUTHORITY, INTERCHANGE AUTHORITY, OPERATING AUTHORITY ~~and RELIABILITY AUTHORITY~~ ~~Participating Entity~~ shall have written operating instructions and procedures to enable continued operation of the system during loss of telecommunications facilities.

D. Security

Requirements

1. **(04129 – R16) NERCnet security.** TRANSMISSION OPERATORS, BALANCING AUTHORITIES, OPERATING AUTHORITIES ~~and RELIABILITY AUTHORITIES~~ ~~Participating entities~~ shall adhere to the requirements set forth in Appendix 7A, Attachment 2 – NERCnet Security Policy.

{Comment: Can NERCnet be described as a data exchange infrastructure that "houses" the ISN and other applications? If so, we need to include a listing of all FM entities that are impacted. Also, do we need a tie in to the Cyber Security standard (urgent action)?}

(Note: Appendix 7A, A. and B and Attachment 1 are included at the bottom of 039, but not in any template)

Appendix 7A Attachment 2 is referenced under Supporting Notes in 041. Not sure how to include this. Ev

Policy 8 – Operating Personnel and Training

Version 2, Draft 4.2

For implementation
February 15, 2000

Policy Requirement Subsections

- A. Responsibility and Authority
- B. Training
- C. Certification

This Policy defines the responsibilities, authorities and the certification standards, and the training requirements of the Reliability Authority, Balancing Authority, Interchange Authority and Transmission Operator Entities and their Operators ~~SYSTEM OPERATORS~~.

A. Responsibility and Authority

Standard Requirement

Responsibilities and Authorities. (042 – Purpose and R1 – Wording for the Standard comes primarily from the PST1 Compliance Template.) The Reliability Authority, Balancing Authority, Interchange Authority and Transmission Operators Entities ~~SYSTEM OPERATOR~~ shall have the responsibility and authority to ~~and will~~ implement real-time actions that ensure the stable and reliable operation of the BULK ELECTRIC SYSTEM.

B. Training

~~[Appendix 8B1, Suggested Items for System Operator Training Courses.]~~

Requirements

1. ~~(USED WORDING FROM APPROVED P9T3 MODIFIED FOR NEW MODEL TERMINOLOGY.)~~
SYSTEM OPERATOR Training. (043 – Purpose) Each Reliability Authority, Balancing Authority, Interchange Authority and Transmission Operator Entities~~OPERATING AUTHORITY~~ shall develop, and provide ~~its SYSTEM OPERATORS~~ their personnel with a coordinated training program that ~~will is designed to ensure~~ promote reliable system operation. This program shall include:
 - 1.1. **Objectives.** Objectives based ~~on all~~ NERC Operating Policies Requirements~~;~~ Regional Council policies~~;~~ OPERATING AUTHORITY RELIABILITY AUTHORITY, BALANCING AUTHORITY, INTERCHANGE AUTHORITY, AND TRANSMISSION OPERATOR operating procedures~~;~~ and all other applicable regulatory requirements. These objectives shall reference the knowledge and competencies needed to apply those policies, procedures, and requirements to normal, emergency, and restoration conditions.
 - 1.2. **Training Plan.** A plan for the initial, and continuing training effort that addresses required knowledge and competencies and their application in system operations.
 - 1.3. **Training time.** Dedicated training time for all RELIABILITY AUTHORITY, BALANCING AUTHORITY, INTERCHANGE AUTHORITY, AND TRANSMISSION OPERATORS ~~SYSTEM OPERATORS~~ to ensure their operating proficiency.
 - 1.4. **Training staff.** Individuals competent in both knowledge of system operations, role responsibilities and instructional capabilities.
 - 1.5. **Verification of achievement.** Verification that all trainees have successfully demonstrated attainment of all required training objectives, including documented assessment of their training progress.
 - 1.6. **Evaluation.** Evaluations of training effectiveness to enhance further training.
 - 1.7. **Review.** Periodic review to ensure that training materials are technically accurate and complete and to ensure that the training program continues to meet its objectives.

Guides

- ~~1.2.~~ **Practice situations.** Each Reliability Authority, Balancing Authority, Interchange Authority and Transmission Operator Entities~~OPERATING AUTHORITY~~ should will periodically practice simulated emergencies at least annually. The scenarios included in practice situations ~~should will~~ represent a variety of operating conditions and emergencies.
- ~~2.3.~~ **Unusual occurrences.** Reliability Authority, Balancing Authority, Interchange Authority and Transmission Operator Entities~~OPERATING AUTHORITIES~~ should will include disturbance reports and reports of other unusual occurrences in their training programs.

C. Certification

[Certification Specifications at: <https://www.nerc.net/exam/>]

Standards Requirements

1. (used P8T2 Wording modified by Model wording) Positions requiring NERC-Certified

RELIABILITY AUTHORITY, BALANCING AUTHORITY, INTERCHANGE AUTHORITY, AND TRANSMISSION OPERATORS SYSTEM OPERATORS. An OPERATING AUTHORITY that maintains a control center(s) for the real-time operation of the interconnected BULK ELECTRIC SYSTEM, shall
032-R1 The Reliability Authority, Balancing Authority, Interchange Authority and Transmission Operator Entities will staff all operating positions that meet both either of the following criteria with personnel that are NERC-certified for the applicable functions. the appropriately certified NERC-Certified SYSTEM OPERATORS personnel: in accordance with the schedule in Standard 2:

1.1. Positions that have the primary responsibility, either directly or through communications with others, for the real-time operation of the interconnected BULK ELECTRIC SYSTEM;⁵
and

—1.2. Positions that are directly responsible for complying with *NERC Operating Policies Reliability Standards Requirements*.

2. Staffing Schedule. Operating positions identified in Standard 1 shall be staffed according to the following schedule:

—After December 31, 1999, at least one NERC-Certified SYSTEM OPERATOR shall be on duty at all times, and

—After December 31, 2000, all of these positions shall be staffed with NERC-Certified SYSTEM OPERATORS at all times.

—EXCEPTION – While in training to become an appropriately certified NERC Operator-Certified SYSTEM OPERATOR, an uncertified individual may work only in a non-independent position and must be under the direct authority of an appropriately certified NERC-Certified Operator SYSTEM OPERATOR.

Policy 9 – Reliability Coordinator Authority Procedures Standards

Standard Version 02 Draft 1

Standard Version 0

Draft 5-7-04

We did not find any Business Practices in Yellow Highlight.

Subsections

- A. Responsibilities – Authorization
- B. Responsibilities – Delegation of Tasks
- C. Common Tasks for Current-Day and Next-Day Operations
- D. Next-Day Operations
- E. Current-Day Operations
- F. Emergency Operations
- G. System Restoration
- H. Coordination Agreements and Data Sharing
- I. Facility
- J. Staffing

Standard Version 02 Draft 1

Draft 5-7-04

We did not find any Business Practices in the main policy document for Policy 9. However, Business Practices in the Appendices are in Yellow Highlight.

