

# **NORTH AMERICAN ELECTRIC RELIABILITY COUNCIL**

Princeton Forrestal Village, 116-390 Village Boulevard, Princeton, New Jersey 08540-5731

## **Operate Within Interconnection Operating Limits Standard Drafting Team Meeting**

Thursday, April 22, 2004, 8 a.m.–5 p.m.

Friday, April 23, 2004, 8 a.m.– 5 p.m.

Hyatt Regency Islandia  
1441 Quivira Road  
San Diego, CA 92109  
Telephone: (619) 224-1234 / (800) 233-0348

### **Agenda**

#### **1. Administrative**

- a. Membership and Guests — Chair
- b. Introductions — Chair
- c. Organization, Roster, and Survey Contacts List — Secretary
- d. Arrangements — Secretary
- e. Parliamentary and Anti-Trust Procedures
  - i. Parliamentary Procedures — Chair
  - ii. Anti-Trust Compliance Guidelines — Chair

#### **2. Operate Within Interconnection Reliability Operating Limits Standard Draft, Version 2**

- a. Respond to Standard Draft Version 4 Comments
- b. Revise Standard Draft Version 4 — Based on Comments
- c. Revise Implementation Plan (Draft Standard — Operating Manual Policy Cross Reference)
- d. Revise Q&A Document
- e. Review Latest Information on Field-Testing
- f. Documents to Support Next Step

#### **3. Operate Within System Operating Limits SAR**

- a. SAR Submitted into Standards Process

#### **4. Future Meetings**

- a. Future Meetings and Conference Calls, to be Determined During the Meeting

## 1. Administrative

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### **Monitor and Assess Short-term Transmission Reliability — Operate Within Transmission System Limits Standard Drafting Team Meeting**

Thursday, April 22, 2004, 8 a.m.–5 p.m.  
Friday, April 23, 2004, 8 a.m.– 5 p.m.

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#### **Agenda**

- a. Membership and Guests — Chair
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  - i. Parliamentary Procedures — Chair
  - ii. Anti-Trust Compliance Guidelines — Chair

#### ***Item 1.a Membership and Guests***

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On behalf of the “Operate Within Interconnection Reliability Operating Limits” Standard Drafting Team, Chairman Ed Riley welcomes the “Operate Within Limits” SDT members and all guests to San Diego, California and to this meeting.

#### ***Item 1.b Introductions***

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The Chair will ask members and guests to introduce themselves.

#### ***Item 1.c Roster, Contacts List and Attendance Sheet***

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The Secretary will review the current Roster and Contacts List. Each member is asked to check the data for accuracy. Each meeting attendee is asked to sign and complete the attendance sheet.

#### **Attachment**

Roster with Contact Information

#### ***Item 1.d Arrangements***

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Standard Drafting Team Secretary Tom Vandervort will review the meeting arrangements. The Operate Within Limits SDT meetings begin on Thursday, April 22, 2004 at 8 a.m. and will adjourn by 5 p.m. The SDT will reconvene Friday, April 23, 2004 at 8 a.m. and will adjourn by 5 p.m. Lunch will be served on Thursday and Friday.

#### ***Item 1.e Parliamentary and Anti-Trust Procedures***

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- i. Parliamentary Procedures:

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A summary of Parliamentary Procedures is attached for reference. The Secretary will answer questions regarding these procedures.

ii. Anti-Trust Compliance Guidelines:

On June 14, 2002 the NERC Board of Trustees adopted antitrust compliance guidelines for NERC. In adopting the guidelines, the Board passed the following resolution:

RESOLVED, that the Board of Trustees (1) adopts the draft Antitrust Compliance Guidelines attached hereto as Exhibit A and (2) instructs that these Antitrust Compliance Guidelines be included in the agenda package for each meeting of every NERC committee, subcommittee, task force, working group, and other NERC-sponsored activity.

The resolution also applies to workshops, training sessions, and any other NERC-sponsored events. A copy of the NERC Anti-Trust Compliance Guidelines will be included in the agenda package for each meeting of each group or event.

Attachment

Parliamentary Procedures  
NERC Anti-Trust Guidelines

## **2. Operate Within Interconnection Reliability Operating Limits Standard Draft, Version 2**

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- a. Respond to Standard Draft Version 4 Comments
- b. Revise Standard Draft Version 4 — Based on Comments
- c. Revise Implementation Plan (Draft Standard — Operating Manual Policy Cross Reference)
- d. Revise Q&A Document
- e. Review Latest Information on Field-Testing
- f. Documents to Support Standard Process Next Action

### ***Item 2.a Respond to Standard Draft Version 4 — Comments***

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#### Discussion and Action:

The Standard Drafting Team (SDT) will review and respond to all “Operate Within Interconnection Reliability Operating Limits” Draft Standard, Version 4, Comments. The comments will be compiled and organized by NERC staff or by Maureen Long. All OWL SDT members are to read all of the comments prior to the meeting. The SDT will respond to all comments in accordance with the NERC Reliability Standards Process Manual.

Ms. Long will forward the comments to the OWL SDT in separate transmittals. The OWL SDT will:

- Discuss summary considerations for groups of comments
- Develop a schedule for drafting responses to individual comments
- Assign sections to team members if necessary

### ***Item 2.b Revise Standard Draft Version 4 — Based on Comments***

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The Standard Draft Version 2, ballot comments that are evaluated to be beneficial or appropriate to enhance the standard will be incorporated. Those comments that are evaluated to be insignificant or do not enhance the standard will not be incorporated.

Issues and concerns that cannot be addressed and resolved by the SDT will be added to the list of Parking Lot Issues or assigned to SDT members as action items.

**SDT Consideration #1:** The Coordinate Operations Standard addresses coordination between RAs and is limited in scope to just RA to RA coordination. The Coordinate Operations standard has a requirement that each RA must have procedures, processes, and/or plans to address situations that require RA to RA coordination. Industry commenters want assurance that the documents covered by the Coordinate Operations standard aren’t also required by any other standard.

The IROL Requirement 207 includes the following:

- (1) The Reliability Authority shall have one or more processes, procedures, or plans that identify actions it shall take or actions it shall direct others to take, for both prevention and mitigation of instances of exceeding its Interconnection Reliability Operating Limits.

Ms. Long suggests a footnote to the requirement to indicate that these processes, procedures and plans are limited to those that identify actions and directives issued within the RA’s Reliability Area and indicate that the processes, procedures, and plans for coordination between RAs are addressed in Standard 100.

**SDT Consideration #2:** The Determine Facility Ratings SDT have modified the criteria for System Operating Limits and are concerned that there may be a significant disconnect between SOLs and IROLs. The DFR SDT suggests that standard 200 can work if there is an acceptance that an IROL and an SOL may have different values for the same facility. See Attachment “Determine Facility Ratings SDT Comments on Standard 200.”

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**SDT Considerations #3:** The Operating Limits Definition Task Force has distributed a Reliability Coordinator Survey. The SDT needs to evaluate the survey and consider what to do with the survey and responses (i.e. how to use the survey to enhance the draft standard).

**SDT Consideration #4:** NERC Operating Policies 5, 6, and 9 have been revised, approved by the Standing Committees, are awaiting NERC Board of Trustees approval, and will be implemented after BoT approval (anticipated to be early June, 2004). The SDT needs to evaluate the NERC Operating Policies 5, 6, and 9, revised versions and consider what to do with the new policy language (i.e. how to use the NERC Operating Policy 5, 6, and 9, new language to enhance the draft standard).

Attachment

Draft Standard, Version 4 (Posted March 1, 2004 through April 14, 2004)

Determine Facility Ratings SDT Comments on Standard 200

OLDTF - Reliability Coordinator Survey of IROL Determination

NERC Operating Policy 5, Draft, Approved by the Standing Committees in March, 2004

NERC Operating Policy 6, Draft, Approved by the Standing Committees in March, 2004

NERC Operating Policy 9, Draft, Approved by the Standing Committees in March, 2004

***Item 2.c Revise Implementation Plan (Draft Standard — Operating Manual Policy Cross Reference)***

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The OWL SDT will review and revise the Implementation Plan from the Operate Within IROLs SAR (the draft standard — operating manual policies cross reference) for accuracy and correct correlation to the current draft standard.

Attachment

Implementation Plan from Operate Within IROLs SAR

***Item 2.d Revise Q&A Document***

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The OWL SDT will review and revise the “Questions & Answers About the Operate Within Operate Within IROLs Standard” for accuracy and correct correlation to the revised draft standard.

Attachment

Questions & Answers About the Operate Within Operate Within IROLs Standard

***Item 2.e Review Latest Information on Field-Testing***

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Field testing of this standard when approved may be an issue.

The OWL SDT will evaluate the draft standard to determine the parameters that need field-testing.

***Item 2.f Documents to Support Next Step***

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If the SDT determines the revised draft standard contains significant changes requiring an additional posting, a Comment form will be developed. If the SDT determines the changes are not significant and recommends the draft standard is ready for ballot, the proper “posting” documentation will be prepared.

### **3. Operate Within System Operating Limits SAR**

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- a. SAR Submitted into Standards Process

#### ***Item 3.a SAR Submitted into Standard Process***

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The “Operate Within System Operating Limits” was submitted to the Standards Process – Director, in accordance with the NERC Standards Process, on March 19, 2004. An update on this SAR will be presented to the SDT including actions taken by the SAC at its meeting on April 6 – 7.

Attachment

Operate Within System Operating Limits SAR

#### **4. Future Meetings**

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- a. Future Meetings and Conference Calls, to be Determined During the Meeting

##### Discussion and Action:

The Standard Drafting Team will determine the next meeting or conference call to continue drafting the “Operate Within Limits” Standard.

## “Operate Within Limits” SDT Roster

Edward R. (Ed) Riley (Chairman) Director of Regional Coordination	California ISO 151 Blue Ravine Rd. Folsom CA 95630	916-351-4463 (office) 916-802-9558 (cell) eriley@caiso.com
Paul Cafone	Public Service Electric & Gas Co. 80 Park Plaza Newark NJ 07101	973- 430-5001 (office) 201- 315-0174 (cell) paul.cafone@pseg.com
Albert DiCaprio (Requestor) Corporate Strategist	PJM Interconnection, L.L.C. 955 Jefferson Avenue Valley Forge Corporate Center Norristown, PA 19403-2497	610-666-8854 (office) <a href="mailto:dicapram@pjm.com">dicapram@pjm.com</a>
Tony Jankowski Mgr., Electric System Operations	WE-Energies W237 N1500 Busse Rd Waukesha WI 53188-1124	262-544-7117 (office) 414-322-6982 (cell) <a href="mailto:tony.jankowski@weenergies.com">tony.jankowski@weenergies.com</a>
Wendy Ladd	Duke Energy/VACAR South PO Box 1244 Charlotte, NC 28201-1244	704-382-6940 (office) <a href="mailto:wtladd@duke-energy.com">wtladd@duke-energy.com</a>
Mauren Long	NERC 116-390 Village Boulevard Princeton, NJ 08540-5731	305-891-5497 maureenlong@earthlink.net
Ellis Rankin Mgr. Grid Operations	Oncor 2233B Mt. Creek Parkway Dallas, TX 75211-6716	214-743-6825 (office) 214-549-6179 (cell) <a href="mailto:erankin@oncorgroup.com">erankin@oncorgroup.com</a>
Gerald Rheault	Manitoba Hydro P.O. Box 815 820 Taylor Avenue Winnipeg Manitoba R3C 2P4	204-487-5423 (office) <a href="mailto:grrheault@hydro.mb.ca">grrheault@hydro.mb.ca</a>
James P. Murphy Electrical Engineer	BPA TOT-DITT-2 5411 NE Highway 99 Vancouver, WA 98663	360- 418-2413 (office) jpmurphy@bpa.gov
Thomas J. Vandervort Manager – Resources	NERC 116-390 Village Boulevard Princeton, NJ 08540-5731	609-452-8060 (office) 609-452-9550 (fax) <a href="mailto:tom.vandervort@nerc.net">tom.vandervort@nerc.net</a>
Charles V. Waits Vice President - Operations & Transmission Strategy	Michigan Electric Transmission Company, LLC 540 Avis Drive, Suite H Ann Arbor, Michigan 48108	734-929-1227 (office) cwaits@metcllc.com
List Server for Standard DT		opwinlimsdt@nerc.com

Item



## Parliamentary Procedures

Based on Robert's Rules of Order, Newly Revised, 10th Edition, plus "Organization and Procedures Manual for the NERC Standing Committees"

### Motions

Unless noted otherwise, all procedures require a "second" to enable discussion.

When you want to...	Procedure	Debatable	Comments
Raise an issue for discussion	Move	Yes	The main action that begins a debate.
Revise a Motion currently under discussion	Amend	Yes	Takes precedence over discussion of main motion. Motions to amend an amendment are allowed, but not any further. The amendment must be germane to the main motion, and can not reverse the intent of the main motion.
Reconsider a Motion already approved	Reconsider	Yes	Allowed only by member who voted on the prevailing side of the original motion.
End debate	Call for the Question <i>or</i> End Debate	No	If the Chair senses that the committee is ready to vote, he may say "if there are no objections, we will now vote on the Motion." Otherwise, this motion is not debatable and subject to 2/3 majority approval.
Record each member's vote on a Motion	Request a Roll Call Vote	No	Takes precedence over main motion. No debate allowed, but the members must approve by 2/3 majority.
Postpone discussion until later in the meeting	Lay on the Table	Yes	Takes precedence over main motion. Used only to postpone discussion until later in the meeting.
Postpone discussion until a future date	Postpone until	Yes	Takes precedence over main motion. Debatable only regarding the date (and time) at which to bring the Motion back for further discussion.
Remove the motion for any further consideration	Postpone indefinitely	Yes	Takes precedence over main motion. Debate can extend to the discussion of the main motion. If approved, it effectively "kills" the motion. Useful for disposing of a badly chosen motion that can not be adopted or rejected without undesirable consequences.
Request a review of procedure	Point of order	No	Second not required. The Chair or secretary shall review the parliamentary procedure used during the discussion of the Motion.

### Notes on Motions

**Seconds.** A Motion must have a second to ensure that at least two members wish to discuss the issue. The "second" is not recorded in the minutes. Neither are motions that do not receive a second.

**Announcement by the Chair.** The Chair should announce the Motion before debate begins. This ensures that the wording is understood by the membership. Once the Motion is announced and seconded, the Committee "owns" the motion, and must deal with it according to parliamentary procedure. Item



# **NORTH AMERICAN ELECTRIC RELIABILITY COUNCIL**

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## **NERC ANTITRUST COMPLIANCE GUIDELINES**

### **I. GENERAL**

It is NERC's policy and practice to obey the antitrust laws and to avoid all conduct that unreasonably restrains competition. This policy requires the avoidance of any conduct that violates, or which might appear to violate, the antitrust laws. Among other things, the antitrust laws forbid any agreement between or among competitors regarding prices, availability of service, product design, terms of sale, division of markets, allocation of customers or any other activity that unreasonably restrains competition.

It is the responsibility of every NERC participant and employee who may in any way affect NERC's compliance with the antitrust laws to carry out this commitment.

Antitrust laws are complex and subject to court interpretation that can vary over time and from one court to another. The purpose of these guidelines is to alert NERC participants and employees to potential antitrust problems and to set forth policies to be followed with respect to activities that may involve antitrust considerations. In some instances, the NERC policy contained in these guidelines is stricter than the applicable antitrust laws. Any NERC participant or employee who is uncertain about the legal ramifications of a particular course of conduct or who has doubts or concerns about whether NERC's antitrust compliance policy is implicated in any situation should consult NERC's General Counsel immediately.

### **II. PROHIBITED ACTIVITIES**

Participants in NERC activities (including those of its committees and subgroups) should refrain from the following when acting in their capacity as participants in NERC activities (e.g., at NERC meetings, conference calls and in informal discussions):

- Discussions involving pricing information, especially margin (profit) and internal cost information and participants' expectations as to their future prices or internal costs.
- Discussions of a participant's marketing strategies.
- Discussions regarding how customers and geographical areas are to be divided among competitors.
- Discussions concerning the exclusion of competitors from markets.
- Discussions concerning boycotting or group refusals to deal with competitors, vendors or suppliers. ItemI

Approved by NERC Board of Trustees  
June 14, 2002

### III. ACTIVITIES THAT ARE PERMITTED

From time to time decisions or actions of NERC (including those of its committees and subgroups) may have a negative impact on particular entities and thus in that sense adversely impact competition. Decisions and actions by NERC (including its committees and subgroups) should only be undertaken for the purpose of promoting and maintaining the reliability and adequacy of the bulk power system. If you do not have a legitimate purpose consistent with this objective for discussing a matter, please refrain from discussing the matter during NERC meetings and in other NERC-related communications.

You should also ensure that NERC procedures, including those set forth in NERC's Certificate of Incorporation and Bylaws are followed in conducting NERC business. Other NERC procedures that may be applicable to a particular NERC activity include the following:

- Organization Standards Process Manual
- Transitional Process for Revising Existing NERC Operating Policies and Planning Standards
- Organization and Procedures Manual for the NERC Standing Committees
- System Operator Certification Program

In addition, all discussions in NERC meetings and other NERC-related communications should be within the scope of mandate for or assignment to the particular NERC committee or subgroup, as well as within the scope of the published agenda for the meeting.

No decisions should be made nor any actions taken in NERC activities for the purpose of giving an industry participant or group of participants a competitive advantage over other participants. In particular, decisions with respect to setting, revising, or assessing compliance with NERC reliability standards should not be influenced by anti-competitive motivations.

Subject to the foregoing restrictions, participants in NERC activities may discuss:

- Reliability matters relating to the bulk power system, including operation and planning matters such as establishing or revising reliability standards, special operating procedures, operating transfer capabilities, and plans for new facilities.
- Matters relating to the impact of reliability standards for the bulk power system on electricity markets, and the impact of electricity market operations on the reliability of the bulk power system.
- Proposed filings or other communications with state or federal regulatory authorities or other governmental entities.
- Matters relating to the internal governance, management and operation of NERC, such as nominations for vacant committee positions, budgeting and assessments, and employment matters; and procedural matters such as planning and scheduling meetings.

Any other matters that do not clearly fall within these guidelines should be reviewed with NERC's General Counsel before being discussed.

## Voting

Voting Method	When Used	How Recorded in Minutes
Unanimous Consent	When the Chair senses that the Committee is substantially in agreement, and the Motion needed little or no debate. No actual vote is taken.	The minutes show "by unanimous consent."
Vote by Voice	The standard practice.	The minutes show Approved or Not Approved (or Failed).
Vote by Show of Hands (tally)	To record the number of votes on each side when an issue has engendered substantial debate or appears to be divisive. Also used when a Voice Vote is inconclusive. (The Chair should ask for a Vote by Show of Hands when requested by a member).	The minutes show both vote totals, and then Approved or Not Approved (or Failed).
Vote by Roll Call	To record each member's vote. Each member is called upon by the Secretary,, and the member indicates either "Yes," "No," or "Present" if abstaining.	The minutes will include the list of members, how each voted or abstained, and the vote totals. Those members for which a "Yes," "No," or "Present" is not shown are considered absent for the vote.

### Notes on Voting

(Recommendations from DMB, not necessarily Mr. Robert)

**Abstentions.** When a member abstains, he is not voting on the Motion, and his abstention is not counted in determining the results of the vote. The Chair should not ask for a tally of those who abstained.

**Determining the results.** The results of the vote (other than Unanimous Consent) are determined by dividing the votes in favor by the total votes cast. Abstentions are not counted in the vote and shall not be assumed to be on either side.

**"Unanimous Approval."** Can only be determined by a Roll Call vote because the other methods do not determine whether every member attending the meeting was actually present when the vote was taken, or whether there were abstentions.

**Majorities.** Robert's Rules use a simple majority (one more than half) as the default for most motions. NERC uses 2/3 majority for all motions.

## Operate Within Interconnection Reliability Operating Limits Standard

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### Definitions

**Bulk Electric System:** A term commonly applied to the portion of an electric utility system that encompasses the electrical generation resources and high-voltage transmission system (above 35 kV or as approved in a tariff filed with FERC).

**Cascading Outages:** The uncontrolled successive loss of system elements triggered by an incident at any location that results in the loss of 300 MW or more of networked system load for a minimum of 15 minutes.

**Generator Owner:** The entity that owns the generator.

**Instability:** The inability of the transmission system to maintain a state of equilibrium during normal and abnormal system conditions or disturbances.

**Interconnection Reliability Operating Limit:** A system operating limit which, if exceeded, could lead to instability, uncontrolled separation, or cascading outages that adversely impact the reliability of the bulk electric system.

**Interconnection Reliability Operating Limit Event:** An instance of exceeding an Interconnection Reliability Operating Limit for any length of time.

**Interconnection Reliability Operating Limit Event Duration:** The length of time an Interconnection Reliability Operating Limit is exceeded. The duration is measured from the point where the limit is first exceeded and ends when the value drops below the limit and remains below the limit for at least 30 seconds.

**Occurrence Period:** The time period in which performance is measured and evaluated.

**Performance-reset Period:** The time period that the entity being assessed must operate without any violations to reset the level of non-compliance to zero.

**Operational Planning Analysis:** An analysis of the expected system conditions for the next day's operation and up to 12 months ahead. Expected system conditions include things such as load forecast(s), generation output levels, and known system constraints (transmission facility outages, generator outages, equipment limitations, etc.).

**Real-time:** Present time as opposed to future time.

**Real-time Assessment:** An examination of existing and expected system conditions, conducted by collecting and reviewing immediately available data.

**Real-time Data:** Real-time measured values, state estimator values derived from the measured values, or other calculated values derived from the measured values — may include directly monitored data, Inter-utility data exchange (e.g., Interconnection Control Area Communication Protocol or SCADA Data), and manually collected data.

**Real-time Monitoring:** The act of scanning data and drawing conclusions about what the data indicates.

## Operate Within Interconnection Reliability Operating Limits Standard

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**Reliability Authority Area:** The collection of generation, transmission, and loads within the boundaries of the organization performing the Reliability Authority function. Its boundary coincides with one or more Balancing Authority areas.

**Self-certification:** A process by which an entity does a self-evaluation to determine if it is compliant with the specific requirements for a reliability standard.

**$T_v$ :** The maximum time that an Interconnection Reliability Operating Limit can be exceeded before the risk to the interconnection becomes greater than acceptable.  $T_v$  may not be greater than 30 minutes.

**Transmission Operator:** The entity that operates the transmission facilities and executes switching orders.

**Uncontrolled Separation:** The unplanned break-up of an interconnection, or portion of an interconnection, that is not the result of automatic action by a special protection system or remedial action scheme operating correctly.

**Wide-Area Impact:** The impact of a single incident resulting in the uncontrolled loss of 300 MW or more of networked system load for a minimum of 15 minutes.

## 200 — Operate Within Interconnection Reliability Operating Limits

- 201 Interconnection Reliability Operating Limit Identification
- 202 Monitoring
- 203 Analyses and Assessments
- 204 Actions
- 205 Data Specification and Collection
- 206 Data Provision
- 207 Processes, Procedures, or Plans
- 208 Reliability Authority Directives

1. Purpose: To prevent instability, uncontrolled separation, or cascading outages that adversely impact the reliability of the bulk electric system.
2. Effective Date: This standard will become effective three months after the latter of either the date the NERC Board of Trustees votes to adopt the Determine Facility Ratings, System Operating Limits, and Transfer Capabilities Standard or three months after the date the NERC Board of Trustees votes to adopt this standard.

