

## Standard Development Timeline

This section is maintained by the drafting team during the development of the standard and will be removed when the standard is adopted by the NERC Board of Trustees (Board).

### Description of Current Draft

Completed Actions	Date
Standards Committee approved Standard Authorization Request (SAR) for posting	08/19/15
SAR posted for comment	08/20/15 – 09/21/15
Draft Reliability Standard posted for Informal Comment Period	07/14/16 – 08/12/16
45-day formal comment period with initial ballot	09/29/17 – 11/14/17
45-day formal comment period with additional ballot	08/24/18-10/17/18
45-day formal comment period with additional ballot	6/19/20 - 8/26/20

Anticipated Actions	Date
10-day final ballot	April 2021
NERC Board adoption	May 2021

## New or Modified Term(s) Used in NERC Reliability Standards

This section includes all new or modified terms used in the proposed standard that will be included in the *Glossary of Terms Used in NERC Reliability Standards* upon applicable regulatory approval. Terms used in the proposed standard that are already defined and are not being modified can be found in the *Glossary of Terms Used in NERC Reliability Standards*. The new or revised terms listed below will be presented for approval with the proposed standard. Upon Board adoption, this section will be removed.

### Proposed Modified Term

#### System Operating Limit:

~~All Facility Ratings, System Voltage Limits, and stability limits, applicable to The value (such as MW, Mvar, amperes, frequency or volts) that satisfies the most limiting of the prescribed operating criteria for a specified system configurations, used in Bulk Electric System operations for monitoring and assessing pre- and post-Contingency operating states. 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 Ratings 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)~~

#### Clean

All Facility Ratings, System Voltage Limits, and stability limits, applicable to specified System configurations, used in Bulk Electric System operations for monitoring and assessing pre- and post-Contingency operating states.

### Proposed New Term

#### System Voltage Limit:

The maximum and minimum steady-state voltage limits (both normal and emergency) that provide for acceptable System performance.

## A. Introduction

**Title:** System Operating Limits Methodology for the Operations Horizon

**Number:** FAC-011-~~43~~

**Purpose:** To ensure that System Operating Limits (SOLs) used in the reliable operation of the Bulk Electric System (BES) are determined based on an established methodology or methodologies.

**Applicability:**

### 1.1. Functional Entities:

#### 4.1.1. Reliability Coordinator

**Effective Date:** See Implementation Plan for [Project 2015-09](#).

## B. Requirements and Measures

**R1.** ~~The Each~~ Reliability Coordinator shall have a documented methodology for ~~use~~ ~~in establishing developing~~ SOLs (i.e., SOL ~~M~~ methodology) within its Reliability Coordinator Area. ~~This SOL Methodology shall:~~ *[Violation Risk Factor: Medium] [Time Horizon: Operations Planning]*

~~1.1.~~ — Be applicable for developing SOLs used in the operations horizon.

~~1.2.~~ — State that SOLs shall not exceed associated Facility Ratings.

~~1.3.~~ — Include a description of how to identify the subset of SOLs that qualify as IROLs.

**M1.** Acceptable evidence may include, but is not limited to, dated electronic or hard copy documentation of its ~~The Reliability Coordinator's SOL M~~ methodology shall address all of the items listed in Requirement 1 through Requirement 3.

**R2.** ~~The Each~~ Reliability Coordinator ~~'s~~ shall include in its SOL ~~M~~ methodology the method for Transmission Operators to determine which owner-provided Facility Ratings are to be used in operations such that the Transmission Operator and its Reliability Coordinator use common Facility Ratings shall include a requirement that SOLs provide BES performance consistent with the following: *[Violation Risk Factor: Medium] [Time Horizon: Operations Planning]*

~~2.1.~~ — In the pre-contingency state, 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 current or expected system conditions and shall reflect changes to system topology such as Facility outages.

