



December 8, 2009

**VIA ELECTRONIC FILING**

Ms. Erica Hamilton, Commission Secretary  
British Columbia Utilities Commission  
Box 250, 900 Howe Street  
Sixth Floor  
Vancouver, B.C.  
V6Z 2N3

Re: *North American Electric Reliability Corporation*

Dear Ms. Hamilton:

The North American Electric Reliability Corporation (“NERC”) hereby submits Notice of Filing of an errata to correct two misnumbered requirements referenced in the WECC Regional Differences portion of the NERC Reliability Standard FAC-010-2 — System Operating Limits Methodology for the Planning Horizon, which was originally approved by the NERC Board of Trustees on June 24, 2008 and submitted to this authority on July 11, 2008. These errata were approved by the NERC Board of Trustees on November 5, 2009.

Accordingly, NERC is submitting the following corrected version of this Reliability Standard designated, as set forth below:

- FAC-010-2.1 — System Operating Limits Methodology for the Planning Horizon

The corrected Reliability Standard is contained in **Exhibit A** to this filing. As no changes to requirements are proposed in this filing, Violation Risk Factors and Violation Severity Levels for FAC-010-2 will be carried forward intact to Version 2.1. NERC

submitted this errata filing with the Federal Energy Regulatory Commission (“FERC”) on November 20, 2009, and is submitting this errata filing with the other applicable governmental authorities in Canada.

NERC’s filing consists the following:

- This transmittal letter;
- A table of contents for the filing;
- A narrative description explaining the proposed correction; and
- Reliability Standard FAC-010-2.1 — System Operating Limits Methodology for the Planning Horizon, submitted for approval (**Exhibit A**).

Please contact the undersigned if you have any questions.

Respectfully submitted,

/s/ Holly A. Hawkins

Holly A. Hawkins

*Attorney for North American  
Electric Reliability Corporation*

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**BEFORE THE  
BRITISH COLUMBIA UTILITIES COMMISSION  
OF THE PROVINCE OF BRITISH COLUMBIA**

**NORTH AMERICAN ELECTRIC )  
RELIABILITY CORPORATION )**

**NOTICE OF FILING OF THE  
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION  
OF CORRECTED RELIABILITY STANDARD FAC-010-2 SYSTEM  
OPERATING LIMITS METHODOLOGY FOR THE PLANNING HORIZON**

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December 8, 2009

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**Exhibit A** — Corrected Reliability Standard FAC-010-2.1 — System Operating Limits Methodology for the Planning Horizon

## I. INTRODUCTION

The North American Electric Reliability Corporation (NERC) hereby submits this corrected version of Reliability Standard FAC-010-2 — System Operating Limits Methodology for the Planning Horizon. FAC-010-2 was developed to directly address matters identified by FERC in Order No. 705.<sup>1</sup> The revised standard did not include necessary conforming changes to the Western Electricity Coordinating Council (“WECC”) Regional Differences section of the standard, and as a result, references to some requirements are incorrect. In this filing, NERC has redesignated the corrected Reliability Standard as FAC-010-2.1, and has renumbered some requirements to comport with other previously approved changes to the standards. No other changes are proposed. **Exhibit A** to this filing sets forth the proposed reliability standard. The existing Violation Severity Levels and Violation Risk Factors will be applicable to requirements in FAC-010-2. NERC submitted this filing with the Federal Energy Regulatory Commission on November 20, 2009, and is submitting this filing with the other applicable governmental authorities in Canada.

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<sup>1</sup> *Facilities Design, Connections and Maintenance Reliability Standards*, Order No. 705, 121 FERC ¶ 61,296 (2007).

## **II. NOTICES AND COMMUNICATIONS**

Notices and communications with respect to this filing may be addressed to the following:

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## **III. FAC-010-2 — SYSTEM OPERATING LIMITS METHODOLOGY FOR THE PLANNING HORIZON**

In FAC-010-2 Reliability Standard, references to certain requirements in the WECC Regional Differences portion of the standard were referred to incorrectly. That is, Section E1.1 that addresses the WECC Regional Differences incorrectly cross references Requirements R2.4 and 2.5 of the standard. In fact, the correct cross references in section E1.1 should be to Requirements R2.5 and R2.6. WECC notified NERC of this necessary change on October 8, 2009. Accordingly, requirements R2.4 and R2.5 of FAC-010-2 have been changed to R2.5 and R2.6 in Section E1.1 of FAC-010-2.1 proposed herein for approval. No changes were made to the content of any other portion of the Reliability Standard. Section E.1.1 of the FAC-010-2 Reliability Standard has been modified to

accurately reflect the proper reference to Requirements R2.5 and R2.6 of the standard. A redline of the proposed change to Section E1.1 is as follows:

As governed by the requirements of ~~R2.4~~ R2.5 and ~~R2.5~~R2.6, starting with all Facilities in service, shall require the evaluation of the following multiple Facility Contingencies when establishing SOLs.