(Not included in Standard- See individual sections)

Introduction Purpose

This document contains the process and procedures that the NERC RELIABILITY ~~COORDINATORS~~ AUTHORITIES are expected to follow to ensure the operational reliability of the INTERCONNECTIONS. These include:

- Planning for next-day operations, ~~including reliability analyses (such as pre- and post-CONTINGENCY thermal monitoring, system reserves, area reserves, reactive reserves, voltage limits, stability, etc.) and identifying special operating procedures that might be needed,~~
- Analyzing current day operating conditions, and
- Implementing procedures (local, INTERCONNECTION-wide, or other) to mitigate SYSTEM OPERATING LIMIT (SOL) and INTERCONNECTION RELIABILITY OPERATING LIMIT (IROL) violations on the transmission system. ~~Regardless of the process, the RELIABILITY COORDINATOR AUTHORITY shall ensure its CONTROL AREAS TRANSMISSION OPERATING ENTITIES return their transmission system to within INTERCONNECTED RELIABILITY OPERATING LIMITS without delay, and no longer than 30 minutes¹~~

~~RELIABILITY COORDINATORS AUTHORITY shall have the capability to monitor their responsibilities with a WIDE AREA view perspective and calculate INTERCONNECTED RELIABILITY OPERATING LIMITS. WIDE AREA is described as the ability to monitor the complete RELIABILITY COORDINATOR AUTHORITY AREA and may include critical flow and status information from adjacent RELIABILITY COORDINATOR AUTHORITY AREAS as determined by detailed system studies. With this in mind it is likely that RELIABILITY COORDINATORS~~

¹ The 30-minute time period is not intended as a grace period for operating one CONTINGENCY away from instability, uncontrolled separation, or cascading outages. Some operating limit violations require mitigation much sooner.

~~AUTHORITIES will discover IROL violations not normally seen by its TRANSMISSION OPERATING ENTITIES.~~

Terms

~~**RELIABILITY COORDINATOR AUTHORITY.** The entity that is the highest level of authority who is responsible for the reliable operation of the BULK ELECTRIC SYSTEM, has the WIDE AREA view of the BULK ELECTRIC SYSTEM and has the operating tools, processes and procedures, including the authority to prevent or mitigate emergency operating situations in both next day analysis and real time operations.~~

~~**OPERATING AUTHORITY.** An entity that:~~

- ~~1. Has ultimate accountability for a defined portion of the BULK ELECTRIC SYSTEM to meet one or more of three reliability objectives — generation/demand balance, transmission reliability, and/or emergency preparedness, and~~
- ~~2. Is accountable to NERC and its Regional Reliability Councils for complying with NERC and Regional Policies, and~~
- ~~3. Has the authority to control or direct the operation of generating resources, transmission facilities, or loads, to meet these Policies.~~

~~OPERATING AUTHORITIES include such entities as CONTROL AREAS BALANCING AUTHORITIES, generation operators and TRANSMISSION OPERATING ENTITIES; they do not include RELIABILITY COORDINATOR AUTHORITIES.~~

~~**RELIABILITY COORDINATOR AUTHORITY AREA.** That portion of the Bulk Electric System under the purview of the RELIABILITY COORDINATOR AUTHORITY.~~

~~**OPERATING AUTHORITY AREA.** That portion of the BULK ELECTRIC SYSTEM under the purview of the OPERATING AUTHORITY that is contained within a RELIABILITY COORDINATOR AUTHORITY AREA AREA.~~

~~**BURDEN.** Operation of the BULK ELECTRIC SYSTEM that violates or is expected to violate a SOL or IROL in the INTERCONNECTION or that violates any other NERC, Regional, or local operating reliability policies or standards.~~

~~**WIDE AREA.** The entire RELIABILITY COORDINATOR AUTHORITY AREA as well as the critical flow and status information from adjacent RELIABILITY COORDINATOR AUTHORITY AREAS as determined by detailed system studies to allow the calculation of INTERCONNECTED RELIABILITY OPERATING LIMITS.~~

~~**CONTINGENCY.** The unexpected failure or outage of a system component, such as a generator, transmission line, circuit breaker, switch or other electrical element. A CONTINGENCY also may include multiple components that are related by situations leading to simultaneous component outages.~~

~~**SYSTEM OPERATING LIMIT (SOL).** The value (such as MW, MVar, Amperes, Frequency or Volts) that satisfies the most limiting of the prescribed operating criteria for a specified system configuration to ensure operation within acceptable reliability criteria. SYSTEM OPERATING LIMITS are based upon certain operating criteria. These include, but are not limited to:~~

- ~~– Facility Ratings (Applicable pre and post CONTINGENCY equipment or facility ratings)~~
- ~~– Transient Stability Ratings (Applicable pre and post CONTINGENCY Stability Limits)~~
- ~~– Voltage Stability Ratings (Applicable pre and post CONTINGENCY Voltage Stability)~~
- ~~– System Voltage Limits (Applicable pre and post CONTINGENCY Voltage Limits)~~

~~**INTERCONNECTION RELIABILITY OPERATING LIMIT (IROL).** The value (such as MW, MVar, Amperes, Frequency or Volts) derived from, or a subset of the SYSTEM OPERATING LIMITS, which if exceeded, could expose a widespread area of the BULK ELECTRIC SYSTEM to instability, uncontrolled separation(s) or cascading outages.~~

A. Responsibilities – Authorization

Requirements

1. **RELIABILITY ~~COORDINATOR~~AUTHORITY responsibilities.** The RELIABILITY ~~COORDINATOR~~AUTHORITY ~~is~~ shall be responsible for the reliable operation of its RELIABILITY ~~COORDINATOR~~AUTHORITY AREA within the BULK ELECTRIC SYSTEM in accordance with NERC, Regional and sub-Regional practices.
 - 1.1. ~~(046034 – R1)~~ The RELIABILITY ~~COORDINATOR~~AUTHORITY ~~is~~ shall be responsible for having the WIDE AREA view, the operating tools, processes and procedures, including the authority, to prevent or mitigate emergency operating situations in both next-day analysis and during real-time conditions.
 - 1.2. ~~(045033 – R1)~~ The RELIABILITY ~~COORDINATOR~~AUTHORITY shall have clear decision-making authority to act and to direct actions to be taken by ~~other OPERATING-BALANCING AUTHORITIES, GENERATOR OPERATORS, TRANSMISSION OPERATORS, TRANSMISSION SERVICE PROVIDERS, LOAD-SERVING ENTITIES, and PURCHASING-SELLING ENTITIES~~ within its RELIABILITY ~~COORDINATOR~~AUTHORITY AREA to preserve the integrity and reliability of the BULK ELECTRIC SYSTEM. These actions shall be taken ~~-without delay, and no longer than 30 minutes~~²
 - 1.3. ~~(Delete – Covered in 047035)~~ The RELIABILITY ~~COORDINATOR~~AUTHORITY shall not delegate its responsibilities ~~to other OPERATING AUTHORITIES or entities.~~
2. ~~(048033 – R19)~~ **Serving the interests of the RELIABILITY ~~COORDINATOR~~AUTHORITY AREA and the INTERCONNECTION.** The RELIABILITY ~~COORDINATOR~~AUTHORITY shall act in the interests of reliability for the overall RELIABILITY ~~COORDINATOR~~AUTHORITY AREA and its INTERCONNECTION before the interests of any other entity. ~~(CONTROL AREA BALANCING AUTHORITY, TRANSMISSION OPERATING ENTITY, PURCHASING-SELLING ENTITY, etc.)~~
3. ~~(049033 – R18)~~ **Compliance with RELIABILITY ~~COORDINATOR~~AUTHORITY directives.** All ~~BALANCING OPERATING AUTHORITIES, GENERATOR OPERATORS, TRANSMISSION OPERATORS, TRANSMISSION SERVICE PROVIDERS, LOAD-SERVING ENTITIES, and PURCHASING-SELLING ENTITIES~~ shall comply with RELIABILITY ~~COORDINATOR~~AUTHORITY directives unless such actions would violate safety, equipment, or regulatory or statutory requirements. Under these circumstances the ~~BALANCING AUTHORITY, GENERATOR OPERATOR,~~

² The 30-minute time period is not intended as a grace period for operating one CONTINGENCY away from instability, uncontrolled separation, or cascading outages. Some operating limit violations require mitigation much sooner.