- ~~2.2.~~ Following the single Contingencies<sup>+</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.
- ~~1.~~ Single line to ground or 3 phase Fault (whichever is more severe), with Normal Clearing, on any Faulted generator, line, transformer, or shunt device.
  - ~~2.~~ Loss of any generator, line, transformer, or shunt device without a Fault.
  - ~~3.~~ Single pole block, with Normal Clearing, in a monopolar or bipolar high voltage direct current system.
- ~~2.3.~~ In determining the system's response to a single Contingency, the following shall be acceptable:
- ~~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.
  - ~~2.~~ Interruption of other network customers, (a) only if the system has already been adjusted, or is being adjusted, following at least one prior outage, or (b) if the real time operating conditions are more adverse than anticipated in the corresponding studies
  - ~~3.~~ System reconfiguration through manual or automatic control or protection actions.
- ~~2.4.~~ 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.

M2. Acceptable evidence may include, but is not limited to, dated electronic or hard copy documentation of its The Reliability Coordinator shall have evidence it issued its SOL Methodology, that addresses the items listed in Requirement R2 and any changes to that methodology, including the date they were issued, in accordance with Requirement 4.

R3. The Each Reliability Coordinator's shall include in its SOL methodology method the methodology for Transmission Operators to determine the System Voltage Limits to be used in operations. The method shall: SOLs, shall include, as a minimum, a

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<sup>+</sup>The Contingencies identified in FAC-011 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.

~~description of the following, along with any reliability margins applied for each:  
[Violation Risk Factor: Medium] [Time Horizon: Operations Planning]~~

- ~~3.1. Require that each BES bus/station have an associated System Voltage Limits, unless its SOL methodology specifically allows the exclusion of BES buses/stations from the requirement to have an associated System Voltage Limit; Study model (must include at least the entire Reliability Coordinator Area as well as the critical modeling details from other Reliability Coordinator Areas that would impact the Facility or Facilities under study.)~~
- ~~3.2. Require that System Voltage Limits respect voltage-based Facility Ratings; Selection of applicable Contingencies~~
- ~~3.3. Require that System Voltage Limits are greater than or equal to in-service BES relay settings for undervoltage load shedding systems and Undervoltage Load Shedding Programs; A process for determining which of the stability limits associated with the list of multiple contingencies (provided by the Planning Authority in accordance with FAC-014 Requirement 6) are applicable for use in the operating horizon given the actual or expected system conditions.
 
  - ~~1. This process shall address the need to modify these limits, to modify the list of limits, and to modify the list of associated multiple contingencies.~~~~
- ~~3.4. Identify the minimum allowable System Voltage Limit; Level of detail of system models used to determine SOLs.~~
- ~~3.5. Define the method for determining common System Voltage Limits between the Reliability Coordinator and its Transmission Operators, between adjacent Transmission Operators, and between adjacent Reliability Coordinators within an Interconnection Allowed uses of Remedial Action Schemes.~~
- ~~3.6. Anticipated transmission system configuration, generation dispatch and Load level~~
- ~~3.7. 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>.~~
- ~~M3. Acceptable evidence may include, but is not limited to, dated electronic or hard copy documentation of its SOL methodology that addresses the items listed in Requirement R3.~~
- ~~R4. The Each Reliability Coordinator shall include in issue its SOL methodology the method for determining the stability limits to be used in operations. The method shall: [Violation Risk Factor: Medium] [Time Horizon: Operations Planning] and any changes to that methodology, prior to the effectiveness of the Methodology or of a change to the Methodology, to all of the following:~~

