

NERC

NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

Project 2017-01 – Phase II Modifications to BAL-003

Industry Webinar
August 23, 2022

RELIABILITY | RESILIENCE | SECURITY



- North American Electric Reliability Corporation (NERC) Antitrust Guidelines
 - It is NERC's policy and practice to obey the antitrust laws and to avoid all conduct that unreasonably restrains competition. This policy requires the avoidance of any conduct that violates, or that might appear to violate, the antitrust laws. Among other things, the antitrust laws forbid any agreement between or among competitors regarding prices, availability of service, product design, terms of sale, division of markets, allocation of customers or any other activity that unreasonably restrains competition
- Notice of Open Meeting
 - Participants are reminded that this webinar is public. The access number was widely distributed. Speakers on the call should keep in mind that the listening audience may include members of the press and representatives of various governmental authorities, in addition to the expected participation by industry stakeholders.

- Use the [Standards Balloting and Commenting System \(SBS\)](#) to submit comments on draft one of Reliability Standard BAL-003-3 Frequency Response and Frequency Bias Setting by 8 p.m. Eastern, Wednesday, September 7, 2022.
- Questions should be submitted in the chat feature.
- All questions will be read and answered at the end of the presentation.
- If we do not get to your question, please email NERC staff: [Laura Anderson](#) (404) 446-9671

- Welcome and Introductions - **Laura Anderson**, NERC Standards Developer
- Project Background – **David Lemmons**
- Project Overview – **David Lemmons**
- Balancing Authority Requirements, **Tom Pruitt and Greg Park**
- Generator Owner/Generator Operator Requirements Options, **Bill Shultz and Rich Hydzik**
- Questions and Answers

- **Phase I**
- Revise the IFRO calculation in BAL-003-1 due to issues identified in the 2016 Frequency Response Annual Analysis (FRAA) Report, such as the Interconnection Frequency Response Obligation (IFRO) values with respect to Point C and varying Value B;
- Reevaluate the interconnections' Resource Contingency Protection Criteria;
- Reevaluate the frequency nadir point limitations (currently limited to t_0 to $t+12$);

- Review and modify as necessary Attachment A of the Reliability Standard to remove administrative tasks and provide additional clarity, e.g., related to Frequency Response Reserve Sharing Groups (FRSG) and the timeline for Frequency Response and Frequency Bias Setting activities; and
- Make enhancements to the BAL-003-1.1 FRS Forms that include, but may not be limited to, the ability to collect and submit FRSG performance data.
- Completed – BAL-003-2 effective 12/01/2020

- **Phase II**
- Both the IFRO calculations and the allocation of IFROs to reliability entities are retrospective (up to 2 years). The review should determine if there are alternate methodologies which consider characteristics affecting Frequency Response (e.g., load response, mix and type of generation, BAA footprint changes) to make allocation as equitable as possible;

- Although BAs and FRSGs are responsible for coordination and/or management of Frequency Response from both resources and loads, response from resources is not addressed. The review should determine if additional reliability entities should have responsibility (e.g., GOPs) for provision of generator governor response; and
- Review the measurement methodology of Frequency Response (both System and equipment level):
 - The FRM should be reviewed to ensure that over-performance by one entity does not negatively impact the evaluation of performance by another.

- The SDT discussed several different options while trying to address the concerns raised in the SAR. These options include:
 - Potentially adding additional Balancing Authority (BA) requirements to address Real-time primary Frequency Response reserves;
 - Modification to existing BA requirements on performance measurements; and
 - Adding Generator Owner (GO) and Generator Operator (GOP) requirements for operational and responsive control.
- The SDT drafted a White Paper and requested industry comments on the different options.
- Based on the feedback received from the posting, continued discussions by the SDT and regulator feedback, the SDT has posted for comment the draft BAL-003-3

- The SDT determined that the BA performance requirement must remain in place for multi-BA Interconnections.
- The measurement methodology has been modified to address certain issues but:
 - The BAs (or Reserve Sharing Groups, if applicable) have ultimate responsibility for ensuring ***all*** reserve requirements are met at the BA level.
 - There is no other NERC Registered Entity that is in the position to ensure resources are scheduled to provide the needed service.
 - GOs and GOPs are not able to ensure that any single generator should be committed and dispatched in such a way to allow the generator to respond to an event.

In addition, the SDT has proposed new requirements :

- Requirement R5 – Balancing Authority must have an Operational Planning process to address Frequency Responsive Reserves;
- Requirement 6 – Generator Operator will operate the unit with the frequency response capability operational or the Balancing Authority has been notified that it is not responsive.
- Requirement R7 - Generator Owner to have governor settings of no more than 0.036 Hz deadband and a droop of 5 percent or less. If settings are not within these parameters, notify the Balancing Authority.

