Standard Development Roadmap

This section is maintained by the drafting team during the development of the standard and will be removed when the standard becomes effective.

Development Steps Completed:

1. The Standards Committee approved the SAR for posting on January 13, 2005.
2. The SAR was posted for industry comment from January 17, 2005 through February 17, 2005.
3. Reply comments and a revised SAR were posted for a second industry comment period from April 4, 2006 through May 3, 2006.
4. Reply comments and a revised SAR were posted for a third industry comment period from February 8, 2007 through March 9, 2007.
5. Standards Committee approved moving the project into the standards development phase on July 12, 2007.
6. The Standards Committee appointed the Standard Drafting Team on August 13, 2007.
7. The draft standard was posted for a 30 day formal comment period from February 4, 2011 through March 7, 2011.
8. The draft standard was posted for a 45-day formal comment period and a 10 day initial ballot from October 25, 2011 through December 8, 2011.

Proposed Action Plan and Description of Current Draft:

This is the third posting of the proposed standard and its associated documents for a 30 day formal comment period and a successive 10 day ballot, from February 21, 2012through March 21, 2012.

Future Development Plan:

Anticipated Actions	Anticipated Date
1. Respond to comments submitted within the comment period and with the successive ballot.	March, 2012
2. Conduct a recirculation ballot for ten days.	April, 2012
3. BOT adoption.	May, 2012

Definitions of Terms used in the Standard

Frequency Response Measure (FRM)

The median of all the Frequency Response observations reported annually by Balancing Authorities or Frequency Response Sharing Groups for frequency events specified by the ERO~~on FRS Form 1~~. This will be calculated as MW/0.1Hz.

Frequency Response Obligation (FRO)

The Balancing Authority's share of the required Frequency Response needed for the reliable operation of an Interconnection. This will be calculated as MW/0.1Hz.

Frequency Bias Setting

A number~~value~~, ~~(~~either ~~a~~ fixed or variable ~~Frequency Bias)~~, usually expressed in MW/0.1 Hz, included in~~set into~~ a Balancing Authority's Area Control Error equation to account for~~that allows~~ the Balancing Authority's inverse Frequency Response contribution ~~to contribute its Frequency Response~~ to the Interconnection, and discourage response withdrawal through secondary control systems.

Frequency Response Sharing Group (FRSG)

A group whose members consist of two or more Balancing Authorities that collectively maintain, allocate, and supply operating resources required to jointly meet the sum of the Frequency Response Obligations of its members.

A. Introduction

Title: Frequency Response and Frequency Bias Setting

Number: BAL-003-1

Purpose: To require sufficient Frequency Response from the Balancing Authority to maintain Interconnection Frequency within predefined bounds by arresting frequency deviations and supporting frequency until the frequency is restored to its scheduled value. To provide consistent methods for measuring Frequency Response and determining the Frequency Bias Setting.

Applicability:

1.1. Balancing Authority

1.2. Frequency Response~~reserve~~ Sharing Group

~~1.1.1~~1.2.1 The Balancing Authority is the responsible entity unless the Balancing Authority is a member of a Frequency Response Sharing Group, in which case, the Frequency Response Sharing Group becomes the responsible entity. ~~(where applicable)~~

Effective Date:

~~1.2.~~1.3. In those jurisdictions where regulatory approval is required, Requirements R2, R3 and R4 ~~and R5~~ of this standard shall become effective the first calendar day of the first calendar quarter 12 months after applicable regulatory approval. In those jurisdictions where no regulatory approval is required, Requirements R2, R3 and~~,~~ R4 ~~and R5~~ of this standard shall become effective the first calendar day of the first calendar quarter 12 months after Board of Trustees adoption.

~~1.3.~~1.4. In those jurisdictions where regulatory approval is required, Requirements R1 of this standard shall become effective the first calendar day of the first calendar quarter 24 months after applicable regulatory approval. In those jurisdictions where no regulatory approval is required, Requirements R1 of this standard shall become effective the first calendar day of the first calendar quarter 24 months after Board of Trustees adoption.