Initial Compliance with the individual requirements will be phased in as follows:

- 201 — Interconnection Reliability Operating Limit Identification — six months from implementation of Requirement 604.
- 202 — Monitoring — six months from implementation of Requirement 604.
- 203 — Analyses and Assessments — six months from implementation of Requirement 604.
- 204 — Actions — six months from implementation of Requirement 604.
- 205 — Data Specification & Collection — nine months from implementation of Requirement 604.
- 206 — Data Provision — 12 months from implementation of Requirement 604.
- 207 — Processes, Procedures, or Plans — six months from implementation of Requirement 604.
- 208 — Reliability Authority Directives — nine months from implementation of Requirement 604.

3. Applicability: These requirements apply to entities performing various electric system functions, as defined in the Functional Model. NERC is now developing standards and procedures for the identification and certification of such entities. Until that identification and certification is complete, this standard applies to the existing entities (such as control areas, transmission owners and operators, and generator owners) that are currently performing the defined functions.

In this standard, the terms Balancing Authority, Generator Operator, Generator Owner, Interchange Authority, Load-serving Entity, Reliability Authority, Transmission Operator, and

## **Operate Within Interconnection Reliability Operating Limits Standard**

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Transmission Owner refer to the entities performing these functions as defined in the Functional Model.



## 201 — Interconnection Reliability Operating Limits Identification

### (a) Requirements

- (1) The Reliability Authority shall identify and document which Facilities (or groups of Facilities) in its Reliability Authority Area are subject to Interconnection Reliability Operating Limits<sup>1</sup>.
  - (i) All Reliability Authorities that share a Facility (or group of Facilities) shall agree on whether that Facility (or group of Facilities) is (are) subject to Interconnection Reliability Operating Limits.
- (2) The Reliability Authority shall identify Interconnection Reliability Operating Limits for its Reliability Authority Area. Each Interconnection Reliability Operating Limit shall have a  $T_v$  that is smaller than or equal to 30 minutes.
- (3) All Reliability Authorities that share a Facility (or group of Facilities) subject to an Interconnection Reliability Operating Limit shall agree upon the process used to determine that Interconnection Reliability Operating Limit and its associated  $T_v$ .

### (b) Measures

- (1) The Reliability Authority shall have a list of Facilities (or group of Facilities) in its Reliability Authority Area that are subject to Interconnection Reliability Operating Limits.
  - (i) The Reliability Authority shall have evidence it has reviewed and updated its list of Facilities (or groups of Facilities) to reflect changes in its Reliability Authority Area's system topology.
- (2) The Reliability Authority shall be able to identify the current values of the Interconnection Reliability Operating Limits it monitors. Each of these Interconnection Reliability Operating Limits shall have a  $T_v$  that is smaller than or equal to 30 minutes.
  - (i) The Reliability Authorities that share a Facility (or group of Facilities) shall have an agreed upon process for determining if that Facility (or group of Facilities) is subject to an Interconnection Reliability Operating Limit and for determining the value of that Interconnection Reliability Operating Limit and its associated  $T_v$ .
- (3) The Reliability Authority shall be able to demonstrate that its Interconnection Reliability Operating Limit values and their  $T_v$  reflect current system conditions.

### (c) Regional Differences

None identified.

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<sup>1</sup> Each Interconnection Reliability Operating Limit is developed by following the requirements in the Determine Facility Ratings, System Operating Limits, and Transfer Capabilities Standard.

**(d) Compliance Monitoring Process**

- (1) The Reliability Authority shall demonstrate compliance through self-certification submitted to its Compliance Monitor annually. The Compliance Monitor may also use scheduled on-site reviews every three years, and investigations upon complaint, to assess performance.
- (2) The Performance-reset Period shall be 12 months from the last violation. The Reliability Authority shall keep data on facilities and limits for three calendar years. The Compliance Monitor shall keep audited data for three calendar years.
- (3) The Reliability Authority shall have the following available upon the request of its Compliance Monitor:
  - (i) List of Facilities (or group of Facilities) in its Reliability Authority Area that are subject to Interconnection Reliability Operating Limits. The list shall be contained on paper, displayed through an Energy Management System, or via another data source.
  - (ii) Evidence that the list of Facilities (or group of Facilities) subject to Interconnection Reliability Operating Limits was updated.
  - (ii) An agreed upon process for determining if a shared Facility (or group of Facilities) is subject to an Interconnection Reliability Operating Limit and for determining the value of that Interconnection Reliability Operating Limit and its associated  $T_v$ .
- (4) The Reliability Authority shall demonstrate that it can identify the current values of the Interconnection Reliability Operating Limits it monitors and shall show that each of these Interconnection Reliability Operating Limits shall have a  $T_v$  that is smaller than or equal to 30 minutes.

**(e) Levels of Noncompliance**

- (1) Level One: No process for determining if shared Facilities (or groups of Facilities) are subject to Interconnection Reliability Operating Limits and for determining the value of that Interconnection Reliability Operating Limit and its associated  $T_v$ .
- (2) Level Two: No evidence that a shared Facility (or group of Facilities) has an Interconnection Reliability Operating Limit with a  $T_v$  that has been agreed to by all Reliability Authorities that share the Facility (or group of Facilities).
- (3) Level Three: A level three noncompliance occurs if either of the following conditions are present:
  - (i) One or more Interconnection Reliability Operating Limits had a  $T_v$  that was greater than 30 minutes.
  - (ii) No evidence that the list of Facilities (or groups of Facilities) subject to Interconnection Reliability Operating Limits was updated.
- (4) Level Four: A level four noncompliance occurs if either of the following conditions are present:
  - (i) Could not identify the current values of the Interconnection Reliability Operating Limits for its Reliability Area.
  - (ii) No list of Facilities (or groups of Facilities) subject to Interconnection Reliability Operating Limits exists for the Reliability Authority Area.

**(f) Sanctions**

- (1) Sanctions for noncompliance shall be applied consistent with the NERC Compliance and Enforcement Matrix. In places where financial sanctions are applied for noncompliance, these penalties shall be the fixed dollar sanctions listed in the matrix, not the dollars per megawatt sanctions.

## 202 — Monitoring

### (a) Requirements

- (1) The Reliability Authority shall perform Real-time Monitoring of system operating parameters to determine if its Reliability Authority Area is operating within its Interconnection Reliability Operating Limits.

### (b) Measures

- (1) The Reliability Authority shall have a list of Facilities (or groups of Facilities) subject to Interconnection Reliability Operating Limits available for its operations personnel's Real-time use.
- (2) The Reliability Authority shall have Interconnection Reliability Operating Limits available for its operations personnel's Real-time use.
- (3) The Reliability Authority shall have Real-time Data available in a form that system operators can compare to the Interconnection Reliability Operating Limits.
- (4) The Reliability Authority shall monitor system operating parameters and compare these against its Interconnection Reliability Operating Limits.

### (c) Regional Differences

None identified.

### (d) Compliance Monitoring Process

- (1) The Reliability Authority shall demonstrate compliance through self-certification submitted to its Compliance Monitor annually. The Compliance Monitor may also use scheduled on-site reviews every three years, and investigations upon complaint, to assess performance.
- (2) The Performance-reset Period shall be 12 months from the last violation. The Reliability Authority shall keep data on limits for three calendar years. The Compliance Monitor shall keep audited data for three calendar years.
- (3) The Reliability Authority shall demonstrate the following upon the request of the Compliance Monitor:
  - (i) System operators actively monitoring and comparing Real-time system operating parameters associated with Interconnection Reliability Operating Limits.

### (e) Levels of Noncompliance

- (1) Level One: Not applicable.
- (2) Level Two: List of Facilities (or groups of Facilities) subject to Interconnection Reliability Operating Limits not available to operations personnel for Real-time use.
- (3) Level Three: Not applicable.

## Operate Within Interconnection Reliability Operating Limits Standard

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- (4) Level Four: A level four noncompliance occurs if any of the following conditions are present:
- (i) Interconnection Reliability Operating Limits not available to operations personnel for Real-time use; or
  - (ii) Real-time Data not available in a form that can be compared to the Interconnection Reliability Operating Limits; or
  - (iii) System operating parameters not monitored and compared against Interconnection Reliability Operating Limits.

### **(f) Sanctions**

- (1) Sanctions for noncompliance shall be applied consistent with the NERC Compliance and Enforcement Matrix. In places where financial sanctions are applied for noncompliance, these penalties shall be the fixed dollar sanctions listed in the matrix, not the dollars per megawatt sanctions.

## 203 — Analyses and Assessments

### (a) Requirements

- (1) The Reliability Authority shall perform Operational Planning Analyses to assess whether the planned Bulk Electric System operations within its Reliability Authority Area will exceed any of its Interconnection Reliability Operating Limits.
- (2) The Reliability Authority shall perform Real-time Assessments to determine if its Reliability Authority Area is exceeding any Interconnection Reliability Operating Limits or is expected to exceed any Interconnection Reliability Operating Limits.

### (b) Measures

- (1) The Reliability Authority shall identify operating situations or events that impact its Reliability Authority Area's ability to operate without exceeding any Interconnection Reliability Operating Limits.
  - (i) The Reliability Authority shall conduct an Operational Planning Analysis at least once each day, evaluating the next day's projected system operating conditions.
  - (ii) The Reliability Authority shall conduct a Real-time Assessment periodically, but at least once every 30 minutes.

### (c) Regional Differences

None identified.

### (d) Compliance Monitoring Process

- (1) The Reliability Authority shall demonstrate compliance through self-certification submitted to its Compliance Monitor annually. The Compliance Monitor may also use scheduled on-site reviews once every three years, and investigations upon complaint, to assess performance.
- (2) The Performance-reset Period shall be 12 months from the last violation. The Compliance Monitor shall keep audited data for three calendar years.
- (3) The Reliability Authority shall identify the following upon the request of the Compliance Monitor:
  - (i) The time the most recent Operational Planning Analysis was conducted.
  - (ii) Whether the planned Bulk Electric System operations within the Reliability Authority's Reliability Authority Area will exceed any of its Interconnection Reliability Operating Limits.
  - (iii) The time the most recent Real-time Assessment was conducted.
  - (iv) Whether the Real-time Assessment identified if its Reliability Authority Area is exceeding any Interconnection Reliability Operating Limits or is expected to exceed any Interconnection Reliability Operating Limits.

**(e) Levels of Noncompliance**

- (1) Level One: Not applicable.
- (2) Level Two: Not applicable.
- (3) Level Three: A level three noncompliance exists if any of the following conditions are present:
  - (i) No indication that an Operational Planning Analysis was conducted at least once each day.
  - (ii) No indication that a Real-time Assessment was conducted at least once each 30 minutes.
- (4) Level Four: A level four noncompliance exists if either of the following conditions are present:
  - (i) The Reliability Authority could not identify whether the planned Bulk Electric System operations within its Reliability Authority Area is expected to exceed any of its Interconnection Reliability Operating Limits, based on the results of the most recent Operational Planning Analysis.
  - (ii) The Reliability Authority could not identify whether the most recent Real-time Assessment identified if its Reliability Authority Area is exceeding any Interconnection Reliability Operating Limits or is expected to exceed any Interconnection Reliability Operating Limits.

**(f) Sanctions**

- (1) Sanctions for noncompliance shall be applied consistent with the NERC Compliance and Enforcement Matrix. In places where financial sanctions are applied for noncompliance, these penalties shall be the fixed dollar sanctions listed in the matrix, not the dollars per megawatt sanctions.

**204 — Actions**

**(a) Requirements**

- (1) The Reliability Authority shall, without delay, act<sup>2</sup> or direct others to act to:
  - (i) Prevent instances where Interconnection Reliability Operating Limits may be exceeded.
  - (ii) Mitigate the magnitude and duration of instances where Interconnection Reliability Operating Limits have been exceeded.
- (2) The Reliability Authority shall include a statement in each Interconnection Reliability Operating Limit-related directive, that informs the recipient that the directive is related to an Interconnection Reliability Operating Limit.
- (3) The Reliability Authority shall document instances of exceeding Interconnection Reliability Operating Limits and shall document and complete an Interconnection Reliability Operating Limit Violation Report for instances of exceeding Interconnection Reliability Operating Limits for time greater than  $T_v$ .

**(b) Measures**

- (1) The Reliability Authority shall have documentation to support each instance where actions were taken or directives were issued to mitigate the magnitude and duration of exceeding an Interconnection Reliability Operating Limit.
  - (i) The documentation shall include the actions taken or directives issued, the magnitude of the event, and the duration of the event. (This data may be from an operating log, may be from the entity's energy management system, or may be from some other source.)
  - (i) The duration of the event shall be measured from the point when the limit is exceeded to the point when the system has returned to a state that is within the Interconnection Reliability Operating Limit for a minimum of one minute.
- (2) The Reliability Authority shall report each instance of exceeding an Interconnection Reliability Operating Limit for time greater than  $T_v$ .
  - (i) The Reliability Authority shall complete an Interconnection Reliability Operating Limit Violation Report and shall file the report with its Compliance Monitor within five business days of the initiation of the event. (The report shall include the date and time of the event, identification of which Interconnection Reliability Operating Limit was violated and the  $T_v$  for that limit, magnitude and duration of exceeding the Interconnection Reliability Operating Limit, actions taken or directives issued and

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<sup>2</sup> Note that the Reliability Authority is expected to act without delay and may choose to take 'no overt action' and this may be an acceptable action as long as it is documented. Taking 'no overt action' is not the same as ignoring the problem.



the time these were initiated or issued, and an explanation of results of actions or directives.)

**(c) Regional Differences**

None identified.

**(d) Compliance Monitoring Process**

- (1) The Reliability Authority shall demonstrate compliance through self-certification submitted to its Compliance Monitor annually. The Compliance Monitor may also use scheduled on-site reviews every three years, and investigations upon complaint, to assess performance.
- (2) The Performance-reset Period shall be 12 months from the last violation. The Reliability Authority shall keep Interconnection Reliability Operating Limit Violation Reports, operations logs, or other documentation for three calendar years. The Compliance Monitor shall keep audited data for three calendar years.
- (3) The Reliability Authority shall have the following available upon the request of its Compliance Monitor:
  - (i) Operations logs or other documentation indicating the magnitude and duration of each instance of exceeding an Interconnection Reliability Operating Limit and the actions or directives issued for each of these instances.
  - (ii) Interconnection Reliability Operating Limit Violation Reports.

**(e) Levels of Noncompliance<sup>3</sup>**

- (1) Level One: Interconnection Reliability Operating Limit exceeded for a time less than or equal to  $T_v$  and no documentation to indicate actions taken or directives issued to mitigate the instance.
- (2) Level Two: Not applicable.
- (3) Level Three: Not applicable.
- (4) Level Four: Interconnection Reliability Operating Limit exceeded for time greater than  $T_v$ .

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<sup>3</sup> Note that the Reliability Authority is expected to act without delay and may choose to take 'no overt action' and this may be an acceptable action as long as it is documented. Taking 'no overt action' is not the same as ignoring the problem.

**Operate Within Interconnection Reliability Operating Limits Standard**

**(f) Sanctions**

(1) Sanctions for noncompliance shall be applied consistent with the NERC Compliance and Enforcement Matrix.

- (i) Level one noncompliance sanctions shall be the fixed dollar sanctions listed in the matrix, not the dollars per megawatt sanctions.
- (ii) Level four noncompliance sanctions shall be the greater of the fixed dollar sanctions listed in the matrix, or the dollar amount that corresponds to the magnitude and duration of the event as highlighted in the following table:

If the Maximum Value % over the Limit (measured after the event duration exceeds $T_v$ ) is: Max Value % = (Max Value/IROL limit - 1)*100	And the event duration exceeds its $T_v$ by ___ minutes:	Then Multiply the Level 4 \$ sanction by:
0% < Max Value % ≤ 5%	$T_v < \text{Duration} \leq T_v + 5$ minutes	5
	$T_v + 5 \text{ minutes} < \text{Duration} \leq T_v + 10$ minutes	10
	$T_v + 10 \text{ minutes} < \text{Duration} \leq T_v + 15$ minutes	15
	$\text{Duration} > T_v + 15$ minutes	20
5% < Max Value % ≤ 10%	$T_v < \text{Duration} \leq T_v + 5$ minutes	10
	$T_v + 5 \text{ minutes} < \text{Duration} \leq T_v + 10$ minutes	15
	$T_v + 10 \text{ minutes} < \text{Duration} \leq T_v + 15$ minutes	20
	$\text{Duration} > T_v + 15$ minutes	25
10% < Max Value % ≤ 15%	$T_v < \text{Duration} \leq T_v + 5$ minutes	15
	$T_v + 5 \text{ minutes} < \text{Duration} \leq T_v + 10$ minutes	20
	$T_v + 10 \text{ minutes} < \text{Duration} \leq T_v + 15$ minutes	25
	$\text{Duration} > T_v + 15$ minutes	30
15% < Max Value % ≤ 20%	$T_v < \text{Duration} \leq T_v + 5$ minutes	20
	$T_v + 5 \text{ minutes} < \text{Duration} \leq T_v + 10$ minutes	25
	$T_v + 10 \text{ minutes} < \text{Duration} \leq T_v + 15$ minutes	30
	$\text{Duration} > T_v + 15$ minutes	35
20% < Max Value % ≤ 25%	$T_v < \text{Duration} \leq T_v + 5$ minutes	25
	$T_v + 5 \text{ minutes} < \text{Duration} \leq T_v + 10$ minutes	30
	$T_v + 10 \text{ minutes} < \text{Duration} \leq T_v + 15$ minutes	35
	$\text{Duration} > T_v + 15$ minutes	40
25% < Max Value % ≤ 30%	$T_v < \text{Duration} \leq T_v + 5$ minutes	30
	$T_v + 5 \text{ minutes} < \text{Duration} \leq T_v + 10$ minutes	35
	$T_v + 10 \text{ minutes} < \text{Duration} \leq T_v + 15$ minutes	40
	$\text{Duration} > T_v + 15$ minutes	45

## 205 — Data Specification and Collection

### (a) Requirements

- (1) The Reliability Authority shall specify and collect the data it needs to support Real-time Monitoring, Operational Planning Analyses, and Real-time Assessments conducted relative to operating within its Reliability Authority Area's Interconnection Reliability Operating Limits. The Reliability Authority shall collect this data from the entities performing functions that have Facilities monitored by the Reliability Authority, and from entities that provide Real-time Facility status to the Reliability Authority. This includes specifying and collecting data from the following:
  - (i) Balancing Authorities
  - (ii) Generator Owners
  - (iii) Generator Operators
  - (iv) Load-serving Entities
  - (v) Reliability Authorities
  - (vi) Transmission Operators
  - (vii) Transmission Owners
- (2) The Reliability Authority shall specify when to supply data (based on its hardware and software requirements, and the time needed to do its Operational Planning Analyses).
- (3) The Reliability Authority shall notify its Compliance Monitor when both of the following conditions are present:
  - (i) An entity that has data needed to support Real-time Monitoring, Operational Planning, or Real-time Assessments relative to operating within the Reliability Authority's Reliability Authority Area has not provided data as specified, and
  - (ii) The Reliability Authority was unable to resolve the issue with the entity responsible for providing the data.

### (b) Measures

- (1) The Reliability Authority shall have a documented specification for data needed to build and maintain models needed to support Real-time Monitoring, Operational Planning Analyses, and Real-time Assessments relative to Interconnection Reliability Operating Limits.
  - (i) Specification shall include a list of required data, a mutually agreeable format, and timeframe and periodicity for providing data.
  - (ii) Specification shall address the data provision process to use when automated Real-time system operating data is unavailable.
- (2) The Reliability Authority shall have evidence that it has distributed its data specification to entities that have Facilities monitored by the Reliability

Authority and to entities that provide Facility status to the Reliability Authority.

- (3) The Reliability Authority shall notify its Compliance Monitor when an entity that has Facilities monitored by the Reliability Authority, or an entity that provides Facility status to the Reliability Authority, does not provide data as specified and the Reliability Authority was unable to resolve the issue with the entity responsible for providing the data.
  - (i) If the Reliability Authority does not receive data as specified, and is unable to resolve the situation, then the Reliability Authority shall notify its Compliance Monitor within five business days of discovering that the data is missing.

### **(c) Regional Differences**

None identified.

### **(d) Compliance Monitoring Process**

- (1) The Reliability Authority shall demonstrate compliance through self-certification submitted to its Compliance Monitor annually. The Compliance Monitor may also use scheduled on-site reviews every three years, and investigations upon complaint, to assess performance.
- (2) The Performance-reset Period shall be 12 months from the last violation. The Reliability Authority shall keep its data specification(s) for three calendar years. The Compliance Monitor shall keep audited data for three calendar years.
- (3) The Reliability Authority shall have the following available upon the request of the Compliance Monitor:
  - (i) Data specification(s).
  - (ii) Proof of distribution of the data specification(s).

### **(e) Levels of Noncompliance**

- (1) Level One: Data specification incomplete (missing either the list of required data, a mutually agreeable format, a timeframe for providing data, or a data provision process to use when automated real-time system operating data is unavailable).
- (2) Level Two: No data specification or the specification not distributed to the entities that have Facilities monitored by the Reliability Authority and the entities that provide the Reliability Authority with Facility status.
- (3) Level Three: Not applicable.
- (4) Level Four: Not applicable.

**(f) Sanctions**

- (1) Sanctions for noncompliance shall be applied consistent with the NERC Compliance and Enforcement Matrix. In places where sanctions are applied for noncompliance, these penalties shall be the fixed dollar sanctions listed in the matrix, not the dollars per megawatt sanctions.

## 206 — Data Provision

### (a) Requirements

- (1) Each entity performing one of the following functions shall provide data and real-time Facility status, as specified, to the Reliability Authority(ies) with which it has a reliability relationship. The data is limited to data needed by the Reliability Authority to support Real-time Monitoring, Operational Planning Analyses, and Real-time Assessments conducted relative to operating within its Reliability Authority Area's Interconnection Reliability Operating Limits.
  - (i) Balancing Authorities
  - (ii) Generator Owners
  - (iii) Generator Operators
  - (iv) Load-serving Entities
  - (v) Reliability Authorities
  - (vi) Transmission Operators
  - (vii) Transmission Owners

### (b) Measures

- (1) The responsible entity shall have evidence that it has provided data, as specified, to the requesting Reliability Authority, within the timeframe specified, in the mutually agreed upon format.

### (c) Regional Differences

None identified.

### (d) Compliance Monitoring Process

- (1) The responsible entity shall demonstrate compliance through self-certification submitted to its Compliance Monitor annually. The Compliance Monitor may also use scheduled on-site reviews every three years, and investigations upon complaint, to assess performance.
- (2) The Performance-reset Period is 12 months from the last violation. The responsible entity shall keep data transmittal documentation for three calendar years. The Compliance Monitor shall keep audited data for three calendar years.
- (3) The responsible entity shall have the following available upon the request of the Compliance Monitor:
  - (i) Evidence indicating data was sent to the Reliability Authority or evidence that the entity responsible committed to providing the data identified in the specification.

**(e) Levels of Noncompliance**

- (1) Level One: Not applicable.
- (2) Level Two: Not applicable.
- (3) Level Three: Not applicable.
- (4) Level Four: Data was not provided to the Reliability Authority as specified and the situation was not resolved with the Reliability Authority.

**(f) Sanctions**

- (1) Sanctions for noncompliance shall be applied consistent with the NERC Compliance and Enforcement Matrix. In places where sanctions are applied for noncompliance, these penalties shall be the fixed dollar sanctions listed in the matrix, not the dollars per megawatt sanctions.

**207 — Processes, Procedures, or Plans for Preventing and Mitigating Interconnection Reliability Operating Limits**

**(a) Requirements**

- (1) The Reliability Authority shall have one or more processes, procedures, or plans that identify actions it shall take or actions it shall direct others to take, for both prevention and mitigation of instances of exceeding its Interconnection Reliability Operating Limits.

**(b) Measures**

- (1) The Reliability Authority shall have one or more documented processes, procedures, or plans that address both preventing and mitigating instances of exceeding Interconnection Reliability Operating Limits. The processes, procedures, or plans shall identify and be coordinated with those entities responsible for taking actions and with those entities impacted by such actions.