- **Governor** – The electronic, digital or mechanical device that implements Primary Frequency Response of generating units/generating facilities or other system elements.
 - This is the currently-approved Texas RE Regional definition of Governor.
- **Primary Frequency Response** – The immediate proportional increase or decrease in real power output provided by generating units/generating facilities in response to system Frequency Deviations. The response is in the direction that stabilizes frequency.
 - This is the currently-approved Texas RE Regional definition of Primary Frequency Response.

- To ~~require ensure~~ sufficient Frequency Response ~~from the Balancing Authority (BA) to maintain within the~~ 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**

4.1. Functional Entities:

4.1.1. ~~Balancing Authority~~ Responsible Entity

4.1.1.1. Balancing Authority

4.1.1.1.1. 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.

4.1.1.2. Frequency Response Sharing Group

4.1.2 Generator Operator

4.1.3 Generator Owner

- Requirement R1

- Each ~~Responsible Entity shall achieve an annual Frequency Response Sharing Group (FRSG) or Balancing Authority that is not a member of a FRSG shall achieve an annual~~ Frequency Response ~~Compliance Measure (FRCM)~~ (as calculated and reported in accordance with Attachment A) that is ~~greater than or equal to 1 or more negative than its Frequency Response Obligation (FRO)~~ to ensure that sufficient Frequency Response is provided by each ~~Responsible Entity FRSG or BA that is not a member of a FRSG~~ to maintain Interconnection Frequency Response equal to or more negative than the Interconnection Frequency Response Obligation. [Violation Risk Factor: High] [Time Horizon: Real-time Operations]

- Measure M1

- Each ~~Frequency Response Sharing Group or Balancing Authority that is not a member of a Frequency Response Sharing Group~~ Responsible Entity shall have evidence, such as dated data plus documented formula in either hardcopy or electronic format that it achieved an annual FRCM (in accordance with the methods **and data** specified by the ERO in Attachment A) ~~with data from FRS Form 1 reported to the ERO as specified in Attachment A)~~ that is **greater than or equal to 1** ~~or more negative than its FRO~~ to demonstrate compliance with Requirement R1.

- Requirement 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 in accordance with Attachment A, as validated by the ERO, into its Area Control Error (ACE) calculation during the implementation period specified by the ERO and shall use this Frequency Bias Setting until directed **by the ERO** to change ~~by the ERO~~.

- Requirement R3 (no modifications)
- Requirement 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: [Violation 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 for the participating Balancing Authorities, or
 - The Frequency Bias Setting ~~as validated by the ERO shown on FRS Form 1 and FRS Form 2~~ for the entirety of the participating Balancing Authorities' Areas.

- Requirement R5
 - Each Balancing Authority shall develop, review and maintain annually, and implement an Operating Process as part of its Operating Plan to determine its Frequency Response requirements and make preparations to have Frequency Response equal to or greater than (in absolute value) the Balancing Authority's Frequency Response Obligation available for maintaining system reliability. [Violation Risk Factor: High] [Time Horizon: Operations Planning]

- Measure M5

- The Balancing Authority will have the following documentation to show compliance with Requirement R5:
 - a dated Operating Process;
 - evidence to indicate that the Operating Process has been reviewed and maintained annually; and
 - evidence, such as Operating Plans or other operator documentation, that demonstrate that the entity determines in its Operating Plans its Frequency Response available and that Frequency Response is equal to or greater than (in absolute value) its Frequency Response Obligation.

- Requirement R6
 - Each Generator Operator shall operate each generating unit/generating facility that is connected to the interconnected transmission system with frequency responsive controls in service when the generating unit/generating facility is online and released for dispatch,¹ unless the Generator Operator has notified the Balancing Authority as soon as practical but within 30 minutes of the discovery of a Governor status change (in-service, out-of-service) of a Governor. [Violation Risk Factor = Medium] [Time Horizon = Real-time Operations]

¹ That the generator is not being operated in start-up, shutdown or testing mode pursuant to a Real-time communication or a procedure that was previously provided to the Balancing Authority.

- Measure M6
 - The Generator Operator shall have evidence to show that it notified its associated Balancing Authority any time it failed to operate a generator in the frequency responsive mode when the generating facility was online and released for dispatch.

- Requirement R7

- Each Generator Owner shall have its Governor capability on each resource set with a droop of no more than five (5) percent and a deadband not more than 0.036 Hz. Exceptions to these setting requirements are allowed if the Generator Owner has notified its Balancing Authority that: [Violation Risk Factor: Medium] [Time Horizon: Operations Planning]
 - The droop setting is greater than five (5) percent or the deadband is greater than 0.036 Hz; or
 - The resource as designed does not have frequency response capability.