The current Violation Severity Levels and Violation Risk Factors for FAC-010-2 have been assigned to this proposed version of the Reliability Standard.

WECC, a Regional Entity organized on an Interconnection basis, is entitled to a rebuttable presumption of validity for Regional Standards it proposes, including regional differences to NERC continent-wide standards. Therefore, upon request, specific action of the NERC Board of Trustees was required, and has been taken, to correct these errors. The NERC Board of Trustees approved the change necessary to correct these errors on November 5, 2009.

Respectfully submitted,

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**Exhibit A**

**Corrected Reliability Standard**

**FAC-010-2.1 — System Operating Limits Methodology for the Planning Horizon**



## A. Introduction

1. **Title:** System Operating Limits Methodology for the Planning Horizon
2. **Number:** FAC-010-2
3. **Purpose:** To ensure that System Operating Limits (SOLs) used in the reliable planning of the Bulk Electric System (BES) are determined based on an established methodology or methodologies.
4. **Applicability**
  - 4.1. Planning Authority
5. **Effective Date:** July 1, 2008

## B. Requirements

- R1.** The Planning Authority shall have a documented SOL Methodology for use in developing SOLs within its Planning Authority Area. This SOL Methodology shall:
  - R1.1.** Be applicable for developing SOLs used in the planning horizon.
  - R1.2.** State that SOLs shall not exceed associated Facility Ratings.
  - R1.3.** Include a description of how to identify the subset of SOLs that qualify as IROLs.
- R2.** The Planning Authority's SOL Methodology shall include a requirement that SOLs provide BES performance consistent with the following:
  - R2.1.** In the pre-contingency state and with all Facilities in service, the BES shall demonstrate transient, dynamic and voltage stability; all Facilities shall be within their Facility Ratings and within their thermal, voltage and stability limits. In the determination of SOLs, the BES condition used shall reflect expected system conditions and shall reflect changes to system topology such as Facility outages.
  - R2.2.** Following the single Contingencies<sup>1</sup> identified in Requirement 2.2.1 through Requirement 2.2.3, the system shall demonstrate transient, dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading or uncontrolled separation shall not occur.
    - R2.2.1.** Single line to ground or three-phase Fault (whichever is more severe), with Normal Clearing, on any Faulted generator, line, transformer, or shunt device.
    - R2.2.2.** Loss of any generator, line, transformer, or shunt device without a Fault.

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<sup>1</sup> The Contingencies identified in R2.2.1 through R2.2.3 are the minimum contingencies that must be studied but are not necessarily the only Contingencies that should be studied.

- R2.2.3.** Single pole block, with Normal Clearing, in a monopolar or bipolar high voltage direct current system.
  - R2.3.** Starting with all Facilities in service, the system's response to a single Contingency, may include any of the following:
    - R2.3.1.** Planned or controlled interruption of electric supply to radial customers or some local network customers connected to or supplied by the Faulted Facility or by the affected area.
    - R2.3.2.** System reconfiguration through manual or automatic control or protection actions.
  - R2.4.** To prepare for the next Contingency, system adjustments may be made, including changes to generation, uses of the transmission system, and the transmission system topology.
  - R2.5.** Starting with all Facilities in service and following any of the multiple Contingencies identified in Reliability Standard TPL-003 the system shall demonstrate transient, dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading or uncontrolled separation shall not occur.
  - R2.6.** In determining the system's response to any of the multiple Contingencies, identified in Reliability Standard TPL-003, in addition to the actions identified in R2.3.1 and R2.3.2, the following shall be acceptable:
    - R2.6.1.** Planned or controlled interruption of electric supply to customers (load shedding), the planned removal from service of certain generators, and/or the curtailment of contracted Firm (non-recallable reserved) electric power Transfers.
- R3.** The Planning Authority's methodology for determining SOLs, shall include, as a minimum, a description of the following, along with any reliability margins applied for each:
  - R3.1.** Study model (must include at least the entire Planning Authority Area as well as the critical modeling details from other Planning Authority Areas that would impact the Facility or Facilities under study).
  - R3.2.** Selection of applicable Contingencies.
  - R3.3.** Level of detail of system models used to determine SOLs.
  - R3.4.** Allowed uses of Special Protection Systems or Remedial Action Plans.
  - R3.5.** Anticipated transmission system configuration, generation dispatch and Load level.
  - R3.6.** Criteria for determining when violating a SOL qualifies as an Interconnection Reliability Operating Limit (IROL) and criteria for developing any associated IROL T<sub>v</sub>.

- R4.** The Planning Authority shall issue its SOL Methodology, and any change to that methodology, to all of the following prior to the effectiveness of the change:
  - R4.1.** Each adjacent Planning Authority and each Planning Authority that indicated it has a reliability-related need for the methodology.
  - R4.2.** Each Reliability Coordinator and Transmission Operator that operates any portion of the Planning Authority's Planning Authority Area.
  - R4.3.** Each Transmission Planner that works in the Planning Authority's Planning Authority Area.
- R5.** If a recipient of the SOL Methodology provides documented technical comments on the methodology, the Planning Authority shall provide a documented response to that recipient within 45 calendar days of receipt of those comments. The response shall indicate whether a change will be made to the SOL Methodology and, if no change will be made to that SOL Methodology, the reason why.