TRANSMISSION OPERATOR, TRANSMISSION SERVICE PROVIDER, LOAD-SERVING ENTITY, and PURCHASING-SELLING ENTITY~~OPERATING AUTHORITY~~ must immediately inform the RELIABILITY ~~COORDINATOR~~AUTHORITY of the inability to perform the directive so that the RELIABILITY ~~COORDINATOR~~AUTHORITY may implement alternate remedial actions.

4. **(050038 – R1) Reliability Plan approval.** ~~The NERC Operating Committee must approve~~ The RELIABILITY ~~COORDINATOR~~AUTHORITY shall prepare and submit a ~~Regional~~ Reliability Plan to the NERC Operating Committee for its approval.

An alternative would be to say
"The RA shall operate in
accordance with a Reliability Plan
approved by the NERC OC."

B. Responsibilities – Delegation of Tasks

Requirements

1. **(047033 – R14) Delegating tasks.** The RELIABILITY ~~COORDINATOR~~AUTHORITY may delegate tasks to other ~~OPERATING AUTHORITIES and~~ entities, but this delegation ~~must~~ shall be accompanied by formal operating agreements. The RELIABILITY ~~COORDINATOR~~AUTHORITY shall ensure that all delegated tasks are understood, communicated, and addressed ~~by all OPERATING AUTHORITIES~~ within its RELIABILITY ~~COORDINATOR~~AUTHORITY AREA.
2. **(047033 – R25) Designating delegation.** The RELIABILITY ~~COORDINATOR~~AUTHORITY ~~or Regional Reliability Plan must~~ shall list ~~within its Reliability Plan~~ all ~~OPERATING AUTHORITIES and~~ entities to which RELIABILITY ~~COORDINATOR~~AUTHORITY tasks have been delegated.
3. **(047033 – R36) Requirements for certified operators.** ~~The RELIABILITY AUTHORITY~~OPERATING AUTHORITIES and entities ~~must~~ shall ensure that ~~these~~ delegated tasks are carried out by NERC-certified RELIABILITY ~~COORDINATOR~~AUTHORITY operators.
4. ~~Auditing delegated tasks.~~ Entities that accept delegation of RELIABILITY ~~COORDINATOR~~AUTHORITY tasks, ~~may have these tasks audited under the NERC RELIABILITY COORDINATOR AUTHORITY audit program.~~

C. Common Tasks for Next-Day and Current-Day Operations

Requirements

1. ~~In all time frames RELIABILITY COORDINATORS AUTHORITIES are responsible for the following:~~
 - 1.1. ~~(Covered in 051039 and 052040) Assessing CONTINGENCY situations.~~ The RELIABILITY ~~COORDINATOR AUTHORITY~~ shall coordinate operations in regards to SOLS and IROLS for real time and next day operations for its RELIABILITY ~~COORDINATOR AUTHORITY~~ AREA including thermal, voltage and stability related analysis. ~~The TRANSMISSION OPERATOR Assessments shall conduct assessments shall be conducted,~~ up to and including next-day, ~~at the CONTROL AREA TRANSMISSION OPERATOR level with and report~~ any identified potential SOL violations ~~reported to the RELIABILITY COORDINATOR AUTHORITY.~~ The RELIABILITY ~~COORDINATOR AUTHORITY is to~~ shall ensure that its WIDE AREA view is modeled to ensure coordinated operations.
 - 1.2. ~~(Covered in 051039 and 052040) Determining IROLS.~~ The RELIABILITY ~~COORDINATOR AUTHORITY~~ shall determine IROLS based on local, regional and interregional studies. The RELIABILITY ~~COORDINATOR AUTHORITY must shall~~ be aware that an IROL violation can be created during multiple, normally non-critical outage conditions and, as such, the RELIABILITY ~~COORDINATOR AUTHORITY must shall~~ be knowledgeable of events that could lead to such an occurrence. The RELIABILITY ~~COORDINATOR AUTHORITY is shall be~~ responsible for disseminating this information within its RELIABILITY ~~COORDINATOR AUTHORITY~~ AREA and to neighboring RELIABILITY ~~COORDINATORS AUTHORITIES.~~
 - 1.3. ~~(05938 R15) Assuring OPERATING AUTHORITIES shall others are not BURDENED others.~~ The RELIABILITY ~~COORDINATOR AUTHORITY~~ shall ensure that all ~~BALANCING AUTHORITIES, GENERATOR OPERATORS, TRANSMISSION OPERATORS, TRANSMISSION SERVICE PROVIDERS, LOAD-SERVING ENTITIES, and PURCHASING-SELLING ENTITIES OPERATING AUTHORITIES will~~ operate to prevent the likelihood that a disturbance, action, or non-action in its RELIABILITY ~~COORDINATOR AUTHORITY~~ AREA will result in a SOL or IROL violation in another area of the INTERCONNECTION. ~~Doing otherwise is considered a BURDEN that one OPERATING AUTHORITY places on another.~~ In instances where there is a difference in derived limits, the RELIABILITY

Is this requirement addressed in Policy 6?
Also, this is not crisp and we aren't sure that potential SOLV's can be forecast.

AUTHORITY and its BALANCING AUTHORITIES, GENERATOR OPERATORS, TRANSMISSION OPERATORS, TRANSMISSION SERVICE PROVIDERS, LOAD-SERVING ENTITIES, and PURCHASING-SELLING ENTITIES shall always operate the BULK ELECTRIC SYSTEM shall always be operated by the RELIABILITY COORDINATOR AUTHORITY and its OPERATING AUTHORITIES to the most limiting parameter.

- 1.4. **(covered in 052040) Operating under known conditions.** The RELIABILITY ~~COORDINATORS~~ ~~AUTHORITIES~~ shall ensure ~~BALANCING~~ ~~OPERATING~~ ~~AUTHORITIES~~ and ~~TRANSMISSION OPERATORS~~ always operate ~~their OPERATING AUTHORITY AREA~~ under known and studied conditions and also ensure they reassess and reposture their systems following CONTINGENCY events without delay, and no longer than 30 minutes³, regardless of the number of CONTINGENCY events that occur or the status of their monitoring, operating and analysis tools.

- 1.5. **(05938 R216) Total Transfer Capability or Available Transfer Capability and transmission coordination.** The RELIABILITY ~~COORDINATOR~~ ~~AUTHORITY~~ shall make known to ~~TRANSMISSION SERVICE PROVIDERS~~ ~~OPERATING AUTHORITIES~~ within its RELIABILITY ~~COORDINATOR~~ ~~AUTHORITY~~ AREA, SOLs or IROLs within its WIDE AREA view. The ~~TRANSMISSION SERVICE PROVIDERS~~ ~~OPERATING AUTHORITY~~ shall respect these SOLs or IROLs in accordance with filed tariffs and regional TTC/ATC calculation processes.

- 1.6. **(05938-R317) Communications.** The RELIABILITY ~~COORDINATOR~~ ~~AUTHORITY~~ shall issue directives in a clear, concise, definitive manner. The RELIABILITY ~~COORDINATOR~~ ~~AUTHORITY~~ shall receive a response from the person receiving the directive that repeats the information given. The RELIABILITY ~~COORDINATOR~~ ~~AUTHORITY~~ shall acknowledge the statement as correct or repeat the original statement to resolve misunderstandings.

³ The 30-minute time period is not intended as a grace period for operating one CONTINGENCY away from instability, uncontrolled separation, or cascading outages. Some operating limit violations require mitigation much sooner.