**(c) Regional Differences**

None identified.

**(d) Compliance Monitoring Process**

- (1) The Reliability Authority shall demonstrate compliance through self-certification submitted to its Compliance Monitor annually. The Compliance Monitor may also use scheduled on-site reviews every three years, and investigations upon complaint, to assess performance.
- (2) The Performance-reset Period is 12 months from the last violation. The Reliability Authority shall keep its action plan for three calendar years. The Compliance Monitor shall keep audit records for three calendar years.
- (3) The Reliability Authority shall make the following available for inspection by the Compliance Monitor upon request:
  - (i) Processes, procedures, or plans that address preventing and mitigating instances of exceeding Interconnection Reliability Operating Limits.

**(e) Levels of Noncompliance**

- (1) Level One: Processes, procedures, or plans exist but weren't coordinated with all involved and impacted entities.
- (2) Level Two: Processes, procedures, or plans exist but weren't coordinated with any involved or any impacted entities.
- (3) Level Three: Processes, procedures, or plans exist but do not address both preventing and mitigating instances of exceeding Interconnection Reliability Limits.
- (4) Level Four: No processes, procedures, or plans exist addressing preventing and mitigating instances of exceeding Interconnection Reliability Operating Limits.



**(f) Sanctions**

- (1) Sanctions for noncompliance shall be applied consistent with the NERC Compliance and Enforcement Matrix. In places where sanctions are applied for noncompliance, these penalties shall be the fixed dollar sanctions listed in the matrix, not the dollars per megawatt sanctions.

## 208 — Reliability Authority Directives

### (a) Requirements

- (1) The Transmission Operator, Balancing Authority, and Interchange Authority shall follow the Reliability Authority's directives to:
  - (i) Prevent instances where Interconnection Reliability Operating Limits may be exceeded.
  - (ii) Mitigate the magnitude and duration of instances where Interconnection Reliability Operating Limits have been exceeded.
- (2) The responsible entity shall document the Reliability Authority's directives and the actions taken.

### (b) Measures

- (1) The responsible entity shall follow the Reliability Authority's directives and shall document the directives and actions taken to meet the directives.
- (2) The responsible entity shall document via an operations log or other data source, the following for each directive it receives relative to an Interconnection Reliability Operating Limit:
  - (i) Date and time of directive received.
  - (ii) Directive issued.
  - (iii) Actions taken in response to directive.

### (c) Regional Differences

None identified.

### (d) Compliance Monitoring Process

- (1) The responsible entity shall demonstrate compliance through self-certification submitted to its Compliance Monitor annually. The Compliance Monitor may also use scheduled on-site reviews every three years, and investigations upon complaint to assess performance.
- (2) The Performance-reset Period is 12 months from the last violation. The responsible entity shall keep its documentation for three calendar years. The Compliance Monitor shall keep audit records for three calendar years.
- (3) The responsible entity shall make the following available for inspection by the Compliance Monitor upon request:
  - (i) Operations log or other data source(s) to show the following for each instance of being issued a Reliability Authority directive relative to an Interconnection Reliability Operating Limit:
    - 1) Date and time of each directive received.
    - 2) Directive issued.
    - 3) Actions taken in response to directive.

**(e) Levels of Noncompliance**

- (1) Level One: The responsible entity followed Reliability Authority's directives relative to preventing or mitigating instances of exceeding Interconnection Reliability Operating Limits but did not document the date and time of each directive received, the directive received, and the actions taken in response to the directive.
- (2) Level Two: Not applicable.
- (3) Level Three: Not applicable.
- (4) Level Four: The responsible entity did not follow the Reliability Authority's directives.

**(f) Sanctions**

- (1) Sanctions for noncompliance shall be applied consistent with the NERC Compliance and Enforcement Matrix. In places where sanctions are applied for noncompliance, these penalties shall be the fixed dollar sanctions listed in the matrix, not the dollars per megawatt sanctions.

## Facility Ratings Standard Drafting Team Comments

Comments on aspects of the NERC Standard on Operating Within Limits (200)

The link between an Interconnection Reliability Operating Limit and the limits defined in standard 600 is tenuous – especially as the term “system operating limits” is not capitalized nor is there a reference to standard 600 in the definitions. Without that link, an IROL could be seen as a limit even in steady state (there is no contingency clearly associated with the definition – the consideration of contingencies is buried in standard 603). Presumably the link is believed to be made by calling IROLs a subset of SOLs. While I still believe that such limits are not a subset of SOLs but, rather, new limits based on similar studies, but with different criteria for acceptable performance (i.e., limits may be exceeded but cascading, instability and uncontrolled separation are BARELY avoided) there is value in discussing the IROL concept as put forward by the OWL team.

Based on standard 600 SOLs will be established through consideration of all next single contingencies and for some regions, all multiple contingencies and for others, a set of credible multiple contingencies. Universally, a SOL must be established to avoid cascading, instability and uncontrolled separation. The question for the OWL group to consider is – how does standard 200 deal with the fact that in thermally-limited systems the margin between the SOL and cascading, etc., may be very large, while in stability-limited systems, there will still be some reliability margin, likely not a large one, between the SOL and the onset of cascading, etc. Thus, the increased risk of a problem if an SOL is violated is a function of the nature of the limit itself – the risk associated with stability limits is likely higher than for thermal limits.

Of the list of nasty events, the risk of instability and uncontrolled separation will be fairly evident from stability studies but the risk of cascading is dependent on thermal ratings, thermal overload and operator action to some extent. Since the SOL definition allows for system readjustments, while requiring limits not be exceeded, the risk of cascading increases if the required adjustments are not undertaken – and these may not be automatic actions. Note that the 600 standard assumes that qualified ratings will be provided for all facilities (i.e, the rating value will have an associated time period – perhaps 15 minute, 2 hour, etc.) so that facilities ratings are assumed to be respected – there could an exception in the case of credible multiple contingencies, where a region may tolerate some facility violation if it can be managed expeditiously and not lead to cascading – MAPP presently does this although the ratings being exceeded in the checking process are likely the long term values, not the short term values.

Since the Q&A document for standard 200 talks about increased RISK of cascading, rather than occurrence of cascading, the OWL team needs to clarify this potential source of confusion – there will almost always be increased risk of a problem as loadings increase or are left unchanged – but that opens the door to IROL evaluation having to consider the impacts of failures of the operator, etc. As such, any limit in the system could be considered an IROL, since, for some combination of contingencies, the **Item**

unacceptable consequences could be seen. In fact, you could even consider the definition of an IROL as a steady state limit.

If the OWL team is adamant that IROLs are a subset of SOLs then the rest of the standard 200 should be reviewed to ensure that risks are properly considered in the measurements and compliance process – right now some entities might be penalized for low risk events.

One way to manage the discrepancy would be for IROLs to be established at a known margin from the nasty three events – so the IROL for a thermally-limited system might be significantly higher than the corresponding SOL.

For information.

This survey may also provide input to the Reliability Coordinator Plan Task Force.

## Survey of Interconnected Reliability Operating Limit Determination

For the Operating Limits Definitions Task Force

### Introduction

#### Operating Security Limits

Over the last few years, through meetings with Reliability Coordinators and from compliance program assessments, it is becoming apparent that NERC needs better definitions and understandings of Operating Security Limits. At its November 21, 2002 meeting, the Operating Committee discussed the following issues regarding operating limits: (*excerpt from November 21, 2002 OC meeting agenda*):

1. **Definitions.** What is the difference between Equipment Operating Limits and Operating Security Limits?
2. **Calculating limits.** Who is responsible for calculating Operating Security Limits? What are the roles of the Transmission Operator (Control Area) and the Reliability Coordinator?
3. **Operating within limits.** Who is responsible for operating the system to respect the limits? What are the roles of the Transmission Operator (Control Area) and the Reliability Coordinator? What mitigating actions are allowed both when the limit is exceeded and when another contingency occurs?
4. **Reporting limit violations.** What are NERC's reporting requirements and how do we enforce them? How do we deal with confidentiality issues?

Following that discussion, the Operating Committee commissioned an Operating Limits Definitions Task Force (OLDTF) to address these issues and return with its recommendations at the following OC meeting.

#### System Operating Limits and Interconnected Reliability Operating Limits

At the Operating Committee's March 2003 meeting, the OLDTF presented its report containing new and refined definitions reinforced by requirements and associated operating principles. These definitions included System Operating Limit (SOL) and Interconnected Reliability Operating Limit (IROL)<sup>1</sup>, the latter of which was designed to replace the definition of Operating Security Limit. The task force also recommended a new form for reporting IROL violations that exceeded 30 minutes. The Operating Committee directed the Reliability Coordinators to "field test" the definitions of SOL and IROL for the period May 1 through November 1, 2003, and recently extended the field test period until April 30, 2004. The OC also asked the Reliability Coordinators to use the OLDTF's proposed IROL report form.

As of December 2003, NERC and the Regional Councils have few reports of IROL violations. The OLDTF discussed this with the Operating Committee and suggested a number of possible reasons:

1. There were no IROL violations during the trial reporting period, or
2. IROL violations greater than 30 minutes knowingly occurred, but were not reported, or

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<sup>1</sup> Standard 200 refers to this as the Interconnection Reliability **Operating** Limit.

## Survey of Interconnected Reliability Operating Limit Determination

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3. IROL limits were properly calculated, but system operators were unaware of any IROL violations, perhaps because of a lack of proper monitoring.
4. IROL limits were improperly calculated, making it appear as though IROL violations did not occur.
5. The definitions, requirements, associated principles for operation, or reporting criteria developed by the Operating Limits Definitions Task Force is misunderstood or flawed.

The Reliability Coordinator Working Group reviewed the SOL and IROL definitions at its meeting on December 2, and then engaged in a roundtable discussion that focused on how each Reliability Coordinator calculates Interconnected Reliability Operating Limits. That discussion revealed IROL calculation methods that ranged from predetermining IROLs from off-line operations planning studies that produce static tables or “nomograms,” to near-real-time calculations using state estimators that drive contingency analysis every few minutes or as system topology changes.

The Operating Limits Definitions Task Force held a conference call on December 15 to review the discussions at the Operating Committee’s November 12 – 13 meeting and the Reliability Coordinator Working Group roundtable discussion at its December 2 meeting. The Task Force concluded that it needed more precise information from the Reliability Coordinators than was available from the roundtable discussion to pinpoint how Reliability Coordinators apply the Interconnected Reliability Operating Limit concept and calculation methods. This led to the Task Force’s decision to conduct this survey.

### ***Purpose of this survey***

The purpose of this survey is to determine how Reliability Coordinators are calculating Interconnection Reliability Operating Limits. The Operating Limits Definitions Task Force will use this information to develop a reference document on calculating Interconnected Reliability Operating Limits that Reliability Coordinators and Control Areas can use with existing NERC Operating Policy 2A, “Transmission Operations,” and eventually Reliability Authorities and Transmission Operators can use in conjunction with NERC Standard 200, “Operate Within Interconnected Reliability Operating Limits.”

### ***Survey Instructions***

Please complete the survey by entering your responses in the fields provided. No special format is needed. After completing the survey, please attach it to a email to [don.benjamin@nerc.com](mailto:don.benjamin@nerc.com).

### ***Survey Help***

If you need help completing this survey, please contact any member of the Operating Limits Definitions Task Force:

Wayne VanOsdol (MISO) – (651) 632-8413	Lynna Estep (SERC) – (704) 547-7334
James H Hartwell (NPCC) – (212) 840-1070	Al Miller (IMO) – (905) 855-6158
Steve Myers (ERCOT) – (512) 248-3077	Frank Halpin (BPA) – (503) 230-7545
Ed Pfeiffer (AMEREN) - (314) 554-3763	Bob Reed (PJM) – (610) 666-8862
Don Benjamin (NERC) – (609) 452-8060	

## Interconnected Reliability Operating Limit Survey

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Survey due date: April 5, 2004

### Reliability Coordinator:

For each question, please answer from the following two perspectives as applicable: 1.) Real-time operations, and 2.) Next-day operations.

1. How do you calculate Interconnected Reliability Operating Limits?
  - a. Thermal IROLs:
  - b. Voltage IROLs:
  - c. Stability IROLs:
2. Do you **pre-determine** these limits, or do you **calculate them in near-real-time**, or use a **combination** of calculation methods? :
  - a. If you pre-determine your IROLs...
    - i. How frequently do you recalculate or reassess pre-determined limits to ensure they remain valid? On a fixed schedule? :
    - ii. How do you update these pre-determined IROLs when successive contingencies occur (e.g., within 10 to 30 minutes of each other such as the events that occurred on August 14)? :
  - b. If you calculate your IROLs in near-real-time, what techniques do you use (e.g., state estimator plus contingency analysis)? :
    - i. What “triggers” a state estimator calculation? :
    - ii. Are IROLs calculated automatically on a fixed schedule? How often? :
    - iii. Do your study tools recalculate IROLs when the system topology changes or when contingencies occur? Automatically? Manually? :
3. Do you calculate IROLs yourself, or do you delegate that task to your control areas, transmission operators, or other organizations? :
  - a. To how many entities do you delegate this task? :
4. How far do you “look” into adjacent Reliability Coordinator areas? :
  - a. How do you determine if facilities in adjacent Reliability Coordinator areas impact calculation of IROLs in your area? :
  - b. How do you obtain transmission facility topology and operating information from adjacent areas? :



## **Survey of Interconnected Reliability Operating Limit Determination**

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- c. How up-to-date is the information you have on the status of the transmission facilities in adjacent areas? :
5. If you determine that an IROL violation exists that could involve an adjacent Reliability Coordinator area, how do you coordinate the mitigation of that IROL? Please answer from two perspectives:
  - a. An IROL violation in your area that could impact another Reliability Coordinator area,  
  
and
  - b. An IROL violation in another Reliability Coordinator area that could impact your area. :
6. Do you document or report (or both) all System Operating Limit violations? :
  - a. If so, do you report thermal, voltage, and stability SOLs? :
  - b. And if so, to whom do you report SOL violations? :
  - c. And if so, do you then determine if the SOL was also an IROL? :
7. What steps do you take when you are uncertain as to the consequences of the next contingency?

# Policy 5 — Emergency Operations

Version 3 – Draft 6

## *Policy Subsections*

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

## *Introduction*

Emergencies of varying magnitude do occur on the BULK ELECTRIC SYSTEM. These emergencies 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.

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 are expected to cooperate and take appropriate action to mitigate the severity or extent of any system disturbance.

## *Terms*

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

**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.
4. 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. Operating Authority Responsibilities

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### **Requirements**

1. **OPERATING AUTHORITY authority and responsibility.** OPERATING AUTHORITY shall have the responsibility and have clear decision making authority for reliability within its OPERATING AUTHORITY AREA and shall exercise specific authority to alleviate the emergency.
  - 1.1. The OPERATING AUTHORITY shall take immediate actions including curtailing transmission service or energy schedules, operating equipment (e.g., generators, phase shifters, breakers), shedding firm load, etc.
  - 1.2. The OPERATING AUTHORITY shall comply with RELIABILITY COORDINATOR directives unless such actions would violate safety, equipment, or regulatory or statutory requirements. Under these circumstances the OPERATING AUTHORITY must immediately inform the RELIABILITY COORDINATOR of the inability to perform the directive so that the RELIABILITY COORDINATOR may implement alternate remedial actions.
2. If the OPERATING AUTHORITY enters an unknown operating state (i.e. any state for which valid operating limits have not been determined), it will be considered to be in an emergency and shall restore operations to respect proven secure power system parameters within 30 minutes.
3. The OPERATING AUTHORITY shall inform other potentially affected OPERATING AUTHORITIES and its RELIABILITY COORDINATOR of real time or anticipated emergency conditions to facilitate emergency assistance, and take actions to avoid when possible, or mitigate the emergency.
4. OPERATING AUTHORITIES shall render all available emergency assistance requested, provided that the requesting OPERATING AUTHORITY has implemented its comparable emergency procedures, unless such actions would violate safety, equipment, or regulatory or statutory requirements
5. The OPERATING AUTHORITY shall not remove BULK ELECTRIC SYSTEM facilities from service if removing those facilities would BURDEN neighboring OPERATING AUTHORITIES unless:
  - 5.1. The OPERATING AUTHORITY first notifies the adjacent OPERATING AUTHORITIES and coordinates the impact resulting from the removal of the BULK ELECTRIC SYSTEM facility or,
  - 5.2. 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 AUTHORITY shall notify adjacent OPERATING AUTHORITIES at the earliest possible time to ensure OPERATING AUTHORITY coordination.
6. The OPERATING AUTHORITY shall make every effort to remain connected to the INTERCONNECTION. If the OPERATING AUTHORITY determines that by remaining interconnected, it is in imminent danger of uncontrolled separation, cascading outages or voltage collapse, the OPERATING AUTHORITY may take such actions, as it deems necessary, to protect its OPERATING AUTHORITY AREA.
7. The OPERATING AUTHORITY shall comply with CPS and DCS [see Policy 1A, “Control Performance Standard”] during an emergency.

## **Policy 5 — Emergency Operations**

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### **A. Operating Authority Responsibilities**

- 8.** The OPERATING AUTHORITY shall coordinate INTERCHANGE SCHEDULE changes in accordance with Policy 3, “Interchange” during an emergency.
- 9.** The OPERATING AUTHORITY shall operate within the SYSTEM OPERATING LIMITS (SOLs) and INTERCONNECTION RELIABILITY LIMITS (IRLs).
- 10.** Each CONTROL AREA shall maintain automatic generation control equipment operational and in service. [See also Policy 1E, “Automatic Generation Control Standard”]
- 11.** The OPERATING AUTHORITY shall immediately take action to restore the real and reactive power balance. If the OPERATING AUTHORITY is unable to restore its real and reactive power balance it shall request emergency assistance. If corrective actions or emergency assistance is not adequate to mitigate the real and reactive power balance, then the OPERATING AUTHORITY shall implement firm load shedding.
- 12.** The OPERATING AUTHORITY shall immediately reduce the effects of power flows through other OPERATING AUTHORITY AREAS if those flows have been identified as contributing to an operating emergency (e.g., resulting in SOL or IRL violations) in those other OPERATING AUTHORITY AREAS.

## B. Communications and Coordination

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

### **Requirements**

1. **Communications.** OPERATING AUTHORITIES shall have communications (voice and data links) to appropriate entities within its OPERATING AUTHORITY AREA, which are staffed and available to act in addressing a real time emergency condition.
2. **Coordination.** OPERATING AUTHORITIES shall notify its RELIABILITY COORDINATOR and all other potentially affected OPERATING AUTHORITIES of a condition that could threaten the reliability of its OPERATING AUTHORITY AREA through predetermined communication paths.
  - 2.1. When a condition is identified that could threaten the reliability of the INTERCONNECTION or when firm load shedding is anticipated, the affected OPERATING AUTHORITY, via its RELIABILITY COORDINATOR, 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 AUTHORITY is unable to purchase capacity or energy to meet its load and reserve requirements on a day-ahead or hour-by-hour basis.
    - 2.1.2. **SOL or IRL violation.** The OPERATING 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 AUTHORITY must prepare for the next CONTINGENCY.
    - 2.1.3. **Implementation of emergency actions.** The OPERATING AUTHORITY anticipates initiating a 3% or greater voltage reduction, public appeals for load curtailments, or firm load shedding for other than local problems.
    - 2.1.4. **Sabotage incident.** The OPERATING AUTHORITY suspects or has identified a multi-site sabotage occurrence, or single-site sabotage of a critical facility.
3. **Communications.** The OPERATING AUTHORITY shall issue directives in a clear, concise, definitive manner. The OPERATING AUTHORITY shall receive a response from the person receiving the directive that repeats the information given. The OPERATING AUTHORITY shall acknowledge the statement as correct or repeat the original statement to resolve misunderstandings.

## C. Insufficient Generating Capacity

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### [Appendix 5C – Energy Emergency Alerts]

#### **Introduction**

During a system emergency, the OPERATING AUTHORITY must 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 AUTHORITY may not rely on the frequency bias of the other CONTROL AREAS 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 AUTHORITY cannot comply with the Control Performance and Disturbance Control Standards, then it must immediately implement remedies to do so. These remedies include, but are not limited to:

1. Requesting assistance from other CONTROL AREAS
2. Declaring an ENERGY EMERGENCY through its RELIABILITY COORDINATOR
3. Load reduction, such as public appeals, voltage reductions, curtailing interruptible loads and firm loads.

#### **Requirements**

1. A CONTROL AREA 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. **Returning ACE to Acceptable Levels.** In the event of a capacity or energy deficiency, generation and transmission facilities shall be used to the fullest extent practicable to restore normal system frequency and voltage and return ACE to acceptable CPS and DCS criteria as defined in Policy 1A, “Control Performance Standard.” Using bias variables to “cover up” problems is prohibited.
  - 2.1. **Under-generation Condition.**
    - 2.1.1. **Deficient CONTROL AREA.** A CONTROL AREA is considered deficient when:
      - 2.1.1.1. All available generating capacity is loaded, and
      - 2.1.1.2. All operating reserve is utilized, and
      - 2.1.1.3. All interruptible load and interruptible exports have been interrupted, and
      - 2.1.1.4. All emergency assistance from other control areas is fully utilized, and
      - 2.1.1.5. The ACE is negative and cannot be returned to zero in the next fifteen minutes.
    - 2.1.2. Deficient CONTROL AREAS shall manually shed firm load without delay to return the ACE to zero.



## D. Transmission

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### *Introduction*

This policy:

1. Summarizes the authority, information and tools required by SYSTEM OPERATORS 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 LIMIT (IRL) violations.
3. Describes the requirement to develop procedures for the curtailment and restoration of transmission service.

### *Requirements*

1. **Relieving SOL and IRL violations.** Each OPERATING AUTHORITY experiencing or contributing to an SOL or IRL violation shall take immediate steps to relieve the condition, which may include firm load shedding.
2. **OPERATING AUTHORITIES shall not BURDEN others.** The OPERATING AUTHORITY shall ensure it operates to prevent the likelihood that a disturbance, action, or non-action will result in a SOL or IRL violation in its OPERATING AUTHORITY AREA or another area of the INTERCONNECTION. In instances where there is a difference in derived limits, the BULK ELECTRIC SYSTEM shall always be operated to the most limiting conservative parameter.
3. The OPERATING 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. Neighboring OPERATING AUTHORITIES and RELIABILITY COORDINATORS impacted by the disconnection shall be notified prior to switching, if time permits, otherwise, immediately thereafter.
5. The OPERATING 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 shall use the results of these analyses to immediately mitigate the SOL violation.



## E. System Restoration

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

### ***Introduction***

After a system collapse, restoration shall begin when the RELIABILITY COORDINATOR and its affected OPERATING AUTHORITY(IES) determine that they can proceed in an orderly and secure manner. RELIABILITY COORDINATORS 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.

Customer load shall be restored as generation and transmission equipment becomes available, recognizing that load and generation must 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 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 working in conjunction with its RELIABILITY COORDINATOR shall determine the extent and condition of the isolated area(s).
  - 1.2. **Frequency restoration.** The OPERATING 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.** INTERCHANGE SCHEDULES between CONTROL AREAS or fragments of CONTROL AREAS within the separated area shall be immediately reviewed by the RELIABILITY COORDINATOR and affected CONTROL AREAS and appropriate adjustments made in order to gain maximum assistance in restoration. Attempts shall be made to maintain the adjusted INTERCHANGE SCHEDULES whether generation control is manual or automatic.
  - 1.4. **Resynchronizing.** When voltage, frequency and phase angle permit, the OPERATING AUTHORITY may resynchronize the isolated area(s) with the surrounding area(s), upon notifying its RELIABILITY COORDINATOR and adjacent OPERATING AUTHORITIES, and considering the size of the area being reconnected and the capacity of the transmission lines effecting the reconnection. (The 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 AUTHORITY shall give high priority to restoration of off-site power to nuclear stations.
  - 1.6. **Load Shedding.** Load shall be shed in neighboring OPERATING AUTHORITY areas, where required, to permit successful interconnected system restoration.

