

Project 2007-12 Frequency Response BAL-003-1 Mapping Document

Standard: BAL-003-1 Frequency Response and Frequency Bias Setting		
Requirement in Approved Standard	Translation to New Standard or Other Action	Proposed Language in BAL-003-1/Comments
<p>R1. Each Balancing Authority shall 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 Balancing Authority Area.</p> <p>R1.1. The Balancing Authority 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.</p> <p>R1.2. Each Balancing Authority shall report its Frequency Bias Setting, and method for determining that setting, to the NERC Operating Committee.</p>	<p>This Requirement has been moved into BAL-003-1 Attachment A & FRS Form 1 <u>as described in the Proposed Language Section</u></p>	<p>Attachment A</p> <p><u>Balancing Authorities that merge or that transfer load or generation are encouraged to notify the ERO of the change in footprint and corresponding changes in allocation such that the net obligation to the Interconnection remains the same and so that CPS limits can be adjusted.</u></p> <p>Each Balancing Authority shall <u>reports</u> its previous year's Frequency Response Measure (FRM), Frequency Bias Setting and Frequency Bias type (fixed or variable) to the ERO on FRS Form 1 by January 10 <u>to allow the ERO to validate the revised Frequency Bias Settings on FRS Form 1</u>. If the ERO posts the official list of events after <u>the date specified in the timeline below</u> December 10, Balancing Authorities will be given 30 days from the date the ERO posts the official list of events to submit their FRS Form 1.</p> <p>AND</p>

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		FRS Form 1 Note : Balancing Authorities with variable Frequency Bias Settings shall calculate monthly average Frequency Bias Settings. The previous year’s monthly averages will be reported annually on FRS Form 1.
<p>R2. Each Balancing Authority shall establish and maintain a Frequency Bias Setting that is as close as practical to, or greater than, the Balancing Authority’s Frequency Response. Frequency Bias may be calculated several ways:</p> <p>R2.1. The Balancing Authority may use a fixed Frequency Bias value which is based on a fixed, straight-line function of Tie Line deviation versus Frequency Deviation. The Balancing Authority shall determine the fixed value by observing and averaging the Frequency Response for several Disturbances during on-peak hours.</p> <p>R2.2. The Balancing Authority may use a variable (linear or non-linear) bias value, which is based on a variable function of Tie Line deviation to Frequency Deviation.</p>	<p>This Requirement is included in BAL-003-1 as described in the Proposed Language Section.</p>	<p><u>R2.</u> <u>Each Balancing Authority that is a member of a multiple Balancing Authority Interconnection and is not receiving Overlap Regulation Service and uses a fixed Frequency Bias Setting shall implement the Frequency Bias Setting determined subject to Attachment A, as validated by the ERO, into its Area Control Error (ACE) calculation during the implementation period specified by the ERO.</u></p> <p><u>R3.</u> <u>Each Balancing Authority that is a member of a multiple Balancing Authority Interconnection, is not receiving Overlap Regulation Service and is utilizing a variable Frequency Bias Setting shall maintain a Frequency Bias setting that is:</u></p> <p><u>3.1 Less than zero at all times, and</u></p> <p><u>3.2 Equal to or more negative than its Frequency Response Obligation when Frequency varies from 60 Hz by more than +/- 0.036 Hz.</u></p> <p><u>R2.</u> <u>Each Balancing Authority not participating in Overlap Regulation Service shall implement the Frequency Bias Setting (fixed or variable) validated by the ERO, into its Area Control Error (ACE) calculation beginning on the date specified by the ERO to ensure effectively</u></p>

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<p>The Balancing Authority shall determine the variable frequency bias value by analyzing Frequency Response as it varies with factors such as load, generation, governor characteristics, and frequency.</p>		<p>coordinated Tie Line Bias control.</p> <p>AND</p> <p>Attachment A</p> <p>Each Balancing Authority shall <u>reports</u> its previous year's Frequency Response Measure (FRM), Frequency Bias Setting and Frequency Bias type (fixed or variable) to the ERO on FRS Form 1 by January 10 each year <u>to allow the ERO to validate the revised Frequency Bias Settings on FRS Form 1</u>. If the ERO posts the official list of events after <u>the date specified in the timeline below</u> December 10, Balancing Authorities will be given 30 days from the date the ERO posts the official list of events to submit their FRS Form 1.</p> <p>AND</p> <p>FRS Form 1</p> <p>Note : Balancing Authorities with variable Frequency Bias Settings shall calculate monthly average Frequency Bias Settings. The previous year's monthly averages will be reported annually on FRS Form 1.</p> <p>AND</p>