D. Next-Day Operations

Requirements

1. **(Used wording from P9T1 for purpose) Performing reliability analysis and system studies.** The RELIABILITY ~~COORDINATOR~~AUTHORITY shall conduct next-day reliability analyses for its RELIABILITY ~~COORDINATOR~~AUTHORITY AREA to ensure that the BULK ELECTRIC SYSTEM can be operated reliably in anticipated normal and CONTINGENCY event conditions.
 - 1.1. **037-R1 (used wording from P9T1 for R1) Contingency analysis.** The RELIABILITY ~~COORDINATOR~~AUTHORITY shall conduct CONTINGENCY analysis studies to identify potential interface and other SOL and IROL violations, including overloaded transmission lines and transformers, voltage and stability limits, etc.
 - 1.2. **(051037 – R2) Considering parallel flows.** The RELIABILITY ~~COORDINATOR~~AUTHORITY shall pay particular attention to parallel flows to ensure one RELIABILITY ~~COORDINATOR~~AUTHORITY AREA does not place an unacceptable or undue BURDEN on an adjacent RELIABILITY ~~COORDINATOR~~AUTHORITY AREA.
2. **(051037 – R34) Sharing information.** Each ~~BALANCING AUTHORITY, OPERATING AUTHORITY, INTERCHANGE AUTHORITY, TRANSMISSION OWNER, TRANSMISSION OPERATOR, GENERATION OWNER, GENERATION OPERATOR, and LOAD-SERVING ENTITY~~ in the RELIABILITY ~~COORDINATOR~~AUTHORITY AREA shall provide information required for system studies, such as critical facility status, load, generation, operating reserve projections, and known INTERCHANGE TRANSACTIONS. This information shall be available by 1200 Central Standard Time for the Eastern INTERCONNECTION, and 1200 Pacific Standard Time for the Western INTERCONNECTION.
3. **(051037 – R3) Developing action plans.** The RELIABILITY ~~COORDINATOR~~AUTHORITY shall, in conjunction with its ~~BALANCING OPERATING AUTHORITIES, and TRANSMISSION OPERATORS~~ develop action plans that may be required including reconfiguration of the transmission system, redispatching of generation, reduction or curtailment of INTERCHANGE TRANSACTIONS, or reducing load to return transmission loading to within acceptable SOLs or IROLs.
4. **(051037 – R5) Sharing study results.** The RELIABILITY ~~COORDINATOR~~AUTHORITY shall share the results of its system studies, when conditions warrant or upon request, with other RELIABILITY ~~COORDINATOR~~AUTHORITIES, and ~~BALANCING OPERATING AUTHORITIES, TRANSMISSION OPERATORS, GENERATION and TRANSMISSION SERVICE PROVIDERS~~ within its RELIABILITY ~~COORDINATION~~AUTHORITY AREA. ~~The RELIABILITY AUTHORITY shall~~

BAs and Generator Operators must sign NERC Data Confidentiality to receive results.

~~make Study-study~~ results ~~shall be~~ available no later than 1500 Central Standard Time for the Eastern INTERCONNECTION, and 1500 Pacific Standard Time for the Western INTERCONNECTION, unless circumstances warrant otherwise.

5. **~~(051037 – R6)~~ Communication of results of next-day reliability analyses.** Whenever conditions warrant, the RELIABILITY ~~COORDINATOR~~AUTHORITY shall initiate a conference call or other appropriate communications to address the results of its reliability analyses.
6. **~~(051037 – R7)~~ Alerts.** If the results of these studies indicate potential SOL or IROL violations, the RELIABILITY ~~COORDINATORS~~ AUTHORITIES shall issue the appropriate alerts via the Reliability ~~Coordinator~~Authority Information System (~~RCISRAIS~~) and direct their ~~OPERATING-BALANCING~~ AUTHORITIES, ~~INTERCHANGE~~ AUTHORITIES, ~~TRANSMISSION SERVICE PROVIDERS~~ and ~~TRANSMISSION OPERATORS~~ to take any necessary action the RELIABILITY ~~COORDINATOR~~AUTHORITY deems appropriate to address the potential SOL or IROL violation.
7. **~~(051037 – R8)~~ Operating Authority Response to RELIABILITY AUTHORITY Directives.** The ~~BALANCING AUTHORITY~~, ~~INTERCHANGE AUTHORITY~~, ~~TRANSMISSION SERVICE PROVIDER~~ and ~~TRANSMISSION OPERATOR~~OPERATING AUTHORITIES shall comply with the directives of its RELIABILITY ~~COORDINATOR~~AUTHORITY based on the next day assessments in the same manner in which ~~the OPERATING AUTHORITY~~it would comply during real time operating events.

E. Current-Day Operations

Requirements

1. Monitoring and Coordination

- 1.1. ~~(046035-R1)~~ **WIDE AREA view.** The RELIABILITY ~~COORDINATOR~~AUTHORITY shall monitor all BULK ELECTRIC SYSTEM facilities, including sub-transmission information, within its RELIABILITY ~~COORDINATOR~~AUTHORITY AREA and adjacent RELIABILITY ~~COORDINATOR~~AUTHORITY AREAS as necessary to ensure that, at any time, regardless of prior planned or unplanned events, the RELIABILITY ~~COORDINATOR~~AUTHORITY is able to determine any potential SOL and IROL violations within its RELIABILITY ~~COORDINATOR~~AUTHORITY AREA. ~~This responsibility may require RELIABILITY COORDINATORS AUTHORITIES to receive sub-transmission information not normally monitored by their Energy Management System to assist in IROL determination.~~
- 1.1.1. ~~(046035-R2)~~ **WIDE AREA view – coordination.** When a neighboring RELIABILITY ~~COORDINATOR~~AUTHORITY is aware of an external operational concern, such as declining voltages, excessive reactive flows, or an IROL violation, the neighboring RELIABILITY ~~COORDINATOR~~AUTHORITY shall contact the RELIABILITY ~~COORDINATOR~~AUTHORITY in whose RELIABILITY ~~COORDINATOR~~AUTHORITY AREA the operational concern was observed. They shall coordinate any actions, including emergency assistance, required by the RELIABILITY ~~COORDINATOR~~AUTHORITY in mitigating the operational concern.
- 1.2. ~~(046035-R3)~~ **Facility status.** The RELIABILITY ~~COORDINATOR~~AUTHORITY ~~must shall~~ know the status of all current critical facilities whose failure, degradation or disconnection could result in an SOL or IROL violation. RELIABILITY ~~COORDINATORS~~AUTHORITIES ~~must shall~~ also know the status of any facilities that may be required to assist area restoration objectives.
- 1.3. **Situational awareness.** ~~(06038- PurposeR1)~~ The RELIABILITY ~~COORDINATOR~~AUTHORITY shall be continuously aware of conditions within its RELIABILITY ~~COORDINATOR~~AUTHORITY AREA and include this information in its reliability assessments. ~~(1.3 to 1.3.10 060 – R1)~~ To accomplish this objective the RELIABILITY ~~COORDINATOR~~AUTHORITY shall monitor its RELIABILITY ~~COORDINATOR~~AUTHORITY AREA parameters, including but not limited to the following:

