
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 *frequency bias* component of *Area Control Error* (ACE).

2. Applicability

This *reliability standard* applies to:

- *Independent System Operator* (ISO)

3. Definitions

Italicized terms used in this *reliability standard* have the meanings as set out in 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 *tie 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 *automatic generation control* (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

