Alberta Reliability Standard
Protection System Coordination
PRC-001-AB2-1

1. Purpose

The purpose of this **reliability standard** is to ensure **protection systems** are coordinated among operating entities.

2. Applicability

This **reliability standard** applies to:

(a) the **legal owner** of a **transmission facility** that is:

(i) part of the **bulk electric system**; or

(ii) not part of the **bulk electric system** and which the **ISO**:

(A) determines is necessary for the reliable operation of either the **interconnected electric system** or the City of Medicine Hat electric system, and

(B) publishes on the AESO website and may amend from time to time in accordance with the process set out in Appendix 1;

(b) the **legal owner** of a **generating unit** that is:

(i) directly connected to the **bulk electric system** and has a **maximum authorized real power** rating greater than eighteen (18) MW;

(ii) within a power plant which:

(A) is not part of an **aggregated generating facility**;

(B) is directly connected to the **bulk electric system**; and

(C) has a combined **maximum authorized real power** rating greater than sixty-seven point five (67.5) MW;

(iii) a blackstart resource; or

(iv) regardless of **maximum authorized real power** rating, material to this **reliability standard** and to the reliability of the **bulk electric system** as the **ISO** determines and publishes on the AESO website and may amend from time to time in accordance with the process set out in Appendix 1;

(c) the **legal owner** of an **aggregated generating facility** that is:

(i) directly connected to the **bulk electric system** and has a **maximum authorized real power** rating greater than sixty-seven point five (67.5) MW;

(ii) a blackstart resource; or

(iii) regardless of **maximum authorized real power** rating, material to this **reliability standard** and to the reliability of the **bulk electric system** as the **ISO** determines and publishes on the AESO website and may amend from time to time in accordance with the process set out in Appendix 1;

(d) the **operator** of a **transmission facility** that is:

(i) part of the **bulk electric system**; or

(ii) not part of the **bulk electric system** and which the **ISO**:

(A) determines is necessary for the reliable operation of either the **interconnected electric system** or the City of Medicine Hat electric system; and

(B) publishes on the AESO website and may amend from time to time in accordance with the process set out in Appendix 1;

(e) the **operator** of a **generating unit** that is:

(i) directly connected to the **bulk electric system** and has a **maximum authorized real power** rating greater than eighteen (18) MW;

(ii) within a power plant which:

(A) is not part of an **aggregated generating facility**;

(B) is directly connected to the **bulk electric system**; and

(C) has a combined **maximum authorized real power** rating greater than sixty-seven point five (67.5) MW;

(iii) a blackstart resource; or

(iv) regardless of **maximum authorized real power** rating, material to this **reliability standard** and to the reliability of the **bulk electric system** as the **ISO** determines and publishes on the AESO website and may amend from time to time in accordance with the process set out in Appendix 1;

(f) the **operator** of an **aggregated generating facility** that is:

(i) directly connected to the **bulk electric system** and has a **maximum authorized real power** rating greater than sixty-seven point five (67.5) MW;

(ii) a blackstart resource; or

(iii) regardless of **maximum authorized real power** rating, material to this **reliability standard** and to the reliability of the **bulk electric system** as the **ISO** determines and publishes on the AESO website and may amend from time to time in accordance with the process set out in Appendix 1; and

(g) the **ISO**.

3. Requirements

R1 The operating personnel of each of the **ISO**, the **operator** of a **transmission facility**, the **operator** of a **generating unit** and the **operator** of an **aggregated generating facility** must be familiar with the purpose and limitations of **protection system** schemes applied in its area.

R2 Each **operator** of a **generating unit** and **operator** of an **aggregated generating facility** must do the following if a protective relay or any equipment of a **protection system** of a **generating unit** or an **aggregated generating facility** that measures voltage, current or frequency from the **generating unit** or the **aggregated generating facility** to the

interconnected electric system , but excluding the prime mover and associated control systems, fails and such failure reduces **transmission system** reliability:

R2.1 notify the **operator** of a **transmission facility** in its area and the **ISO** as soon as possible, but no longer than twenty four (24) hours after receiving knowledge of such failure; and

R2.2 commence as soon as possible, and proceed diligently thereafter, to correct such failure.

R3 Each **operator** of a **transmission facility** must do the following if a protective relay or equipment fails, and such failure reduces **transmission system** reliability on the **bulk electric system**:

R3.1 notify the **ISO**, each directly affected **operator** of a **transmission facility** and **interconnected transmission operator** as soon as possible, but no longer than twenty four (24) hours after the earlier of receiving knowledge of or detecting such failure; and

R3.2 commence as soon as possible, and proceed diligently thereafter, to correct such failure unless otherwise directed by the **ISO**.

R4 Intentionally left blank.

R5 Each **legal owner** of a **generating unit** and **legal owner** of an **aggregated generating facility** must coordinate all new **protection systems** and all **protection system** changes with each interconnecting **legal owner** of a **transmission facility** and the **ISO**.