B. Requirements

R1. Each Balancing Authority ~~(BA)~~ or Frequency Response~~reserve~~ Sharing Group (FRSG) shall achieve an annual Frequency Response Measure (FRM) (as ~~detailed in Attachment A and~~ calculated and reported in accordance with Attachment A~~on FRS Form 1~~) that is equal to or more negative than its Frequency Response Obligation (FRO) to ensure that sufficient Frequency Response is provided by each Balancing Authority or FRSG to maintain Interconnection Frequency Response equal to or more negative than the Interconnection Frequency Response Obligation~~an adequate level of Frequency Response in the Interconnection~~. *[Risk Factor: Medium][Time Horizon: Real-time Operations~~Operations Assessment~~]*

R2. Each Balancing Authority that is a member of a multiple Balancing Authority Interconnection and is not receiving~~participating in~~ Overlap Regulation Service and uses a fixed Frequency Bias Setting shall implement the Frequency Bias Setting determined subject to Attachment A, as ~~(fixed or variable)~~ validated by the ERO, into its Area Control Error (ACE) calculation during the implementation period~~beginning on the date~~ specified by the ERO ~~to ensure effectively coordinated Tie Line Bias control~~. *[Risk Factor: Medium][Time Horizon: Operations Planning]*

R3. Each Balancing Authority that is a member of a multiple Balancing Authority Interconnection and is not receiving Overlap Regulation Service and uses a variable Frequency Bias Setting shall have an absolute average Frequency Bias Setting, computed from clock minute samples of its Frequency Bias Setting when the clock minute samples of its Interconnection's frequency is greater than 60.036 Hz or less than 59.964 Hz, that equals or exceeds the greater of the absolute values of its Frequency Response Measure from the previous evaluation period and its Interconnection's minimum as specified in Attachment A~~operate its Automatic Generation Control (AGC) in Tie Line Bias mode to ensure effectively coordinated control, unless such operation would have an Adverse Reliability Impact on the Balancing Authority's Area~~. *[Risk Factor: Medium][Time Horizon: Operations Planning~~Real-time Operations~~]*

R4. Each Balancing Authority that is performing Overlap Regulation Service shall modify its Frequency Bias Setting in its ACE calculation, in order to represent the Frequency Bias Setting for the combined Balancing Authority Area, to be equivalent to either~~the sum of the Frequency Bias Settings of the participating Balancing Authorities as validated by the ERO or calculate the Frequency Bias Setting based on the entire area being combined and thereby represent the Frequency Response for the combined area being controlled.~~: *[Risk Factor: Medium][Time Horizon: Operations Planning]*

- The sum of the Frequency Bias Settings as shown on FRS Form 1 and FRS Form 2 for the participating Balancing Authorities as validated by the ERO, or
- The Frequency Bias Setting shown on FRS Form 1 and FRS Form 2 for the entirety of the participating Balancing Authorities' Areas.

~~**R4.** In order to ensure adequate control response, each Balancing Authority shall use a monthly average Frequency Bias Setting whose absolute value is at least equal to one of the following: *[Risk Factor: Medium][Time Horizon: Operations Planning]*~~

- ~~The minimum percentage of the Balancing Authority Area's estimated yearly Peak Demand within its metered boundary per 0.1 Hz change as specified by the ERO in accordance with Attachment B.~~

~~The minimum percentage of the Balancing Authority Area's estimated yearly peak generation for a generation-only Balancing Authority, per 0.1 Hz change as specified by the ERO in accordance with Attachment B.~~

C. Measures

M1. Each~~The~~ Balancing Authority and each~~or~~ Frequency Response~~eserve~~ Sharing Group shall have evidence such as dated data plus documented formula in either hardcopy or electronic format that it achieved an annual FRM (in accordance with the methods specified by the ERO in Attachment A with data from FRS Form 1 reported to the ERO as specified in Attachment A) ~~FRS Form 1 with data to show~~ that ~~its FRM~~ is equal to or more negative than its FRO to demonstrate compliance with Requirement R1.

M2. The Balancing Authority shall have evidence such as a dated document in hard copy or electronic format showing the ERO validated Frequency Bias Setting was implemented~~entered~~ into its ACE calculation within the implementation period~~on the date~~ specified or other evidence to demonstrate compliance with Requirement R2.

M3. The Balancing Authority shall have evidence such as a dated report~~operating log, database or list~~ in hard copy or electronic format showing the average clock-minute average Frequency Bias Setting during periods when the clock-minute average frequency is outside of the range 59.964 Hz to 60.036 Hz was equal to or more negative than the minimum defined in Attachment A~~or operator interviews supported by other evidence showing the AGC operating mode including explanation when operating in other than Tie Line Bias mode~~ to demonstrate compliance with Requirement R3.

~~**M4.**~~ The Balancing Authority shall have evidence such as a dated operating log, database or list in hard copy or electronic format showing that when it performed Overlap Regulation Service, it modified its Frequency Bias Setting in its ACE calculation as specified in Requirement R4~~when Overlap Regulation Service is provided including Frequency Bias Setting calculation to~~ to demonstrate compliance with Requirement R4.