### **C. Measures**

- M1.** The Planning Authority's SOL Methodology shall address all of the items listed in Requirement 1 through Requirement 3.
- M2.** The Planning Authority shall have evidence it issued its SOL Methodology and any changes to that methodology, including the date they were issued, in accordance with Requirement 4.
- M3.** If the recipient of the SOL Methodology provides documented comments on its technical review of that SOL methodology, the Planning Authority that distributed that SOL Methodology shall have evidence that it provided a written response to that commenter within 45 calendar days of receipt of those comments in accordance with Requirement 5.

### **D. Compliance**

#### **1. Compliance Monitoring Process**

##### **1.1. Compliance Monitoring Responsibility**

Regional Reliability Organization

##### **1.2. Compliance Monitoring Period and Reset Time Frame**

Each Planning Authority shall self-certify its compliance to the Compliance Monitor at least once every three years. New Planning Authorities shall demonstrate compliance through an on-site audit conducted by the Compliance Monitor within the first year that it commences operation. The Compliance Monitor shall also conduct an on-site audit once every nine years and an investigation upon complaint to assess performance.

The Performance-Reset Period shall be twelve months from the last non-compliance.

##### **1.3. Data Retention**

The Planning Authority shall keep all superseded portions to its SOL Methodology for 12 months beyond the date of the change in that methodology and shall keep all documented comments on its SOL Methodology and associated

responses for three years. In addition, entities found non-compliant shall keep information related to the non-compliance until found compliant.

The Compliance Monitor shall keep the last audit and all subsequent compliance records.

**1.4. Additional Compliance Information**

The Planning Authority shall make the following available for inspection during an on-site audit by the Compliance Monitor or within 15 business days of a request as part of an investigation upon complaint:

**1.4.1** SOL Methodology.

**1.4.2** Documented comments provided by a recipient of the SOL Methodology on its technical review of a SOL Methodology, and the associated responses.

**1.4.3** Superseded portions of its SOL Methodology that had been made within the past 12 months.

**1.4.4** Evidence that the SOL Methodology and any changes to the methodology that occurred within the past 12 months were issued to all required entities.

**2. Levels of Non-Compliance for Western Interconnection: (To be replaced with VSLs once developed and approved by WECC)**

**2.1. Level 1:** There shall be a level one non-compliance if either of the following conditions exists:

**2.1.1** The SOL Methodology did not include a statement indicating that Facility Ratings shall not be exceeded.

**2.1.2** No evidence of responses to a recipient's comments on the SOL Methodology.

**2.2. Level 2:** The SOL Methodology did not include a requirement to address all of the elements in R2.1 through R2.3 and E1.

**2.3. Level 3:** There shall be a level three non-compliance if any of the following conditions exists:

**2.3.1** The SOL Methodology did not include a statement indicating that Facility Ratings shall not be exceeded and the methodology did not include evaluation of system response to one of the three types of single Contingencies identified in R2.2.

**2.3.2** The SOL Methodology did not include a statement indicating that Facility Ratings shall not be exceeded and the methodology did not include evaluation of system response to two of the seven types of multiple Contingencies identified in E1.1.

**2.3.3** The System Operating Limits Methodology did not include a statement indicating that Facility Ratings shall not be exceeded and the methodology did not address two of the six required topics in R3.

**2.4. Level 4:** The SOL Methodology was not issued to all required entities in accordance with R4.

Standard FAC-010-2 — System Operating Limits Methodology for the Planning Horizon

3. Violation Severity Levels:

Requirement	Lower	Moderate	High	Severe
R1	Not applicable.	The Planning Authority has a documented SOL Methodology for use in developing SOLs within its Planning Authority Area, but it does not address R1.2	The Planning Authority has a documented SOL Methodology for use in developing SOLs within its Planning Authority Area, but it does not address R1.3.	The Planning Authority has a documented SOL Methodology for use in developing SOLs within its Planning Authority Area, but it does not address R1.1.  OR The Planning Authority has no documented SOL Methodology for use in developing SOLs within its Planning Authority Area.
R2	The Planning Authority's SOL Methodology requires that SOLs are set to meet BES performance following single and multiple contingencies, but does not address the pre-contingency state (R2.1)	The Planning Authority's SOL Methodology requires that SOLs are set to meet BES performance in the pre-contingency state and following single contingencies, but does not address multiple contingencies. (R2.5-R2.6)	The Planning Authority's SOL Methodology requires that SOLs are set to meet BES performance in the pre-contingency state and following multiple contingencies, but does not meet the performance for response to single contingencies. (R2.2 –R2.4)	The Planning Authority's SOL Methodology requires that SOLs are set to meet BES performance in the pre-contingency state but does not require that SOLs be set to meet the BES performance specified for response to single contingencies (R2.2-R2.4) and does not require that SOLs be set to meet the BES performance specified for response to multiple contingencies. (R2.5-R2.6)
R3	The Planning Authority has a methodology for determining SOLs that	The Planning Authority has a methodology for determining SOLs that	The Planning Authority has a methodology for determining SOLs that	The Planning Authority has a methodology for determining SOLs that is