E. Current-Day Operations

- 1.3.1. Current status of BULK ELECTRIC SYSTEM elements (transmission or generation including critical auxiliaries such as Automatic Voltage Regulators and Special Protection Systems and system loading)
 - 1.3.2. Current pre-CONTINGENCY element conditions (voltage, thermal, or stability), including any applicable mitigation plans to alleviate an SOL or IROL violation including the plan's viability and scope
 - 1.3.3. Current post- CONTINGENCY element conditions (voltage, thermal, or stability), including any applicable mitigation plans to alleviate an SOL or IROL including the plan's viability and scope
 - 1.3.4. System real and reactive reserves (actual versus required)
 - 1.3.5. Capacity and energy adequacy conditions
 - 1.3.6. Current ACE for all its ~~CONTROL AREAS~~BALANCING AUTHORITIES
 - 1.3.7. Current local or TLR procedures in effect
 - 1.3.8. Planned generation dispatches
 - 1.3.9. Planned transmission or generation outages
 - 1.3.10. CONTINGENCY events
- 1.4. **BULK ELECTRIC SYSTEM monitoring.** The RELIABILITY ~~COORDINATOR~~AUTHORITY shall monitor BULK ELECTRIC SYSTEM parameters that may have significant impacts upon the RELIABILITY ~~COORDINATOR~~AUTHORITY AREA and with neighboring RELIABILITY ~~COORDINATOR~~AUTHORITY AREAS with respect to:
- 1.4.1. **~~(06038 - R2)~~ INTERCHANGE TRANSACTION information.** ~~(06038 - R2)~~ The RELIABILITY ~~COORDINATOR~~AUTHORITY shall be aware of all INTERCHANGE TRANSACTIONS that wheel-through, source, or sink in its RELIABILITY ~~COORDINATOR~~AUTHORITY AREA and make that INTERCHANGE TRANSACTION information available to all RELIABILITY ~~COORDINATORS~~AUTHORITIES in the INTERCONNECTION. (Note: This requirement is satisfied by the Interchange Distribution Calculator and E-Tag process for the Eastern INTERCONNECTION.)
 - 1.4.2. **~~(06038 - R3)~~ Pending INTERCHANGE SCHEDULES to identify potential flow impacts.** As portions of the transmission system approach or exceed SOLS or

E. Current-Day Operations

IROLS, the RELIABILITY ~~COORDINATOR~~AUTHORITY shall work with the ~~OPERATING-BALANCING and INTERCHANGE~~ AUTHORITIES to evaluate and assess any additional INTERCHANGE SCHEDULES that would violate those limits. If the potential or actual ~~SOL or~~ IROL violation cannot be avoided through proactive intervention, the RELIABILITY ~~COORDINATOR~~AUTHORITY shall initiate control actions or emergency procedures to relieve the violation without delay, and no longer than 30 minutes⁴. The RELIABILITY AUTHORITY shall be able to utilize All-all resources, including load shedding, shall be available to the RELIABILITY COORDINATOR AUTHORITY in addressing a potential or actual SOL or IROL violation.

- 1.4.3. **(06038 – R4) Availability or shortage of OPERATING RESERVES needed to maintain reliability.** The RELIABILITY ~~COORDINATOR~~AUTHORITY shall monitor ~~CONTROL AREA~~BALANCING AUTHORITY parameters to ensure that the required amount of OPERATING RESERVES are provided and available as required to meet NERC Control Performance Standard and Disturbance Control Standards requirements. If necessary, the RELIABILITY ~~COORDINATOR~~AUTHORITY shall direct the ~~CONTROL AREA~~ ~~AUTHORITIES~~ in the RELIABILITY ~~COORDINATOR~~AUTHORITY A assistance from neighboring ~~AREAS~~BALANCING AUTHORITY RELIABILITY ~~COORDINATOR~~A ENERGY EMERGENCY Alerts, as needed, and at the request of ~~BALANCING AUTHORITIES~~ ~~LOAD~~ ~~LOAD-SERVING ENTITIES~~.

LSEs really aren't ever short of reserves. BA's are the entities that must maintain reserves.

- 1.4.4. **(06038 – R5) Actual flows versus limits.** The RELIABILITY ~~COORDINATOR~~AUTHORITY shall identify the cause of the potential or actual SOL or IROL violations. The RELIABILITY AUTHORITY shall and initiate the control action or emergency procedure to relieve the potential or actual ~~SOL or~~ IROL violation without delay, and no longer than 30 minutes.⁵ The RELIABILITY AUTHORITY shall be able to utilize All-all resources, including load shedding, shall be available to the RELIABILITY COORDINATOR AUTHORITY in addressing an SOL or IROL violation.

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⁴ The 30-minute time period is not intended as a grace period for operating one CONTINGENCY away from instability, uncontrolled separation, or cascading outages. Some operating limit violations require mitigation much sooner.

⁵ The 30-minute time period is not intended as a grace period for operating one CONTINGENCY away from instability, uncontrolled separation, or cascading outages. Some operating limit violations require mitigation much sooner.

E. Current-Day Operations

1.4.5. ~~(06038 – R6 and R7)~~ **Time error correction and GMD notification.** The RELIABILITY ~~COORDINATOR~~~~AUTHORITY~~ ~~will~~~~shall~~ communicate start and end times for time error corrections to ~~the~~~~all~~ ~~CONTROL AREAS~~~~OPERAT~~~~BALANCING~~ ~~AUTHORITIES~~ within its RELIABILITY AREA. The RELIABILITY ~~COORDINATOR~~~~AUTHORITY~~ ~~will~~~~shall~~ ensure all ~~CONTROL AREAS~~~~OPERAT~~~~BALANCING~~ ~~AUTHORITIES~~, ~~TRANSMISSION OPERATORS~~, and ~~GENERATION OPERATORS~~ are aware of Ge (GMD) forecast information and development of any required

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1.4.6. ~~(060 – R79)~~ **RELIABILITY C coordination with other Reg** ~~COORDINATOR~~~~AUTHORITY~~ shall participate in NERC Hotline discussions, assist in the assessment of reliability of the Regions and the overall interconnected system, and coordinate actions in anticipated or actual emergency situations. The RELIABILITY ~~COORDINATOR~~~~AUTHORITY~~ will disseminate information within its RELIABILITY ~~COORDINATOR~~~~AUTHORITY~~ AREA.

1.4.7. ~~(06038 – R810)~~ **System frequ significant frequency errors time trends.** The RELIABILITY ~~COORDINATOR~~~~AUTHORITY~~ shall frequency and its ~~CONTROL AREAS~~~~BALANCING~~ ~~AUTHORITIES~~' performance and direct any necessary rebalancing to return to CPS and DCS compliance. ~~The~~ ~~BALANCING~~ ~~AUTHORITIES~~ and ~~TRANSMISSION OPERATORS~~ shall utilize ~~All~~~~all~~ resources, including firm load shedding, ~~shall be utilize~~ RELIABILITY ~~COORDINATOR~~~~A~~ emergent condition.

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1.4.8. ~~(06038 – R911)~~ **Sharing with** ~~COORDINATORS~~ ~~AUTHORIT~~ regarding potential, expected, or actual critical operating conditions that could negatively impact other RELIABILITY ~~COORDINATOR~~~~AUTHORITY~~ AREAS. The RELIABILITY ~~COORDINATOR~~~~AUTHORITY~~ shall coordinate with other RELIABILITY ~~COORDINATORS~~ ~~AUTHORITIES~~ and ~~CONTROL AREAS~~ ~~BALANCING~~ ~~AUTHORITIES~~, ~~GENERATION OPERATORS~~, and ~~TRANSMISSION OPERATORS~~ as needed, to develop and imp mitigate potential or actual S violations. ~~These would RELI~~ ~~include coordination~~ ~~coordin~~ and transmission maintenance

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E. Current-Day Operations

RELIABILITY AUTHORITIES and BALANCING AUTHORITIES, GENERATION OPERATORS, and TRANSMISSION OPERATORS, as needed, in both the real time and next day reliability analysis timeframes.

1.4.9. (06038 – R102) Availability or shortage of Interconnected Operations Services required (in applicable RELIABILITY COORDINATOR AUTHORITY AREAS). As necessary, the RELIABILITY COORDINATOR AUTHORITY shall assist the CONTROL AREAS BALANCING AUTHORITIES in its RELIABILITY AREA in arranging for assistance from neighboring RELIABILITY COORDINATOR AUTHORITY AREAS or CONTROL AREAS BALANCING AUTHORITIES.

