Alberta Reliability Standard
Disturbance Control Performance
BAL-002-AB-1

1. Purpose

The purpose of this **reliability standard** is to ensure the **ISO** is able to utilize its **contingency reserve** to balance resources and **demand** and return **interconnection** frequency within defined limits following a **disturbance** resulting from a loss of supply.

2. Applicability

This **reliability standard** applies to the following:

- the **ISO** which may meet the requirements of BAL-002-AB-1 through participation in a **reserve sharing group** which the **ISO** has designated as its agent.

3. Requirements

R1 The **ISO** must have access to **contingency reserves** to respond to **disturbances** resulting from a loss of supply and requiring the activation of **contingency reserves** except within the first sixty (60) minutes following the **disturbance** or except following the deployment of **contingency reserves** during implementation of the **ISO**'s capacity and energy emergency plan.

R2 The **ISO** must have access to **contingency reserves** from any, or a combination of: **generating units**, controllable **load** resources, or coordinated adjustments to **interchange schedules**.

R3 The **ISO** must have access to at least enough **contingency reserves** to cover its most severe single **contingency**.

R4 The **ISO** must activate sufficient **contingency reserve** to restore its **area control error** to the lesser of zero (0) or the pre-**disturbance** level within fifteen (15) minutes of any **reportable disturbances** subject to requirement R4.1.1 through R4.1.3.

R4.1.1 The **ISO** must treat multiple **contingencies** occurring within one (1) minute or less of each other as a single **contingency**.

R4.1.2 If the magnitude of the single **contingency** referred to in requirement R4.1.1 exceeds the **ISO**'s most severe single **contingency** the **ISO** must still consider the single contingency as a **reportable disturbance** but the ISO is excluded from compliance evaluation under requirement R4.

R4.1.3 If any subsequent **contingency** occur between one (1) minute and fifteen (15) minutes after the start of a **reportable disturbance,** any such subsequent **contingency** will be excluded from compliance evaluation under requirement R4 and the **ISO** must only determine compliance with requirement R4 for the initial **reportable disturbance** by performing a reasonable estimation of the response that would have occurred had any subsequent **contingency** not occurred.

R4.2 Subject to requirement R4.3, the **ISO** must report subsequent r**eportable disturbances** that occur fifteen (15) minutes after the initial **contingency** but

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before sixty (60) minutes after the initial **contingency** and include such **reportable disturbances** in the compliance evaluation.

R4.3 If **contingency reserves** were rendered inadequate by responding to any prior **contingency,** the **ISO** must be able to show a good faith effort to activate available **contingency reserves** however the ISO is not required to successfully restore its **area control error** to the lesser of zero (0) or the pre-**disturbance** level within fifteen (15) minutes of any **reportable disturbances**.

R4.4 The **ISO** must, no later than the tenth (10^{th}) day following the end of each calendar quarter, report all **reportable disturbances** for that quarter by submitting one (1) completed copy of DCS Form, "NERC Control Performance Standard Survey – All Interconnections" to the NERC Resources Subcommittee Survey contact.

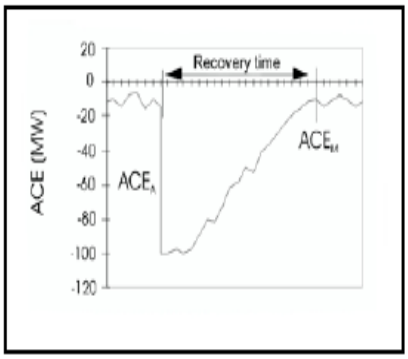
R5 The **ISO** must use the following formula to calculate the recovery of **area control error** for a **reportable disturbance**:

For loss of generation:

if $ACE_A < 0$

then

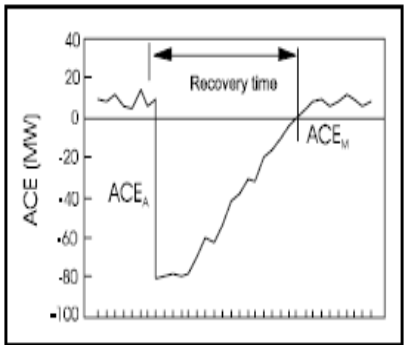
$$R_i = \frac{MW_{Loss} - \max(0, ACE_A - ACE_M)}{MW_{Loss}} * 100\%$$



if $ACE_A \geq 0$

then

$$R_i = \frac{MW_{Loss} - \max(0, -ACE_M)}{MW_{Loss}} * 100\%$$



where:

- MW_{LOSS} is the MW size of the **disturbance,** resulting from a loss of supply, as measured at the beginning of the loss. The **ISO** must record the MW_{LOSS} value as measured at the site of the loss to the extent possible. The value should not be measured as a change in **area control error** since governor response and **automatic generation control** response may introduce error.
- ACE_A is the pre-**disturbance** value of **area control error** measured as the average **area control error** over the period just prior to the start of

the **disturbance,** resulting from a loss of supply, (10 and 60 seconds prior and including at least 4 scans of **area control error**).

- ACE_M is the maximum algebraic value of **area control error** measured within the fifteen (15) minutes following the **disturbance** resulting from a loss of supply.

R6 The **ISO** must determine its prospective most severe single **contingency** at least once every calendar year by reviewing any probable **contingency** on the **interconnected electric system**.

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 having access to **contingency reserves** as required in requirement R1 exists. Evidence may include records of **ancillary services** contracts or a **reserve sharing group** agreement including a **reserve sharing group** agent appointment agreement.

MR2 Evidence of supplying **contingency reserves** as required in requirement R2 exists. Evidence may include records of **ancillary services** contracts or a **reserve sharing group** agreement including a **reserve sharing group** agent appointment agreement.

MR3 Evidence of having access to **contingency reserves** as required in requirement R3 exists. Evidence may include records of **ancillary services** contracts or a **reserve sharing group** agreement including a **reserve sharing group** agent appointment agreement.

MR4 Evidence of activating **contingency reserves** as required in requirement R4 exists. Evidence may include records of calculation showing the value of parameters used for calculating the percentage recovery (Ri), the calculation formula, a chart (area control area with respect to time) and the result of the calculation or a **reserve sharing group** agreement including a **reserve sharing group** agent appointment agreement.

MR4.1 Evidence of treating multiple **contingencies** as required in requirement R4.1 exists. Evidence may include disturbance control performance reports and records of any **directive** for **ancillary services** or a **reserve sharing group** agreement including a **reserve sharing group** agent appointment agreement.

MR4.2 Evidence of determining compliance in a multiple **contingency** situation as required in requirement R4.2 exists. Evidence may include records of any **directive** for **ancillary services** or a **reserve sharing group** agreement including a **reserve sharing group** agent appointment agreement.

MR4.3 Evidence of reporting additional **reportable disturbances** as required in requirement R4.3 exists. Evidence may include disturbance control performance reports or a **reserve sharing group** agreement including a **reserve sharing group** agent appointment agreement.

MR5 Evidence of using the formula as required in requirement R5 exists. Evidence may include confirmation emails or a **reserve sharing group** agreement including a **reserve sharing group** agent appointment agreement.

MR6 Evidence of determining the prospective most severe single **contingency** as required in requirement R6 exists. Evidence may include email or **ISO** log sheet or a **reserve sharing group** agreement including a **reserve sharing group** agent appointment agreement.

5. Appendices

No appendices have been defined for this **reliability standard**.

Revision History

Effective	Description
2012-10-01	Initial Release