~~**M5.**~~**M4.** ~~The Balancing Authority shall have evidence such as dated data plus documented formula to support the calculation retained in either hardcopy or electronic format showing the monthly average Frequency Bias Setting or other evidence to demonstrate compliance with Requirement R5.~~

D. Compliance

1. Compliance Monitoring Process

1.1. Compliance Enforcement Authority

The Regional Entity is the Compliance Enforcement Authority except where the responsible entity works for the Regional Entity. Where the responsible entity works for the Regional Entity, the Regional Entity will establish an agreement with the ERO or another entity approved by the ERO and FERC (i.e. another Regional Entity), to be responsible for compliance enforcement.

1.2. Compliance Monitoring and Assessment Processes:

Compliance Audits

Self-Certifications

Spot Checking

Compliance ~~Violation~~ Investigation~~s~~

Self-Reporting

Complaints

~~Periodic Data Submittals~~

1.3. Data Retention

The following evidence retention periods identify the period of time an entity is required to retain specific evidence to demonstrate compliance. For instances where the evidence retention period specified below is shorter than the time since the last audit, the Compliance Enforcement Authority may ask an entity to provide other evidence to show that it was compliant for the full time period since the last audit.

The Balancing Authority shall retain data or evidence to show compliance with Requirements R1, R2, R3 and~~,~~ R4 ~~and R5~~, Measures M1, M2, M3 and~~,~~ M4~~, and M5~~ for the current year plus the previous three calendar years unless directed by its Compliance Enforcement Authority to retain specific evidence for a longer period of time as part of an investigation.

The Frequency Response~~reserve~~ Sharing Group shall retain data or evidence to show compliance with Requirement R1 and Measure M1 for the current year plus the previous three calendar years unless directed by its Compliance Enforcement Authority to retain specific evidence for a longer period of time as part of an investigation.

If a Balancing Authority or Frequency Response~~reserve~~ Sharing Group is found non-compliant, it shall keep information related to the non-compliance until found compliant or for the time period specified above, whichever is longer.

The Compliance Enforcement Authority shall keep the last audit records and all subsequent requested and submitted records.

1.4. Additional Compliance Information

For Interconnections that are also Balancing Authorities, Tie Line Bias control and f~~F~~lat ~~F~~frequency control are equivalent and either is acceptable.

2.0 Violation Severity Levels

R#	Lower VSL	Medium VSL	High VSL	Severe VSL
R1	The summation of the Balancing	The summation of the Balancing	The summation of the Balancing	The summation of the Balancing

	Authorities' FRM within an Interconnection was equal to or more negative than the Interconnection's FRO and the Balancing Authority's, or Frequency Response~~eserve~~ Sharing Group's, FRM was less negative than its FRO by more than 1% but by at most 30% or 15 MW/0.1 Hz, whichever one is the greater deviation from its FRO	Authorities' FRM within an Interconnection was equal to or more negative than the Interconnection's FRO and the Balancing Authority's, or Frequency Response~~eserve~~ Sharing Group's, FRM was less negative than its FRO by more than 30% or by more than 15 MW/0.1 Hz, whichever is the greater deviation from its FRO	Authorities' FRM within an Interconnection did not meet its FRO and the Balancing Authority's, or Frequency Response~~eserve~~ Sharing Group's, FRM was less negative than its FRO by more than 1% but by at most 30% or 15 MW/0.1 Hz, whichever one is the greater deviation from its FRO	Authorities' FRM within an Interconnection did not meet its FRO and the Balancing Authority's, or Frequency Response~~eserve~~ Sharing Group's, FRM was less negative than its FRO by more than 30% or by more than 15 MW/0.1 Hz, whichever is the greater deviation from its FRO
R2	The Balancing Authority in a multiple Balancing Authority Interconnection and not receiving Overlap Regulation Service and uses a fixed Frequency Bias Setting failed to implement the validated Frequency Bias Setting value into its ACE calculation within the implementation period~~on the date~~ specified but did so within 5 calendar days from the implementation period~~ollowing the date~~ specified by the ERO.	The Balancing Authority in a multiple Balancing Authority Interconnection and not receiving Overlap Regulation Service and uses a fixed Frequency Bias Setting implemented the validated Frequency Bias Setting value into its ACE calculation in more than 5 calendar days but less than or equal to 15 calendar days from the implementation period~~ollowing the date~~ specified by the ERO.	The Balancing Authority in a multiple Balancing Authority Interconnection and not receiving Overlap Regulation Service and uses a fixed Frequency Bias Setting implemented the validated Frequency Bias Setting value into its ACE calculation in more than 15 calendar days but less than or equal to 25 calendar days from the implementation period~~ollowing the date~~ specified by the ERO.	The Balancing Authority in a multiple Balancing Authority Interconnection and not receiving Overlap Regulation Service and uses a fixed Frequency Bias Setting did not implement the validated Frequency Bias Setting value into its ACE calculation in more than 25 calendar days from the implementation period~~ollowing the date~~ specified by the ERO.
R3	~~N/A~~The Balancing	The Balancing	The Balancing	The Balancing

