# BAL-003-AB-0a Frequency Response and Bias

## 1. Purpose

The purpose of this *reliability standard* is to provide a consistent method for calculating the f*requency bias* component of *ACE*.

## 2. Applicability

This *reliability standard* applies to:

- *ISO*

## 3. Definitions

Italicized terms used in this *reliability standard* have the meanings as set out in the Alberta Reliability Standards Glossary of Terms and Part 1 of the ISO Rules.

## 4. Requirements

**R1** The *ISO* must review its *frequency bias settings* by January 1 of each year, and recalculate its setting to reflect any change in the *frequency response* of the *AIES*.

**R1.1.** The *ISO* may change its *frequency bias setting* and the method used to determine the setting, whenever any of the factors used to determine the current bias value change.

**R1.2.** The *ISO* must report its *frequency bias setting* and method for determining that setting, to the *NERC* Operating Committee.

**R2** The *ISO* must establish and maintain a *frequency bias setting* that is as close to practical or greater than the *AIES*'s *frequency response*. *Frequency bias* may be calculated in several ways:

**R2.1.** The *ISO* may use a fixed *frequency bias* value that is based on a fixed, straight-line function of *tie line* deviation or *tie line* trip event measurements versus *frequency deviation*. The *ISO* must determine the fixed value by observing and averaging the *frequency response* for several *disturbances*.

**R2.2.** The *ISO* may use a variable (linear or non-linear) *frequency bias* value that is based on a variable function of t*ie line* deviation, or *tie line* trip event measurements to *frequency deviation*. The *ISO* must determine the variable *frequency bias* value by analyzing *frequency response* as it varies with factors such as *load*, generation, governor characteristics, and frequency.

**R3** The *ISO* must operate its *AGC* on *tie line frequency bias*, unless such operation is adverse to system or *Interconnection* reliability.

**R4** The *ISO* must have a monthly average *frequency bias setting* that is at least 1% of the *AIES's* estimated yearly peak demand per 0.1 Hz change.

## 5. Procedures

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

## 6. 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** Documentation exists to show that a review was carried out according to R1.

**MR1.2** Confirmation that *frequency bias setting* and methods have been submitted to *NERC* (*NERC* survey or e-mail submission is sufficient).

**MR2** The *frequency bias setting* is close to or greater than the *AIES's* frequency response. The *frequency response* data is available for events analysis.

**MR3** Energy Management System (EMS) records, which set *AGC* control modes of operation, are available to support R3.

**MR4** A monthly average *frequency bias setting* and estimated yearly peak demand is available to support R4.

## 7. Appendices

## 8. Guidelines

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

## Revision History

| Effective | Description |
|---|---|
| 2009-02-13 | New Issue |
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