## F. Disturbance Reporting

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[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 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, and OPERATING AUTHORITIES, Regional Councils, NERC, and regulatory agencies entitled to the information.

### *Requirements*

1. **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. **Analyzing disturbances.** BULK ELECTRIC SYSTEM disturbances shall be promptly analyzed by the affected OPERATING AUTHORITIES.
3. **Disturbance reports.** Based on the NERC and DOE disturbance reporting requirements, those OPERATING AUTHORITIES 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 Limit and Preliminary Disturbance Report form shall be submitted by the affected 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 Limit and Preliminary Disturbance Report within 24 hours. In such cases, the affected OPERATING AUTHORITY shall notify its Regional Council(s) and NERC promptly and verbally provide as much information as is available at that time. The affected 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 OPERATING AUTHORITY in which a disturbance occurred, a final report is required, the affected 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.

**F. Disturbance Reporting**

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. **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 immediately affected to provide any needed assistance in the investigation and to assist in the preparation of a final report.
  
7. **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

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### *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. **Recognizing sabotage.** Each 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 in the INTERCONNECTION.
2. **Reporting guidelines.** SYSTEM OPERATORS shall be provided with guidelines including lists of utility contact personnel, for reporting disturbances due to sabotage events.
3. **Contact with FBI and RCMP.** OPERATING AUTHORITIES 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

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Version 2, Draft 6

## ***Policy Subsections***

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

## ***Introduction***

Each OPERATING AUTHORITY 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 is responsible for using available personnel and system equipment to implement these plans to assure that interconnected systems reliability will be maintained.

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.

## A. Normal Operations

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### **Requirements**

1. Each OPERATING AUTHORITY shall plan its current-day, next-day, and seasonal operations in coordination with neighboring OPERATING AUTHORITIES so that normal INTERCONNECTION operation will proceed in an orderly and consistent manner.
  - 1.1. Each transmission and generation owner shall coordinate its current-day, next-day, and seasonal operations with its host CONTROL AREA(s).
  - 1.2. Each CONTROL AREA shall coordinate its current-day, next-day, and seasonal operations with neighboring CONTROL AREAS and with its RELIABILITY COORDINATOR.
2. **Current-day, next-day, and seasonal planning.** Each OPERATING AUTHORITY shall plan to meet:
  - 2.1. Planned changes in system configuration, generation dispatch, interchange scheduling and demand patterns.
  - 2.2. 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. Capacity and energy reserve requirements, including the deliverability/capability for any single CONTINGENCY.
  - 2.4. Voltage and/or reactive limits, including the deliverability/capability for any single CONTINGENCY.
  - 2.5. INTERCHANGE SCHEDULES. All generator owners shall operate their plant so as to adhere to ramp schedules.
  - 2.6. SYSTEM OPERATING LIMITS.
3. **BULK ELECTRIC SYSTEM studies.** CONTROL AREAS shall perform seasonal, next-day, and current-day BULK ELECTRIC SYSTEM studies to determine SYSTEM OPERATING LIMITS. Neighboring 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 CONTROL AREA operators and to its RELIABILITY COORDINATOR.
4. **Total Transfer Capability or Available Transfer Capability and transmission coordination.** The CONTROL AREA shall include known SOLs or IRLs 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. **Generator capability.** At the request of the CONTROL AREA, generator operators shall perform generating 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 CONTROL AREA operator as requested. (See also Planning Standard II.B.S1)

**A. Normal Operations**

**6. Communication of facility status.**

**6.1.** Generator operators shall immediately notify their CONTROL AREA 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.** Generation operators shall provide a forecast of expected real power output to their CONTROL AREAS to assist in operations planning at the CONTROL AREA'S request (e.g. a seven-day forecast of real output).

**6.3.** Transmission operators shall immediately notify their CONTROL AREA operators 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.** CONTROL AREA shall immediately communicate the above information to their RELIABILITY COORDINATOR.

**6.5.** Immediately shall be defined as without any intentional time delay.

**6.6. Uniform line identifiers.** Neighboring OPERATING AUTHORITIES shall use uniform line identifiers when referring to transmission facilities of an interconnected network.

**7. Computer models.** CONTROL AREAS shall maintain accurate computer models utilized for analyzing and planning system operations.

## B. Emergency Operations

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### ***Introduction***

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

### ***Requirements***

1. **Agreements for emergency assistance.** CONTROL AREAS shall have operating agreements with adjacent CONTROL AREAS that shall, at a minimum, contain provisions for emergency assistance, including provisions to obtain emergency assistance from remote CONTROL AREAS.
2. **Staffing and training.** The CONTROL AREA shall be staffed with adequately trained operating personnel. Training for 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. **Load shedding to prevent separation.** The OPERATING AUTHORITY shall have an emergency load reduction plan for all identified IRLs. The plan shall include the details on how the OPERATING AUTHORITY will implement load reduction in sufficient amount and time to mitigate the IRL violation before system separation or collapse would occur. The load reduction plan must be capable of being implemented within 30 minutes.
4. **Emergency plans.** Each CONTROL AREA shall have emergency plans that will enable it to resolve the effect of the emergency. At a minimum the CONTROL AREA'S emergency plans shall include:
  - 4.1. **Communications.** Establish communications protocols to be used during emergencies.
  - 4.2. **Controlling Actions.** Develop a list of controlling actions to resolve the emergency. Load shedding, in sufficient quantity to resolve the emergency within NERC established timelines, shall be one of the controlling actions.
  - 4.3. **Coordinating Tasks.** The tasks to be coordinated with and among adjacent CONTROL AREAS and OPERATING AUTHORITIES within the CONTROL AREA.
  - 4.4. **Staffing.** Staffing levels for the emergency.
5. The OPERATING AUTHORITY shall have emergency plans that address the following:
  - 5.1. **Insufficient Generating Capacity**
  - 5.2. **Transmission**
  - 5.3. **Load Shedding**
  - 5.4. **System Restoration**
6. The OPERATING AUTHORITY shall annually review and update each emergency plan. The OPERATING AUTHORITY shall provide a copy of its updated emergency plans to neighboring OPERATING AUTHORITIES and to its RELIABILITY COORDINATOR.



**B. Emergency Operations**

7. **Coordination of emergency plans.** Each emergency plan shall be coordinated with other OPERATING AUTHORITIES, CONTROL AREAS, and RELIABILITY COORDINATORS as appropriate. The following steps should be taken:
  - 7.1. **Communications.** Establish and maintain reliable communications between interconnected systems.
  - 7.2. **Interchange agreements.** If existing interchange agreements cannot be used, new agreements should be arranged to provide for emergency capacity or energy transfers.
  - 7.3. **Maintenance coordination.** Coordinate transmission and generator maintenance schedules to maximize capacity or 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.

**B. Emergency Operations**

12. **Requests of government.** Requests to appropriate government agencies to implement programs to achieve necessary energy reductions.
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

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### *Introduction*

After taking all other remedial steps, a system or CONTROL AREA whose integrity is in jeopardy due to insufficient generation or transmission capacity shall shed customer load rather than risk an uncontrolled failure of components or cascading outages of the INTERCONNECTION.

### *Requirements*

1. **Plans for automatic load shedding.** Each system shall establish plans for automatic load shedding.
  - 1.1. **Coordination.** Load shedding plans shall be coordinated among the interconnected systems.
  - 1.2. **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. **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. **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. **Underfrequency load shedding on separation.** After a system or CONTROL AREA separates from the INTERCONNECTION, if there is insufficient generating capacity to restore system frequency following automatic underfrequency load shedding, additional load shall be shed manually.
    - 1.2.4. **Coordination with generator, et al, tripping.** Automatic load shedding shall be coordinated throughout the Region with underfrequency isolation of generating units, tripping of shunt capacitors, and other automatic actions which will occur under abnormal frequency, voltage, or power flow conditions.
2. **Plans for manual load shedding.** Each system shall have plans for SYSTEM 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.



## D. System Restoration

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

### *Introduction*

Each OPERATING AUTHORITY and Region 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 system. This plan shall be coordinated with other 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. **Restoration plan.** Each OPERATING AUTHORITY shall have a restoration plan with necessary operating instructions and procedures to cover emergency conditions, including the loss of vital telecommunications channels.
  - 1.1. **Restoration plan update.** The restoration plan shall be reviewed annually and updated, as necessary, to reflect changes in the power system network and to correct deficiencies found during the simulated restoration exercises.
  - 1.2. **Restoring the INTERCONNECTION.** Restoration plans must be developed with the intent of restoring the integrity of the INTERCONNECTION.
  - 1.3. **Coordination.** Restoration plans shall be coordinated with neighboring systems.
  - 1.4. **Testing telecommunications.** Telecommunication facilities needed to implement the plan shall be periodically tested.
2. **SYSTEM OPERATOR training.** Operating personnel shall be trained in the implementation of the plan. Such training should include simulated exercises, if practicable.
3. **Procedure testing.** System restoration procedures shall be verified by actual testing or by simulation.
4. **Blackstart capability.** The OPERATING AUTHORITY shall ensure the availability and location of Blackstart capability within its OPERATING AUTHORITY AREA to meet the needs of the restoration plan.

### *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.

**D. System Restoration**

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.
4. **Startup and shutdown plans.** Each CONTROL AREA 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

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[Backup Control Center Reference Document]

### ***Requirement***

CONTROL AREAS and RELIABILITY COORDINATORS 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 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 has a backup control center, it should be remote from the primary control center site.

# Policy 9 – Reliability Coordinator Procedures

Version 2

## 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

## Introduction

This document contains the process and procedures that the NERC RELIABILITY COORDINATORS 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 INTERCONNECTED RELIABILITY LIMIT (IRL) violations on the transmission system. Regardless of the process, the RELIABILITY COORDINATOR shall ensure its CONTROL AREAS return their transmission system to within INTERCONNECTED RELIABILITY LIMITS as soon as possible, but no longer than 30 minutes as indicated in the requirements section of NERC Policy 2, “Transmission.”
- RELIABILITY COORDINATORS shall have the capability to monitor their responsibilities with a WIDE AREA view perspective and calculate INTERCONNECTED RELIABILITY LIMITS. WIDE AREA is described as the ability to monitor the complete RELIABILITY COORDINATOR AREA and may include critical flow and status information from adjacent RELIABILITY COORDINATOR AREAS as determined by detailed system studies. With this in mind it is likely that RELIABILITY COORDINATORS will discover IRL violations not normally seen by its TRANSMISSION OPERATING ENTITIES.

## Terms

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

**RELIABILITY COORDINATOR AREA.** That portion of the BULK ELECTRIC SYSTEM under the purview of the RELIABILITY COORDINATOR.

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

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

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

**INTERCONNECTED RELIABILITY LIMIT (IRL).** 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

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### *Requirements*

1. **RELIABILITY COORDINATOR responsibilities.** The RELIABILITY COORDINATOR is responsible for the reliable operation of its RELIABILITY COORDINATOR AREA within the BULK ELECTRIC SYSTEM in accordance with NERC, Regional and sub-Regional practices.
  - 1.1. The RELIABILITY COORDINATOR is 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. The RELIABILITY COORDINATOR shall have clear decision-making authority to act and to direct actions to be taken by other OPERATING AUTHORITIES within its RELIABILITY COORDINATOR AREA to preserve the integrity and reliability of the BULK ELECTRIC SYSTEM. These actions shall be taken within the NERC approved timelines listed in Policy 2, “Transmission.”
  - 1.3. The RELIABILITY COORDINATOR shall not delegate its responsibilities to other OPERATING AUTHORITIES or entities.
2. **Serving the interests of RELIABILITY COORDINATOR AREA and the INTERCONNECTION.** The RELIABILITY COORDINATOR shall act in the interests of reliability for the overall RELIABILITY COORDINATOR AREA and its INTERCONNECTION before the interests of any other entity (CONTROL AREA, TRANSMISSION OPERATING ENTITY, PURCHASING-SELLING ENTITY, etc.).
3. **Compliance with RELIABILITY COORDINATOR directives.** All OPERATING AUTHORITIES shall comply with RELIABILITY COORDINATOR directives unless such actions would violate safety, equipment, or regulatory or statutory requirements. Under these circumstances the OPERATING AUTHORITY must immediately inform the RELIABILITY COORDINATOR of the inability to perform the directive so that the RELIABILITY COORDINATOR may implement alternate remedial actions.
4. **Reliability Plan approval.** The NERC Operating Committee must approve the RELIABILITY COORDINATOR or Regional Reliability Plan.

## B. Responsibilities – Delegation of Tasks

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### *Requirements*

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

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

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### *Requirements*

1. In all time frames RELIABILITY COORDINATORS are responsible for the following:
  - 1.1. **Assess CONTINGENCY situations.** The RELIABILITY COORDINATOR shall coordinate operations in regards to SOLS and IRLs for real time and next day operations for its RELIABILITY COORDINATOR AREA including thermal, voltage and stability related analysis. Assessments shall be conducted, up to and including next-day, at the CONTROL AREA level with any identified potential SOL violations reported to the RELIABILITY COORDINATOR. The RELIABILITY COORDINATOR is to ensure that its WIDE AREA view is modeled to ensure coordinated operations.
  - 1.2. **Determination of IRLs.** The RELIABILITY COORDINATOR shall determine IRLs based on local, regional and interregional studies. The RELIABILITY COORDINATOR must be aware that an IRL violation can be created during multiple, normally non-critical outage conditions and, as such, the RELIABILITY COORDINATOR must be knowledgeable of events that could lead to such an occurrence. The RELIABILITY COORDINATOR is responsible for disseminating this information within its RELIABILITY COORDINATOR AREA and to neighboring RELIABILITY COORDINATORS.
  - 1.3. **Assuring OPERATING AUTHORITIES shall not BURDEN others.** The RELIABILITY COORDINATOR shall ensure that all OPERATING AUTHORITIES will operate to prevent the likelihood that a disturbance, action, or non-action in its RELIABILITY COORDINATOR AREA will result in a SOL or IRL 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 BULK ELECTRIC SYSTEM shall always be operated by the RELIABILITY COORDINATOR and its OPERATING AUTHORITIES to the most limiting conservative parameter.
  - 1.4. **Operating under known conditions.** The RELIABILITY COORDINATORS shall ensure OPERATING AUTHORITIES always operate their OPERATING AUTHORITY AREA under known and studied conditions and also ensure they reassess and reposture their systems following CONTINGENCY events within approved timelines, regardless of the number of CONTINGENCY events that occur or the status of their monitoring, operating and analysis tools.
  - 1.5. **Total Transfer Capability or Available Transfer Capability and transmission coordination.** The RELIABILITY COORDINATOR shall make known to OPERATING AUTHORITIES within its RELIABILITY COORDINATOR AREA, SOLs or IRLs within its WIDE AREA view. The OPERATING AUTHORITY shall respect these SOLs or IRLs in accordance with filed tariffs and regional TTC/ATC calculation processes.
  - 1.6. **Communications.** The RELIABILITY COORDINATOR shall issue directives in a clear, concise, definitive manner. The RELIABILITY COORDINATOR shall receive a response from the person receiving the directive that repeats the information given. The RELIABILITY COORDINATOR shall acknowledge the statement as correct or repeat the original statement to resolve misunderstandings.

## D. Next-Day Operations

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### **Requirements**

1. **Performing reliability analysis and system studies.** The RELIABILITY COORDINATOR shall conduct next-day reliability analyses for its RELIABILITY COORDINATOR AREA to ensure that the BULK ELECTRIC SYSTEM can be operated reliably in anticipated normal and CONTINGENCY event conditions. The RELIABILITY COORDINATOR shall conduct CONTINGENCY analysis studies to identify potential interface and other SOL and IRL violations, including overloaded transmission lines and transformers, voltage and stability limits, etc. The RELIABILITY COORDINATOR shall pay particular attention to parallel flows to ensure one RELIABILITY COORDINATOR AREA does not place an unacceptable or undue BURDEN on an adjacent RELIABILITY COORDINATOR AREA.
2. **Sharing information.** Each OPERATING ENTITY in the RELIABILITY COORDINATOR 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. **Performing system studies.** The RELIABILITY COORDINATOR shall conduct CONTINGENCY analysis studies to identify potential interface and other SOL and IRL violations, including overloaded transmission lines and transformers, voltage and stability limits, etc. The RELIABILITY COORDINATOR shall pay particular attention to parallel flows to ensure one RELIABILITY COORDINATOR AREA does not place an unacceptable or undue BURDEN on an adjacent RELIABILITY COORDINATOR AREA.
4. **Developing action plans.** The RELIABILITY COORDINATOR shall, in conjunction with its OPERATING AUTHORITIES, develop action plans that may be required including reconfiguration of the transmission system, redispatching of generation, reduction or curtailment of INTERCHANGE TRANSACTIONS, or reducing firm load to return transmission loading to within acceptable SOLs or IRLs.
5. **Sharing study results.** The RELIABILITY COORDINATOR shall share the results of its system studies, when conditions warrant or upon request, with other RELIABILITY COORDINATORS, and OPERATING AUTHORITIES within its RELIABILITY COORDINATION AREA. 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.
6. **Communication of results of next-day reliability analyses.** Whenever conditions warrant, the RELIABILITY COORDINATOR shall initiate a conference call or other appropriate communications to address the results of its reliability analyses.
7. **Alerts.** If the results of these studies indicate potential SOL or IRL violations, the RELIABILITY COORDINATORS shall issue the appropriate alerts via the Reliability Coordinator Information System (RCIS) and direct their OPERATING AUTHORITIES to take any necessary action the RELIABILITY COORDINATOR deems appropriate to address the potential SOL or IRL violation.
8. **OPERATING AUTHORITY Response.** OPERATING AUTHORITIES shall comply with the directives of its RELIABILITY COORDINATOR based on the next day assessments in the same manner in which the OPERATING AUTHORITY would comply during real time operating events.

## E. Current-Day Operations

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### *Requirements*

#### 1. Monitoring and Coordination

- 1.1. **WIDE AREA view.** The RELIABILITY COORDINATOR shall monitor all BULK ELECTRIC SYSTEM facilities within its RELIABILITY COORDINATOR AREA and adjacent RELIABILITY COORDINATOR AREAS as necessary to ensure that, at any time, regardless of prior planned or unplanned events, the RELIABILITY COORDINATOR is able to determine any potential SOL and IRL violations within its RELIABILITY COORDINATOR AREA. This responsibility may require RELIABILITY COORDINATORS to receive sub-transmission information not normally monitored by their Energy Management System to assist in IRL determination.
  - 1.1.1. **WIDE AREA view – coordination.** When a neighboring RELIABILITY COORDINATOR is aware of an external operational concern, such as a neighboring IRL violation, the neighboring RELIABILITY COORDINATOR shall contact the host RELIABILITY COORDINATOR. They shall coordinate any actions, including emergency assistance, required by the host RELIABILITY COORDINATOR in mitigating the operational concern.
- 1.2. **Facility status.** The RELIABILITY COORDINATOR must know the status of all current critical facilities whose failure, degradation or disconnection could result in an SOL or IRL violation. RELIABILITY COORDINATORS must also know the status of any facilities that may be required to assist area restoration objectives.
- 1.3. **Situational awareness.** The RELIABILITY COORDINATOR shall be continuously aware of conditions within its RELIABILITY COORDINATOR AREA and include this information in its reliability assessments. To accomplish this objective the RELIABILITY COORDINATOR shall monitor its RELIABILITY COORDINATOR AREA parameters, including but not limited to the following:
  - 1.3.1. Current status of BULK ELECTRIC SYSTEM elements (transmission or generation including critical auxiliaries such as AVRs and SPS schemes) 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 IRL 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 IRL including the plan's viability and scope
  - 1.3.4. System real and reactive reserves, (actual versus requirements)
  - 1.3.5. Capacity and energy adequacy conditions
  - 1.3.6. Current ACE for all its CONTROL AREAS
  - 1.3.7. Current local or TLR procedures in effect
  - 1.3.8. Planned generation dispatches

E. Current-Day Operations

1.3.9. Planned transmission or generation outages

1.3.10. CONTINGENCY events

1.4. **BULK ELECTRIC SYSTEM monitoring.** The RELIABILITY COORDINATOR shall monitor BULK ELECTRIC SYSTEM parameters that may have significant impacts upon the RELIABILITY COORDINATOR AREA and with neighboring RELIABILITY COORDINATOR AREAS with respect to:

1.4.1. **INTERCHANGE TRANSACTION information.** The RELIABILITY COORDINATOR shall be aware of all INTERCHANGE TRANSACTIONS that wheel-through, source, or sink in its RELIABILITY COORDINATOR AREA and make that INTERCHANGE TRANSACTION information available to all RELIABILITY COORDINATORS in the INTERCONNECTION. (Note: This requirement is satisfied by the Interchange Distribution Calculator and E-Tag process for the Eastern INTERCONNECTION.)

1.4.2. **Pending INTERCHANGE SCHEDULES to identify potential flow impacts.** As portions of the transmission system approach or exceed SOLS or IRLS, the RELIABILITY COORDINATOR shall work with the OPERATING AUTHORITIES to evaluate and assess any additional INTERCHANGE SCHEDULES that would violate those limits. If the potential or actual SOL or IRL violation cannot be avoided through proactive intervention, the RELIABILITY COORDINATOR shall initiate control actions or emergency procedures to relieve the violation consistent within the NERC-approved timelines in Policy 2, “Transmission.” All resources, including load shedding shall be available to the RELIABILITY COORDINATOR in addressing a potential or actual SOL or IRL violation.

1.4.3. **Availability/shortage of OPERATING RESERVES needed to maintain reliability.** The RELIABILITY COORDINATOR shall monitor CONTROL AREA parameters to ensure that the required amount of OPERATING RESERVES are provided and available as required to meet NERC CPS and DCS requirements. If necessary, the RELIABILITY COORDINATOR shall direct the CONTROL AREAS in the RELIABILITY COORDINATOR AREA to arrange for assistance from neighboring areas (CONTROL AREAS, REGIONS, etc.). The RELIABILITY COORDINATOR shall issue ENERGY EMERGENCY Alerts, as needed, and at the request of LOAD SERVING ENTITIES.

1.4.4. **Actual flows versus limits.** The RELIABILITY COORDINATOR shall identify the cause of the potential or actual SOL or IRL violation and initiate the control action or emergency procedure to relieve the potential or actual SOL or IRL violation consistent with the NERC approved timelines in Policy 2, “Transmission.” All resources, including load shedding, shall be available to the RELIABILITY COORDINATOR in addressing a SOL or IRL violation.

1.4.5. **Time error correction and SMD notification.** The RELIABILITY COORDINATOR will communicate start and end times for time error corrections to the CONTROL AREAS within its RELIABILITY AREA. The RELIABILITY COORDINATOR will ensure all CONTROL AREAS are aware of Solar-Magnetic Disturbance (SMD) forecast information and assist as needed in the development of any required response plans.

1.4.6. **RELIABILITY COORDINATOR coordination with other Regions.** The RELIABILITY COORDINATOR will participate in NERC Hotline discussions, assist

E. Current-Day Operations

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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 will disseminate information within its RELIABILITY COORDINATOR AREA.