R6 Each **legal owner** of a **transmission facility** must coordinate all **protection systems** including existing, new and modified **protection systems** with each adjacent **legal owner** of a **transmission facility**, affected **legal owner** of a **generating unit**, affected **legal owner** of an **aggregated generating facility**, affected **interconnected transmission operators** and the **ISO**.

R7 Each **operator** of a **generating unit**, **operator** of an **aggregated generating facility** and **operator** of a **transmission facility** must identify and coordinate changes in generation, transmission, load and/or operating conditions that require changes in the **protection systems** of others as follows:

R7.1 each **operator** of a **generating unit** and **operator** of an **aggregated generating facility** must identify changes in each of its generation, load, or operating conditions that may require changes in **protection systems** of others, and notify the **ISO** in advance of their changes;

R7.2 the **ISO** must notify each affected **operator** of a **transmission facility** and adjacent **interconnected transmission operator** in advance of changes in each of its generation or operating conditions that may require changes in **protection systems**; and

R7.3 each **operator** of a **transmission facility** must identify changes in any of its transmission, load or operating conditions that may require changes in **protection systems** of others, and provide reasonable prior notice to the **ISO** and each affected

operator of a **transmission facility** and adjacent **interconnected transmission operator** of such proposed changes.

R8 Each **operator** of a **transmission facility** must monitor the status of each **remedial action scheme** in its area, and must notify each affected **operator** of a **transmission facility**, **operator** of a **generating unit**, **operator** of an **aggregated generating facility** and the **ISO** of each change in status.

R9 Each **operator** of a **generating unit** and **operator** of an **aggregated generating facility** must provide reasonable prior notice to the **operator** of a **transmission facility** and the **ISO** of proposed changes to the arming status (on, off and which generator) of any **remedial action scheme** in their facility.

4. Measures

The following measures correspond to the requirements identified in Section 4 of this **reliability standard**. For example, MR1 is the measure for R1.

MR1 Training records are available that indicate training of staff who operate the system in **protection system** schemes and any **remedial action scheme** applicable within their system.

MR2 Measures for this requirement are identified in the subsections below:

MR2.1 notifications exist for each failure as specified in requirement R2.1.; and

MR2.2 evidence exists that corrective actions have been taken as specified in requirement R2.2.

MR3 Measures for this requirement are identified in the subsections below:

MR3.1 notifications exist for each failure as specified in requirement R3.1; and

MR3.2 evidence exists that corrective actions have been taken as specified in requirement R3.2.

MR4 Intentionally left blank.

MR5 Evidence exists including, but not limited to, revised fault analysis study, letters of agreement on settings, notifications of changes, all of which meets the requirements as specified in requirement R5.

MR6 Evidence exists that could include, but is not limited to, revised fault analysis study, letters of agreement on settings, notifications of changes, that meets the requirements as specified in requirement R6.

MR7 Measures for this requirement are identified in the subsections below:

MR7.1 evidence exists and shows that all changes requiring protection changes were made as specified in requirement R7.1;

MR7.2 evidence exists and shows that all changes requiring protection changes were made as specified in requirement R7.2; and

MR7.3 evidence exists and shows that all changes requiring protection changes were made as specified in requirement R7.3.

MR8 Operator logs, voice recordings or other evidence exists that affected parties were notified as specified in requirement R8.

MR9 Operator logs, voice recordings or other evidence exists that affected parties were notified as specified in requirement R9.

5. Appendices

Appendix 1 – *Amending Process for List of Material Facilities*

Revision History

Effective Date	Description
2015-05-01	Revised for ISO assumption of RC functionality for the Alberta footprint
2013-01-02	Administrative update – “TFO” and “GFO” replaced with “legal owner of a transmission facility”, “operator of a transmission facility”, “legal owner of a generating unit”, “operator of a generating unit”, “legal owner of an aggregated generating facility”, and “operator of an aggregated generating facility”; applied standard at the bulk electric system level; added Appendix 1; and other minor cleanup items.
2011-01-13	R1
2010-01-22	New Issue

Appendix 1
Amending Process for List of Facilities

In order to amend any list referenced in subsections (a)(ii)(B), (b)(iv), (c)(iii), (d)(ii)(B), (e)(iv) and (f)(iii) of section 2, *Applicability*, the **ISO** must:

(a) upon determining that a **transmission facility**, **generating unit** or **aggregated generating facility** is to be added, notify the **legal owner** and **operator** in writing and determine an effective date, which must be no less than thirty (30) **days** after the date of notice, for the **legal owner** and **operator** to meet the applicable requirements;

(b) upon determining that a **transmission facility**, **generating unit** or **aggregated generating facility** is to be deleted, notify the **legal owner** and **operator** in writing and determine an effective date for the **legal owner** and **operator** to no longer be required to meet the applicable requirements; and

(c) publish the amended list with effective dates on the AESO website.