- Measure M7
 - Each Generator Owner shall have evidence that it set its Governor in accordance with Requirement R7. Examples of evidence include, but are not limited to, Governor test reports, Governor setting sheets, performance monitoring reports or documentation that shows the Generator Owner has provided information to the Balancing Authority information to address the exceptions allowed.

Data Collection Modifications

- We are removing the requirement to use specific forms for calculations.
- Data collection will occur through ERO determined process ([Procedure for ERO Support of Frequency Response and Frequency Bias Setting Standard](#)).
- The goal is to move to Section 1600 Data Collection process, similar to GADS or Misoperations.

- Instructions to complete the individual event analyses to populate the submittal are included in Attachment A.
- No changes to the calculation methods have been made.
- No changes to the allowed adjustments have been made.
- The calculation of the final step to determine the FRCM (FRM/FRO) for each event has been added.
- Instructions on calculations for FRSGs has been added.

The screenshot displays an Excel spreadsheet titled "NERC_BAL-003-3_Reporting_Form_Western_V5_0725022 (1) - Excel". The spreadsheet is a reporting form for 2022, with columns H through Q and rows 1 through 46. The form is divided into several sections, each with a specific color-coded header:

- Reporting Form for 2022** (Rows 1-4): Contains instructions for data entry, such as "Enter Data in Green Highlighted Cells" and "Upload Form to the NERC BASS: Grey and light blue cells are calculated or set by the ERO."
- Interconnection RLPC and Minimum Bias Data Submittal** (Rows 11-21): Includes fields for "Contact e-mail", "Largest potential resource loss within the Balancing Authority Area for the next operating year as detailed in the 'Procedure for ERO Support of Frequency Response and Frequency Bias Settings Standard'", "Second largest potential resource loss within the Balancing Authority Area for the next operating year as detailed in the Procedure for ERO Support of Frequency Response and Frequency Bias Settings Standard", "The largest resource loss within the Balancing Authority Area that results from a BAS action initiated by a multiple contingency (N-2) event as detailed in the Procedure for ERO Support of Frequency Response and Frequency Bias Settings Standard", and "Credit for Load Resources (CLR)".
- FRM Performance Results for 2022** (Rows 22-31): Includes fields for "Balancing Authority Area Net Generation (MWh) for the Operating Period of January 1, 2022 through December 31, 2022", "Balancing Authority Area Net Energy for Load (MWh) for the Operating Period of January 1, 2022 through December 31, 2022", "Balancing Authority Area Integrated Hourly Peak Load (MW) for the Operating Period of January 1, 2022 through December 31, 2022", "2022 FRM - Median Estimated Frequency Response MW/0.1Hz according to R1, minimum Frequency Response", and "2022 FRCM - Median Frequency Compliance Measurement for Compliance to R2, minimum threshold for compliance is 100%".
- BA Bias Type and Bias Setting** (Rows 32-41): Includes fields for "Fixed", "Your BA's lowest absolute Fixed Frequency Bias Setting based on interconnection non-coincident peak demand.", "Your BA's lowest absolute Fixed Frequency Bias Setting based on 100% of FRM.", "Your BA's highest absolute Fixed Bias Setting - 125% of FRM.", "For Balancing Authorities utilizing a Variable Bias, the Balancing Authority Average Frequency Bias Setting", and "Enter Balancing Authority desired Frequency Bias Setting: May be set to a value between 100% to 125% of its FRM if this value is more negative than the minimum Frequency Bias based on Peak Demand. If not more negative, then the Frequency Bias must be the minimum Bias based on Peak Demand."
- 2023 Frequency Bias Setting - (minimum of 100% to 125% of FRM, or Minimum FBS in Cell Q30 if not Variable)** (Row 42): Includes a field for "2023 Frequency Bias Setting".
- BA Overlap Regulation** (Rows 43-46): Includes a field for "Do you RECEIVE Overlap regulation? If Yes, list the BA name and the associated Bias of that BA in the table below."

The spreadsheet also includes a summary row at the bottom with columns for "BA Instructions", "BA Data Entry", "FRO Data", "Change History", and "Balancing Authority". The status bar at the bottom indicates "Edit" and "80%" zoom.