Standard FAC-010-2 — System Operating Limits Methodology for the Planning Horizon

Requirement	Lower	Moderate	High	Severe
R4	<p>includes a description for all but one of the following: R3.1 through R3.6.</p> <p>One or both of the following:                      The Planning Authority issued its SOL Methodology and changes to that methodology to all but one of the required entities.                      For a change in methodology, the changed methodology was provided up to 30 calendar days after the effectiveness of the change.</p>	<p>includes a description for all but two of the following: R3.1 through R3.6.</p> <p>One of the following:                      The Planning Authority issued its SOL Methodology and changes to that methodology to all but one of the required entities AND for a change in methodology, the changed methodology was provided 30 calendar days or more, but less than 60 calendar days after the effectiveness of the change.</p> <p>OR</p> <p>The Planning Authority issued its SOL Methodology and changes to that methodology to all but two of the required entities AND for a change in methodology, the changed methodology was provided up to 30 calendar days after the effectiveness of the change.</p>	<p>includes a description for all but three of the following: R3.1 through R3.6.</p> <p>One of the following:                      The Planning Authority issued its SOL Methodology and changes to that methodology to all but one of the required entities AND for a change in methodology, the changed methodology was provided 60 calendar days or more, but less than 90 calendar days after the effectiveness of the change.</p> <p>OR</p> <p>The Planning Authority issued its SOL Methodology and changes to that methodology to all but two of the required entities AND for a change in methodology, the changed methodology was provided 90 calendar days or more after the effectiveness of the change.</p>	<p>missing a description of four or more of the following: R3.1 through R3.6.</p> <p>One of the following:                      The Planning Authority failed to issue its SOL Methodology and changes to that methodology to more than three of the required entities.                      The Planning Authority issued its SOL Methodology and changes to that methodology to all but one of the required entities AND for a change in methodology, the changed methodology was provided 90 calendar days or more after the effectiveness of the change.</p> <p>OR</p> <p>The Planning Authority issued its SOL Methodology and changes to that methodology to all but two of the required entities AND for a change in methodology, the changed methodology was provided 60 calendar days or more, but less than 90 calendar</p>

Standard FAC-010-2 — System Operating Limits Methodology for the Planning Horizon

Requirement	Lower	Moderate	High	Severe
			<p>and changes to that methodology to all but three of the required entities AND for a change in methodology, the changed methodology was provided up to 30 calendar days after the effectiveness of the change.</p>	<p>days after the effectiveness of the change. OR The Planning Authority issued its SOL Methodology and changes to that methodology to all but three of the required entities AND for a change in methodology, the changed methodology was provided 30 calendar days or more, but less than 60 calendar days after the effectiveness of the change. The Planning Authority issued its SOL Methodology and changes to that methodology to all but four of the required entities AND for a change in methodology, the changed methodology was provided up to 30 calendar days after the effectiveness of the change.</p>

Standard FAC-010-2 — System Operating Limits Methodology for the Planning Horizon

R5	<p>The Planning Authority received documented technical comments on its SOL Methodology and provided a complete response in a time period that was longer than 45 calendar days but less than 60 calendar days.</p>	<p>The Planning Authority received documented technical comments on its SOL Methodology and provided a complete response in a time period that was 60 calendar days or longer but less than 75 calendar days.</p>	<p>The Planning Authority received documented technical comments on its SOL Methodology and provided a complete response in a time period that was 75 calendar days or longer but less than 90 calendar days.</p> <p>OR</p> <p>The Planning Authority's response to documented technical comments on its SOL Methodology indicated that a change will not be made, but did not include an explanation of why the change will not be made.</p>	<p>The Planning Authority received documented technical comments on its SOL Methodology and provided a complete response in a time period that was 90 calendar days or longer.</p> <p>OR</p> <p>The Planning Authority's response to documented technical comments on its SOL Methodology did not indicate whether a change will be made to the SOL Methodology.</p>
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**E. Regional Differences**