- 1.4.7. System frequency and resolution of significant frequency errors, deviations, and real-time trends.** The RELIABILITY COORDINATOR shall monitor system frequency and its CONTROL AREAS' performance and direct any necessary rebalancing to return to CPS and DCS compliance. All resources, including firm load shedding, shall be utilized as directed by a RELIABILITY COORDINATOR to relieve the emergent condition.
- 1.4.8. Sharing with other RELIABILITY COORDINATORS any information regarding potential, expected, or actual critical operating conditions that could negatively impact other RELIABILITY COORDINATOR AREAS.** The RELIABILITY COORDINATOR shall coordinate with other RELIABILITY COORDINATORS and CONTROL AREAS, as needed, to develop and implement action plans to mitigate potential or actual SOL, IRL, CPS or DCS violations. This would include coordination of pending generation and transmission maintenance outages in both the real time and next day reliability analysis timeframes.
- 1.4.9. Availability or shortage of Interconnected Operations Services required (in applicable RELIABILITY COORDINATOR AREAS).** As necessary, the RELIABILITY COORDINATOR shall assist the CONTROL AREAS in its RELIABILITY AREA in arranging for assistance from neighboring RELIABILITY COORDINATOR AREAS or CONTROL AREAS.
- 1.4.10. Individual CONTROL AREA or RELIABILITY COORDINATOR AREA ACE (in applicable RELIABILITY AREAS).** The RELIABILITY COORDINATOR will identify sources of large ACE deviations that may be contributing to frequency, time error, or inadvertent problems and will discuss corrective actions with the appropriate CONTROL AREA operator. If a frequency, time error, or inadvertent problem occurs outside of the RELIABILITY COORDINATOR AREA, the RELIABILITY COORDINATOR will initiate a NERC Hotline call to discuss the frequency, time error, or inadvertent problem with other RELIABILITY COORDINATORS. The RELIABILITY COORDINATOR shall direct its CONTROL AREAS to comply with CPS and DCS as indicated in section 1.4.7 above.
- 1.4.11. Use of Special Protection Systems (in applicable RELIABILITY COORDINATOR AREAS).** Whenever a Special Protection System that may have an inter-CONTROL AREA or inter-RELIABILITY COORDINATOR AREA impact (e.g. could potentially affect transmission flows resulting in a SOL or IRL violation) is armed, the RELIABILITY COORDINATORS shall be aware of the impact of the operation on inter-Area flows. The RELIABILITY COORDINATOR shall be kept informed of the status of the SPS scheme including any degradation or potential failure to operate as expected.
- 1.5. Communication with RELIABILITY COORDINATORS of potential problems.** The RELIABILITY COORDINATOR who foresees a transmission problem (such as an SOL or IRL violation, loss of reactive reserves, etc.) within its RELIABILITY COORDINATOR AREA shall issue an alert to all CONTROL AREAS and TRANSMISSION OPERATING ENTITIES in its RELIABILITY AREA, and all RELIABILITY COORDINATORS within the



**E. Current-Day Operations**

INTERCONNECTION via the Reliability Coordinator Information System without delay. RELIABILITY COORDINATOR will disseminate this information to their OPERATING AUTHORITIES.

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

## F. Emergency Operations

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### **Requirements**

1. **Mitigating SOL and IRL violations.** Regardless of the process used, the RELIABILITY COORDINATOR shall direct its OPERATING AUTHORITIES to return the transmission system to within the SOL or IRL as soon as possible, but no longer than 30 minutes, as indicated in Policy 2, “Transmission.” With this in mind, RELIABILITY COORDINATORS and their OPERATING AUTHORITIES must be aware that Transmission Loading Relief (TLR) procedures may not be able to address the SOL or IRL violation in a timely fashion. Under these circumstances other actions such as reconfiguration, redispatch or load shedding may be necessary until the relief requested by the TLR process is achieved. In these instances the RELIABILITY COORDINATOR shall direct and OPERATING AUTHORITIES shall comply with the more timely requests.
2. **Implementing emergency procedures.** If the RELIABILITY COORDINATOR deems that SOL or IRL violations are imminent, the RELIABILITY COORDINATOR shall have the authority and obligation to immediately direct its OPERATING AUTHORITIES to redispatch generation, reconfigure transmission, manage INTERCHANGE TRANSACTIONS, or reduce system demand to mitigate the SOL or IRL violation until INTERCHANGE TRANSACTIONS can be reduced utilizing a transmission loading relief procedure, or other procedures, to return the system to a reliable state. The RELIABILITY COORDINATOR shall coordinate these emergency procedures with other RELIABILITY COORDINATORS as needed. [See also Policy 5, “Emergency Operations”]
3. **Implementing relief procedures.** If transmission loading progresses or is projected to violate a SOL or IRL, the RELIABILITY COORDINATOR will perform the following procedures as necessary:
  - 3.1. **Selecting transmission loading relief procedure.** The RELIABILITY COORDINATOR experiencing a potential or actual SOL or IRL violation on the transmission system within its RELIABILITY COORDINATOR 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
  - 3.2. **Using local transmission loading relief procedure.** The RELIABILITY COORDINATOR may use local transmission loading relief or congestion management procedures, provided the TRANSMISSION OPERATING ENTITY experiencing the potential or actual SOL or IRL violation is a party to those procedures.
  - 3.3. **Using with an INTERCONNECTION-wide procedure.** A RELIABILITY COORDINATOR may implement a local transmission loading relief or congestion management procedure simultaneously with an INTERCONNECTION-wide procedure. However, the RELIABILITY COORDINATOR is obligated to follow the curtailments as directed by the INTERCONNECTION-wide procedure. If the RELIABILITY COORDINATOR desires to use a local procedure as a substitute for curtailments as directed by the INTERCONNECTION-wide procedure, it may do so only if such use is approved by the NERC Operating Reliability Subcommittee and Operating Committee.
  - 3.4. **Complying with procedures.** When implemented, all RELIABILITY COORDINATORS shall comply with the provisions of the INTERCONNECTION-wide procedure. This may include action by RELIABILITY COORDINATORS in other INTERCONNECTIONS to, for

**F. Emergency Operations Requirements**

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example, curtail an INTERCHANGE TRANSACTION that crosses an INTERCONNECTION boundary.

- 3.5. Complying with interchange policies.** During the implementation of relief procedures, and up to the point that emergency action is necessary, RELIABILITY COORDINATORS and OPERATING AUTHORITIES shall comply with the Requirements of Policy 3, “Interchange.”
- 4. Determining causes of Interconnection frequency error.** Any FREQUENCY MONITOR 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 RCIS, to determine the CONTROL AREA(S) with the energy emergency or control problem.
- 4.1.** If a RELIABILITY COORDINATOR determines that one or more of its CONTROL AREAS is contributing to the frequency error, the associated RELIABILITY COORDINATOR shall direct those CONTROL AREA(S) to immediately comply with CPS and DCS requirements by using all resources available to it, including load shedding. The CONTROL AREA(S) shall comply with the RELIABILITY COORDINATOR request.
- 5. Authority to provide emergency assistance.** The RELIABILITY COORDINATOR shall have the authority to take or direct whatever action is needed to mitigate an energy emergency within its RELIABILITY COORDINATOR AREA including load shedding. OPERATING AUTHORITIES shall ensure the direction of the RELIABILITY COORDINATOR is implemented as directed. RELIABILITY COORDINATORS shall provide assistance to other RELIABILITY COORDINATORS experiencing an energy emergency in accordance with Appendix 5C, Subsection A, “Energy Emergency Alerts.”
- 6. Communication of Energy Emergencies.** Each Reliability Coordinator that is experiencing a potential or actual Energy Emergency within any CONTROL AREA, Reserve-Sharing Group, or LOAD-SERVING ENTITY within its RELIABILITY COORDINATOR AREA shall initiate an Energy Emergency Alert as detailed in Appendix 5C, Subsection A – “Energy Emergency Alert Levels.” The RELIABILITY COORDINATOR shall also act to mitigate the emergency condition, including a request for emergency assistance if required.

## G. System Restoration

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### *Requirements*

1. The RELIABILITY COORDINATOR shall be aware of each OPERATING AUTHORITY'S restoration plan in its RELIABILITY COORDINATOR AREA in accordance with NERC and Regional requirements. During system restoration, the RELIABILITY COORDINATOR shall monitor restoration progress and coordinate any needed assistance.
2. The RELIABILITY COORDINATOR shall have a RELIABILITY COORDINATOR AREA restoration plan that provides for appropriate coordination between individual OPERATING AUTHORITY restoration plans and that ensures reliability is maintained during system restoration events.
3. The RELIABILITY COORDINATOR shall serve as the primary contact for disseminating information regarding restoration to neighboring RELIABILITY COORDINATORS and OPERATING AUTHORITIES not immediately involved in restoration.
4. RELIABILITY COORDINATORS shall approve, communicate and coordinate the re-parallelizing of major system islands or paralleling points that could potentially have an adverse impact on an adjacent OPERATING AUTHORITIES or RELIABILITY COORDINATORS.
  - 4.1. **Reestablishing normal operations.** The RELIABILITY COORDINATOR shall take actions in accordance with its restoration plan to restore normal operations once an operating emergency has been resolved.

## H. Coordination Agreements and Data Sharing

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### *Requirements*

- 1. Coordination agreements.** The RELIABILITY COORDINATOR must have clear, comprehensive coordination agreements with adjacent RELIABILITY COORDINATORS to ensure that SOL or IRL violation mitigation requiring actions in adjacent RELIABILITY COORDINATOR AREAS are coordinated.
- 2. Data requirements.** The RELIABILITY COORDINATOR shall determine the data requirements to support its reliability coordination tasks and shall request such data from its OPERATING AUTHORITIES or adjacent RELIABILITY COORDINATORS, in accordance with the provisions of Policy 4, “System Coordination.”
- 3. Data exchange.** The RELIABILITY COORDINATOR or its OPERATING AUTHORITIES shall provide, or arrange provisions for, data exchange to other RELIABILITY COORDINATORS or OPERATING AUTHORITIES via the Interregional Security Network or RCIS network as required by NERC policy.

## I. Facility

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### **Requirements**

1. RELIABILITY COORDINATORS shall have the facilities to perform their responsibilities, including:
  - 1.1. **Communications.** RELIABILITY COORDINATORS shall have adequate communications (voice and data links) to appropriate entities within its RELIABILITY COORDINATOR AREA, which are staffed and available to act in addressing a real time emergency condition.
  - 1.2. **Timely dissemination of information.** This includes multi directional capabilities between an OPERATING AUTHORITY and its RELIABILITY COORDINATOR and also from a RELIABILITY COORDINATOR to its neighboring RELIABILITY COORDINATOR(S) for both voice and data exchange as required to meet reliability needs of the INTERCONNECTION.
  - 1.3. **Monitoring capability.** Detailed real-time monitoring capability of the RELIABILITY COORDINATOR AREA and sufficient monitoring capability of the surrounding RELIABILITY COORDINATOR AREAS to ensure that potential or actual SOL or IRL violations are identified. Monitoring systems shall provide information that can be easily understood and interpreted by the RELIABILITY COORDINATOR, 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. RELIABILITY COORDINATORS shall monitor BULK ELECTRIC SYSTEM elements (generators, transmission lines, busses, transformers, breakers, etc.) that could result in SOL or IRL violations within its RELIABILITY COORDINATOR AREA. This monitoring overview shall include 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 IRLs and system restoration requirements within its RELIABILITY COORDINATOR AREA.
  - 1.4. **Study and analysis tools.**
    - 1.4.1. **Analysis tools.** The RELIABILITY COORDINATOR 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 AREA.** The RELIABILITY COORDINATOR shall continuously monitor its RELIABILITY COORDINATOR AREA. This includes the provisions for backup facilities that shall be exercised if the main monitoring system is unavailable. Backup provisions shall ensure SOL and IRL monitoring and derivations continues if the main monitoring system is unavailable.
    - 1.4.3. **Availability of analysis capabilities.** RELIABILITY COORDINATOR analysis tools shall be under the control of the RELIABILITY COORDINATOR, including approvals for planned maintenance. Procedures shall be in place to mitigate the affects of analysis tool outages.

## J. Staffing

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### Requirements

1. RELIABILITY COORDINATORS shall have adequate staff and facilities:
  - 1.1. **Staffing and training.** The RELIABILITY COORDINATOR shall be staffed with adequately trained and NERC-Certified RELIABILITY COORDINATOR operators, 24 hours/day, seven days/week. The RELIABILITY COORDINATOR must have detailed knowledge of its RELIABILITY COORDINATOR AREA, its facilities, and associated OPERATING AUTHORITIES' processes including emergency procedures and restoration objectives. Training for RELIABILITY COORDINATOR 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.
  - 1.2. **Knowledge of the RELIABILITY COORDINATOR AREA.** The RELIABILITY COORDINATOR shall have a comprehensive understanding of its RELIABILITY COORDINATOR AREA and interaction with neighboring RELIABILITY COORDINATOR AREAS. Although OPERATING AUTHORITIES have the most detailed knowledge of their particular systems, the RELIABILITY COORDINATOR must have an extensive understanding of the OPERATING AUTHORITIES within its RELIABILITY COORDINATOR AREA, such as staff, operating practices and procedures, restoration priorities and objectives, outage plans, equipment capabilities and restrictions. The RELIABILITY COORDINATOR shall place particular attention on SOLs and IRLs and intertie facility limits. The RELIABILITY COORDINATOR shall ensure protocols are in place to allow the RELIABILITY COORDINATOR to have the best available information at all times.
  - 1.3. **Standards of Conduct.** The entity responsible for the RELIABILITY COORDINATOR function shall sign and adhere to the NERC RELIABILITY COORDINATOR Standards of Conduct.

The minimum training requirements shall be moved to Policy 8 upon its next revision.

**Implementation Plan for Standard 200 – Operate Within Interconnection Reliability  
Operating Limits**

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**Implementation Plan Contents:**

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## **Implementation Plan for Standard 200 – Operate Within Interconnection Reliability Operating Limits**

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### **Prerequisite Approvals**

The Determine Facility Ratings, System Operating Limits and Transfer Capabilities Standard must be implemented before this standard can be implemented.

### **Applicability during Transition to Functional Model**

The requirements in Standard 200 apply to entities performing various electric system functions, as defined in the functional model approved by the NERC Board of Trustees in June 2001. NERC is now developing standards and procedures for the identification and certification of such entities. Until that identification and certification is complete, these standards apply to the existing entities (such as control areas, transmission owners and operators, and generation owners and operators) that are currently performing the defined functions.

## Implementation Plan for Standard 200 – Operate Within Interconnection Reliability Operating Limits

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### Retirement of Sections of Operating Policies

Many elements contained in Standard 200 address the same or similar performance objectives as sections of Operating Policy 2, Operating Policy 4, Operating Policy 5 and Operating Policy 9. To eliminate duplication and minimize confusion, the following sections of existing Operating Policies should be retired when this standard is implemented. Justification for these retirements is provided in the tables on the following pages.

#### Operating Policy 2:

- Standard A.1
- Standard A.1.2
- Standard A.2
- Requirement A.1 (just last 2 bullets)
- Requirement A.1.1
- Requirement A.1.2
- Requirement B.5

#### Operating Policy 4:

- Requirement A.1
- Requirement B.3
- Requirement B.3.1
- Requirement B.4
- Requirement B.4.1
- Appendix 4BA

#### Operating Policy 5:

- Requirement 5.C.1
- Requirement 5.C.2

#### Operating Policy 9:

- Requirement A.1
- Requirement A.1.1
- Requirement A.1.2

#### Other Changes:

- Operating Policy 4, Requirement A.2 should be ‘tagged’ to note that the requirement is no longer applicable to system operators working for entities performing the Reliability Authority function, but is still applicable to system operators working for entities performing the Transmission Operator function.



**Implementation Plan for Standard 200 – Operate Within Interconnection Reliability Operating Limits**

**Policy Retirements or Revisions**

The following tables identify the sections of existing Operating Policies that shall be retired when this standard is implemented.

Policy 2 – Transmission Language in Policy	Standard 200 Replacement Requirement
<p><b>Standard A.1.</b>  <b>Basic reliability requirement regarding single contingencies.</b> All CONTROL AREAS shall operate so that instability, uncontrolled separation, or cascading outages will not occur as a result of the most severe single contingency.</p>	<p>204. 1.1 The Reliability Authority shall act or direct others to act to:</p> <ul style="list-style-type: none"> <li>- Prevent instances where Interconnection Reliability Operating Limits may be exceeded</li> <li>- Mitigate the magnitude and duration of instances where Interconnection Reliability Operating Limits have been exceeded</li> </ul>
<p><b>Standard A .1 .2.</b>  <b>Operating Security Limits.</b> Operating Security Limits define the acceptable operating boundaries.</p>	<p>201.1 The Reliability Authority shall identify and document which facilities (or groups of facilities) in the Reliability Authority’s reliability area are subject to Interconnection Reliability Operating Limits.</p> <p>201.2 The Reliability Authority shall identify each Interconnection Reliability Operating Limit within the Reliability Authority’s reliability area.</p> <ul style="list-style-type: none"> <li>- The Reliability Authority shall identify a <math>T_v</math> for each Interconnection Reliability Operating Limit.</li> </ul>
<p><b>Standard A.2.</b>  <b>Return from OPERATING SECURITY LIMIT Violation.</b> Following a contingency or other event that results in an OPERATING SECURITY LIMIT violation, the CONTROL AREA shall return its transmission system to within OPERATING SECURITY LIMITS soon as possible, but no longer than 30 minutes.</p>	<p>204.1.1 The Reliability Authority shall act or direct others to act to:</p> <ul style="list-style-type: none"> <li>- Prevent instances where Interconnection Reliability Operating Limits may be exceeded</li> <li>- Mitigate the magnitude and duration of instances where Interconnection Reliability Operating Limits have been exceeded</li> </ul>

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Policy 2 – Transmission Language in Policy	Standard 200 Replacement
<p><b>Requirement A.1.</b> Policies for dealing with transmission security. CONTROL AREAS, 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:</p> <ul style="list-style-type: none"> <li>- Equipment ratings</li> <li>- Monitoring and controlling voltage levels and real and reactive power flows</li> <li>- Switching transmission elements</li> <li>- Planned outages of transmission elements</li> <li>- <b>Development of Operating Security Limits</b></li> <li>- <b>Responding to OPERATING SECURITY LIMIT violations.</b></li> </ul>	<p><i>(Only highlighted items should be retired.)</i></p> <p>201.1 The Reliability Authority shall identify and document which Facilities (or groups of Facilities) in its Reliability Authority Area are subject to Interconnection Reliability Operating Limits<sup>1</sup>.</p> <p>201.2 The Reliability Authority shall identify Interconnection Reliability Operating Limits for its Reliability Authority Area. Each Interconnection Reliability Operating Limit shall have a T<sub>v</sub> that is smaller than or equal to 30 minutes.</p> <p>201.3 All Reliability Authorities that share a Facility (or group of Facilities) subject to an Interconnection Reliability Operating Limit shall agree upon the process used to determine that Interconnection Reliability Operating Limit and its associated T<sub>v</sub></p> <p>207.1.1 The Reliability Authority shall have one or more processes, procedures or plans that identify actions it shall take or actions it shall direct others to take, for both prevention and mitigation of instances of exceeding its Interconnection Reliability Operating Limits.</p> <p><i>(Operating Security Limits that, when exceeded may cause instability and cascading outages on the bulk electric system have now been defined as Interconnection Reliability Operating Limits (IROLs) within this standard.)</i></p>
<p><b>Requirement A.1.1.</b> Responsibility for transmission security. When OPERATING SECURITY LIMIT violations occur, or are expected to occur, the CONTROL AREAS affected by and the CONTROL AREAS contributing to these violations shall implement established joint actions to restore transmission security.</p>	<p>204.1.1 The Reliability Authority shall, without delay, act or direct others to act to:</p> <ul style="list-style-type: none"> <li>- Prevent instances where Interconnection Reliability Operating Limits may be exceeded</li> <li>- Mitigate the magnitude and duration of instances where Interconnection Reliability Operating Limits have been exceeded</li> </ul>

<sup>1</sup> Each IROL is developed by following the requirements in the Determine Facility Ratings, System Operating Limits and Transfer Capabilities Standard.

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Policy 2 – Transmission Language in Policy	Standard 200 Replacement
<p><b>Requirement A.1.2.</b> Action to keep transmission within limits. CONTROL AREAS shall take all appropriate action up to and including shedding of firm load in order to comply with Standard 2.A.2.</p>	<p>204.1.1 The Reliability Authority shall, without delay, act or direct others to act to:</p> <ul style="list-style-type: none"> <li>- Prevent instances where Interconnection Reliability Operating Limits may be exceeded</li> <li>- Mitigate the magnitude and duration of instances where Interconnection Reliability Operating Limits have been exceeded</li> </ul> <p>208.1.1 The Transmission Operator, Balancing Authority and Interchange Authority shall follow the Reliability Authority’s directives to:</p> <ul style="list-style-type: none"> <li>- Prevent instances where Interconnection Reliability Operating Limits may be exceeded</li> <li>- Mitigate the magnitude and duration of instances where Interconnection Reliability Operating Limits have been exceeded</li> </ul>
<p><b>Requirement B.5.</b> <b>Preventing Voltage Collapse.</b> The SYSTEM OPERATOR shall take corrective action, including load reduction, necessary to prevent voltage collapse when reactive resources are insufficient.</p>	<p>204.1.1 The Reliability Authority shall act or direct others to act to:</p> <ul style="list-style-type: none"> <li>- Prevent instances where Interconnection Reliability Operating Limits may be exceeded</li> <li>- Mitigate the magnitude and duration of instances where Interconnection Reliability Operating Limits have been exceeded</li> </ul> <p><i>(Note that IROLs may be voltage limits)</i></p>

**Implementation Plan for Standard 200 – Operate Within Interconnection Reliability Operating Limits**

<p align="center"><b>Policy 4 – System Coordination</b></p> <p align="center"><b>Language in Policy</b></p>	<p align="center"><b>Standard 200 Replacement</b></p>
<p><b>Section A – Monitoring System Conditions</b>  <b>Requirement A.1 Resources.</b> The system operator shall be kept informed of all generation and transmission resources available for use.</p>	<p><i>Keep for transmission operator’s system operators</i></p> <p>205.1.1 The Reliability Authority shall specify and collect the data it needs to support Real-Time Monitoring, Operational Planning Analyses, and Real-Time Assessments conducted relative to operating within its reliability area’s Interconnection Reliability Operating Limits. The Reliability Authority shall collect this data from the entities performing functions that have Facilities monitored by the Reliability Authority, and from entities that provide Real-time Facility status to the Reliability Authority. This includes specifying and collecting data from the following:</p> <ul style="list-style-type: none"> <li>- Balancing Authorities</li> <li>- Generator Owners</li> <li>- Generator Operators</li> <li>- Reliability Authorities</li> <li>- Transmission Operators</li> <li>- Transmission Owners</li> <li>- Load Serving Entities</li> </ul>
<p><b>Requirement A.2 Transmission status and data.</b> System operators shall monitor transmission line status, MW and MVAR flows, voltage, LTC settings and status of rotating and static reactive resources</p>	<p><i>Keep for transmission operator’s system operators</i></p> <p>202.1.1 The Reliability Authority shall perform Real-time Monitoring of system operating parameters to determine if the Reliability Authority Area is operating within its Interconnection Reliability Operating Limits.</p>

