

1. Purpose

The purpose of this **reliability standard** is to establish design and documentation requirements for any automatic **underfrequency load shedding** program that arrests declining frequency, assists recovery of frequency following underfrequency events, and provides last resort system preservation measures.

2. Applicability

This **reliability standard** applies to:

- (a) the **legal owner** of a **transmission facility** that has responsibility in an **underfrequency load shedding** program established by the ISO.
- (b) the **legal owner** of an **electric distribution system** that has responsibility in an **underfrequency load shedding** program established by the ISO.
- (c) a **market participant** receiving service under *Rate DTS* of the **ISO tariff** that has responsibility in an **underfrequency load shedding** program established by the ISO.

Entities identified in item (a), (b) and (c) above are collectively referred to as “UFLS entities” in this **reliability standard**. For requirements in this **reliability standard** where a specific entity or subset of entities are the applicable entity or entities, the entity or entities are specified explicitly.

3. Requirements

R1 Intentionally left blank.

RD.B.1 The **ISO** must participate, through its involvement in the **WECC** UFLS Review Group or its successor, in a joint regional review with the other planning coordinators in the **WECC** regional entity area that develops and documents criteria, including consideration of historical events and system studies, to select portions of the **bulk electric system** that may form islands.

R2 Intentionally left blank.

RD.B.2 The **ISO** must identify one or more islands from the regional review, set out in requirement RD.B.1, to serve as a basis for designing a region-wide coordinated **underfrequency load shedding** program including:

RD.B.2.1 those islands selected by applying the criteria in requirement RD.B.1; and

RD.B.2.2 any portions of the **bulk electric system** designed to detach from the **Interconnection** as a result of the operation of a **protection system** or **remedial action scheme**.

R3 Intentionally left blank.

RD.B.3. The **ISO** must adopt an **underfrequency load shedding** program;

- (a) coordinated across the **WECC** regional entity area; and
- (b) modified as appropriate for Alberta;

including notification to the UFLS entities of the adopted **underfrequency load shedding** program and a schedule for implementation within Alberta.

R4 Intentionally left blank.

RD.B.4 The **ISO** must participate in a coordinated **underfrequency load shedding** design assessment with the other planning coordinators in the **WECC** regional entity area at least once every five years.

RD.B.4.1 Intentionally left blank.

RD.B.4.2 Intentionally left blank.

RD.B.4.3 Intentionally left blank.

RD.B.4.4 Intentionally left blank.

RD.B.4.5 Intentionally left blank.

RD.B.4.6 intentionally left blank.

RD.B.4.7 Intentionally left blank.

R5 Intentionally left blank.

R6 The **ISO** must maintain the set of **underfrequency load shedding** data necessary to model its **underfrequency load shedding** program for use in event analyses and assessments of the **underfrequency load shedding** program at least once each calendar year, with no more than 15 **months** between maintenance activities.

R7 Intentionally left blank.

R8 Each **legal owner** of a **transmission facility**, **legal owner** of an **electric distribution system** and **market participant** receiving service under *Rate DTS* of the **ISO tariff** must provide data to support maintenance of the **underfrequency load shedding** program, to the **ISO** according to the schedule specified by the **ISO**.

R9 Each **legal owner** of a **transmission facility**, **legal owner** of an **electric distribution system** and **market participant** receiving service under *Rate DTS* of the **ISO tariff** must provide, as determined by the **ISO**, automatic tripping of load in accordance with the **underfrequency load shedding** program design, and schedule for implementation, including any corrective action plan.

R10 Each **legal owner** of a **transmission facility** must provide, as determined by the **ISO**, automatic switching of its existing capacitor banks, transmission lines, and reactors to control over-voltage as a result of **underfrequency load shedding** if required by the **underfrequency load shedding** program and schedule for implementation, including any corrective action plan.

R11 Intentionally left blank.