- 4.1. Specify stability performance criteria, including any margins applied. The criteria shall, at a minimum, include the following: ~~Each adjacent Reliability Coordinator and each Reliability Coordinator that indicated it has a reliability-related need for the methodology.~~
- 4.1.1. steady-state voltage stability;
  - 4.1.2. transient voltage response;
  - 4.1.3. angular stability; and
  - 4.1.4. System damping.
- 4.1.4.2. Require that stability limits are established to meet the criteria specified in Part 4.1 for the Contingencies identified in Requirement R5 applicable to the establishment of stability limits that are expected to produce more severe System impacts on its ~~Each Planning Authority and Transmission Planner that models any portion of the Reliability Coordinator's Reliability Coordinator Area~~ the BES.
- 4.3. Describe how the Reliability Coordinator establishes stability limits when ~~there is an impact to more than one~~ Each Transmission Operator in its Reliability Coordinator Area or other that operates in the Reliability Coordinator Areas.
- 4.4. Describe how stability limits are determined, considering levels of transfers, Load and generation dispatch, and System conditions including any changes to System topology such as Facility outages.
- 4.5. Describe the level of detail that is required for the study model(s), including the portion modeled of the Reliability Coordinator Area, and the critical modeling details from other Reliability Coordinator Areas, necessary to determine different types of stability limits.
- 4.6. Describe the allowed uses of Remedial Action Schemes and other automatic post-Contingency mitigation actions in establishing stability limits used in operations.
- 4.7. State that the use of underfrequency load shedding (UFLS) programs and Undervoltage Load Shedding (UVLS) Programs are not allowed in the establishment of stability limits.
- M4. Acceptable evidence may include, but is not limited to, dated electronic or hard copy documentation of its SOL methodology that addresses the items listed in Requirement R4.
- R5. Each Reliability Coordinator shall identify in its SOL methodology the set of Contingency events for use in determining stability limits and the set of Contingency events for use in performing Operational Planning Analysis (OPAs) and Real-time Assessments (RTAs). The SOL methodology for each set shall: *[Violation Risk Factor: Medium] [Time Horizon: Operations Planning]*

5.1. Specify the following single Contingency events

5.1.1. Loss of any of the following either by single phase to ground or three phase Fault (whichever is more severe) with Normal Clearing, or without a Fault:

- generator;
- transmission circuit;
- transformer;
- shunt device; or
- single pole block in a monopolar or bipolar high voltage direct current system.

5.2. Specify additional single or multiple Contingency events or types of Contingency events, if any.

5.3. Describe the method(s) for identifying which, if any, of the Contingency events provided by the Planning Coordinator or Transmission Planner in accordance with FAC-014-3, Requirement R7, to use in determining stability limits.

M5. Acceptable evidence may include, but is not limited to, dated electronic or hard copy documentation of its SOL methodology that addresses the items listed in Requirement R5.

R6. Each Reliability Coordinator shall include the following performance framework in its SOL methodology to determine SOL exceedances when performing Real-time monitoring, Real-time Assessments, and Operational Planning Analyses: [Violation Risk Factor: High] [Time Horizon: Operations Planning]

6.1. System performance for no Contingencies demonstrates the following:

6.1.1. Steady state flow through Facilities are within Normal Ratings; however, Emergency Ratings may be used when System adjustments to return the flow within its Normal Rating could be executed and completed within the specified time duration of those Emergency Ratings.

6.1.2. Steady state voltages are within normal System Voltage Limits; however, emergency System Voltage Limits may be used when System adjustments to return the voltage within its normal System Voltage Limits could be executed and completed within the specified time duration of those emergency System Voltage Limits.

6.1.3. Predetermined stability limits are not exceeded.

- 6.1.4. Instability, Cascading or uncontrolled separation that adversely impact the reliability of the Bulk Electric System does not occur.<sup>1</sup>
- 6.2. System performance for the single Contingencies listed in Part 5.1 demonstrates the following:
- 6.2.1. Steady state post-Contingency flow through Facilities within applicable -Emergency Ratings. Steady state post-Contingency flow through a Facility -must not be above the Facility’s highest Emergency Rating.
- 6.2.2. Steady state post-Contingency voltages are within emergency System -Voltage Limits.
- 6.2.3. The stability performance criteria defined in the Reliability Coordinator’s -SOL methodology are met<sup>1</sup>.
- 6.2.4. Instability, Cascading or uncontrolled separation that adversely impact -the reliability of the Bulk Electric System does not occur<sup>1</sup>.
- 6.3. System performance for applicable Contingencies identified in Part 5.2 demonstrates that: instability, Cascading, or uncontrolled separation that adversely impact the reliability of the Bulk Electric System does not occur.
- 6.4. In determining the System’s response to any Contingency identified in Requirement R5, planned manual load shedding is acceptable only after all other available System adjustments have been made.
- M6. Acceptable evidence may include, but is not limited to, dated electronic or hard copy documentation of its SOL methodology that addresses the items listed in Requirement R6.
- R7. Each Reliability Coordinator shall include in its SOL methodology a risk-based approach for determining how SOL exceedances identified as part of Real-time monitoring and Real-time Assessments must be communicated and if so, the timeframe that communication must occur. The approach shall include: *[Violation Risk Factor: High] [Time Horizon: Operations Planning]*
- 7.1. A requirement that the following SOL exceedances will always be communicated, within a timeframe identified by the Reliability Coordinator.
- 7.1.1 IROL exceedances;
- 7.1.2 SOL exceedances of stability limits;
- 7.1.3 Post Contingency SOL exceedances that are identified to have a validated risk of instability, Cascading, and uncontrolled separation;
- 7.1.4 Pre-Contingency SOL exceedances of Facility Ratings; and