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<p align="center"><b>Policy 4 – System Coordination</b></p> <p align="center"><b>Language in Policy</b></p>	<p align="center"><b>Standard 200 Replacement</b></p>
<p><b>B3 – Data required from control areas</b></p> <p><b>3. Data required from Control Areas.</b> Each CONTROL AREA shall provide its SECURITY COORDINATOR(S) with the Electric System Security Data that is necessary to allow THE SECURITY COORDINATOR(S) to perform its operational security assessments and coordinate reliable operations.</p> <p><b>3.1 Data.</b> CONTROL AREAS shall provide the types of data as listed in Appendix 4B, “Electric System Security Data, Section A, Electric System Security Data”, unless otherwise agreed to by the CONTROL AREAS and their SECURITY COORDINATOR(S).</p>	<p>206.1.1 Each entity performing one of the following functions shall provide data, as specified, to the Reliability Authority(ies) with which it has a reliability relationship.</p> <ul style="list-style-type: none"> <li>- Balancing Authorities</li> <li>- Generator Owners</li> <li>- Generator Operators</li> <li>- Reliability Authorities</li> <li>- Transmission Operators</li> <li>- Transmission Owners</li> <li>- Load Serving Entities</li> </ul>
<p><b>4. Data exchange among SECURITY COORDINATORS.</b> Upon request, SECURITY COORDINATORS shall, via the ISN, exchange with each other Electric Security Data that is necessary to allow the SECURITY COORDINATORS to perform their operational security assessments and coordinate their reliable operations.</p>	<p>206.1.1 Each entity performing one of the following functions shall provide data, as specified, to the Reliability Authority(ies) with which it has a reliability relationship.</p> <ul style="list-style-type: none"> <li>- Balancing Authorities</li> <li>- Generator Owners</li> <li>- Generator Operators</li> <li>- Reliability Authorities</li> <li>- Transmission Operators</li> <li>- Transmission Owners</li> <li>- Load Serving Entities</li> </ul>



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<p align="center"><b>Policy 4 – System Coordination</b></p> <p align="center"><b>Language in Policy</b></p>	<p align="center"><b>Standard 200 Replacement</b></p>
<p><b>4.1. Data.</b> SECURITY COORDINATORS shall share with each other the types of data as listed in Appendix 4B, “Electric System Security Data, Section A, Electric System Security Data”, unless otherwise agreed to.</p>	<p>206.1.1 Each entity performing one of the following functions shall provide data, as specified, to the Reliability Authority(ies) with which it has a reliability relationship.</p> <ul style="list-style-type: none"> <li>- Balancing Authorities</li> <li>- Generator Owners</li> <li>- Generator Operators</li> <li>- Reliability Authorities</li> <li>- Transmission Operators</li> <li>- Transmission Owners</li> <li>- Load Serving Entities</li> </ul>

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<p><b>Appendix 4BA</b></p>	<p>205.1.1 The Reliability Authority shall specify and collect the data it needs to support Real-Time Monitoring, Operational Planning Analyses And Real-Time Assessments conducted relative to operating within its Reliability Authority Area’s Interconnection Reliability Operating Limits. The Reliability Authority shall collect this data from the entities performing functions that have Facilities monitored by the Reliability Authority, and from entities that provide Real-time Facility status to the Reliability Authority. This includes specifying and collecting data from the following:</p> <ul style="list-style-type: none"> <li>- Balancing Authorities</li> <li>- Generator Owners</li> <li>- Generator Operators</li> <li>- Reliability Authorities</li> <li>- Transmission Operators</li> <li>- Transmission Owners</li> <li>- Load Serving Entities</li> </ul>
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<p><b>Policy 5 – Emergency Operations Language in Policy</b></p>	<p><b>Standard 200 Replacement</b></p>
<p><b>Requirement 5.C.1. Relieving security limit violations.</b> Each CONTROL AREA experiencing or materially contributing to an OPERATING SECURITY LIMIT violation shall take immediate steps to relieve the condition.</p>	<p>204.1.1 The Reliability Authority shall, without delay, act or direct others to act to:</p> <ul style="list-style-type: none"> <li>- Prevent instances where Interconnection Reliability Operating Limits may be exceeded</li> <li>- Mitigate the magnitude and duration of instances where Interconnection Reliability Operating Limits have been exceeded</li> </ul> <p>208.1.1 The Transmission Operator, Balancing Authority and Interchange Authority shall follow the Reliability Authority’s directives to:</p> <ul style="list-style-type: none"> <li>- Prevent instances where Interconnection Reliability Operating Limits may be exceeded</li> </ul>

**Implementation Plan for Standard 200 – Operate Within Interconnection Reliability Operating Limits**

	<ul style="list-style-type: none"> <li>- Mitigate the magnitude and duration of instances where Interconnection Reliability Operating Limits have been exceeded</li> </ul>
<p><b>Requirement 5.C.2 Operator authority and responsibility.</b>  SYSTEM OPERATORS having responsibility for the reliability of the transmission system within a CONTROL AREA, pool, etc. shall be given and shall exercise specific authority to alleviate OPERATING SECURITY LIMIT violations. The authority shall enable the SYSTEM OPERATOR to take timely and appropriate actions including curtailing transmission service or energy schedules, operating equipment (e.g., generators, phase shifters, breakers), shedding load, etc.</p>	<p>204.1.1 The Reliability Authority shall, without delay, act or direct others to act to:</p> <ul style="list-style-type: none"> <li>- Prevent instances where Interconnection Reliability Operating Limits may be exceeded</li> <li>- Mitigate the magnitude and duration of instances where Interconnection Reliability Operating Limits have been exceeded</li> </ul> <p>208.1.1 The Transmission Operator, Balancing Authority And Interchange Authority shall follow the Reliability Authority’s directives to:</p> <ul style="list-style-type: none"> <li>- Prevent instances where Interconnection Reliability Operating Limits may be exceeded</li> <li>- Mitigate the magnitude and duration of instances where Interconnection Reliability Operating Limits have been exceeded</li> </ul>

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<p align="center"><b>Policy 9 – Security Coordinator Language in Policy</b></p>	<p align="center"><b>Standard 200 Replacement</b></p>
<p><b>Requirement A.1.</b> <b>Perform security analysis.</b> The RELIABILITY COORDINATORS shall ensure that next-day reliability analyses are performed simultaneously for all CONTROL AREAS and TRANSMISSION PROVIDERS in its RELIABILITY AREA to ensure that the bulk power system can be operated in anticipated normal and contingency conditions.</p>	<p>203.1.1 The Reliability Authority shall perform Operational Planning Analyses to assess whether the planned bulk electric system operations within its Reliability Authority Area will exceed any of its Interconnection Reliability Operating Limits.</p> <p>203.1.2 The Reliability Authority shall perform Real-Time Assessments to determine if its Reliability Authority Area is exceeding any Interconnection Reliability Operating Limits or is expected to exceed any Interconnection Reliability Operating Limits.</p>
<p><b>1.1. Information sharing.</b> Each CONTROL AREA in the SECURITY 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.</p>	<p>206.1.1 Each entity performing one of the following functions shall provide data, as specified, to the Reliability Authority(ies) with which it has a reliability relationship.</p> <ul style="list-style-type: none"> <li>- Balancing Authority</li> <li>- Generator Owners</li> <li>- Generator Operators</li> <li>- Reliability Authorities</li> <li>- Transmission Operators</li> <li>- Transmission Owners</li> <li>- Load Serving Entities</li> </ul> <p><i>(Note that this data is only a subset of the data addressed in Policy 9 Requirement A.1.1.1)</i></p>

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<p><b>Requirement A.1.2.</b> <b>System Studies.</b> The RELIABILITY COORDINATORS shall conduct studies to identify potential interface and other OPERATING RELIABILITY LIMIT violations, including overloaded transmission lines and transformers, voltage and stability limits, etc.</p>	<p>203.1.1 The Reliability Authority shall perform Operational Planning Analyses to assess whether the planned bulk electric system operations within its Reliability Authority Area will exceed any of its Interconnection Reliability Operating Limits.</p> <p>203.1.2 The Reliability Authority shall Perform Real-Time Assessments to determine if its Reliability Authority Area is exceeding any Interconnection Reliability Operating Limits or is expected to exceed any Interconnection Reliability Operating Limits.</p>
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**Compliance with Standard**

Requirement	Functions that Must Comply With the Requirements							
	Reliability Authority	Balancing Authority	Interchange Authority	Transmission Operator	Transmission Owner	Generator Owner	Generator Operator	Load Serving Entity
201 IROL Identification	X							
202 Monitoring	X							
203 Analyses & Assessments	X							
204 Actions	X							
205 Data Specification & Collection	X							
206 Data Provision	X	X		X	X	X	X	X
207 Processes, Procedures or Plans	X							
208 RA Directives		X	X	X				

## Implementation Plan for Standard 200 – Operate Within Interconnection Reliability Operating Limits

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### *Phased-in Compliance*

The following table identifies the implementation date and the earliest compliance date for each requirement.

The implementation date is the date entities are expected to begin meeting the performance identified in this standard. Because this standard rests upon the communication of system operating limits as defined in Requirement 204 - 604 Communication of System Operating Limits, the compliance dates are fixed from that date. Additional time (preparation time) has been added to give entities time needed to fully comply with the requirements. The justification for the staggered effective dates is in the tables on the following pages.

<b>Requirement</b>	<b>Effective Date</b>	<b>Compliance Date</b>
201 - IROL Identification	3 months from BOT adoption	6 months from implementation of Requirement 604
202 – Monitoring	3 months from BOT adoption	6 months from implementation of Requirement 604
203 - Analyses and Assessments	3 months from BOT adoption	6 months from implementation of Requirement 604
204 - Actions	3 months from BOT adoption	6 months from implementation of Requirement 604
205 – Data Specification & Collection	3 months from BOT adoption	9 months from implementation of Requirement 604
206 – Data Provision	3 months from BOT adoption	12 months from implementation of Requirement 604
207 – Processes, Procedures or Plans	3 months from BOT adoption	6 months from implementation of Requirement 604
208 – Reliability Authority Directives	3 months from BOT adoption	9 months from implementation of Requirement 604

**Implementation Plan for Standard 200 – Operate Within Interconnection Reliability Operating Limits**

<b>Requirement 201 – IROL Identification</b>		
<b>Measure</b>	<b>Description</b>	<b>Preparation</b>
201.1	<p>The Reliability Authority shall have a list of Facilities (or group of Facilities) in its Reliability Authority Area that are subject to Interconnection Reliability Operating Limits.</p> <p>(i) The Reliability Authority shall have evidence it has reviewed and updated its list of Facilities (or groups of Facilities) to reflect changes in its Reliability Authority Area’s system topology.</p>	<p>This should already be done in some format to comply with current field testing of IRLs and to comply with existing Operating Policy – only additional time needed would be to produce some evidence that list has been updated</p>
201.2	<p>The Reliability Authority shall be able to identify the current values of the Interconnection Reliability Operating Limits it monitors. Each of these Interconnection Reliability Operating Limits shall have a <math>T_v</math> that is smaller than or equal to 30 minutes.</p> <p>(i) The Reliability Authorities that share a Facility (or group of Facilities) shall have an agreed upon process for determining if that Facility (or group of Facilities) is subject to an Interconnection Reliability Operating Limit and for determining the value of that Interconnection Reliability Operating Limit and its associated <math>T_v</math>.</p>	<p>Current policy has a 30-minute response time for all limits. Entities may need additional time to establish variable <math>T_v</math>s for IROLs. This should be done within 6 months.</p> <p>This should already be done in some format to comply with current field testing of IRLs and to comply with existing Operating Policy – only additional time needed would be to put produce some evidence that list has been updated and this could be done in less than a week if needed.</p>
201.3	<p>The Reliability Authority shall be able to demonstrate that its Interconnection Reliability Operating Limit values and their <math>T_v</math> reflect current system conditions.</p>	<p>This should not require any additional work – if limits are being updated to reflect ‘current’ conditions today, then the ability exists.</p>



**Implementation Plan for Standard 200 – Operate Within Interconnection Reliability Operating Limits**

<b>Requirement 202 – Monitoring</b>		
<b>Measure</b>	<b>Description</b>	<b>Preparation</b>
202.1	The Reliability Authority shall have a list of Facilities (or groups of Facilities) subject to IROLs available for its operations personnel’s Real-time use.	This should already be done in some format to comply with current field testing of IRLs and to comply with existing Operating Policy – only additional time needed would be to produce some evidence that list has been updated
202.2.	The Reliability Authority shall have Interconnection Reliability Operating Limits available for its operations personnel’s Real-time use.	This should already be done in some format to comply with existing Operating Policy – only additional time needed would be to re-title the limits as IROLs.
202.3	The Reliability Authority shall have Real-time Data available in a form that system operators can compare to the Interconnection Reliability Operating Limits.	This should already be done in some format to comply with existing Operating Policy – only additional time needed would be to let system operators know that the limits are called IROLs and may have unique T <sub>v</sub> s.
202..4	The Reliability Authority shall monitor real-time system operating parameters and compare these against its Interconnection Reliability Operating Limits.	This should already be done in some format to comply with existing Operating Policy – only additional time needed would be to let system operators know that the limits are called IROLs and may have unique T <sub>v</sub> s.

**Implementation Plan for Standard 200 – Operate Within Interconnection Reliability Operating Limits**

<b>Requirement 203 – Analyses and Assessments</b>		
<b>Measure</b>	<b>Description</b>	<b>Preparation</b>
203..1	The Reliability Authority shall identify operating situations or events that impact its Reliability Authority Area’s ability to operate without exceeding any Interconnection Reliability Operating Limits.	This should already be done in some format to comply with existing Operating Policy – only additional time needed would be to let system operations personnel know that the limits are called IROLs and may have unique T <sub>v,s</sub> .
203.1.i.	The Reliability Authority shall conduct an Operational Planning Analysis at least once each day, evaluating the next day’s projected system operating conditions.	This should already be done to comply with existing Operating Policy – current operating practice in many locations is to do the analysis each day for the day ahead only on weekdays, and to do the ‘weekend ahead’ on Friday. Many entities do not conduct an operational planning analysis on Saturday or Sunday for Sunday and Monday. Entities may need some time to train additional personnel so that the analysis could be conducted every day of the week.
203.1ii	The Reliability Authority shall conduct a Real-time Assessment periodically, but at least once every 30 minutes.	This should already be done to comply with existing Operating Policy – only additional time needed would be to let system operators know that the limits are called IROLs and may have unique T <sub>v,s</sub> and to identify that the assessment must be conducted at least once every 30 minutes.

**Implementation Plan for Standard 200 – Operate Within Interconnection Reliability Operating Limits**

<b>Requirement 204 - Actions</b>		
<b>Measure</b>	<b>Description</b>	<b>Preparation</b>
204.1.1	<p>The Reliability Authority shall have documentation to support each instance where actions were taken or directives were issued to mitigate the magnitude and duration of exceeding an Interconnection Reliability Operating Limit.</p> <p>(i) The documentation shall include the actions taken or directives issued, the magnitude of the event, and the duration of the event. (This data may be from an operating log, may be from the entity’s energy management system, or may be from some other source.)</p>	<p>This requires that the system operators know which of their limits are IROLs. The actions are done today to comply with Operating Policy.</p>
204.2.	<p>The Reliability Authority shall report each instance of exceeding an Interconnection Reliability Operating Limit for time greater than <math>T_v</math>:</p> <p>(i) The Reliability Authority shall complete an Interconnection Reliability Operating Limit Violation Report and shall file the report with its Compliance Monitor within five business days of the initiation of the event. (The report includes the date and time of the event; identification of which Interconnection Reliability Operating Limit was violated and the <math>T_v</math> for that limit; magnitude and duration of exceeding the Interconnection Reliability Operating Limit after exceeding <math>T_v</math>; actions taken or directives issued and the time these were initiated or issued; explanation of results of actions or directives.)</p>	<p>This requires that the system operators know which of their limits are IROLs. The actions are done today to comply with Operating Policy.</p> <p>This also requires that the Compliance Enforcement Program accept the IROL Violation Report developed by the IROL SDT. The report collects only the information identified in the measure.</p> <p>This also requires that the RA know which entity is acting as its compliance monitor.</p> <p>This also requires that the IROL Violation Report be made available to the RAs.</p>

**Implementation Plan for Standard 200 – Operate Within Interconnection Reliability Operating Limits**

<b>Requirement 205 – Data Specification &amp; Collection</b>		
<b>Measure</b>	<b>Description</b>	<b>Preparation</b>
205..1	<p>The Reliability Authority shall have a documented specification for data needed to build and maintain models needed to support real time monitoring, operational planning analyses and real time assessments relative to Interconnection Reliability Operating Limits.</p> <p>(i) Specification shall include a list of required data, a mutually agreeable format, and timeframe and periodicity for providing data.</p>	<p>Many entities may not have a data specification in place. The data specification may be distributed in several other documents, and entities may need time to assemble this. Since the data needed is known, even if it is not formally documented, it should be possible to accomplish this documentation within 9 months – this includes time to come to ‘mutual agreement’ with other entities.</p>
205.1.ii	<p>Specification shall address the data provision process to use when automated real-time system operating data is unavailable.</p>	<p>This may not exist and may need to be developed. It should be possible to develop this within the 9 month period identified for developing the complete data specification.</p>
205.2	<p>The Reliability Authority shall have evidence that it has distributed its data specification to the entities that have Facilities monitored by the Reliability Authority and to entities that provide Real-time Facility status to the Reliability Authority.</p>	<p>This requires documentation that wouldn’t be available until after the data specification were completed. This should be done no later than 10 months after the standard is approved – this allows 9 months to develop the specification, and then a month to deliver it.</p>
205..3	<p>The Reliability Authority shall notify its Compliance Monitor when an entity that has Facilities monitored by the Reliability Authority, or an entity that provides Real-time Facility status to the Reliability Authority, does not provide data as specified and the Reliability Authority was unable to resolve the issue with the entity responsible for providing the data .</p>	<p>This requires that the data specification be developed and distributed. This should come into affect a year after the standard is approved. This allows entities some time to ‘field test’ their data specification before compliance is a factor.</p>
205..3.i	<p>If the Reliability Authority does not receive data as specified and is unable to resolve the situation, then the Reliability Authority shall notify its Compliance Monitor within five business days of discovering that the data is missing.</p>	<p>This also requires that the RA know which entity is acting as its compliance monitor.</p>

**Implementation Plan for Standard 200 – Operate Within Interconnection Reliability Operating Limits**

<b>Requirement 206 – Data Provision</b>		
<b>Measure</b>	<b>Description</b>	<b>Preparation</b>
206.2.1	The entity responsible shall have evidence that it has provided data, as specified, to the requesting Reliability Authority, within the time frame specified, in the mutually agreed upon format.	The Data Specification in requirement 205 needs to be in place before this can be implemented. There should be a 12 month delay in implementing compliance with this measure. This allows entities time to work with their RA to come to agreement with a ‘mutually acceptable format’ and gives the entities that must provide the RA with data a 3 month trial and error period for providing data before there is any compliance measurement.

<b>Requirement 207 – Processes, Procedures or Plans</b>		
<b>Measure</b>	<b>Description</b>	<b>Preparation</b>
207.2.1	The Reliability Authority shall have one or more documented processes, procedures, or plans that identify both preventing and mitigating instances of exceeding Interconnection Reliability Operating Limits. The processes, procedures, or plans shall identify and be coordinated with those entities responsible for taking actions and with those entities impacted by such actions.	Entities should have this plan in place now. A six-month delay in compliance should allow everyone time to develop a plan if it doesn’t already exist.

**Implementation Plan for Standard 200 – Operate Within Interconnection Reliability Operating Limits**

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<b>Requirement 208 – Reliability Authority Directives</b>		
<b>Measure</b>	<b>Description</b>	<b>Preparation</b>
208.2.1	<p>The responsible entity shall follow the Reliability Authority’s directives and shall document the directives and actions taken to meet the directives.</p> <p>The responsible entity shall document via an operations log or other data source, the following for each directive it receives relative to an Interconnection Reliability Operating Limit:</p> <ul style="list-style-type: none"><li>- Date and time of directive received</li><li>- Directive issued</li><li>- Actions taken in response to directive</li></ul>	<p>This should already be done and no additional time for preparation should be needed.</p>

## Questions & Answers About the Operate within Operate within IROLs Standard

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### Introduction to Standard

This standard requires adherence to the subset of system operating limits<sup>1</sup> identified to prevent instability, uncontrolled separation or cascading outages that adversely impact the reliability of the bulk transmission system. These limits are called interconnection reliability operating limits and are under the authority of the entity performing the reliability authority function. (Note that there are many other system operating limits that are used by system operators working for entities performing the Reliability Authority function and for entities performing the Transmission Operator function. This standard only addresses Interconnection Reliability Operating Limits.)

This standard is aimed at preventing instances of exceeding IROLs – and for those rare occasions when an IROL may be exceeded, the standard is aimed at minimizing the impact of such an event.

The standard is subdivided into eight requirements. Each of the requirements addresses some aspect of monitoring or controlling the transmission system to operate within IROLs. Some of these requirements address underlying responsibilities that must be accomplished as a prerequisite to monitoring and controlling the transmission system relative to IROLs.

201 Interconnection Reliability Operating Limit Identification – requires identification of the facilities that are subject to IROLs, and requires RAs to be able to identify current IROLs. Each IROL must have a  $T_v$  and the  $T_v$  may not be greater than 30 minutes. The list of facilities subject to IROLs must be updated to reflect changes in topology and system conditions. Entities that share a facility must have an agreed upon process for determining whether that facility is subject to an IROL and for developing the IROL and its  $T_v$ . (The entity performing the Reliability Authority Function is responsible for this requirement.)

202 Monitoring – requires monitoring real time data and comparing the data to IROLs to determine if the RA Area is operating within its IROLs (The entity performing the Reliability Authority Function is responsible for this requirement.)

203 Analyses and Assessments – requires that an operational planning analyses be conducted at least once each day to look at the ‘day ahead’ and requires that real-time assessments be conducted at least once every 30 minutes. These analyses and assessments are done to see if the transmission system is expected to be operated within its IROLs and to see if the transmission system is operating within its IROLs. (The entity performing the Reliability Authority Function is responsible for this requirement.)

204 Actions – requires that actions be taken or directives issued to prevent or mitigate instances of exceeding IROLs. These actions and directives must be documented when an IROL is exceeded, and when an IROL is exceeded for a time greater than the IROL’s  $T_v$ , this event must be reported to the Compliance Monitor. The entity that issues a directive relative to an IROL must include a statement in the directive to clarify that the directive is related to an IROL. (The entity performing the Reliability Authority Function is responsible for this requirement.)

205 Data Specification & Collection – requires that a data specification be developed that identifies the data needed for monitoring real-time parameters against IROLs, and for conducting operational planning analyses and real-time assessments relative to operating within its reliability area’s IROLs. The Data Specification must be distributed to entities that are expected to provide data and needs to address what data to provide, a mutually agreeable format for the data, a timeframe and periodicity for providing data, and must address the data provision process to use when automated real-time system operating data is unavailable. The Reliability Authority must notify its Compliance

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<sup>1</sup> System Operating Limits are established through the standard, “Determine Facility Ratings, Operating Limits and Transfer Capabilities”

## **Questions & Answers About the Operate within Operate within IROLs Standard**

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Monitor if data is not provided as specified. (The entity performing the Reliability Authority Function is responsible for this requirement.)

206 Data Provision – requires that entities provide the Reliability Authority with data needed to monitor real-time parameters against IROLs, and to conduct operational planning analyses and real-time assessments relative to operating within its reliability area's IROLs. (The entities performing the following Functions are responsible for this requirement: Balancing Authorities, Generator Operators, Generator Owners, Load-serving Entities, Reliability Authorities, Transmission Operators, and Transmission Owners)

207 Processes, Procedures or Plans – requires that there be one or more processes, procedures or plans to address actions to take or directions to issue to prevent and mitigate instances of exceeding IROLs. The processes, procedures or plans must identify and be coordinated with all entities that have to take actions as part of the plan, and with entities that would be impacted by the actions taken in the plan. (The entity performing the Reliability Authority Function is responsible for this requirement.)

208 Reliability Authority Directives – requires that entities follow the Reliability Authority's directives issued to prevent or mitigate instances of exceeding IROLs. The directives issued and the actions taken in response to those directives must be documented. (The entities performing the following functions are responsible for this requirement: Balancing Authority, Interchange Authority, and Transmission Operator.)