1.4.10. (06038 – R113) Individual CONTROL AREA BALANCING AUTHORITY COORDINATOR AUTHORITY RELIABILITY AREAS). The RELIABILITY COORDINATOR AUTHORITY will discuss large AREA CONTROL ERRORS that may be contributing to frequency, time error, or inadvertent interchange and will shall discuss corrective actions with the appropriate CONTROL AREA BALANCING AUTHORITY operator. If a frequency, time error, or inadvertent interchange occurs outside of the RELIABILITY COORDINATOR AUTHORITY AREA, the RELIABILITY COORDINATOR AUTHORITY shall initiate a NERC Hotline call to discuss the frequency, time error, or inadvertent interchange with other RELIABILITY COORDINATOR AUTHORITY AREAS. The RELIABILITY COORDINATOR AUTHORITY shall direct its CONTROL AREAS BALANCING AUTHORITY to comply with CPS and DCS as indicated in section 1.4.7 above.

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1.4.11. (06038 – R1214) Use of Special Protection Systems (in applicable RELIABILITY COORDINATOR AUTHORITY AREAS). Whenever a Special Protection System that may have an inter-CONTROL AREA BALANCING AUTHORITY, inter-TRANSMISSION OPERATOR, or inter-RELIABILITY COORDINATOR AUTHORITY AREA impact (e.g. could potentially affect transmission flows resulting in a SOL or IROL violation) is armed, the RELIABILITY COORDINATORS-AUTHORITIES shall be aware of the impact of the operation on inter-TRANSMISSION OPERATOR shall inform the RELIABILITY COORDINATOR AUTHORITY shall be kept informed of the operation of the Special Protection System including a failure to operate as expected.

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1.5. (06038 – R1318) Communication with RELIABILITY COORDINATORS-AUTHORITIES of potential problems. The

E. Current-Day Operations

RELIABILITY ~~COORDINATOR~~AUTHORITY who foresees a transmission problem (such as an SOL or IROL violation, loss of reactive reserves, etc.) within its RELIABILITY ~~COORDINATOR~~AUTHORITY AREA shall issue an alert to all impacted ~~CONTROL AREAS~~BALANCING AUTHORITIES and TRANSMISSION OPERATING ENTITIES in its RELIABILITY AREA, and all impacted RELIABILITY ~~COORDINATOR~~AUTHORITIES within the INTERCONNECTION via the Reliability ~~Coordinator~~Authority Information System without delay. The receiving RELIABILITY ~~COORDINATOR~~AUTHORITY will shall disseminate this information to its impacted OPERATING BALANCING AUTHORITIES and TRANSMISSION OPERATORS.

1.5.1. Notification of Conclusion of Alert: The RELIABILITY AUTHORITY shall notify all impacted BALANCING AUTHORITIES, TRANSMISSION OPERATORS and RELIABILITY AUTHORITIES when the transmission problem has been mitigated.

- 1.6. **(060 – R14)** Provide other coordination services as appropriate ~~and as requested by the CONTROL AREAS~~OPERATING AUTHORITIES within its RELIABILITY ~~COORDINATOR~~AUTHORITY AREA and neighboring RELIABILITY ~~COORDINATOR~~AUTHORITY AREAS. The RELIABILITY ~~COORDINATOR~~AUTHORITY shall confirm reliability assessment results and determine the effects within its own and adjacent RELIABILITY ~~COORDINATOR~~AUTHORITY AREAS. ~~The RELIABILITY AUTHORITY shall~~This action includes discussing options to mitigate potential or actual SOL or IROL violations and ~~taking take~~ actions as necessary as to always act in the best interests of the INTERCONNECTION at all times.

F. Emergency Operations

Requirements

1. **(052040 – Purpose – Also left the P9T2 wording for consideration)**
Mitigating SOL and IROL violations. Regardless of the process it uses, the RELIABILITY ~~COORDINATOR~~AUTHORITY shall direct its ~~OPERATING AUTHORITIES~~BALANCING AUTHORITIES and TRANSMISSION OPERATORS to return the transmission system to within the SOL or IROL as soon as possible, but no longer than 30 minutes. ~~With this in mind, RELIABILITY COORDINATORS AUTHORITIES and their OPERATING AUTHORITIES must be aware that Transmission Loading Relief (TLR) procedures may not be able to mitigate the SOL or IROL violation in a timely fashion. Under these circumstances other actions such as reconfiguration, redispach or load shedding may be necessary until the relief requested by the TLR process is achieved. In these instances t~~ The RELIABILITY ~~COORDINATOR~~AUTHORITY shall direct and ~~BALANCING AUTHORITIES and TRANSMISSION OPERATORS~~OPERATING AUTHORITIES shall ~~comply with~~ execute the more timely requests ~~actions such as reconfiguration, redispach or load shedding until relief requested by the TLR process is achieved.~~

2. **(Authority of RC to give Direction is covered in P5 standards)**
Implementing emergency procedures. If the RELIABILITY ~~COORDINATOR~~AUTHORITY deems that SOL or IROL violations are imminent, the RELIABILITY ~~COORDINATOR~~AUTHORITY shall have the authority and obligation to immediately direct its ~~BALANCING AUTHORITIES and TRANSMISSION OPERATORS~~OPERATING AUTHORITIES to redispach generation, reconfigure transmission, manage ~~INTERCHANGE TRANSACTIONS~~, or reduce system demand until the SOL or IROL violation is resolved. ~~The RELIABILITY COORDINATOR AUTHORITY shall coordinate these emergency procedures with other RELIABILITY COORDINATORS AUTHORITIES as needed. [See also Policy 5, “Emergency Operations”]~~

Section 2: Does this duplicate Policy 5, can it be removed?

3. **(Not used) Implementing relief procedures for IROL’s.** If transmission loading progresses or is projected to violate an SOL or IROL, the RELIABILITY ~~COORDINATOR~~AUTHORITY ~~will~~shall perform the following procedures as necessary:
 - 3.1. **(Used 4.1 Below 039-R2) Selecting transmission loading relief procedure.** The RELIABILITY ~~COORDINATOR~~AUTHORITY experiencing a potential or actual SOL or IROL violation on the transmission system within its RELIABILITY ~~COORDINATOR~~AUTHORITY AREA shall, at its discretion, select from either a “local” (Regional, Interregional, or subregional) transmission loading relief procedure or an INTERCONNECTION-wide procedure, such as those listed in Appendix 9C1, 9C2, or 9C3

Policy 9 – Reliability Coordinator Procedures

F. Emergency Operations Requirements

Section 2: Does this duplicate Policy 5, can it be removed?

- 3.2. ~~(052039 – R3)~~ **Using local transmission loading relief procedure.** The RELIABILITY ~~COORDINATOR~~A use local transmission loading relief or congestion management procedures, provided the TRANSMISSION OPERATOR experiencing the potential or actual SOL or IROL violation is a party to those procedures.
- 3.3. ~~(052039 – R4)~~ **Using a local procedure with an INTERCONNECTION-wide procedure.** A RELIABILITY ~~COORDINATOR~~AUTHORITY may implement a local transmission loading relief or congestion management procedure simultaneously with an INTERCONNECTION-wide procedure. However, the RELIABILITY ~~COORDINATOR~~AUTHORITY ~~is obligated to shall~~ follow the curtailments as directed by the INTERCONNECTION-wide procedure. ~~If the~~A RELIABILITY ~~COORDINATOR~~AUTHORITY ~~desires desiring~~ to use a local procedure *as a substitute* for curtailments as directed by the INTERCONNECTION-wide procedure, ~~it may do so only if shall have~~ such use ~~is~~ approved by the NERC Operating Reliability Subcommittee and Operating Committee.
- 3.4. ~~(used 4.2 below)~~**039-R5 Complying with procedures.** When implemented, all RELIABILITY ~~COORDINATORS~~/AUTHORITIES shall comply with the provisions of the INTERCONNECTION-wide procedure. ~~This may include including~~ action by RELIABILITY ~~COORDINATORS~~ AUTHORITY in other INTERCONNECTIONS to, for example, curtail an INTERCHANGE TRANSACTION that crosses an INTERCONNECTION boundary.
- 3.5. ~~(Used 4.3 Below)~~**039-R6 Complying with interchange policies.** During the implementation of relief procedures, and up to the point that emergency action is necessary, RELIABILITY ~~COORDINATORS~~ AUTHORITY and ~~OPERATING~~BALANCING AUTHORITY shall comply with the Requirements of Policy 3, Section C, “Interchange Schedule Standards.”