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		<p>A portion of this Requirement is being phased out in accordance with the process detailed in the Procedure Attachment B. This phase out is intended to bring the Frequency Bias Setting closer or equal to the natural Frequency Response.</p>
<p>R3. Each Balancing Authority shall operate its Automatic Generation Control (AGC) on Tie Line Frequency Bias, unless such operation is adverse to system or Interconnection reliability.</p>	<p>This Requirement has been <u>removed from into the BAL-003-1 standard Requirement R3.</u></p>	<p>R3.— Each Balancing Authority not receiving Overlap Regulation Service shall 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.— This Requirement has been removed from proposed standard BAL-003-1. It is duplicative of BAL-005-0.1b Requirements R6 and R7.</p> <p><u>BAL-005-0.1b</u></p> <p><u>R6. The Balancing Authority’s AGC shall compare total Net Actual Interchange to total Net Scheduled Interchange plus Frequency Bias obligation to determine the Balancing Authority’s ACE. Single Balancing Authorities operating asynchronously may employ alternative ACE calculations such as (but not limited to) flat frequency control. If a Balancing Authority is unable to calculate ACE for more than 30 minutes it shall notify its Reliability Coordinator.</u></p> <p><u>R7. The Balancing Authority shall operate AGC continuously unless such operation adversely impacts the reliability of the Interconnection. If AGC has become inoperative, the Balancing Authority shall use manual control to adjust generation to maintain the Net Scheduled Interchange.</u></p>

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<p>R4. Balancing Authorities that use Dynamic Scheduling or Pseudo-ties for jointly owned units shall reflect their respective share of the unit governor droop response in their respective Frequency Bias Setting.</p> <p>R4.1. Fixed schedules for Jointly Owned Units mandate that Balancing Authority (A) that contains the Jointly Owned Unit must incorporate the respective share of the unit governor droop response for any Balancing Authorities that have fixed schedules (B and C).</p> <p>R4.2. The Balancing Authorities that have a fixed schedule (B and C) but do not contain the Jointly Owned Unit shall not include their share of the governor droop response in their Frequency Bias Setting.</p>	<p>This Requirement has been removed from the BAL-003-1 standard.</p>	<p>This Requirement addresses how to calculate Frequency Bias Settings. This is no longer needed since the Frequency Bias Settings are calculated in FRS Form 1 using Frequency Response associated with the “official” list of events and a couple of “floor or ceiling” limits (% of peak load/gen and FRO). The entire calculation is built into the FRS Form 1 workbook.</p>
<p>R5. Balancing Authorities that serve native load shall have a monthly average Frequency Bias Setting that is at least 1% of the Balancing Authority’s estimated yearly peak demand per 0.1 Hz change.</p> <p>R5.1. Balancing Authorities that do not serve native load shall</p>	<p>This Requirement has been <u>combined into Requirements R2 and R3</u></p>	<p><u>R2. Each Balancing Authority that is a member of a multiple Balancing Authority Interconnection and is not receiving Overlap Regulation Service and uses a fixed Frequency Bias Setting shall implement the Frequency Bias Setting determined subject to Attachment A, as validated by the ERO, into its Area Control Error (ACE) calculation during the implementation</u></p>

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<p>have a monthly average Frequency Bias Setting that is at least 1% of its estimated maximum generation level in the coming year per 0.1 Hz change.</p>	<p>of moved into BAL-003-1 Requirement R5.</p>	<p><u>period specified by the ERO.</u></p> <p>R3. <u>Each Balancing Authority that is a member of a multiple Balancing Authority Interconnection, is not receiving Overlap Regulation Service and is utilizing a variable Frequency Bias Setting shall maintain a Frequency Bias setting that is:</u></p> <p><u>3.1 Less than zero at all times, and</u></p> <p><u>3.2 Equal to or more negative than its Frequency Response Obligation when Frequency varies from 60 Hz by more than +/- 0.036 Hz.</u></p> <p>R5. 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:</p> <ul style="list-style-type: none"> • 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.
<p>R6. A Balancing Authority that is performing Overlap Regulation Service</p>	<p>This Requirement</p>	<p>R4. <u>Each Balancing Authority that is performing Overlap Regulation Service shall modify its Frequency Bias Setting in</u></p>

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<p>shall increase its Frequency Bias Setting to match the frequency response of the entire area being controlled. A Balancing Authority shall not change its Frequency Bias Setting when performing Supplemental Regulation Service.</p>	<p>has been moved into BAL-003-1 Requirement R4.</p>	<p><u>its ACE calculation, in order to represent the Frequency Bias Setting for the combined Balancing Authority Area, to be equivalent to either:</u></p> <ul style="list-style-type: none"> • <u>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</u> • <u>The Frequency Bias Setting as shown on FRS Form 1 and FRS Form 2 for the entirety of the participating Balancing Authorities' Areas.</u> <p>R4.— Each Balancing Authority that is performing Overlap Regulation Service shall modify its Frequency Bias Setting in its ACE calculation to be equivalent to 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.</p>