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<sup>1</sup> Stability evaluations and assessments of instability, Cascading, and uncontrolled separation can be performed using real-time stability assessments, predetermined stability limits or other offline analysis techniques.



7.1.5 Pre-Contingency SOL exceedances of normal minimum System Voltage Limits.

7.2. A requirement that the following SOL exceedances must be communicated, if not resolved within 30 minutes, within a timeframe identified by the Reliability Coordinator.

7.2.1 Post-Contingency SOL exceedances of Facility Ratings and emergency System Voltage Limits, and

7.2.2 Pre-Contingency SOL exceedances of normal maximum System Voltage Limits.

M7. Acceptable evidence may include, but is not limited to dated electronic or hard copy documentation of its SOL methodology that addresses the items listed in Requirement R7.

R8. Each Reliability Coordinator shall include in its SOL methodology: *[Violation Risk Factor: High] [Time Horizon: Operations Planning]*

8.1. A description of how to identify the subset of SOLs that qualify as Interconnection Reliability Operating Limits (IROLs).

8.2. Criteria for determining when exceeding a SOL qualifies as exceeding an IROL and criteria for developing any associated IROL  $T_v$ .

M8. Acceptable evidence may include, but is not limited to, dated electronic or hard copy documentation of its SOL methodology that addresses the items listed in Requirement R8.

R9. Each Reliability Coordinator shall provide its SOL methodology to: *[Violation Risk Factor: Lower] [Time Horizon: Operations Planning]*

9.1. Each Reliability Coordinator that requests and indicates it has a reliability-related need within 30 days of a request.

9.2. Each of the following entities prior to the effective date of the SOL methodology:

9.2.1. Each adjacent Reliability Coordinator within the same; Interconnection;

9.2.2. Each Planning Coordinator and Transmission Planner that is responsible for planning any portion of the Reliability Coordinator Area;

9.2.3. Each Transmission Operator within its Reliability Coordinator Area; and

9.2.4. Each Reliability Coordinator that has requested to receive updates and -indicated it had a reliability-related need.

M9. Acceptable evidence may include, but is not limited to, dated electronic or hard copy documentation such as emails with receipts, registered mail receipts, or postings to a secure web site with accompanying notification(s).

M1.—

~~M2-M1. The Reliability Coordinator’s SOL Methodology shall address all of the items listed in Requirement 1 through Requirement 3.~~

~~M3-M1. The Reliability Coordinator 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.~~

## C. Compliance

### 1. Compliance Monitoring Process

**1.1. Compliance Enforcement Authority:** “Compliance Enforcement Authority” means NERC or the Regional Entity, or any entity as otherwise designated by an Applicable Governmental Authority, in their respective roles of monitoring and/or enforcing compliance with mandatory and enforceable Reliability Standards in their respective jurisdictions.

**1.2. Evidence Retention:** The following evidence retention period(s) identify the period of time an entity is required to retain specific evidence to demonstrate compliance. For instances where the evidence retention period specified below is shorter than the time since the last audit, the Compliance Enforcement Authority may ask an entity to provide other evidence to show that it was compliant for the full-time period since the last audit.

The applicable entity shall keep data or evidence to show compliance as identified below unless directed by its Compliance Enforcement Authority to retain specific evidence for a longer period of time as part of an investigation.

- The Reliability Coordinator shall keep data or evidence of compliance with Requirements R1 through R9 for the current year plus the previous 12 calendar months.

