

Alberta Reliability Standard Generator Operation for Maintaining Network Voltages VAR-002-AB-3



1. Purpose

To ensure **generating units** and **aggregated generating facilities** provide reactive support and voltage control, within generating facility capabilities, in order to protect equipment and maintain reliable operation of the **Interconnection**.

2. Applicability

This **reliability standard** applies to:

- (a) the **legal owner** of a **generating unit**, including a **generating unit** that operates as a synchronous condenser, that:
 - (i) is not part of an **aggregated generating facility**;
 - (ii) has a **maximum authorized real power** rating greater than 4.5 MW; and
 - (iii) is directly connected to either the **transmission system** or to **transmission facilities** within the City of Medicine Hat;
- (b) the **operator** of a **generating unit**, including a **generating unit** that operates as a synchronous condenser, that:
 - (i) is not part of an **aggregated generating facility**;
 - (ii) has a **maximum authorized real power** rating greater than 4.5 MW; and
 - (iii) is directly connected to either the **transmission system** or to **transmission facilities** within the City of Medicine Hat;
- (c) the **legal owner** of an **aggregated generating facility** that:
 - (i) has a **maximum authorized real power** rating greater than 4.5 MW; and
 - (ii) is directly connected to either the **transmission system** or to **transmission facilities** within the City of Medicine Hat; and
- (d) the **operator** of an **aggregated generating facility** that:
 - (i) has a **maximum authorized real power** rating greater than 4.5 MW; and
 - (ii) is directly connected to either the **transmission system** or to **transmission facilities** within the City of Medicine Hat.

Notwithstanding subsections (c) and (d) above, this **reliability standard** does not apply to the **legal owner** of an **aggregated generating facility** or the **operator** of an **aggregated generating facility** that meets the criteria listed in Appendix 1 of VAR-001-AB.

Requirements

R1 The **operator** of a **generating unit** and the **operator** of an **aggregated generating facility** must, while a **generating unit** or **aggregated generating facility** is electrically connected to the **transmission**

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system, operate the **generating unit** or **aggregated generating facility** with its **automatic voltage regulator** or **voltage regulating system** in service and in voltage control mode unless:

- a) exempted by the **ISO**;
- b) the **operator** of the **generating unit** or **operator** of the **aggregated generating facility** provides voice notification to the **ISO** of its intention to operate the **generating unit** or **aggregated generating facility** otherwise;
- c) the **generating unit** or **aggregated generating facility** is being operated in start-up or shut-down mode in accordance with the procedure of the **operator** of a **generating unit** or **operator** of an **aggregated generating facility**; or
- d) the **operator** of a **generating unit** or the **operator** of an **aggregated generating facility** has previously obtained approval from the **ISO** allowing the **generating unit** or **aggregated generating facility** to be in a testing mode.

R2 Unless exempted by the **ISO**, each **operator** of a **generating unit** and each **operator** of an **aggregated generating facility** must, upon receiving an instruction from the **ISO** regarding voltage levels or **reactive power**, comply with that instruction.

R2.1 Each **operator** of a **generating unit** and each **operator** of an **aggregated generating facility** must, when:

- a) the **automatic voltage regulator** of a **generating unit** or the **voltage regulating system** of an **aggregated generating facility** is out of service; or
- (b) the **generating unit** does not have an **automatic voltage regulator**, or the **aggregated generating facility** does not have a **voltage regulating system**,

use an alternative method to control the generator reactive output to comply with an instruction from the **ISO** regarding voltage levels or **reactive power**.

R2.2 Notwithstanding requirement R2, where the **operator** of a **generating unit** or the **operator** of an **aggregated generating facility** cannot comply with an instruction to modify voltage, the **operator** of a **generating unit** or the **operator** of an **aggregated generating facility** must provide an explanation for why the instruction cannot be met.

R2.3 Each **operator** of a **generating unit** and **operator** of an **aggregated generating facility** that does not monitor the voltage or **reactive power** at the location specified in an instruction from the **ISO**, or at the location specified in a **directive** issued by the **ISO** in accordance with section 301.2 of the **ISO rules**, *ISO Directives*, must have a methodology for converting the voltage or **reactive power** at the location specified by the **ISO**.