4. **Implementing relief procedures for SOL’s.** If transmission loading progresses or is projected to violate a SOL, the TRANSMISSION OPERATOR shall perform the following procedures as necessary:

- 4.1. ~~(052039 – R27)~~ **Selecting transmission loading relief procedure.** The TRANSMISSION OPERATOR experiencing a potential or actual SOL violation on the transmission system within its area shall, at its discretion, select from either a “local” (Regional, Interregional, or subregional) transmission loading relief procedure or may request it’s RELIABILITY AUTHORITY to issue an INTERCONNECTION-wide procedure, such as those listed in Appendix 9C1, 9C2, or 9C3.
- 4.2. ~~(052040 – R5)~~**Complying with procedures.** When implemented, all TRANSMISSION OPERATORS and RELIABILITY AUTHORITY shall comply with the provisions of the INTERCONNECTION-wide

Policy 9 – Reliability Coordinator Procedures

F. Emergency Operations Requirements

procedure including action by RELIABILITY AUTHORITIES in other INTERCONNECTIONS to, for example, curtail an INTERCHANGE TRANSACTION that crosses an INTERCONNECTION boundary.

4.3. (052040 –R6) Complying with interchange policies. During the implementation of relief procedures, and up to the point that emergency action is necessary, TRANSMISSION OPERATORS, RELIABILITY AUTHORITIES and BALANCING AUTHORITIES shall comply with the Requirements of Policy 3, Section C, “Interchange Schedule Standards.”

4.5. (covered in 052040) Determining causes of INTERCONNECTION frequency error. Any RELIABILITY AUTHORITY noticing an INTERCONNECTION frequency error in excess of 0.03 Hz (Eastern INTERCONNECTION) or 0.05 Hz (Western and ERCOT INTERCONNECTIONS) for more than 20 minutes shall initiate a NERC Hotline conference call, or notification via the Reliability Authority Information System, to determine the CONTROL AREA BALANCING AUTHORITY (IES) with the energy emergency or control problem.

4.1.5.1. (RC Authority covered elsewhere.) If a RELIABILITY AUTHORITY determines that one or more of its CONTROL AREAS BALANCING AUTHORITIES is contributing to the frequency error, the RELIABILITY AUTHORITY shall direct those CONTROL AREA BALANCING AUTHORITY (IES) to immediately comply with CPS and DCS requirements by using all resources available to it, including load shedding. The CONTROL AREA BALANCING AUTHORITY (IES) shall comply with the RELIABILITY AUTHORITY request.

5.6. (Covered in 052040 using P9T4 wording) Authority to provide emergency assistance. The RELIABILITY AUTHORITY shall have the authority to take or direct whatever action is needed, including load shedding, to mitigate an energy emergency within its RELIABILITY AUTHORITY AREA. OPERATING BALANCING AUTHORITIES shall ensure the directive of the RELIABILITY AUTHORITY is implemented. RELIABILITY AUTHORITIES shall provide assistance to other RELIABILITY AUTHORITIES experiencing an energy emergency in accordance with Appendix 5C, Subsection A, “Energy Emergency Alerts.”

6.7. (Covered in 052040 using P9T4 Wording) Communication of Energy Emergencies. The RELIABILITY AUTHORITY that is experiencing a potential or actual Energy Emergency within any CONTROL AREA BALANCING AUTHORITY, RESERVE SHARING GROUP, or LOAD-SERVING ENTITY within its RELIABILITY AUTHORITY AREA shall issue an Energy Emergency Alert as detailed in Appendix 5C, Subsection A, “Energy Emergency Alert Levels.” The RELIABILITY AUTHORITY shall also act to mitigate the emergency condition, including a request for emergency assistance if required.

RSG and LSE were struck because RSG is not a FM function and LSE’s have no obligation to balance.

G. System Restoration

Requirements

1. ~~OPERATING BALANCING AUTHORITY and TRANSMISSION OPERATOR restoration plans. (05440-R1)~~ The RELIABILITY AUTHORITY shall be aware of the restoration plan of each OPERATING BALANCING AUTHORITY'S and TRANSMISSION OPERATOR restoration plan in its RELIABILITY AUTHORITY AREA in accordance with NERC and Regional requirements.

~~(054-R2)~~ GENERATOR OPERATORS and BALANCING AUTHORITIES shall follow TRANSMISSION OPERATOR directives during system restoration and During system restoration, the RELIABILITY AUTHORITY shall monitor restoration progress and coordinate any needed assistance.

2. **RELIABILITY AUTHORITY restoration plan. (05440-R3)** The RELIABILITY AUTHORITY shall have a RELIABILITY AUTHORITY AREA restoration plan that provides coordination between individual ~~OPERATING BALANCING AUTHORITY and TRANSMISSION OPERATOR~~ restoration plans and that ensures reliability is maintained during system restoration events.
3. **RELIABILITY AUTHORITY is the primary contact. (05440-R4)** The RELIABILITY AUTHORITY shall serve as the primary contact for disseminating information regarding restoration to neighboring RELIABILITY AUTHORITIES and BALANCING AUTHORITIES or TRANSMISSION OPERATORS ~~OPERATING AUTHORITIES~~ not immediately involved in restoration.
4. **Re-synchronizing islands. (05440-R5)** ~~RELIABILITY COORDINATORS~~ AUTHORITIES shall approve, communicate, and coordinate the re-synchronizing of major system islands or synchronizing points so as not to BURDEN adjacent BALANCING AUTHORITY, TRANSMISSION OPERATOR, OPERATING AUTHORITIES or RELIABILITY ~~COORDINATOR~~ AUTHORITY AREAS.
 - 4.1. **Reestablishing normal operations. (05440-R6)** The RELIABILITY ~~COORDINATOR~~ AUTHORITY shall take actions to restore normal operations once an operating emergency has been mitigated in accordance with its restoration plan.

H. Coordination Agreements and Data Sharing

Requirements

1. **Coordination agreements.** ~~(05533 – R17)~~ The RELIABILITY ~~COORDINATOR~~AUTHORITY ~~must shall~~ have clear, comprehensive coordination agreements with adjacent RELIABILITY ~~COORDINATORS~~ AUTHORITIES to ensure that SOL or IROL violation mitigation requiring actions in adjacent RELIABILITY ~~COORDINATOR~~AUTHORITY AREAS are coordinated.
2. **Data requirements.** ~~(05534 – R2)~~ The RELIABILITY ~~COORDINATOR~~AUTHORITY shall determine the data requirements to support its reliability coordination tasks and shall request such data from its BALANCING AUTHORITIES, INTERCHANGE AUTHORITIES, TRANSMISSION OWNERS, TRANSMISSION OPERATORS, GENERATION OWNERS, GENERATION OPERATORS, and LOAD-SERVING ENTITIES~~OPERATING AUTHORITIES~~ or adjacent RELIABILITY ~~COORDINATORS~~AUTHORITIES, in accordance with the provisions of Policy 4, “System Coordination.”
3. **Data exchange.** ~~(05534 – R3)~~ The RELIABILITY ~~COORDINATOR~~AUTHORITY or its BALANCING AUTHORITIES and TRANSMISSION OPERATORS~~OPERATING AUTHORITIES~~ shall provide, or arrange provisions for, data exchange to other RELIABILITY ~~COORDINATORS~~AUTHORITIES or BALANCING AUTHORITIES and TRANSMISSION OPERATORS~~OPERATING AUTHORITIES~~ via the Interregional Security Network or RCIS-RAIS network as required by NERC policy.