NERC_BAL-003-3_Reporting_Form_Western_V5_0725022 (1) - Excel

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		Operating Year 2021		FRSG	FRSG	Posted 2021	Posted 2022	Balancing Authority	Posted 2022
		2020	2021	FRSG	FRSG	Operating Year FRO	Operating Year FRO		Minimum Bias Setting
						(Mw/0.1Hz)	(Mw/0.1Hz)		
1									
2									
3									
4									
5									
6									
7									
8									
9									
46	2	Western	AVA	WFRSG	WFRSG	Avista Corporation	-12.2	AVA	-12.2
47	3	Western	AVRN			Avangrid Renewables	-2.8	AVRN	-2.8
48	4	Western	ACPS			Arizona Public Service Company	-23.5	ACPS	-23.5
49	5	Western	BANC	WFRSG	WFRSG	Balancing Area of Northern California	-15.5	BANC	-15.5
50	6	Western	BCHA			British Columbia Hydro and Power Authority	-61.0	BCHA	-61.0
51	7	Western	BPAT	WFRSG	WFRSG	Bonneville Power Administration	-70.5	BPAT	-70.5
52	8	Western	CFE			Comision Federal de Electricidad	-13.5	CFE	-13.5
53	9	Western	CHPD	WFRSG	WFRSG	Public Utility District No. 1 of Chelan County	-3.4	CHPD	-3.4
54	10	Western	CISO			California Independent System Operator	-190.5	CISO	-190.5
55	11	Western	DEAA			Arlington Valley, LLC - AVBA (Duke Energy Control Area Services LLC)	-0.6	DEAA	-0.6
56	12	Western	DOPO	WFRSG	WFRSG	PLD No. 1 of Douglas County	-2.1	DOPO	-2.1
57	13	Western	EPE			El Paso Electric Company	-6.9	EPE	-6.9
58	14	Western	GCPO	WFRSG	WFRSG	Public Utility District No. 2 of Grant County Washington	-5.9	GCPO	-5.9
59	15	Western	GRD	WFRSG	WFRSG	Gridforce Energy Management, LLC	-7.8	GRD	-7.8
60	16	Western	GRIF			Griffith Energy, LLC	-1.5	GRIF	-1.5
61	17	Western	GWA	WFRSG	WFRSG	NaurEner Power Watch, LLC (Glacier Wind Balancing Authority)	-0.3	GWA	-0.3
62	18	Western	HGBA			New Hanguahala Generating Company LLC - HGBA	0.0	HGBA	0.0
63	19	Western	ID			Imperial Irrigation District	-2.0	ID	-2.0
64	20	Western	IPCO	WFRSG	WFRSG	Idaho Power Company	-17.1	IPCO	-17.1
65	21	Western	LDWP			Los Angeles Department of Water and Power	-24.1	LDWP	-24.1
66	22	Western	NEVP	WFRSG	WFRSG	Nevada Power Company	-33.6	NEVP	-33.6
67	23	Western	NO_BA			Not a Balancing Authority	-45.4	NO_BA	-45.4
68	24	Western	NWMT	WFRSG	WFRSG	NorthWestern Corporation	-11.6	NWMT	-11.6
69	25	Western	PACE	WFRSG	WFRSG	PacificCorp (East)	-48.2	PACE	-48.2
70	26	Western	PACW	WFRSG	WFRSG	PacificCorp (West)	-19.8	PACW	-19.8
71	27	Western	PGE	WFRSG	WFRSG	Portland General Electric Company	-18.8	PGE	-18.8
72	28	Western	PNM			Public Service Company of New Mexico	-13.4	PNM	-13.4
73	29	Western	PSCD	WFRSG	WFRSG	Public Service Company of Colorado	-45.4	PSCD	-45.4
74	30	Western	PSEI	WFRSG	WFRSG	Puget Sound Energy, Inc.	-19.6	PSEI	-19.6
75	31	Western	SCL	WFRSG	WFRSG	Seattle City Light	-7.5	SCL	-7.5
76	32	Western	SFP			Sak River Project Agricultural Improvement and Power District	-30.6	SFP	-30.6
77	33	Western	TEPC			Tucson Electric Power	-16.1	TEPC	-16.1
78	34	Western	TED	WFRSG	WFRSG	Tullock Irrigation District	-2.2	TED	-2.2
79	35	Western	TPWR	WFRSG	WFRSG	City of Tacoma, Department of Public Utilities, Light Division	-3.3	TPWR	-3.3
80	36	Western	WACH			Western Area Power Administration - Rocky Mountain Region	-28.0	WACH	-28.0
81	37	Western	WALC			Western Area Power Administration - Desert Southwest Region	-8.6	WALC	-8.6
82	38	Western	WALU	WFRSG	WFRSG	Western Area Power Administration - Upper Great Plains Region	-0.7	WALU	-0.7
83	39	Western	WVA	WFRSG	WFRSG	NaurEner Wind Watch, LLC	-0.3	WVA	-0.3
84	40	Western	WFRSG			Western Frequency Response Sharing Group	-456.8		-456.8
85							-858	0	-858
86									
87									
88									
89									
90									
BA Instructions BA Data Entry FRO Data Change History									

- Use the [Standards Balloting and Commenting System \(SBS\)](#) to submit comments on draft one of Reliability Standard **BAL-003-3 Frequency Response and Frequency Bias Setting** by **8 p.m. Eastern, Wednesday, September 7, 2022.**
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Questions and Answers