	Authority in a multiple Balancing Authority Interconnection and not receiving Overlap Regulation Service and uses a variable Frequency Bias Setting average Frequency Bias Setting during periods when the clock-minute average frequency was outside of the range 59.964 Hz to 60.036 Hz was less negative than its minimum Frequency Bias Setting as defined in Attachment A by more than 1% but by at most 10%.	Authority in a multiple Balancing Authority Interconnection and not receiving Overlap Regulation Service and uses a variable Frequency Bias Setting average Frequency Bias Setting during periods when the clock-minute average frequency was outside of the range 59.964 Hz to 60.036 Hz was less negative than its minimum Frequency Bias Setting as defined in Attachment A by more than 10% but by at most 20%.~~N/A~~	Authority in a multiple Balancing Authority Interconnection and not receiving Overlap Regulation Service and uses a variable Frequency Bias Setting average Frequency Bias Setting during periods when the clock-minute average frequency was outside of the range 59.964 Hz to 60.036 Hz was less negative than its minimum Frequency Bias Setting as defined in Attachment A by more than 20% but by at most 30%.~~N/A~~	Authority in a multiple Balancing Authority Interconnection and not receiving Overlap Regulation Service and uses a variable Frequency Bias Setting average Frequency Bias Setting during periods when the clock-minute average frequency was outside of the range 59.964 Hz to 60.036 Hz was less negative than its minimum Frequency Bias Setting as defined in Attachment A by more than 30%..~~The Balancing Authority not receiving Overlap Regulation service failed to operate AGC in Tie Line Bias mode and such operation would not have had an Adverse Reliability Impact on the Balancing Authority's Area.~~
R4	The Balancing Authority incorrectly changed the Frequency Bias Setting value used in its ACE calculation when providing Overlap Regulation Services with combined footprint setting-error less	The Balancing Authority incorrectly changed the Frequency Bias Setting value used in its ACE calculation when providing Overlap Regulation Services with combined footprint setting-error more	The Balancing Authority incorrectly changed the Frequency Bias Setting value used in its ACE calculation when providing Overlap Regulation Services with combined footprint setting-error more	The Balancing Authority incorrectly changed the Frequency Bias Setting value used in its ACE calculation when providing Overlap Regulation Services with combined footprint setting-error more

	than or equal to 105% of the validated or calculated~~correct~~ value.	than 105% but less than or equal to 2015% of the validated or calculated~~correct~~ value.	than 2015% but less than or equal to 3025% of the ~~correct~~ validated or calculated value.	than 3025% of the ~~correct~~ validated or calculated value. OR The Balancing Authority failed to change the Frequency Bias Setting value used in its ACE calculation when providing Overlap Regulation Services.
~~R5~~	~~The absolute value of the Balancing Authorities' calculated monthly average Frequency Bias Setting was less than or equal to 5% below the minimum specified by the ERO.~~	~~The absolute value of the Balancing Authorities' calculated monthly average Frequency Bias Setting was more than 5% but less than or equal to 15% below the minimum specified by the ERO.~~	~~The absolute value of the Balancing Authorities' calculated monthly average Frequency Bias Setting was more than 15% but less than or equal to 25% below the minimum specified by the ERO.~~	~~The absolute value of the Balancing Authorities' calculated monthly average Frequency Bias Setting was more than 25% below the minimum specified by the ERO.~~

E. Regional Variance

None

F. Associated Documents

~~Attachment A - Frequency Response Standard Supporting Document~~

~~Attachment B - Process for Adjusting Bias Setting Floor~~Procedure for ERO Support of Frequency Response and Frequency Bias Setting Standard

FRS Form 1

FRS Form 2

Frequency Response Standard Background Document

G. Version History

Version	Date	Action	Change Tracking
0	April 1, 2005	Effective Date	New
1		Complete Revision under	Revision

		Project 2007-12	