### Expansion on Definitions

**Balancing Authority:** Integrates resource plans ahead of time, and maintains load-interchange-generation balance within its metered boundary and supports system frequency in real time.

*(Note – this term was defined in the NERC Functional Model approved by the NERC Board of Trustees, June 12, 2001.)*

**Bulk Electric System:** A term commonly applied to the portion of an electric utility system that encompasses the electrical generation resources and high voltage transmission system (above 35 kV or as approved in a tariff filed with FERC).

*(Note – the original definition of this term was ‘circular’ and did not reference any voltage class. The definition was changed to include the reference to a measurable voltage class.)*

**Cascading Outages:** The uncontrolled successive loss of system elements triggered by an incident at any location that results in the loss of 300 MW or more of networked system load for a minimum of 15 minutes.

*(Note –this definition was developed to help provide some measurable basis for determining if a system operating limit is an Interconnection Reliability Operating Limit.)*

**Generator Operator:** Operates generating unit(s) and performs the functions of supplying energy and Interconnected Operations Services.

*Note – This is the definition proposed by the Functional Model Review Task Group for inclusion in the second version of the Functional Model.*

**Generator Owner:** The entity that owns the generator.

*Note – This is the definition proposed by the Functional Model Review Task Group for inclusion in the second version of the Functional Model.*

**Instability:** The inability of the transmission system to maintain a state of equilibrium during normal and abnormal system conditions or disturbances.

**Interconnection Reliability Operating Limit:** A system operating limit which, if exceeded, could lead to instability, uncontrolled separation, or cascading outages that adversely impact the reliability of the bulk electric system.

*(Note – this term was adapted from the term, Interconnection Reliability Limit, drafted by the Operating Limit Definition Task Force.)*

**Interconnection Reliability Operating Limit Event:** An instance of exceeding an interconnection reliability operating limit for any length of time.

*(Note – all IROL Events must be documented.)*

**Interconnection Reliability Operating Limit Event Duration:** The length of time an interconnection reliability operating limit is exceeded. The duration is measured from the point where the limit is first exceeded and ends when the value drops below the limit and remains below the limit for at least 30 seconds.

*(Note –graphics in next section of this Technical Reference shows the application of this 30-second rule.)*

## Questions & Answers About the Operate within Operate within IROLs Standard

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**Load-serving Entity:** Secures energy and transmission (and related generation services) to serve the end user.

*(Note – this term was defined in the NERC Functional Model approved by the NERC Board of Trustees, June 12, 2001.)*

**Occurrence period:** The time period in which performance is measured and evaluated.

*(Note – this is a term used by the Compliance Monitors. When you look at the Sanctions Tables, note that the first table’s column headings reference the number of infractions within the Performance-reset period. As the number of infractions within a performance reset period increases, so does the severity of the sanctions.)*

**Operating Procedure** – A document that identifies specific steps or tasks that must be taken by one or more specific operating positions to achieve a single specific operating goal. The steps in an Operating Procedure must be followed in the order in which they are presented, and must be performed by the position(s) identified. A document that lists the specific steps to take in removing a specific transmission line from service is an example of an Operating Procedure.

*(Note – this is a term defined within the Coordinate Operations standard.)*

**Operating Process** – A document that identifies general steps for achieving a generic operating goal. An Operating Process includes steps with options that may be selected depending upon real-time conditions. A guideline for controlling high voltage is an example of an Operating Process.

*(Note – this is a term defined within the Coordinate Operations standard.)*

**Operating Plan-** A document that identifies a group of activities that may be used to achieve some goal. An Operating Plan may contain Operating Procedures and Operating Processes. A company-specific system restoration plan that includes an Operating Procedure for black-starting units, Operating Processes for communicating restoration progress with other entities, etc., is an example of an Operating Plan.

*(Note – this is a term defined within the Coordinate Operations standard.)*

### **Operational Planning Analysis:**

An analysis of the expected system conditions for the next day’s operation and up to 12 months ahead. Expected system conditions include things such as load forecast(s), generation output levels, and known system constraints (transmission facility outages, generator outages, equipment limitations, etc.)

*(Note – this standard requires that an operational planning analysis be conducted at least once each day, looking at the day ahead. This does not mean that operational planning analyses are limited to being conducted on a day-ahead basis. For example an operational planning analysis should be conducted as part of approving a transmission line outage – and this operational planning analysis may be conducted several months ahead of the day being reviewed.)*

**Performance-reset Period:** The time period that the entity being assessed must operate without any violations to reset the level of non-compliance to zero.

*(Note – this is a term used by the Compliance Monitors. When you look at the Sanctions Tables, note that the first table’s column headings reference the number of infractions within the Performance-reset period. As the number of infractions within a performance reset period increases, so does the severity of the sanctions.)*

## Questions & Answers About the Operate within Operate within IROLs Standard

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**Real-time:** Present time as opposed to future time.

**Real-time Assessment:** An examination of existing and expected system conditions, conducted by collecting and reviewing immediately available data.

**Real-time Data:** Real-time measured values, state estimator values derived from the measured values, or other calculated values derived from the measured values – may include directly monitored data, Inter-utility data exchange (e.g., Interconnection Control Area Communication Protocol or SCADA Data), and manually collected data.

**Real-time Monitoring:** The act of scanning data and drawing conclusions about what the data indicates.

*(Note – this definition supports the concept that monitoring is an ‘active’ task. The system operator assigned to monitor system conditions should be prepared to answer questions about what he/she has been monitoring without any preparation time. Simple questions can be used to determine whether or not monitoring has taken place. For example, a system operator who has been monitoring real time data to see if the area under the operator’s direction is approaching or exceeding any IROLs should be able to answer the question, “ Are there any IROLs on your system that have been exceeded? If any have been exceeded, are you approaching or exceeding the IROL’s  $T_v$ ?”*

**Reliability Authority:** Ensures the reliability of the bulk power transmission system within its Reliability Authority Area.

*(Note – this term was defined in the NERC Functional Model approved by the NERC Board of Trustees, June 12, 2001.)*

**Reliability Authority Area:** The collection of generation, transmission, and loads within the boundaries of the Reliability Authority. Its boundary coincides with one or more Balancing Areas.

*Note – This is the definition proposed by the Functional Model Review Task Group for inclusion in the second version of the Functional Model.*

**Self-certification:** A process by which an entity does a self-evaluation to determine if it is compliant with the specific requirements for a reliability standard.

*Note: This is a term used by the Compliance Monitors.*

**$T_v$ :** The maximum time that an Interconnection Reliability Operating Limit can be exceeded before the risk to the interconnection becomes greater than acceptable.  $T_v$  may not be greater than 30 minutes.

*Note – Operating Policy 2 – Standard A.2 included the following requirement:*

*Following a contingency or other event that results in an OPERATING SECURITY LIMIT violation, the CONTROL AREA shall return its transmission system to within OPERATING SECURITY LIMITS soon as possible, but no longer than 30 minutes.*

*This new standard requires results within ‘ $T_v$ ’ minutes. Some IROLs are so critical that exceeding them for 30 minutes may be too long. See the charts in the next section for examples of how  $T_v$  is used to determine whether an instance of exceeding an IROL must be reported to the Compliance Monitor.*

## Questions & Answers About the Operate within Operate within IROLs Standard

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**Transmission Operator:** The entity that operates the transmission facilities and executes switching orders.

*(Note – this term was defined in the NERC Functional Model approved by the NERC Board of Trustees, June 12, 2001.)*

**Transmission Owner:** Owns transmission facilities

*(Note – this term was defined in the NERC Functional Model approved by the NERC Board of Trustees, June 12, 2001.)*

**Uncontrolled Separation:** The unplanned break-up of an interconnection, or portion of an interconnection, that is not the result of automatic action by a special protection system or remedial action scheme operating correctly.

**Wide Area Impact:** The impact of a single incident resulting in the uncontrolled loss of 300 MW or more of networked transmission load for a minimum of 15 minutes.

*(Note – this term was modified to provide a more measurable basis for determining whether a System Operating Limit should also be an Interconnection Reliability Operating Limit. The Standard Drafting Team adopted the threshold criteria used for reporting major incidents to the Department of Energy as the threshold for determining whether an event had a ‘wide area’ impact.)*

## Questions & Answers About the Operate within Operate within IROLs Standard

### Questions and Answers

#### *Who needs to comply with this standard?*

Each of the requirements in the standard assigns responsibility for that requirement to one or more ‘functions.’ The entities performing the listed functions are the entities that must comply with that requirement. Most of the requirements are applicable to entities that perform the Reliability Authority Function – but several functions are assigned responsibility for the Data Provision and RA Directives requirements.

Requirement	Entities that Perform these Functions Must Comply With the Requirements							
	Reliability Authority	Balancing Authority	Interchange Authority	Trans. Operator	Trans. Owner	Gen. Owner	Gen. Operator	Load Serving Entity
201 IROL Identification	X							
202 Monitoring	X							
203 Analyses & Assessments	X							
204 Actions	X							
205 Data Specification & Collection	X							
206 Data Provision	X	X		X	X	X	X	X
207 Processes, Procedures or Plans	X							
208 RA Directives		X	X	X				

### ***When does compliance with this standard start?***

Several things must be in place before entities are expected to come into full compliance with all of the requirements in this standard. Most importantly, the Operate within IROLs Standard can't be implemented until after the Determine Facility Ratings, System Operating Limits and Transfer Capabilities standard has been implemented. The methodology for developing system operating limits must be in place and the RA must identify system operating limits before the RA can be held accountable for identifying which of its system operating limits are IROLs. There are other parts of the standard that will take some time to put into place if they aren't already in place. Some entities performing the RA function may have a detailed data specification that could be used to meet the Data Specification requirement in this standard – but other entities may have handled this requirement on a more casual basis and may need some time to formalize their data specifications.

### ***For a System Operator - how does this new standard differ from Operating Policy 2 - Transmission?***

There are three significant differences between what is expected of system operators under Policy 2, and what is expected of system operators under Standard 200.

#### **Major Difference #1 – Term, 'OSLs' replaced with term, 'IROLs'**

The first difference is a terminology change. The NERC Director–Compliance reports on compliance violations at each NERC Board of Trustees Meeting. He noted an increase in the number of OSL violations, and was directed by the BOT to investigate the cause. The investigation results showed a widespread misunderstanding on what was/was not an OSL. The task force that worked on this problem, called the Operating Limits Definitions Task Force (OLDTF) recommended that the term, "Operating Security Limit" not be used in the future because of the widespread misunderstanding associated with this term. The new standard uses the term, 'Interconnection Reliability Operating Limit – IROL'.

From the Terms Used in the Operating Policies, here is the definition of an Operating Security Limit (OSL):

- The value of a system operating parameter (e.g. total power transfer across an interface) that satisfies the most limiting of prescribed pre- and post-contingency operating criteria as determined by equipment loading capability and acceptable stability and voltage conditions.

From the Operate within IROLs Standard, here is the definition of an Interconnection Reliability Operating Limit (IROL):

- A system operating limit which, if exceeded, could lead to instability, uncontrolled separation, or cascading outages that adversely impact the reliability of the bulk electric system.

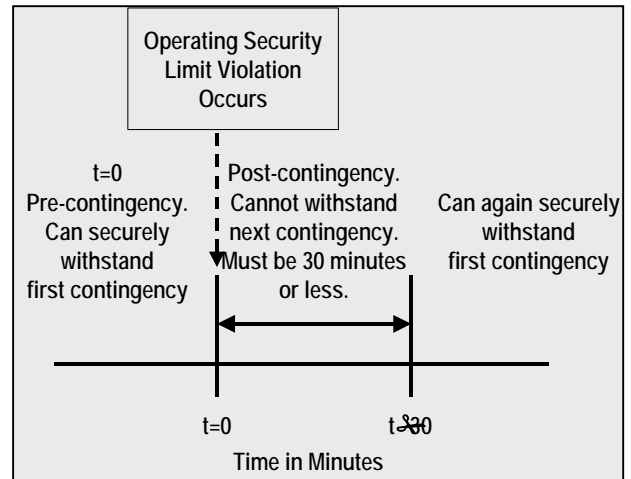


## Questions & Answers About the Operate within IROLs Standard

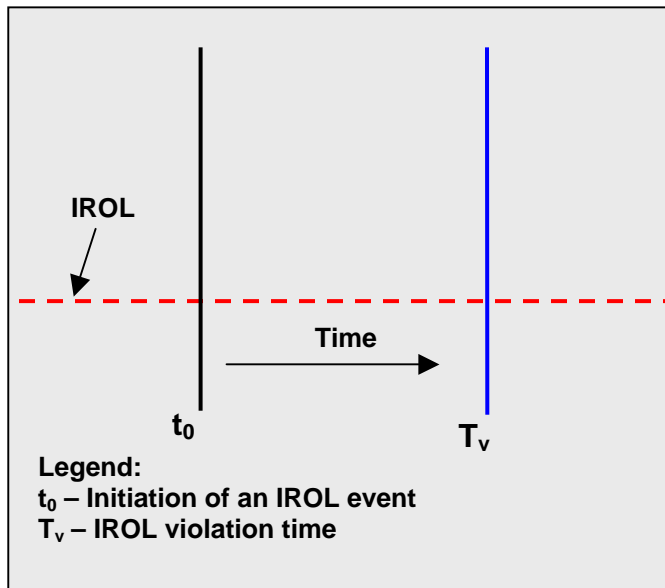
### Major Difference #2 – Resolution time changed from a uniform ‘30-minutes’ for all OSLs to a ‘unique’ $T_v$ that can’t exceed 30 minutes for each IROL

Policy 2 has a standard ‘30 minute’ response time for resolving any instance of exceeding an operating security limit. The 30 minutes was established to give system operators enough time to recognize the problem and take corrective actions. The new Operate within IROLs standard is designed from a perspective of system risk, and doesn’t have a standard ‘30 minute’ response time.

$T_v$  is the maximum amount of time the system operator has to return to a state that is at or below the limit before being subjected to compliance sanctions.  $T_v$  is based on system risk – and recognizes that some IROLs shouldn’t be exceeded for longer than 10 minutes without causing an unacceptable risk to the interconnection. Each IROL may have its own  $T_v$  but no  $T_v$  may exceed 30 minutes.



*From Policy 2 – all OSLs addressed with the same 30-minute maximum resolution time*



← *Operate within IROLs Standard - each IROL may have its own  $T_v$ .*

*For IROLs that should never be exceeded,  $T_v$  may be zero minutes.*

### Major Difference #3 – New Report for IROL Violations

Policy 2 requires that a NERC Preliminary Disturbance Report be completed for OSL Violations that exceed 30 minutes – The Preliminary Disturbance Report asks for a preliminary analysis to be conducted regarding the cause of the event – and is still needed. The new report is a compliance document and doesn’t require the same data that is required of the Preliminary Disturbance Report.

The data that is collected in the IROL Violations Report is data that should be readily available to the system operator shortly after an instance of exceeding an IROL. The report doesn’t ask for an analysis, just for a collection of the facts such as what limit was exceeded, how long was it exceeded, etc. The new report must be filed with the compliance monitor within 5 days of the event.

### ***What is an IROL?***

An IROL is a special type of system operating limit. While operating so that system operating limits aren't exceeded is always important, if an IROL is exceeded, there is an increased risk of voltage instability, cascading outages or uncontrolled separation that adversely impacts the interconnection.

System Operating Limits are monitored by system operators working for entities performing the Transmission Operator function and may also be monitored by system operators working for entities performing the Reliability Authority function.

IROLs are monitored by the Reliability Authority. The Reliability Authority may delegate this task to system operators working for entities performing the Transmission Operator function, but it is the Reliability Authority that is held accountable for ensuring that IROLs aren't exceeded.

### ***What is the IROL's $T_v$ ?***

$T_v$  is the maximum amount of time the system operator has to return to a state that is at or below the limit before being subjected to compliance sanctions.

The  $T_v$  associated with each IROL is a time value used to assess how quickly the interconnection may deteriorate if an IROL isn't mitigated. IROLs should never be exceeded – but if one is exceeded, the  $T_v$  represents the maximum amount of time the limit can be exceeded before the risk to the interconnection becomes unacceptable. Under this standard, if a  $T_v$  is exceeded, there are financial penalties and additional reporting requirements.

### ***Why don't all IROL's have the same $T_v$ ?***

The IROL's  $T_v$  is based on system risk – and recognizes that exceeding some IROLs is unacceptable for any length of time, while exceeding other IROLs can probably be tolerated for a longer period of time before there is an unacceptable risk to the interconnection. By establishing a  $T_v$  for each IROL, the RA has information needed to anticipate the negative results of exceeding an IROL. If an IROL can't be exceeded for any length of time, then the RA may choose to install a special protection scheme to control the risk of exceeding the limit in real time. Note that  $T_v$  may not exceed 30 minutes.

### ***If an RA installs a special protection scheme to reduce the probability of exceeding an IROL for time greater than the limit's $T_v$ , does this eliminate the IROL?***

No. The facility being protected by the special protection scheme would still need to be included in the list of facilities subject to IROLs, and the IROL would need to be listed with its  $T_v$ . Since special protection schemes don't always work as planned, it is important that system operators know where they have IROLs, know which facilities are subject to IROLs and know what the  $T_v$  is for each IROL. The system operator needs access to this data to make appropriate system operating decisions when special protection schemes don't work as planned.

### ***How do you develop a list of IROL's?***

The Determine Facility Ratings, System Operating Limits and Transfer Capabilities standard includes a requirement that entities responsible for developing system operating limits document their methodology for developing these limits. The RA is responsible for developing the subset of system operating limits that are called IROLs. The RA must follow its methodology for developing system operating limits and then must identify whether or not exceeding that limit could cause voltage instability, cascading outages, or uncontrolled separation from the interconnected transmission system. If the system operating limit could lead to one or more of these dire consequences, then the limit is an IROL.

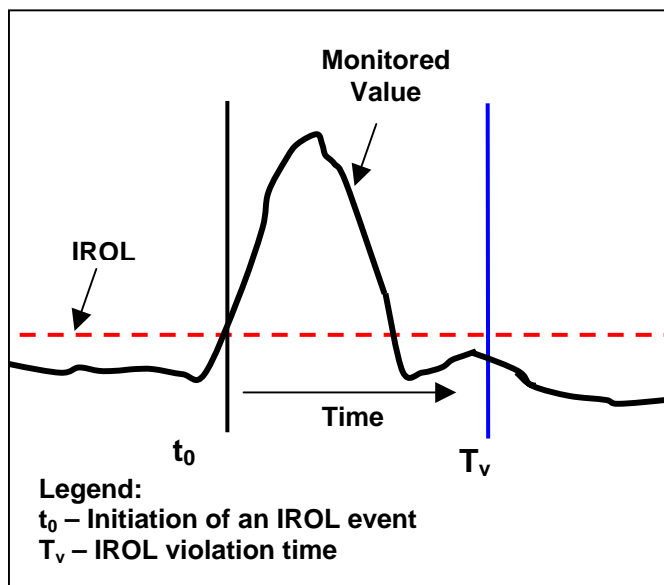
### **How do you establish a $T_v$ for an IROL?**

Each RA may use whatever system it wants for establishing a  $T_v$  for its IROLs. This gives each RA the latitude to be as conservative as it desires. Some RAs may choose to use a default  $T_v$  of 30 minutes – currently some entities have a default of 20 minutes for all limits that would be categorized as IROLs. Here are some ways of setting  $T_v$ :

- Use study results showing the impact of a loss of a unit or line
- Set  $T_v$  at or lower than ‘published’ acceptable time overloads for critical facilities and
- Reference relay settings that have time delays before tripping overloaded facilities

### **Which instances of exceeding an IROL need to be documented?**

All. Every instance of exceeding an IROL for any length of time must be documented. Most entities are expected to document the instance on a system operating log, but the standard does not require that the documentation be on an operating log, just that it be documented.



### **Does the standard require that exceeding an IROL be documented on the system operator’s daily log?**

No. Each entity can document IROL events using whatever documentation system works best for them. While each entity may use whatever system(s) it chooses to document instances of exceeding IROLs, the documentation must be retrievable so it can be shown to the Compliance Monitor. The data can be retrievable through computer screen displays, through paper or electronic logs, or other sources.

### **When you exceed an IROL, what do you have to document?**

When you exceed an IROL for any length of time, you need to document the following three things:

- Actions taken or directives issued
- Magnitude of the event
- Duration of the event

### **How many IROLs do you expect the ‘typical’ RA to have in a year?**

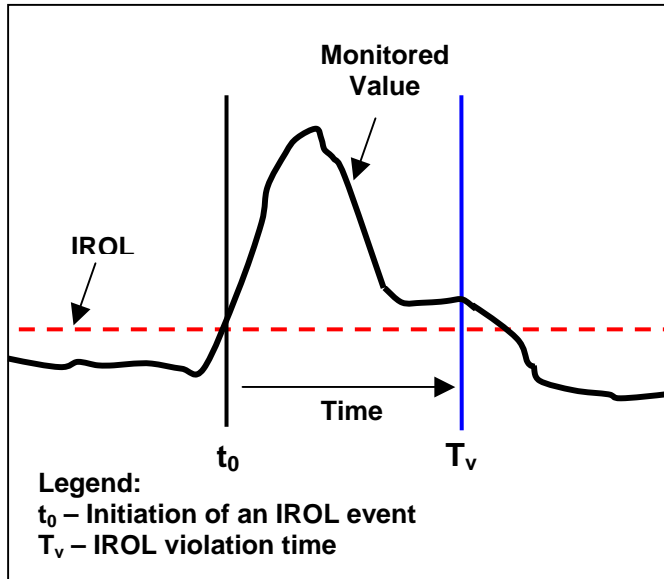
None! This standard focuses on preventing instances of exceeding an IROL. This standard requires the RA to use its tools to actively monitor and assess its Reliability Authority Area with respect to the current

## Questions & Answers About the Operate within IROLs Standard

and expected system conditions. For emerging system conditions, the RA is required to act to prevent exceeding an IROL. For unusual situations, such as a plane crash that knocks down 500kV lines, the RA is required to act to mitigate the instance within the IROL's  $T_v$ . Since most RA's can go many years without ever having a plane crash through their 500kV lines, most RAs won't experience any instances of exceeding an IROL for any length of time.

### **Which instances of exceeding an IROL need to be reported?**

Every instance of exceeding an IROL for time greater than the IROL's  $T_v$  is reported to the Compliance Monitor within five business days.



*The value being monitored exceeded its IROL for a time greater than the IROL's  $T_v$  and the event must be documented **and** reported.*

### **When you exceed an IROL for a time greater than the IROL's $T_v$ , what do you have to report?**

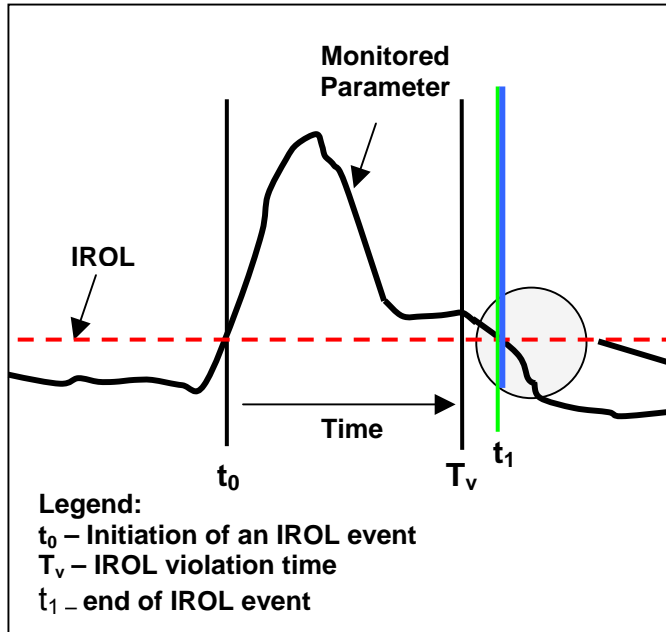
When you exceed an IROL for a time greater than the IROL's  $T_v$ , you have to report the following information to the Compliance Monitor:

- Date and time of the event
- Identification of which interconnection reliability operating limit was violated
- $T_v$  for that limit
- Magnitude and duration of exceeding the interconnection reliability operating limit
- Actions taken or directives issued
- Time actions or directives were initiated or issued,
- Explanation of results of actions or directives

There is a report called the IROL Violation Report that captures this information. This report is available from the NERC Web Site and is provided at the end of this document.

