

Alberta Reliability Standard

System Operating Limits Methodology for the Operations Horizon

FAC-011-AB-2



1. Purpose

To ensure that **system operating limits** used in the reliable operation of the **bulk electric system** are determined based on an established methodology or methodologies.

2. Applicability

This **reliability standard** applies to:

- (a) the **ISO**.

3. Requirements

R1 The **ISO** must have a documented methodology for use in developing **system operating limits (system operating limit methodology)** within its area. This **system operating limit methodology** must:

- R1.1** be applicable for developing **system operating limits** used in the operations horizon;
- R1.2** state that **system operating limits** must not exceed associated **facility ratings**; and
- R1.3** include a description of how to identify the subset of **system operating limits** that qualify as **interconnection reliability operating limits**.

R2 The **system operating limit methodology** of the **ISO** must include a requirement that **system operating limits** provide **bulk electric system** performance consistent with the following:

- R2.1** in the **pre-contingency** state, the **bulk electric system** must demonstrate transient, dynamic and voltage stability; all facilities must be within their **facility ratings** and within their thermal, voltage and stability limits. In the determination of **system operating limits**, the **bulk electric system** condition used must reflect current or expected system conditions and must reflect changes to system topology such as facility outages;
- R2.2** following the single **contingencies**¹ identified in requirement 2.2.1 through requirement 2.2.3, the system must demonstrate transient, dynamic and voltage stability; all facilities must be operating within their **facility ratings** and within their thermal, voltage and stability limits; and **cascading** or uncontrolled separation must not occur:
 - R2.2.1** single line to ground or three (3) -phase **fault** (whichever is more severe), with **normal clearing**, on any **generating unit, aggregated generating facility, line, transformer, or shunt device** that is **faulted**;

¹ The **contingencies** identified in FAC-011-AB-2 requirement R2.2.1 through requirement R2.2.3 are the minimum **contingencies** that must be studied but are not necessarily the only **contingencies** that are studied.

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- R2.2.2 loss of any **generating unit, aggregated generating facility**, line, transformer, or shunt device without a **fault**; and
 - R2.2.3 single pole block, with **normal clearing**, in a monopolar or bipolar high voltage direct current system;
- R2.3 in determining the system’s response to a single **contingency**, the following will be acceptable:
 - 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 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; and
 - R2.3.3 system reconfiguration through manual or automatic control or protection actions; and
- 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.
- R3. The ISO’s methodology for determining **system operating limits**, must 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 **ISO** area as well as the critical modeling details from other **reliability coordinator areas** that would impact the facility or facilities under study);
 - R3.2. selection of applicable **contingencies**;
 - R3.3. a process for determining which of the stability limits associated with the list of multiple **contingencies** (as determined by the **ISO** in accordance with FAC-014 requirement R6) are applicable for use in the operating horizon given the actual or expected system conditions;
 - R3.3.1. this process must address the need to modify these limits, to modify the list of limits, and to modify the list of associated multiple **contingencies**;
 - R3.4. level of detail of system models used to determine **system operating limits**;
 - R3.5. allowed uses of remedial action schemes or remedial action plans;
 - R3.6. anticipated **transmission system** configuration, generation **dispatch** and load level; and

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- R3.7. criteria for determining when violating a **system operating limit** qualifies as an **interconnection reliability operating limit** and criteria for developing any associated **interconnection reliability operating limit Tv**.
- R4. The **ISO** must issue its **system operating limit** methodology and any changes to that methodology, prior to the effective date of the methodology or of a change to the methodology, to all of the following:
 - R4.1. each adjacent **reliability coordinator** and each **reliability coordinator** that indicated it has a reliability-related need for the methodology.
 - R4.2. each **planning authority** and **transmission planner** that models any portion of the **ISO's** area.
 - R4.3. each **operator** of a **transmission facility** that operates in the **ISO's** area.
- R5. Intentionally left blank.

4. Measures

The following measures correspond to the requirements identified in section 3 of this **reliability standard**. For example, MR1 is the measure for requirement R1.

- MR1 The **system operating limit** methodology of the **ISO** may address all of the items listed in requirement R1.1 through requirement R1.3. Evidence may include, but is not limited to, a documented **system operating limit** methodology, or other equivalent evidence as required in requirement R1.
- MR2 Evidence of including requirements in the **system operating limit** methodology as set out in requirement R2. Evidence may include, but is not limited to, a documented **system operating limit** methodology, or other equivalent evidence as set out in requirement R2.
- MR3 Evidence of including all of the items as required in requirement R3.1 through R3.7 in the **system operating limit** methodology. Evidence may include, but is not limited to, a documented **system operating limit** methodology, documented processes or other equivalent evidence as required in requirement R2.
- MR4 The **ISO** may have evidence of issuing the **system operating limit** methodology, and any changes to that methodology, including the date they were issued, as required in requirement R4. Evidence may include, but is not limited to, emails, or other equivalent evidence.
- MR5 Intentionally left blank.

Revision History

Date	Description
2015-09-01	Initial release.