**1.3. Compliance Monitoring and Enforcement Program:** As defined in the NERC Rules of Procedure, “Compliance Monitoring and Enforcement Program” refers to the identification of the processes that will be used to evaluate data or information for the purpose of assessing performance or outcomes with the associated Reliability Standard.

## Violation Severity Levels

Requirement	Lower	Moderate	High	Severe
R1.	<del>N/A Not applicable.</del>	<del>N/A The Reliability Coordinator has a documented SOL Methodology for use in developing SOLs within its Reliability Coordinator Area, but it does not address R1.2</del>	<del>N/A The Reliability Coordinator has a documented SOL Methodology for use in developing SOLs within its Reliability Coordinator Area, but it does not address R1.3.</del>	The Reliability Coordinator <del>has a documented</del> <u>did not have a documented</u> SOL <del>Methodology for use in developing</del> <u>establishing</u> SOLs within its Reliability Coordinator Area, <del>but it does not address R1.1.</del>  OR The Reliability Coordinator <del>has no documented SOL Methodology for use in developing SOLs within its Reliability Coordinator Area.</del>
R2.	<del>N/A The Reliability Coordinator's SOL Methodology requires that SOLs are set to meet BES performance following single contingencies, but does not require that SOLs are set to meet BES performance in the pre-contingency state. (R2.1)</del>	<del>N/A Not applicable.</del>	The Reliability <del>Coordinator's</del> <u>Coordinator</u> <del>included in its</del> <u>included in its</u> SOL <del>Methodology the method</del> <u>Methodology the method</u> <del>for Transmission Operators</del> <u>for Transmission Operators</u> <del>to determine which owner-provided Facility Ratings are to be used in operations, but the method did not address the use of common Facility Ratings between the Reliability Coordinator and the Transmission Operators</del>	The Reliability Coordinator's <del>did not include in its</del> <u>did not include in its</u> SOL <del>Methodology the method</del> <u>Methodology the method</u> <del>for Transmission Operators to determine which owner-provided Facility Ratings are to be used in operations, does not require that SOLs are set to meet BES performance in the pre-contingency state and does not require that SOLs are set to meet BES performance following single</del>

Requirement	Lower	Moderate	High	Severe
			<p><del>in its Reliability Coordinator Area, requires that SOLs are set to meet BES performance in the pre-contingency state, but does not require that SOLs are set to meet BES performance following single contingencies. (R2.2 – R2.4)</del></p>	<p><del>contingencies. (R2.1 through R2.4)</del></p>
<p><del>R3.</del></p>	<p><del>The Reliability Coordinator's failed to incorporate one of the Parts of Requirement R3 into its SOL Methodology includes a description for all but one of the following: R3.1 through R3.7.</del></p>	<p><del>The Reliability Coordinator's failed to incorporate two of the Parts of Requirement R3 into its SOL Methodology includes a description for all but two of the following: R3.1 through R3.7.</del></p>	<p><del>The Reliability Coordinator's failed to incorporate three of the Parts of Requirement R3 into its SOL Methodology includes a description for all but three of the following: R3.1 through R3.7.</del></p>	<p><del>The Reliability Coordinator's failed to incorporate four or more of the Parts of Requirement R3 into its SOL Methodology is missing a description of four or more of the following: R3.1 through R3.7.</del></p>
<p><del>R4.</del></p>	<p><del>The Reliability Coordinator failed to incorporate one of the Parts of Requirement R4 into its SOL Methodology and/or one or more changes to that methodology to one of the required entities specified in R4.1, R4.2, and R4.3.</del></p> <p><del>OR</del></p>	<p><del>The Reliability Coordinator failed to incorporate two of the Parts of Requirement R4 into its SOL Methodology and/or one or more changes to that methodology to two of the required entities specified in R4.1, R4.2, and R4.3.</del></p> <p><del>OR</del></p>	<p><del>The Reliability Coordinator failed to incorporate three of the Parts of Requirement R4 into its SOL Methodology and/or one or more changes to that methodology to three of the required entities specified in R4.1, R4.2, and R4.3.</del></p> <p><del>OR</del></p>	<p><del>The Reliability Coordinator failed to incorporate four or more of the Parts of Requirement R4 into its SOL Methodology and/or one or more changes to that methodology to four or more of the required entities specified in R4.1, R4.2, and R4.3.</del></p> <p><del>OR</del></p>