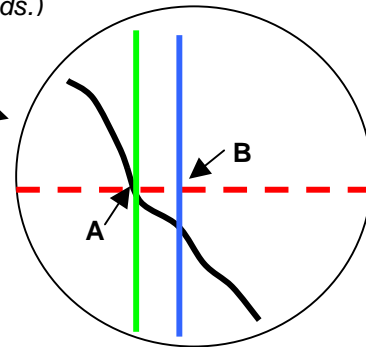
**How do you calculate the duration of an IROL event?**

The duration of an IROL event is measured from the point in time when the IROL is first exceeded to the point in time where the parameter being monitored has returned to a value that is at or below the IROL, providing the actual value remains at or below the IROL for at least 30 seconds.



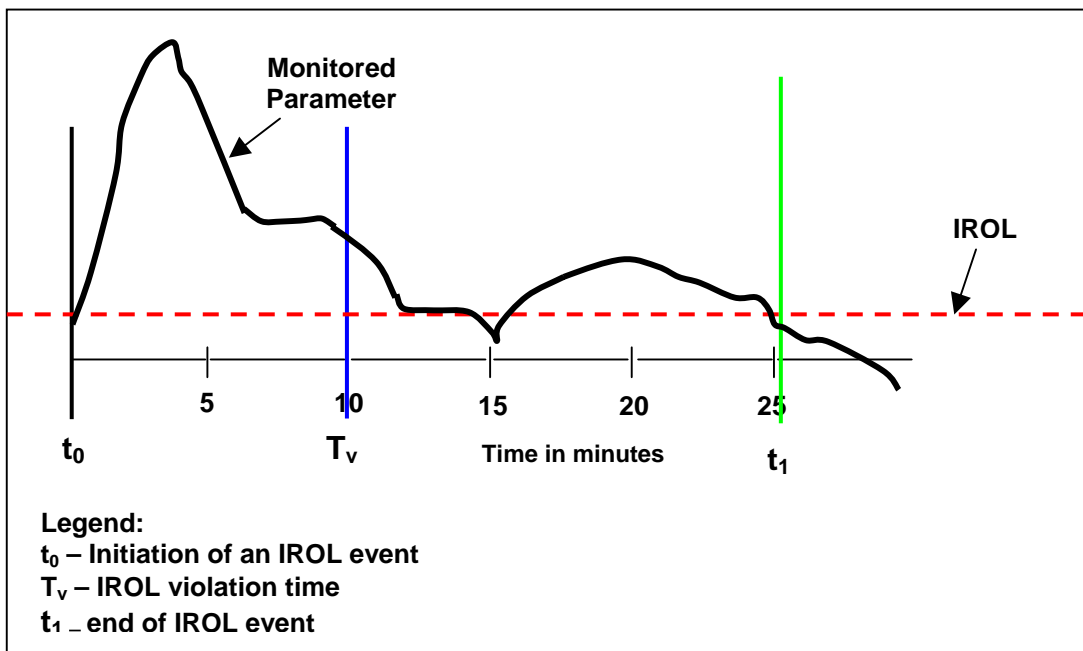
The monitored parameter must remain at or below the IROL for 30 seconds or more.

The line for  $t_1$  shows the end of the IROL event, which is the point in time when the monitored value returns to a value that is at or below the IROL as long as the monitored value remains at or below the limit for at least 30 seconds. (From pt. A to pt. B is 30 seconds.)



The following example is shown in the chart below. The IROL that has been exceeded has a  $T_v$  of 10 minutes. The monitored value exceeds the IROL for 15 minutes, then the monitored value returns to a value that is below that IROL for just 20 seconds, then the monitored value exceeds the IROL for another 10 minutes – then the monitored value returns to a value that is below the IROL for 2 hours. The duration of the event that must be reported is:

- 25 minutes, 20 seconds



## Questions & Answers About the Operate within Operate within IROLs Standard

### *If you exceed an IROL for time greater than $T_v$ , how big is the sanction?*

This is the table used to determine the size of the sanction when an IROL is exceeded for time greater than  $T_v$ .

Example 1: There is an IROL set at 1000 MW with a  $T_v$  of 30 minutes. The IROL is exceeded for 35 minutes. During the time period after  $T_v$  was exceeded (the last 5 minutes of the event), the maximum value was 1100 MW. This is the first IROL violation for this RA.

$$\text{Max Val \%} = (1100 \text{ MW}/1000 \text{ MW} - 1) * 100 = 10$$

The event duration exceeded its  $T_v$  by 5 minutes

The level 4 \$ sanction for the first infraction is \$2000

$$\text{The sanction would be } 10 * \$2000 = \$20,000$$

<b>If the Maximum Value % over the Limit (measured after the event duration exceeds <math>T_v</math>) is:</b> Max Value % = (Max Value/ IROL limit -1)*100	<b>And the event duration exceeds its <math>T_v</math> by ___ minutes:</b>	<b>Then Multiply the Level 4 \$ sanction by:</b>
0% < Max Value % ≤ 5%	$T_v < \text{Duration} \leq T_v + 5 \text{ minutes}$	5
	$T_v + 5 \text{ minutes} < \text{Duration} \leq T_v + 10 \text{ minutes}$	10
	$T_v + 10 \text{ minutes} < \text{Duration} \leq T_v + 15 \text{ minutes}$	15
	$\text{Duration} > T_v + 15 \text{ minutes}$	20
5% < Max Value % ≤ 10%	$T_v < \text{Duration} \leq T_v + 5 \text{ minutes}$	10
	$T_v + 5 \text{ minutes} < \text{Duration} \leq T_v + 10 \text{ minutes}$	15
	$T_v + 10 \text{ minutes} < \text{Duration} \leq T_v + 15 \text{ minutes}$	20
	$\text{Duration} > T_v + 15 \text{ minutes}$	25
10% < Max Value % ≤ 15%	$T_v < \text{Duration} \leq T_v + 5 \text{ minutes}$	15
	$T_v + 5 \text{ minutes} < \text{Duration} \leq T_v + 10 \text{ minutes}$	20
	$T_v + 10 \text{ minutes} < \text{Duration} \leq T_v + 15 \text{ minutes}$	25
	$\text{Duration} > T_v + 15 \text{ minutes}$	30
15% < Max Value % ≤ 20%	$T_v < \text{Duration} \leq T_v + 5 \text{ minutes}$	20
	$T_v + 5 \text{ minutes} < \text{Duration} \leq T_v + 10 \text{ minutes}$	25
	$T_v + 10 \text{ minutes} < \text{Duration} \leq T_v + 15 \text{ minutes}$	30
	$\text{Duration} > T_v + 15 \text{ minutes}$	35
20% < Max Value % ≤ 25%	$T_v < \text{Duration} \leq T_v + 5 \text{ minutes}$	25
	$T_v + 5 \text{ minutes} < \text{Duration} \leq T_v + 10 \text{ minutes}$	30
	$T_v + 10 \text{ minutes} < \text{Duration} \leq T_v + 15 \text{ minutes}$	35
	$\text{Duration} > T_v + 15 \text{ minutes}$	40
25% < Max Value % ≤ 30%	$T_v < \text{Duration} \leq T_v + 5 \text{ minutes}$	30
	$T_v + 5 \text{ minutes} < \text{Duration} \leq T_v + 10 \text{ minutes}$	35
	$T_v + 10 \text{ minutes} < \text{Duration} \leq T_v + 15 \text{ minutes}$	40
	$\text{Duration} > T_v + 15 \text{ minutes}$	45

## Questions & Answers About the Operate within Operate within IROLs Standard

Example 2: There is an IROL set at 1000 MW with a  $T_v$  of 20 minutes. The IROL is exceeded for 35 minutes. During the time period after  $T_v$  was exceeded (the last 5 minutes of the event), the maximum value was 1200 MW. This is the second IROL violation for this RA.

$$\text{Max Val \%} = (1200 \text{ MW}/1000 \text{ MW} - 1) * 100 = 20$$

The event duration exceeded its  $T_v$  by 15 minutes

The level 4 \$ sanction for the second infraction is \$4000

$$\text{The sanction would be } 30 * \$4000 = \$120,000$$

<b>If the Maximum Value % over the Limit (measured after the event duration exceeds <math>T_v</math>) is:</b> Max Value % = (Max Value/ IROL limit -1)*100	<b>And the event duration exceeds its <math>T_v</math> by ___ minutes:</b>	<b>Then Multiply the Level 4 \$ sanction by:</b>
0% < Max Value % ≤ 5%	$T_v < \text{Duration} \leq T_v + 5 \text{ minutes}$	5
	$T_v + 5 \text{ minutes} < \text{Duration} \leq T_v + 10 \text{ minutes}$	10
	$T_v + 10 \text{ minutes} < \text{Duration} \leq T_v + 15 \text{ minutes}$	15
	$\text{Duration} > T_v + 15 \text{ minutes}$	20
5% < Max Value % ≤ 10%	$T_v < \text{Duration} \leq T_v + 5 \text{ minutes}$	10
	$T_v + 5 \text{ minutes} < \text{Duration} \leq T_v + 10 \text{ minutes}$	15
	$T_v + 10 \text{ minutes} < \text{Duration} \leq T_v + 15 \text{ minutes}$	20
	$\text{Duration} > T_v + 15 \text{ minutes}$	25
10% < Max Value % ≤ 15%	$T_v < \text{Duration} \leq T_v + 5 \text{ minutes}$	15
	$T_v + 5 \text{ minutes} < \text{Duration} \leq T_v + 10 \text{ minutes}$	20
	$T_v + 10 \text{ minutes} < \text{Duration} \leq T_v + 15 \text{ minutes}$	25
	$\text{Duration} > T_v + 15 \text{ minutes}$	30
15% < Max Value % ≤ 20%	$T_v < \text{Duration} \leq T_v + 5 \text{ minutes}$	20
	$T_v + 5 \text{ minutes} < \text{Duration} \leq T_v + 10 \text{ minutes}$	25
	$T_v + 10 \text{ minutes} < \text{Duration} \leq T_v + 15 \text{ minutes}$	30
	$\text{Duration} > T_v + 15 \text{ minutes}$	35
20% < Max Value % ≤ 25%	$T_v < \text{Duration} \leq T_v + 5 \text{ minutes}$	25
	$T_v + 5 \text{ minutes} < \text{Duration} \leq T_v + 10 \text{ minutes}$	30
	$T_v + 10 \text{ minutes} < \text{Duration} \leq T_v + 15 \text{ minutes}$	35
	$\text{Duration} > T_v + 15 \text{ minutes}$	40
25% < Max Value % ≤ 30%	$T_v < \text{Duration} \leq T_v + 5 \text{ minutes}$	30
	$T_v + 5 \text{ minutes} < \text{Duration} \leq T_v + 10 \text{ minutes}$	35
	$T_v + 10 \text{ minutes} < \text{Duration} \leq T_v + 15 \text{ minutes}$	40
	$\text{Duration} > T_v + 15 \text{ minutes}$	45

### ***What is the philosophy behind the sanction for exceeding an IROL for time greater than $T_v$ ?***

Most RAs will not exceed an IROL. If there is an ‘emerging’ system condition that is causing operations in the Reliability Authority Area to approach operations outside of the IROLs, then the RA should take actions to prevent the system from exceeding the IROL. This standard requires that the RA monitor and assess its Reliability Authority Area so that emerging system conditions are noted and corrected before an IROL can be exceeded. There are unusual circumstances that do occur – such as a plane crashing through a set of 500 kV lines – that will cause an IROL to be exceeded. When this does occur, the RA needs to take action without delay to remedy the situation. If the RA achieves its goals within  $T_v$ , then there is no sanction.

### ***Why isn't the sanction linked to the highest value over the course of the event?***

Because unusual circumstances occur without warning, the sanction isn't linked to the highest value during the event, the sanction is linked to the highest value during the time period after  $T_v$  has been exceeded. This seemed to be the fairest way of applying the sanction – it gives the RA some time to resolve the situation and allows for ‘credit’ to be given if the RA was able to move the system in the right direction, but wasn't able to achieve the goal of getting within the limits before  $T_v$ .

### ***What's the origin of the concept of these sanctions for exceeding IROLs?***

These sanctions are very similar to the sanctions used for Policy 2 and for the WECC RMS program. The sanction for violating Requirement 204 is linked to the magnitude and duration of the infraction and to the history of the entity with respect to prior similar violations – Policy 2's sanction is linked to magnitude and duration of the infraction and to the size of the company that is responsible for preventing the infraction.

### ***What are you expecting in the requirement for Processes, Procedures or Plans?***

The RA needs to anticipate what actions to take to prevent exceeding IROLs as well as the actions to take when an IROL has been exceeded. The RA has to have some type of document that outlines the actions the RA will take to control the situation. The document can be as specific as needed. It is important that the documents be coordinated with entities that will be involved if the process, procedure or plan is invoked. The Coordinate Operations Standard defines these terms as follows:

**Operating Procedure** – A document that identifies specific steps or tasks that must be taken by one or more specific operating positions to achieve a single specific operating goal. The steps in an Operating Procedure must be followed in the order in which they are presented, and must be performed by the position(s) identified. A document that lists the specific steps to take in removing a specific transmission line from service is an example of an Operating Procedure.

**Operating Process** – A document that identifies general steps for achieving a generic operating goal. An Operating Process includes steps with options that may be selected depending upon real-time conditions. A guideline for controlling high voltage is an example of an Operating Process.

**Operating Plan**- A document that identifies a group of activities that may be used to achieve some goal. An Operating Plan may contain Operating Procedures and Operating Processes. A company-specific system restoration plan that includes an Operating Procedure for black-starting units, Operating Processes for communicating restoration progress with other entities, etc., is an example of an Operating Plan.



**IROL Violation Report**

Interconnection Reliability Operating Limit Violation Report Compliance Template			
<b>Entity Performing Reliability Authority Function:</b>			
<b>Report Date:</b>			
<b>Event Date:</b>	<b>Event Start Time:</b>	<b>Event End Time:</b>	
<b>Name of IROL that was exceeded:</b>	<b>Value of the IROL that was exceeded:</b>	<b>The exceeded IROL's T<sub>v</sub>:</b>	
<b>Magnitude of Limit Exceeded after T<sub>v</sub>:</b>		<b>Duration of Event:</b>	
<b>List of Actions Taken or Directives Issued and Results Achieved:</b>			
Time Action Initiated or Directive Issued:	Action Taken or Directive Issued:	Time Action Completed:	Results Achieved:
<b>Report completed by:</b>			
<b>Name:</b>		<b>Phone:</b>	
<b>Title:</b> _____		<b>E-mail:</b>	

When completed, email to: [gerry.cauley@nerc.net](mailto:gerry.cauley@nerc.net)

## Standard Authorization Request Form

Title of Proposed Standard	Operate Within System Operating Limits
Request Date	March 19, 2004

SAR Requestor Information	SAR Type (Put an 'x' in front of one of these selections)	
Name Operate Within IROL SDT; Ed Riley, Chairman of Operate Within IROL SDT	<input checked="" type="checkbox"/>	New Standard
Primary Contact Gerald Rheault, Charles Waits	<input type="checkbox"/>	Revision to existing Standard
Telephone G. Rheault (204) 487-5423 C. Waits (734) 929-1227	<input type="checkbox"/>	Withdrawal of existing Standard
E-mail G. Rheault <a href="mailto:gnrheault@hydro.mb.ca">gnrheault@hydro.mb.ca</a> C. Waits <a href="mailto:cwaits@metcllc.com">cwaits@metcllc.com</a>	<input type="checkbox"/>	Urgent Action

### Purpose/Industry Need (Provide one or two sentences)

The Transmission System must be continuously monitored and assessed to ensure that system operating limits aren't exceeded. Exceeding system operating limits may result in customer outages and equipment damage. This SAR is submitted to establish a standard for data collection, monitoring, and operating within, Transmission System Operating Limits.

### Brief Description

This standard requires monitoring and controlling the transmission system under the authority of the Transmission Operator such that system operating limits are not exceeded.<sup>1</sup> The system operating limits addressed in this standard are established using the methodology defined in Standard 600 and are not the subset classified as Interconnection Reliability Operating Limits in Standard 200.

Requirements shall address:

<sup>1</sup> These are the system operating limits established through the standard, "Determine Facility Ratings, Operating Limits and Transfer Capabilities"

- Real time monitoring of transmission system parameters against system operating limits
- Performing day ahead operational planning analyses and real-time assessments relative to operating within system operating limits
- Keeping the Reliability Authority informed of changes in the status of the transmission system that could affect interconnection reliability
- Keeping the Generator Operators informed of changes in the status of the transmission system that may affect generator operations
- Taking actions to prevent and/or mitigate instances of operating outside system operating limits
- Having and following operating procedures, processes or plans to prevent and mitigate instances of operating outside system operating limits
- Reporting instances of operating outside any system operating limit for more than 30 minutes to the Compliance Monitor

### **Reliability Functions**

<b>The Standard will Apply to the Following Functions</b> <i>(Check box for each one that applies by double clicking the grey boxes.)</i>		
<input checked="" type="checkbox"/>	Reliability Authority	Ensures the reliability of the bulk transmission system within its Reliability Authority area. This is the highest reliability authority.
<input type="checkbox"/>	Balancing Authority	Integrates resource plans ahead of time, and maintains load-interchange-resource balance within its metered boundary and supports system frequency in real time
<input type="checkbox"/>	Interchange Authority	Authorizes valid and balanced Interchange Schedules
<input type="checkbox"/>	Planning Authority	Plans the bulk electric system
<input type="checkbox"/>	Resource Planner	Develops a long-term (>1year) plan for the resource adequacy of specific loads within a Planning Authority area.
<input type="checkbox"/>	Transmission Planner	Develops a long-term (>1 year) plan for the reliability of transmission systems within its portion of the Planning Authority area.
<input type="checkbox"/>	Transmission Service Provider	Provides transmission services to qualified market participants under applicable transmission service agreements
<input type="checkbox"/>	Transmission Owner	Owens transmission facilities
<input checked="" type="checkbox"/>	Transmission Operator	Operates and maintains the transmission facilities, and executes switching orders
<input checked="" type="checkbox"/>	Distribution Provider	Provides and operates the “wires” between the transmission system and the customer
<input type="checkbox"/>	Generator Owner	Owens and maintains generation unit(s)
<input checked="" type="checkbox"/>	Generator Operator	Operates generation unit(s) and performs the functions of supplying energy and Interconnected Operations Services
<input type="checkbox"/>	Purchasing-Selling Entity	The function of purchasing or selling energy, capacity and all necessary Interconnected Operations Services as required

<input type="checkbox"/>	Market Operator	Integrates energy, capacity, balancing, and transmission resources to achieve an economic, reliability-constrained dispatch.
<input type="checkbox"/>	Load-Serving Entity	Secures energy and transmission (and related generation services) to serve the end user

### **Reliability and Market Interface Principles**

<b>Applicable Reliability Principles</b> (Check boxes for all that apply by double clicking the grey boxes.)	
<input checked="" type="checkbox"/>	1. Interconnected bulk electric systems shall be planned and operated in a coordinated manner to perform reliably under normal and abnormal conditions as defined in the NERC Standards.
<input checked="" type="checkbox"/>	2. The frequency and voltage of interconnected bulk electric systems shall be controlled within defined limits through the balancing of real and reactive power supply and demand.
<input checked="" type="checkbox"/>	3. Information necessary for the planning and operation of interconnected bulk electric systems shall be made available to those entities responsible for planning and operating the systems reliably.
<input type="checkbox"/>	4. Plans for emergency operation and system restoration of interconnected bulk electric systems shall be developed, coordinated, maintained and implemented.
<input type="checkbox"/>	5. Facilities for communication, monitoring and control shall be provided, used and maintained for the reliability of interconnected bulk electric systems.
<input type="checkbox"/>	6. Personnel responsible for planning and operating interconnected bulk electric systems shall be trained, qualified and have the responsibility and authority to implement actions.
<input type="checkbox"/>	7. The security of the interconnected bulk electric systems shall be assessed, monitored and maintained on a wide area basis.
<b>Does the proposed Standard comply with all of the following Market Interface Principles?</b> (Select 'yes' or 'no' from the drop-down box by double clicking the grey area.)	
1. The planning and operation of bulk electric systems shall recognize that reliability is an essential requirement of a robust North American economy. Yes	
2. An Organization Standard shall not give any market participant an unfair competitive advantage. Yes	
3. An Organization Standard shall neither mandate nor prohibit any specific market structure. Yes	
4. An Organization Standard shall not preclude market solutions to achieving compliance with that Standard. Yes	
5. An Organization Standard shall not require the public disclosure of commercially sensitive information. All market participants shall have equal opportunity to access commercially non-sensitive information that is required for compliance with reliability standards. Yes	

## Detailed Description

The Transmission Operator shall:

- Perform Real-time Monitoring of system parameters against System Operating Limits
  - Monitor parameters that indicate the current state of the local transmission system relative to operating within System Operating Limits
- Perform day ahead Operational Planning Analyses and Real-time Assessments of System Operating Limits
  - Collect data needed to monitor and assess the local transmission system relative to operating within System Operating Limits
  - Conduct Operational Planning Analyses and Real-time Assessments to determine if the local transmission system can be/is being operated within System Operating Limits
- Notify its RA and adjacent TOPs of any changes to the local transmission system that may affect adjacent transmission systems
- Notify Generator Operators of changes to the local transmission system that may affect generator operations
- Act to prevent and/or mitigate instances of operating outside System Operating Limits. These documents shall address the three types of System Operating Limits - thermal, voltage and stability.
  - Have operating processes, procedures or plans for preventing and mitigating instances of operating outside system operating limits
  - Implement operating processes, procedures or plans to prevent or mitigate instances of operating outside system operating limits
  - Define a maximum time  $T_m$  within which the system must be returned to a safe operating mode to a maximum time of 30 minutes.
- Document
  - Log all instances of operating outside system operating limits
  - Report information to the Compliance Monitor based on specified criteria (e.g. magnitude, duration, type of violation, instances of operating outside limits<sup>2</sup>)

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<sup>2</sup> If an area bounces over a limit, whether it is caused by a contingency or not, this doesn't need to be reported to NERC as long as the area re-prepares within the NERC guidelines. If the NERC criteria are not met, then these violations should be reported.

***Related Standards***

<b>Standard No.</b>	<b>Explanation</b>
600	The Determine Facility Ratings, System Operating Limits and Transfer Capabilities standard identifies how to set System Operating Limits.
200	The Monitor and Assess Short-term Transmission Reliability – Operate Within Interconnection Reliability Operating Limits establishes a subset of System Operating Limits under the control of the Reliability Authority.
	The Transmission Operator Certification standard establishes a list of processes, procedures, tools and agreements that need to be in place before an entity that wants to perform the Transmission Operator function can be certified. This standard assumes that the Transmission Operator has met all criteria required for certification.

***Related SARs***

<b>SAR ID</b>	<b>Explanation</b>

***Regional Differences***

<b>Region</b>	<b>Explanation</b>
ECAR	
ERCOT	
FRCC	
MAAC	
MAIN	
MAPP	
NPCC	
SERC	
SPP	
WECC	

***Related NERC Operating Policies or Planning Standards***

ID	Explanation