1. The following Interconnection-wide Regional Difference shall be applicable in the Western Interconnection:
  - 1.1. As governed by the requirements of R2.5 and R2.6, starting with all Facilities in service, shall require the evaluation of the following multiple Facility Contingencies when establishing SOLs:
    - 1.1.1 Simultaneous permanent phase to ground Faults on different phases of each of two adjacent transmission circuits on a multiple circuit tower, with Normal Clearing. If multiple circuit towers are used only for station entrance and exit purposes, and if they do not exceed five towers at each station, then this condition is an acceptable risk and therefore can be excluded.
    - 1.1.2 A permanent phase to ground Fault on any generator, transmission circuit, transformer, or bus section with Delayed Fault Clearing except for bus sectionalizing breakers or bus-tie breakers addressed in E1.1.7
    - 1.1.3 Simultaneous permanent loss of both poles of a direct current bipolar Facility without an alternating current Fault.
    - 1.1.4 The failure of a circuit breaker associated with a Special Protection System to operate when required following: the loss of any element without a Fault; or a permanent phase to ground Fault, with Normal Clearing, on any transmission circuit, transformer or bus section.
    - 1.1.5 A non-three phase Fault with Normal Clearing on common mode Contingency of two adjacent circuits on separate towers unless the event frequency is determined to be less than one in thirty years.
    - 1.1.6 A common mode outage of two generating units connected to the same switchyard, not otherwise addressed by FAC-010.
    - 1.1.7 The loss of multiple bus sections as a result of failure or delayed clearing of a bus tie or bus sectionalizing breaker to clear a permanent Phase to Ground Fault.
  - 1.2. SOLs shall be established such that for multiple Facility Contingencies in E1.1.1 through E1.1.5 operation within the SOL shall provide system performance consistent with the following:
    - 1.2.1 All Facilities are operating within their applicable Post-Contingency thermal, frequency and voltage limits.
    - 1.2.2 Cascading does not occur.
    - 1.2.3 Uncontrolled separation of the system does not occur.
    - 1.2.4 The system demonstrates transient, dynamic and voltage stability.
    - 1.2.5 Depending on system design and expected system impacts, the controlled interruption of electric supply to customers (load shedding), the planned removal from service of certain generators, and/or the curtailment of

contracted firm (non-recallable reserved) electric power transfers may be necessary to maintain the overall security of the interconnected transmission systems.

**1.2.6** Interruption of firm transfer, Load or system reconfiguration is permitted through manual or automatic control or protection actions.

**1.2.7** To prepare for the next Contingency, system adjustments are permitted, including changes to generation, Load and the transmission system topology when determining limits.

**1.3.** SOLs shall be established such that for multiple Facility Contingencies in E1.1.6 through E1.1.7 operation within the SOL shall provide system performance consistent with the following with respect to impacts on other systems:

**1.3.1** Cascading does not occur.

**1.4.** The Western Interconnection may make changes (performance category adjustments) to the Contingencies required to be studied and/or the required responses to Contingencies for specific facilities based on actual system performance and robust design. Such changes will apply in determining SOLs.

**Version History**

<b>Version</b>	<b>Date</b>	<b>Action</b>	<b>Change Tracking</b>
1	November 1, 2006	Adopted by Board of Trustees	New
1	November 1, 2006	Fixed typo. Removed the word “each” from the 1 <sup>st</sup> sentence of section D.1.3, Data Retention.	01/11/07
2	June 24, 2008	Adopted by Board of Trustees; FERC Order 705	Revised
2		Changed the effective date to July 1, 2008 Changed “Cascading Outage” to “Cascading” Replaced Levels of Non-compliance with Violation Severity Levels	Revised

## A. Introduction

1. **Title:** System Operating Limits Methodology for the Planning Horizon
2. **Number:** FAC-010-2
3. **Purpose:** To ensure that System Operating Limits (SOLs) used in the reliable planning of the Bulk Electric System (BES) are determined based on an established methodology or methodologies.
4. **Applicability**
  - 4.1. Planning Authority
5. **Effective Date:** July 1, 2008

## B. Requirements

- R1.** The Planning Authority shall have a documented SOL Methodology for use in developing SOLs within its Planning Authority Area. This SOL Methodology shall:
  - R1.1.** Be applicable for developing SOLs used in the planning horizon.
  - R1.2.** State that SOLs shall not exceed associated Facility Ratings.
  - R1.3.** Include a description of how to identify the subset of SOLs that qualify as IROLs.
- R2.** The Planning Authority's SOL Methodology shall include a requirement that SOLs provide BES performance consistent with the following:
  - R2.1.** In the pre-contingency state and with all Facilities in service, the BES shall demonstrate transient, dynamic and voltage stability; all Facilities shall be within their Facility Ratings and within their thermal, voltage and stability limits. In the determination of SOLs, the BES condition used shall reflect expected system conditions and shall reflect changes to system topology such as Facility outages.
  - R2.2.** Following the single Contingencies<sup>1</sup> identified in Requirement 2.2.1 through Requirement 2.2.3, the system shall demonstrate transient, dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading or uncontrolled separation shall not occur.
    - R2.2.1.** Single line to ground or three-phase Fault (whichever is more severe), with Normal Clearing, on any Faulted generator, line, transformer, or shunt device.
    - R2.2.2.** Loss of any generator, line, transformer, or shunt device without a Fault.

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<sup>1</sup> The Contingencies identified in R2.2.1 through R2.2.3 are the minimum contingencies that must be studied but are not necessarily the only Contingencies that should be studied.