Requirement	Lower	Moderate	High	Severe
	<del>For a change in methodology, the changed methodology was provided to one or more of the required entities before the effectiveness of the change, but was provided to all the required entities no more than 10 calendar days after the effectiveness of the change.</del>	<del>For a change in methodology, the changed methodology was provided to one or more of the required entities more than 10 calendar days after the effectiveness of the change, but less than or equal to 20 days after the effectiveness of the change.</del>	<del>For a change in methodology, the changed methodology was provided to one or more of required entities more than 20 calendar days after the effectiveness of the change, but less than or equal to 30 days after the effectiveness of the change.</del>	<del>For a change in methodology, the changed methodology was provided to one or more of the required entities more than 30 calendar days after the effectiveness of the change.</del>
<u>R5.</u>	<u>N/A</u>	<u>N/A</u>	<u>The Reliability Coordinator failed to incorporate one of the Parts 5.2 or 5.3 of Requirement R5 into its SOL methodology.</u>	<u>The Reliability Coordinator failed to incorporate Part 5.1 of Requirement R5 into its SOL methodology.</u>  <u>OR</u> <u>The Reliability Coordinator failed to incorporate Parts 5.2 and 5.3 of Requirement R5 into its SOL methodology.</u>
<u>R6.</u>	<u>The Reliability Coordinator failed to incorporate one of the Parts of Requirement R6 into its SOL methodology.</u>	<u>The Reliability Coordinator failed to incorporate two of the Parts of Requirement R6 into its SOL methodology.</u>	<u>The Reliability Coordinator failed to incorporate three of the Parts of Requirement R6 into its SOL methodology.</u>	<u>The Reliability Coordinator failed to incorporate four of the Parts of Requirement R6 into its SOL methodology.</u>
<u>R7.</u>	<u>N/A</u>	<u>The Reliability Coordinator included in its SOL methodology, a risk-based approach for determining</u>	<u>The Reliability Coordinator included in its SOL methodology, a risk-based approach for determining</u>	<u>The Reliability Coordinator failed to include in its SOL methodology, a risk-based approach for determining</u>

Requirement	Lower	Moderate	High	Severe
		<p><u>how SOL exceedances identified as part of Real-time monitoring and Real-time Assessments must be communicated and if so, with what priority, but failed to include one of the Parts 7.2.1 through 7.2.2.</u></p>	<p><u>how SOL exceedances identified as part of Real-time monitoring and Real-time Assessments must be communicated and if so, with what priority, but failed to include one of the Parts 7.1.1 through 7.1.5.</u></p>	<p><u>how SOL exceedances identified as part of Real-time monitoring and Real-time Assessments must be communicated and if so, with what priority.</u></p>
<p><u>R8.</u></p>	<p><u>N/A</u></p>	<p><u>N/A</u></p>	<p><u>The Reliability Coordinator failed to include Part 8.1 (a description of how to identify the subset of SOLs that qualify as IROLs) in its SOL methodology.</u></p> <p><u>OR</u></p> <p><u>The Reliability Coordinator failed to include Part 8.2 (a criteria for determining when violating a SOL qualifies as an IROL in its SOL methodology.</u></p> <p><u>OR</u></p> <p><u>The Reliability Coordinator failed to include Part 8.2 (criteria for developing any associated IROL T<sub>v</sub>) in its SOL methodology.</u></p>	<p><u>The Reliability Coordinator failed to include Parts 8.1 and 8.2 in its SOL methodology.</u></p>

