

Alberta Reliability Standard

Generator Operation for Maintaining Network Voltages

VAR-002-AB-1.1b

1. Purpose

The purpose of this **reliability standard** is to ensure **generating units** and **aggregated generating facilities** provide **reactive power** and voltage control necessary to ensure voltage levels, **reactive power** flows and **reactive power** resources are maintained within applicable facility ratings to protect equipment and the reliable operation of the **Interconnection**.

2. Applicability

This **reliability standard** applies to:

- (a) the **legal owner** of a **generating unit**, including those that operate as a synchronous condenser, that:
 - (i) is not part of an **aggregated generating facility**;
 - (ii) has a **maximum authorized real power** rating greater than four point five (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 those that operate as a synchronous condenser, that:
 - (i) is not part of an **aggregated generating facility**;
 - (ii) has a **maximum authorized real power** rating greater than four point five (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 four point five (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 four point five (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** or **operator** of a wind **aggregated generating facility** that:

- (e) is not equipped with a **voltage regulating system**; and
- (f) is the subject of an executed *Construction Commitment Agreement* and which has completed the **ISO's** approval process for connection to the **transmission system** under the *Technical Requirements for connecting generators (1999)*.

The **ISO** will publish a list of facilities that meet these criteria in the information document related to this **reliability standard**.

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3. Requirements

R1 The **operator** of a **generating unit**, subject to requirement R3 and the **ISO's** consent to operate otherwise, must only operate such **generating unit** with the **automatic voltage regulator** in service, in voltage control mode and controlling voltage.

R2 The **operator** of an **aggregated generating facility**, subject to requirement R3 and the **ISO's** consent to operate otherwise, must only operate such **aggregated generating facility** with the **voltage regulating system** in service, in voltage control mode and controlling voltage.

R3 Each **operator** of a **generating unit** and **operator** of an **aggregated generating facility** must notify the **ISO** as soon as reasonably possible when the **automatic voltage regulator** or **voltage regulating system** is out of service.

R4 Each **operator** of a **generating unit** and **operator** of an **aggregated generating facility**, upon receiving a **directive** from the **ISO** regarding **reactive power** or voltage levels must:

- (a) subject to the exceptions set out in section 301.2 of the **ISO rules**, *Directives*, comply with the **directive** by adjusting either the
 - (i) set point of the **automatic voltage regulator** or **voltage regulation system**; or
 - (ii) on-load tap changer; but
- (b) if the **operator** determines it is unable to comply, notify the **ISO** with an explanation as to why it cannot comply with the **directive**.

R5 Each **operator** of a **generating unit** and **operator** of an **aggregated generating facility** must use an alternative method to control voltage and **reactive power** output to meet any voltage level **directive** or **reactive power level directive** the **ISO** issues when the **automatic voltage regulator** or **voltage regulating system** is out of service.

R6 Each **operator** of a **generating unit** and **operator** of an **aggregated generating facility** must notify the **ISO** as soon as reasonably possible, but not more than thirty (30) minutes after any of the following:

- R6.1** a status or capability change of the **reactive power** resource on any **generating unit** or **aggregated generating facility**, including the status of each **automatic voltage regulator**, **voltage regulating system** and **power system stabilizer**, as applicable, and the expected duration of the change in status or capability; or
- R6.2** a status or capability change on any other **reactive power** resource under the control of each **operator** of a **generating unit** or **operator** of an **aggregated generating facility** and the expected duration of the change in status or capability.

R7 Each **legal owner** of a **generating unit** and **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 the **ISO** any one (1) or more of the following within thirty (30) **days** of a request:

- R7.1** tap settings;
- R7.2** available fixed tap ranges;
- R7.3** impedance data; and

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R7.4 the plus/minus voltage range with step-change in percentage for on-load tap changing transformers.

R8 Each **legal owner** of a **generating unit** and **legal owner** of an **aggregated generating facility** that has a step-up transformer, with off-lad taps, for connecting to the **transmission system** must change the tap positions according to the specifications the **ISO** provides.

R9 Each **legal owner** of a **generating unit** and **legal owner** of an **aggregated generating facility** that cannot comply with requirement R8, must notify the **ISO** within thirty (30) days of the **ISO** providing the specifications and must include the technical justification in such 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 as required in requirement R1 exists. Evidence may include **operator** logs or data files.

MR2 Evidence of operating as required in requirement R2 exists. Evidence may include **operator** logs or data files.

MR3 Evidence of notifying the **ISO** as required in requirement R3 exists. Evidence may include **operator** logs or voice recordings.

MR4 Evidence of complying with a **directive** or notifying the **ISO** as required in requirement R4 exists. Evidence may include data files or **operator** logs.

MR5 Evidence of using an alternative method to control voltage and **reactive power** output as required in requirement R5 exists. Evidence may include data files, **operator** logs or voice recordings.

MR6 Evidence of notifying the **ISO** as required in requirement R6 exists. Evidence may include **operator** logs or voice recordings.

MR7 Evidence of providing the information identified in requirements R7.1 to R7.4 as required in requirement R7 exists. Evidence may include record of email or mail to appropriate recipients that identifies contents

MR8 Evidence of changing tap positions as required in requirement R8 exists. Evidence may include dated records that such changes conform to specifications the **ISO** provides.

MR9 Evidence of notifying the **ISO** as required in requirement R9 exists. Evidence may include record of email or mail to appropriate recipients that identifies contents submitted.

Revision History

| Effective | Description |
|------------|-----------------|
| 2013-10-01 | Initial release |
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