RD.B.11 The **ISO** must, if a **bulk electric system** islanding event in Alberta results in system frequency excursions below the initializing set points of the **ISO's underfrequency load shedding** program, participate in and document a coordinated event assessment with all affected planning coordinators within one year of event actuation to evaluate:

RD.B.11.1 the performance of the **underfrequency load shedding** equipment; and

RD.B.11.2 the effectiveness of the **underfrequency load shedding** program.

R12 Intentionally left blank.

RD.B.12 The **ISO** must, if an islanding event assessment (per RD.B.11) identifies deficiencies in the **underfrequency load shedding** program, participate in and document a coordinated **underfrequency load shedding** design assessment of the **underfrequency load shedding**

program with the other planning coordinators in the **WECC** regional area to consider the identified deficiencies within two years of event actuation.

R13 Intentionally left blank.

R14 Intentionally left blank.

R15 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 Intentionally left blank.

MD.B.1 Evidence of participating in a joint regional review as required in requirement RD.B.1 exists. Evidence may include reports, or other documentation of its criteria, developed as part of the joint regional review with other planning coordinators in the **WECC** regional entity area, to select portions of the **bulk electric system** that may form islands, including how system studies and historical events were considered to develop the criteria per requirement RD.B.1, meeting minutes showing attendance at the **WECC** UFLS Review Group or its successor, or other equivalent evidence.

MR2 Intentionally left blank.

MD.B.2 Evidence of identifying one or more islands from the regional review as required in requirement RD.B.2 exists. Evidence may include reports, memorandums, e-mails, or other documentation supporting its identification of an island, or other equivalent evidence.

MR3 Intentionally left blank

MD.B.3 Evidence of adopting an **underfrequency load shedding** program as required in requirement RD.B.3 exists. Evidence may include reports, memorandums, e-mails, program plans, or other documentation of its adoption of a **underfrequency load shedding** program, or other equivalent evidence.

MR4 Intentionally left blank

MD.B.4 Evidence of participating in a coordinated **underfrequency load shedding** design assessment as required in requirement RD.B.4 exists. Evidence may include dated documentation of the **ISO's** participation in a coordinated UFLS design assessment with the other planning coordinators in the **WECC** or other equivalent evidence.

MR5 Intentionally left blank

MR6 Evidence of maintaining **underfrequency load shedding** data as required in requirement R6 exists. Evidence may include **underfrequency load shedding** data, data requests, data input forms, other dated documentation or other equivalent evidence.

MR7 Intentionally left blank.

MR8 Evidence of providing data to the **ISO** as required in requirement R8 exists. Evidence may include responses to data requests, spreadsheets, letters or other dated documentation or other equivalent evidence.

MR9 Evidence of providing automatic tripping of load as required in requirement R9 exists. Evidence may include:

- spreadsheets summarizing feeder load armed with **underfrequency load shedding** relays;
- the relay settings and implementation date; and
- schedules for implementation of the **underfrequency load shedding** program or any required corrective action plan;

or other equivalent evidence.

MR10 Evidence of providing automatic switching of capacitor banks, transmission lines, and reactors as required in requirement R10 exists. Evidence may include:

- relay settings and, in some cases, the tripping logic and the implementation date; and
- schedules for implementation of the **underfrequency load shedding** program or any required corrective action plan;

or other equivalent evidence.

MR11 Intentionally left blank.

MD.B.11 Evidence of participating in and documenting a coordinated event assessment with all affected planning coordinators as required in requirement RD.B.11 exists. Evidence may include reports, data gathered from an historical event, other dated documentation, or other equivalent evidence.

MR12 Intentionally left blank.

MD.B.12 Evidence of participating in and documenting a coordinated **underfrequency load shedding** design assessment of the **underfrequency load shedding** program with the other planning coordinators as required in requirement RD.B.12 exists. Evidence may include reports, data gathered from an historical event, dated documentation, or other equivalent evidence.

MR13 Intentionally left blank.

MR14 Intentionally left blank.

MR15 Intentionally left blank.

Revision History

Date	Description
xxxx-xx-xx	Initial release.