- R2.2.3.** Single pole block, with Normal Clearing, in a monopolar or bipolar high voltage direct current system.
- R2.3.** Starting with all Facilities in service, the system's response to a single Contingency, may include any of the following:
- R2.3.1.** Planned or controlled interruption of electric supply to radial customers or some local network customers connected to or supplied by the Faulted Facility or by the affected area.
  - R2.3.2.** System reconfiguration through manual or automatic control or protection actions.
- R2.4.** To prepare for the next Contingency, system adjustments may be made, including changes to generation, uses of the transmission system, and the transmission system topology.
- R2.5.** Starting with all Facilities in service and following any of the multiple Contingencies identified in Reliability Standard TPL-003 the system shall demonstrate transient, dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading or uncontrolled separation shall not occur.
- R2.6.** In determining the system's response to any of the multiple Contingencies, identified in Reliability Standard TPL-003, in addition to the actions identified in R2.3.1 and R2.3.2, the following shall be acceptable:
- R2.6.1.** Planned or controlled interruption of electric supply to customers (load shedding), the planned removal from service of certain generators, and/or the curtailment of contracted Firm (non-recallable reserved) electric power Transfers.
- R3.** The Planning Authority's methodology for determining SOLs, shall include, as a minimum, a description of the following, along with any reliability margins applied for each:
- R3.1.** Study model (must include at least the entire Planning Authority Area as well as the critical modeling details from other Planning Authority Areas that would impact the Facility or Facilities under study).
  - R3.2.** Selection of applicable Contingencies.
  - R3.3.** Level of detail of system models used to determine SOLs.
  - R3.4.** Allowed uses of Special Protection Systems or Remedial Action Plans.
  - R3.5.** Anticipated transmission system configuration, generation dispatch and Load level.
  - R3.6.** Criteria for determining when violating a SOL qualifies as an Interconnection Reliability Operating Limit (IROL) and criteria for developing any associated IROL T<sub>v</sub>.

- R4.** The Planning Authority shall issue its SOL Methodology, and any change to that methodology, to all of the following prior to the effectiveness of the change:
  - R4.1.** Each adjacent Planning Authority and each Planning Authority that indicated it has a reliability-related need for the methodology.
  - R4.2.** Each Reliability Coordinator and Transmission Operator that operates any portion of the Planning Authority's Planning Authority Area.
  - R4.3.** Each Transmission Planner that works in the Planning Authority's Planning Authority Area.
- R5.** If a recipient of the SOL Methodology provides documented technical comments on the methodology, the Planning Authority shall provide a documented response to that recipient within 45 calendar days of receipt of those comments. The response shall indicate whether a change will be made to the SOL Methodology and, if no change will be made to that SOL Methodology, the reason why.

### **C. Measures**

- M1.** The Planning Authority's SOL Methodology shall address all of the items listed in Requirement 1 through Requirement 3.
- M2.** The Planning Authority shall have evidence it issued its SOL Methodology and any changes to that methodology, including the date they were issued, in accordance with Requirement 4.
- M3.** If the recipient of the SOL Methodology provides documented comments on its technical review of that SOL methodology, the Planning Authority that distributed that SOL Methodology shall have evidence that it provided a written response to that commenter within 45 calendar days of receipt of those comments in accordance with Requirement 5.

### **D. Compliance**

#### **1. Compliance Monitoring Process**

##### **1.1. Compliance Monitoring Responsibility**

Regional Reliability Organization

##### **1.2. Compliance Monitoring Period and Reset Time Frame**

Each Planning Authority shall self-certify its compliance to the Compliance Monitor at least once every three years. New Planning Authorities shall demonstrate compliance through an on-site audit conducted by the Compliance Monitor within the first year that it commences operation. The Compliance Monitor shall also conduct an on-site audit once every nine years and an investigation upon complaint to assess performance.

The Performance-Reset Period shall be twelve months from the last non-compliance.

##### **1.3. Data Retention**

The Planning Authority shall keep all superseded portions to its SOL Methodology for 12 months beyond the date of the change in that methodology and shall keep all documented comments on its SOL Methodology and associated

responses for three years. In addition, entities found non-compliant shall keep information related to the non-compliance until found compliant.

The Compliance Monitor shall keep the last audit and all subsequent compliance records.

**1.4. Additional Compliance Information**

The Planning Authority shall make the following available for inspection during an on-site audit by the Compliance Monitor or within 15 business days of a request as part of an investigation upon complaint:

**1.4.1** SOL Methodology.

**1.4.2** Documented comments provided by a recipient of the SOL Methodology on its technical review of a SOL Methodology, and the associated responses.

**1.4.3** Superseded portions of its SOL Methodology that had been made within the past 12 months.

**1.4.4** Evidence that the SOL Methodology and any changes to the methodology that occurred within the past 12 months were issued to all required entities.

**2. Levels of Non-Compliance for Western Interconnection: (To be replaced with VSLs once developed and approved by WECC)**

**2.1. Level 1:** There shall be a level one non-compliance if either of the following conditions exists:

**2.1.1** The SOL Methodology did not include a statement indicating that Facility Ratings shall not be exceeded.

**2.1.2** No evidence of responses to a recipient's comments on the SOL Methodology.

**2.2. Level 2:** The SOL Methodology did not include a requirement to address all of the elements in R2.1 through R2.3 and E1.