R3 Each **operator** of a **generating unit** and **operator** of an **aggregated generating facility** must notify the **ISO** within thirty (30) minutes after a status change of the **automatic voltage regulator**, **voltage regulating system** or alternative voltage controlling device and power system stabilizer, as applicable, on any **generating unit** or **aggregated generating facility**.

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R3.1 If the status has been restored within thirty (30) minutes of such change, then the **operator** of a **generating unit** or **operator** of an **aggregated generating facility** is not required to notify the **ISO** of the status change.

R3.2 If a **generating unit** or an **aggregated generating facility** is in testing, start-up, shut-down or offline mode, requirement R3 does not apply.

R4 Each **operator** of a **generating unit** and **operator** of an **aggregated generating facility** must notify the **ISO** within thirty (30) minutes after becoming aware of a change in reactive capability due to factors other than a status change described in requirement R3.

R4.1 If the capability has been restored within thirty (30) minutes of the **operator** of a **generating unit** or **operator** of an **aggregated generating facility** becoming aware of such change, then the **operator** is not required to notify the **ISO** of the change in reactive capability.

R4.2 If a **generating unit** or an **aggregated generating facility** is in testing, start-up, shut-down or offline mode, requirement R4 does not apply.

R5 Each **legal owner** of a **generating unit** and each **legal owner** of an **aggregated generating facility** whose step-up transformer for connecting to the **transmission system** or auxiliary transformer has primary voltages equal to or greater than the **generating unit** terminal voltage must provide any one (1) or more of the following to the **ISO** within thirty (30) **days** of a request:

- a) tap settings;
- b) available fixed tap ranges; and
- c) impedance data.

R6 Each **legal owner** of a **generating unit** and each **legal owner** of an **aggregated generating facility** that has a step-up transformer, with off-load taps for connecting to the **transmission system** must, change the tap positions according to the specifications the **ISO** provides.

R6.1 Each **legal owner** of a **generating unit** and each **legal owner** of an **aggregated generating facility** that cannot comply with requirement R6 must notify the **ISO** within thirty (30) **days** of the **ISO** providing the specifications, and must include the technical justification along with the notice.

4. Measures

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

MR1 Evidence of operating the **generating unit** or **aggregated generating facility** in automatic voltage control mode as required in requirement R1 exists. Evidence may include, but is not limited to, exemption letters, data files, start-up or shut-down procedures, **operator** logs, voice recordings, e-mail, or other equivalent evidence.

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MR2 Evidence of complying with an instruction as required in requirement R2 exists. Evidence may include, but is not limited to, data files or **operator** logs.

MR 2.1 Evidence of using an alternative method to control generator **reactive power** output as required in requirement R2.1 exists. Evidence may include, but is not limited to, data files, **operator** logs or voice recordings.

MR 2.2 Evidence of providing an explanation to the **ISO**, as required in requirement R2.2 exists. Evidence may include, but is not limited to, voice recordings or **operator** logs.

MR 2.3 Evidence of having a methodology as required in requirement R2.3 exists. Evidence may include, but is not limited to, a documented methodology or other equivalent evidence.

MR3 Evidence of notifying the **ISO** within thirty (30) minutes of any status change as required in requirement R3 exists. Evidence may include, but is not limited to, data logs, SCADA logs, voice recordings or **operator** logs.

MR4 Evidence of notifying the **ISO** within thirty (30) minutes of becoming aware of a change in capability as required in requirement R4 exists. If the capability has been restored within the first thirty (30) minutes of the **operator** of a **generating unit** or **operator** of an **aggregated generating facility** becoming aware of such change, no evidence of notification is necessary. Evidence may include, but is not limited to, voice recordings or **operator** logs.

MR5 Evidence of providing the **ISO** with information on its step-up transformer or auxiliary transformer, as required in requirement R5 exists. Evidence may include, but is not limited to, dated written or electronic records.

MR6 Evidence of changing step-up transformer taps in accordance with the **ISO's** specifications as required in requirement R6 exists. Evidence may include, but is not limited to, written or electronic records.

MR6.1 Evidence of notifying the **ISO** as required in requirement R6.1 exists. Evidence may include, but is not limited to, written or electronic notifications.

Revision History

Date	Description
2013-10-01	Initial release
2016-04-01	Revised to align with NERC version 3.