I. Facility

Requirements

1. ~~(056-PURPOSE)~~ RELIABILITY ~~COORDINATORS~~ ~~AUTHORITIES~~ shall have the facilities to perform their responsibilities, including:

1.1. **Communications.** ~~(05634-R1)~~ RELIABILITY ~~COORDINATOR~~ ~~AUTHORITY~~ shall have adequate communications (voice and data links) to appropriate entities within its RELIABILITY ~~COORDINATOR~~ ~~AUTHORITY~~ AREA, which are staffed and available to act in addressing a real time emergency condition.

1.2 What does Multi-directional mean? Defense in depth for comm. systems or bi-directional communications?

1.2. **Timely dissemination of information.** ~~(05634-R24)~~ THE RELIABILITY ~~AUTHORITIES~~ shall have ~~includes multi-mu~~ directional capabilities between ~~it an OPERATING AUTHORITY~~ and its ~~BALANCING AUTHORITIES~~ and ~~TRANSMISSION OPERATORS~~ ~~RELIABILITY COORDINATOR AUTHORITY~~ and ~~from a RELIABILITY COORDINATOR AUTHORITY to~~ between its neighboring RELIABILITY ~~COORDINATOR~~ ~~AUTHORITY~~ both voice and data exchange as required to meet reliability needs of the INTERCONNECTION.

1.3. **Monitoring capability.** ~~(05634-R35)~~ RELIABILITY ~~AUTHORITIES~~ shall have ~~Detailed-detailed~~ real-time monitoring capability of their RELIABILITY ~~COORDINATOR~~ ~~AUTHORITY~~ AREA and sufficient monitoring capability of their surrounding RELIABILITY ~~COORDINATOR~~ ~~AUTHORITY~~ AREAS to ensure that potential or actual SOL or IROL violations are identified. ~~RELIABILITY AUTHORITIES shall have m~~ Monitoring systems shall ~~that~~ provide information that can be easily understood and interpreted by the RELIABILITY ~~COORDINATOR~~ ~~AUTHORITY~~, giving particular emphasis to alarm management and awareness systems, automated data transfers, synchronized information systems, over a redundant and highly reliable infrastructure.

1.3.1. ~~(05634-R46)~~ RELIABILITY ~~COORDINATORS~~ ~~AUTHORITIES~~ shall monitor BULK ELECTRIC SYSTEM elements (generators, transmission lines, busses, transformers, breakers, etc.) that could result in SOL or IROL violations within ~~its-their~~ RELIABILITY ~~COORDINATOR~~ ~~AUTHORITY~~ AREA. RELIABILITY ~~AUTHORITIES~~ ~~This monitoring overview~~ shall ~~include monitor~~ both real and reactive power system flows, and OPERATING RESERVES, and the status of BULK ELECTRIC SYSTEM elements that are or could be critical to SOLs and IROLs and system restoration requirements within ~~its-their~~ RELIABILITY ~~COORDINATOR~~ ~~AUTHORITY~~ AREA.

1.4. **Study and analysis tools.**

I. Facility

- 1.4.1. **Analysis tools.** ~~(05634-R57)~~ The RELIABILITY ~~COORDINATOR~~ AUTHORITY shall have adequate analysis tools such as State Estimation, pre- and post-CONTINGENCY analysis capabilities (thermal, stability, and voltage) and WIDE AREA overview displays.
- 1.4.2. **Continuous monitoring of RELIABILITY** ~~COORDINATOR~~ AUTHORITY **AREA.** ~~(05634-R68)~~ The RELIABILITY ~~COORDINATOR~~ AUTHORITY shall continuously monitor its RELIABILITY ~~COORDINATOR~~ AUTHORITY AREA. The RELIABILITY AUTHORITY shall have ~~This includes the~~ provisions for backup facilities that shall be exercised if the main monitoring system is unavailable. The RELIABILITY AUTHORITY ~~Backup provisions~~ shall ensure SOL and IROL monitoring and derivations continues if the main monitoring system is unavailable.
- 1.4.3. **Availability of analysis capabilities.** ~~(05634-R79)~~ The RELIABILITY AUTHORITY shall control RELIABILITY ~~COORDINATOR~~ AUTHORITY analysis tools ~~shall be under the control of the RELIABILITY~~ ~~COORDINATOR~~ AUTHORITY, including approvals for planned maintenance. The RELIABILITY AUTHORITY shall ~~Procedures have procedures shall be~~ in place to mitigate the affects of analysis tool outages.

J. Staffing

Requirements

1. ~~(05736 – PURPOSE)~~ RELIABILITY ~~COORDINATORS~~ ~~AUTHORITIES~~ shall have adequate staff and facilities:
 - 1.1. **Staffing and training.** ~~(05736 – R1)~~ The RELIABILITY ~~COORDINATOR~~~~AUTHORITY~~ shall be staffed with adequately trained and NERC-Certified RELIABILITY ~~COORDINATOR~~~~AUTHORITY~~ operators, 24 hours/day, seven days/week. ~~The RELIABILITY COORDINATOR AUTHORITY must have detailed knowledge of its RELIABILITY COORDINATOR AUTHORITY AREA, its facilities, and associated OPERATING AUTHORITIES' processes including emergency procedures and restoration objectives. The Training for RELIABILITY COORDINATOR AUTHORITY operators shall meet or exceed complete~~ a minimum of 5 days per year of training and drills using realistic simulations of system emergencies, in addition to other training required to maintain qualified operating personnel.
 - 1.2. **Knowledge of the RELIABILITY ~~COORDINATOR~~~~AUTHORITY~~ AREA.** ~~(05736-R2)~~ The RELIABILITY ~~COORDINATOR~~~~AUTHORITY~~ shall have a comprehensive understanding of its RELIABILITY ~~COORDINATOR~~~~AUTHORITY~~ AREA and interaction with neighboring RELIABILITY ~~COORDINATOR~~~~AUTHORITY~~ AREAS. ~~(05736-R3) Although OPERATING AUTHORITIES have the most detailed knowledge of their particular systems, the~~ RELIABILITY ~~COORDINATOR~~~~AUTHORITY~~ ~~must shall~~ have an extensive understanding of the ~~OPERATING BALANCING AUTHORITIES, TRANSMISSION OPERATORS, and GENERATION OPERATORS~~ within its RELIABILITY ~~COORDINATOR~~~~AUTHORITY~~ AREA, such as staff, operating practices and procedures, restoration priorities and objectives, outage plans, equipment capabilities and restrictions. The ~~(05736-R4)~~ RELIABILITY ~~COORDINATOR~~~~AUTHORITY~~ shall place particular attention on SOLs and IROLs and intertie facility limits. The RELIABILITY ~~COORDINATOR~~~~AUTHORITY~~ shall ensure protocols are in place to allow the RELIABILITY ~~COORDINATOR~~~~AUTHORITY~~ to have the best available information at all times.
 - 1.3. **Standards of Conduct.** ~~(048036 – Purpose)~~ The entity responsible for the RELIABILITY ~~COORDINATOR~~~~AUTHORITY~~ function shall sign and adhere to the NERC RELIABILITY ~~COORDINATOR~~~~AUTHORITY~~ Standards of Conduct.