**2.3. Level 3:** There shall be a level three non-compliance if any of the following conditions exists:

**2.3.1** The SOL Methodology did not include a statement indicating that Facility Ratings shall not be exceeded and the methodology did not include evaluation of system response to one of the three types of single Contingencies identified in R2.2.

**2.3.2** The SOL Methodology did not include a statement indicating that Facility Ratings shall not be exceeded and the methodology did not include evaluation of system response to two of the seven types of multiple Contingencies identified in E1.1.

**2.3.3** The System Operating Limits Methodology did not include a statement indicating that Facility Ratings shall not be exceeded and the methodology did not address two of the six required topics in R3.

**2.4. Level 4:** The SOL Methodology was not issued to all required entities in accordance with R4.

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3. Violation Severity Levels:

Requirement	Lower	Moderate	High	Severe
R1	Not applicable.	The Planning Authority has a documented SOL Methodology for use in developing SOLs within its Planning Authority Area, but it does not address R1.2	The Planning Authority has a documented SOL Methodology for use in developing SOLs within its Planning Authority Area, but it does not address R1.3.	The Planning Authority has a documented SOL Methodology for use in developing SOLs within its Planning Authority Area, but it does not address R1.1.  OR The Planning Authority has no documented SOL Methodology for use in developing SOLs within its Planning Authority Area.
R2	The Planning Authority's SOL Methodology requires that SOLs are set to meet BES performance following single and multiple contingencies, but does not address the pre-contingency state (R2.1)	The Planning Authority's SOL Methodology requires that SOLs are set to meet BES performance in the pre-contingency state and following single contingencies, but does not address multiple contingencies. (R2.5-R2.6)	The Planning Authority's SOL Methodology requires that SOLs are set to meet BES performance in the pre-contingency state and following multiple contingencies, but does not meet the performance for response to single contingencies. (R2.2 –R2.4)	The Planning Authority's SOL Methodology requires that SOLs are set to meet BES performance in the pre-contingency state but does not require that SOLs be set to meet the BES performance specified for response to single contingencies (R2.2-R2.4) and does not require that SOLs be set to meet the BES performance specified for response to multiple contingencies. (R2.5-R2.6)
R3	The Planning Authority has a methodology for determining SOLs that	The Planning Authority has a methodology for determining SOLs that	The Planning Authority has a methodology for determining SOLs that	The Planning Authority has a methodology for determining SOLs that is

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Requirement	Lower	Moderate	High	Severe
R4	<p>includes a description for all but one of the following: R3.1 through R3.6.</p> <p>One or both of the following:                      The Planning Authority issued its SOL Methodology and changes to that methodology to all but one of the required entities.                      For a change in methodology, the changed methodology was provided up to 30 calendar days after the effectiveness of the change.</p>	<p>includes a description for all but two of the following: R3.1 through R3.6.</p> <p>One of the following:                      The Planning Authority issued its SOL Methodology and changes to that methodology to all but one of the required entities AND for a change in methodology, the changed methodology was provided 30 calendar days or more, but less than 60 calendar days after the effectiveness of the change.</p> <p>OR</p> <p>The Planning Authority issued its SOL Methodology and changes to that methodology to all but two of the required entities AND for a change in methodology, the changed methodology was provided up to 30 calendar days after the effectiveness of the change.</p>	<p>includes a description for all but three of the following: R3.1 through R3.6.</p> <p>One of the following:                      The Planning Authority issued its SOL Methodology and changes to that methodology to all but one of the required entities AND for a change in methodology, the changed methodology was provided 60 calendar days or more, but less than 90 calendar days after the effectiveness of the change.</p> <p>OR</p> <p>The Planning Authority issued its SOL Methodology and changes to that methodology to all but two of the required entities AND for a change in methodology, the changed methodology was provided 90 calendar days or more after the effectiveness of the change.</p>	<p>missing a description of four or more of the following: R3.1 through R3.6.</p> <p>One of the following:                      The Planning Authority failed to issue its SOL Methodology and changes to that methodology to more than three of the required entities.                      The Planning Authority issued its SOL Methodology and changes to that methodology to all but one of the required entities AND for a change in methodology, the changed methodology was provided 90 calendar days or more after the effectiveness of the change.</p> <p>OR</p> <p>The Planning Authority issued its SOL Methodology and changes to that methodology to all but two of the required entities AND for a change in methodology, the changed methodology was provided 60 calendar days or more, but less than 90 calendar</p>