Requirement	Lower	Moderate	High	Severe
<p><u>R9.</u></p>	<p><u>The Reliability Coordinator failed to provide its new or revised SOL methodology to one of the parties specified in Requirement R9, Part 9.2 prior to the effective date</u></p> <p><u>OR</u></p> <p><u>The Reliability Coordinator provided its new or revised SOL methodology to a requesting Reliability Coordinator in accordance with Requirement R9, Part 9.1 but was late by less than or equal to 10 calendar days.</u></p>	<p><u>The Reliability Coordinator failed to provide its new or revised SOL methodology to two of the parties specified in Requirement R9, Part 9.2 prior to the effective date</u></p> <p><u>OR</u></p> <p><u>The Reliability Coordinator provided its new or revised SOL methodology to a requesting Reliability Coordinator in accordance with Requirement R9, Part 9.1, but was late by more than 10 calendar days but less than or equal to 20 calendar days.</u></p>	<p><u>The Reliability Coordinator failed to provide its new or revised SOL methodology to three of the parties specified in Requirement R9, Part 9.2 prior to the effective date</u></p> <p><u>OR</u></p> <p><u>The Reliability Coordinator provided its new or revised SOL methodology to a requesting Reliability Coordinator in accordance with Requirement R9, Part 9.1, but was late by more than 20 calendar days but less than or equal to 30 calendar days.</u></p>	<p><u>The Reliability Coordinator failed to provide its new or revised SOL methodology to four or more of the parties specified in Requirement R9, Part 9.2 prior to the effective date</u></p> <p><u>OR</u></p> <p><u>The Reliability Coordinator failed to provide its new or revised SOL methodology to one or more of the parties specified in Requirement R9, Part 9.2</u></p> <p><u>OR</u></p> <p><u>The Reliability Coordinator provided its new or revised SOL methodology to a requesting Reliability Coordinator in accordance with Requirement R9, Part 9.1, but was late by more than 30 calendar days.</u></p> <p><u>OR</u></p> <p><u>The Reliability Coordinator failed to provide its new or revised SOL methodology to</u></p>

Requirement	Lower	Moderate	High	Severe
				<u>a requesting Reliability Coordinator in accordance with Requirement R9, Part 9.1.</u>



## D. Regional Variances

~~1. The following Interconnection-wide Regional Difference shall be applicable in the Western Interconnection:~~

~~1.1. As governed by the requirements of R3.3, 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 Remedial Action Scheme 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-011.~~

~~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.~~

None.

## E. Associated Documents

~~None.~~Implementation Plan

## Version History

Version	Date	Action	Change Tracking
1	November 1, 2006	Adopted by Board	New
2		<p>Changed the effective date to October 1, 2008</p> <p>Changed “Cascading Outage” to “Cascading”</p> <p>Replaced Levels of Non-compliance with Violation Severity Levels</p> <p>Corrected footnote 1 to reference FAC-011 rather than FAC-010</p>	Revised
2	June 24, 2008	Adopted by Board: FERC Order 705	Revised
2	January 22, 2010	Updated effective date and footer to April 29, 2009 based on the March 20, 2009 FERC Order	Update
2	February 7, 2013	R5 and associated elements approved by NERC Board of Trustees for retirement as part of the Paragraph 81 project (Project 2013-02) pending applicable regulatory approval.	
2	November 21, 2013	R5 and associated elements approved by FERC for retirement as part of the Paragraph 81 project (Project 2013-02)	
2	February 24, 2014	Updated VSLs based on June 24, 2013 approval.	
3	November 13, 2014	Adopted by the NERC Board	Replaced references to Special Protection System and SPS with Remedial Action Scheme and RAS
3	November 19, 2015	FERC Order issued approving FAC-011-3. Docket No. RM15-13-000.	

<u>4</u>	<u>TBD</u>	<u>Adopted by the NERC Board of Trustees</u>	<u>Revised</u>
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## ~~Standard Attachments~~

~~(DELETE GREEN TEXT PRIOR TO PUBLISHING) NOTE: Use this section for attachments or other documents (Interpretations, etc.) that are referenced in the standard as part of the requirements. These should appear after the end of the standard template and before the Supplemental Material. If there are none, delete this section.~~

**[Title of document]**

~~(DELETE GREEN TEXT PRIOR TO PUBLISHING) Documents that should appear in this section are as follows: Application Guidelines, Training Material, Reference Material and/or other Supplemental Material. The header should remain “Supplemental Material.”~~

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