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Requirement	Lower	Moderate	High	Severe
			<p>and changes to that methodology to all but three of the required entities AND for a change in methodology, the changed methodology was provided up to 30 calendar days after the effectiveness of the change.</p>	<p>days after the effectiveness of the change. OR The Planning Authority issued its SOL Methodology and changes to that methodology to all but three of the required entities AND for a change in methodology, the changed methodology was provided 30 calendar days or more, but less than 60 calendar days after the effectiveness of the change. The Planning Authority issued its SOL Methodology and changes to that methodology to all but four of the required entities AND for a change in methodology, the changed methodology was provided up to 30 calendar days after the effectiveness of the change.</p>

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R5	<p>The Planning Authority received documented technical comments on its SOL Methodology and provided a complete response in a time period that was longer than 45 calendar days but less than 60 calendar days.</p>	<p>The Planning Authority received documented technical comments on its SOL Methodology and provided a complete response in a time period that was 60 calendar days or longer but less than 75 calendar days.</p>	<p>The Planning Authority received documented technical comments on its SOL Methodology and provided a complete response in a time period that was 75 calendar days or longer but less than 90 calendar days.</p> <p>OR</p> <p>The Planning Authority's response to documented technical comments on its SOL Methodology indicated that a change will not be made, but did not include an explanation of why the change will not be made.</p>	<p>The Planning Authority received documented technical comments on its SOL Methodology and provided a complete response in a time period that was 90 calendar days or longer.</p> <p>OR</p> <p>The Planning Authority's response to documented technical comments on its SOL Methodology did not indicate whether a change will be made to the SOL Methodology.</p>
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## E. Regional Differences

1. The following Interconnection-wide Regional Difference shall be applicable in the Western Interconnection:
  - 1.1. As governed by the requirements of R2.45 and R2.56, starting with all Facilities in service, shall require the evaluation of the following multiple Facility Contingencies when establishing SOLs:
    - 1.1.1 Simultaneous permanent phase to ground Faults on different phases of each of two adjacent transmission circuits on a multiple circuit tower, with Normal Clearing. If multiple circuit towers are used only for station entrance and exit purposes, and if they do not exceed five towers at each station, then this condition is an acceptable risk and therefore can be excluded.
    - 1.1.2 A permanent phase to ground Fault on any generator, transmission circuit, transformer, or bus section with Delayed Fault Clearing except for bus sectionalizing breakers or bus-tie breakers addressed in E1.1.7
    - 1.1.3 Simultaneous permanent loss of both poles of a direct current bipolar Facility without an alternating current Fault.
    - 1.1.4 The failure of a circuit breaker associated with a Special Protection System to operate when required following: the loss of any element without a Fault; or a permanent phase to ground Fault, with Normal Clearing, on any transmission circuit, transformer or bus section.
    - 1.1.5 A non-three phase Fault with Normal Clearing on common mode Contingency of two adjacent circuits on separate towers unless the event frequency is determined to be less than one in thirty years.
    - 1.1.6 A common mode outage of two generating units connected to the same switchyard, not otherwise addressed by FAC-010.
    - 1.1.7 The loss of multiple bus sections as a result of failure or delayed clearing of a bus tie or bus sectionalizing breaker to clear a permanent Phase to Ground Fault.
  - 1.2. SOLs shall be established such that for multiple Facility Contingencies in E1.1.1 through E1.1.5 operation within the SOL shall provide system performance consistent with the following:
    - 1.2.1 All Facilities are operating within their applicable Post-Contingency thermal, frequency and voltage limits.
    - 1.2.2 Cascading does not occur.
    - 1.2.3 Uncontrolled separation of the system does not occur.
    - 1.2.4 The system demonstrates transient, dynamic and voltage stability.
    - 1.2.5 Depending on system design and expected system impacts, the controlled interruption of electric supply to customers (load shedding), the planned removal from service of certain generators, and/or the curtailment of

contracted firm (non-recallable reserved) electric power transfers may be necessary to maintain the overall security of the interconnected transmission systems.

**1.2.6** Interruption of firm transfer, Load or system reconfiguration is permitted through manual or automatic control or protection actions.

**1.2.7** To prepare for the next Contingency, system adjustments are permitted, including changes to generation, Load and the transmission system topology when determining limits.

**1.3.** SOLs shall be established such that for multiple Facility Contingencies in E1.1.6 through E1.1.7 operation within the SOL shall provide system performance consistent with the following with respect to impacts on other systems:

**1.3.1** Cascading does not occur.

**1.4.** The Western Interconnection may make changes (performance category adjustments) to the Contingencies required to be studied and/or the required responses to Contingencies for specific facilities based on actual system performance and robust design. Such changes will apply in determining SOLs.

**Version History**

<b>Version</b>	<b>Date</b>	<b>Action</b>	<b>Change Tracking</b>
1	November 1, 2006	Adopted by Board of Trustees	New
1	November 1, 2006	Fixed typo. Removed the word “each” from the 1 <sup>st</sup> sentence of section D.1.3, Data Retention.	01/11/07
2	June 24, 2008	Adopted by Board of Trustees; FERC Order 705	Revised
2		Changed the effective date to July 1, 2008 Changed “Cascading Outage” to “Cascading” Replaced Levels of Non-compliance with Violation Severity Levels	Revised