



Description of Changes to Regional Standard BAL-001-TRE-2 Project SAR-013

General Changes

- Revised BAL-001-TRE-2 to BAL-001-TRE-3

BAL-001-TRE-3 Section	Description	Rationale
A 6 Background	Corrected the typo “measureable” to measurable”	Corrected a typo.
A 6 Background	Added “battery energy storage system (BESS)” to the last sentence.	This revision fulfills one of the objectives of the SAR.
Requirement R2	Added BESS to generating unit/generating facility	This revision fulfills one of the objectives of the SAR.
Requirement R2 Footnote 1	Added BESS to generating unit/generating facility	This revision fulfills one of the objectives of the SAR.
Requirement R2 Footnote 1	Added “Attachment 1” to Primary Frequency Response Reference Document.	This revision specifies the Primary Frequency Response Reference Document is in Attachment 1. It is also to be consistent with Requirements R6, R9, and R10.
Requirement Part 2.3	Added BESS to generating unit/generating facility	This revision fulfills one of the objectives of the SAR.
M2	Added BESS to generating unit/generating facility	This revision fulfills one of the objectives of the SAR.
M3	Removed the “per” that should not have been there.	Corrected a typo
Requirement Part 6.1	Added “Generating Units that are not qualified to provide Operating Reserves” to Table 6.1.	This revision fulfills one of the objectives of the SAR.
Requirement Part 6.1 Footnote 2	Added footnote 2: “Refers to ancillary service qualification criteria as required by the Balancing Authority.	This revision fulfills one of the objectives of the SAR.

BAL-001-TRE-3 Section	Description	Rationale
Requirement Part 6,.3	Added Primary Frequency Response Reference Document to Attachment 1.	This aligns with footnote 1.
Requirement Part 6.1 Footnote 3	Added footnote 3: "Only with prior approval from the Balancing Authority"	This revision fulfills one of the objectives of the SAR.
Table 1 Asterisk	Changed the asterisk to footnotes 4 and 5: "Requirements R6.1, R6.2, and R6.3 are not applicable to steam turbine(s) of a combined cycle resource.	This revision makes the footnotes consistent.
Requirement Part 6.2 Table 6.2	Added BESS – 5%	This revision fulfills one of the objectives of the SAR. A 5% droop for BESS was to match the requirements of existing generation units.
Requirement R7	Added BESS to generating unit/generating facility	This revision fulfills one of the objectives of the SAR.
M7	Added BESS to generating unit/generating facility	This revision fulfills one of the objectives of the SAR.
Requirement R9	Added BESS to generating unit/generating facility	This revision fulfills one of the objectives of the SAR.
Requirement R9	Added Primary Frequency Response Reference Document to Attachment 1.	This aligns with footnote 1.
Requirement Part 9.2	Added BESS to generating unit/generating facility	This revision fulfills one of the objectives of the SAR.
Requirement Part 9.3	Added BESS to generating unit/generating facility	This revision fulfills one of the objectives of the SAR.
M9	Added BESS to generating unit/generating facility	This revision fulfills one of the objectives of the SAR.
Requirement R10	Added BESS to generating unit/generating facility	This revision fulfills one of the objectives of the SAR.
Requirement R10	Added Primary Frequency Response Reference Document to Attachment 1.	This aligns with footnote 1.

BAL-001-TRE-3 Section	Description	Rationale
Requirement Part 10.2	Added BESS to generating unit/generating facility	This revision fulfills one of the objectives of the SAR.
Requirement Part 10.3	Added BESS to generating unit/generating facility	This revision fulfills one of the objectives of the SAR.
M10	Added BESS to generating unit/generating facility	This revision fulfills one of the objectives of the SAR.
Section C 1.1	Added abbreviation for Compliance Enforcement Authority (CEA)	This change makes it consistent with other NERC Reliability Standards.
Section C 1.2	Revised this section to include more detail on when the reset time frame will occur.	This revision fulfills one of the objectives of the SAR.
Violation Severity Levels	Corrected formatting for R4	Format correction.
Standard Attachments	Changed font to size 12 to match the rest of the document.	Format correction.
Standard Attachments 1. a	Added comma after R9	Corrected a typo

Attachment 1

General

- Changed font size from 11pt to 12pt
- Removed capitalization from “capacity” as it is not defined in the NERC Glossary.

Attachment 1 Section	Description	Rationale
I. Introduction	Added BESS to the description of High Sustained Limit.	This revision fulfills one of the objectives of the SAR.
I. Introduction	Revised description of Low Sustained Limit (LSL)	Definition was modified to capture the charging side of the operation curve for BESS units.
I. Introduction	Added description for Maximum Megawatt Governor Control System (MW _{GCS})	Captures the available range of MW response for performance calculations.
I. Introduction	Added description for Design Settings versus Real-time Evaluation	To clarify the difference in expectation in minimum design requirements vs operational settings and evaluation.
I. Introduction	Revised Footnote 1 to indicate that the spreadsheets are found on Texas RE's public website, rather than a specific link.	This will not need to be updated if the link changes.
II Initial Primary Frequency Response Calculations Requirement R9	Included the revised language for Requirement R9.	To be consistent with the Regional Standard.
Initial Primary Frequency Response Performance Calculation Methodology	Changed Primary Frequency Response to the acronym (PFR).	The acronym is described in the Introduction paragraph.

Initial Primary Frequency Response Performance Calculation Methodology	Changed Actual to lower case (actual).	This is not a NERC Glossary term.
Initial Primary Frequency Response Performance Calculation Methodology	Changed Final Expected to lower case (final expected).	This is not a NERC Glossary term.
Actual Primary Frequency Response	Changed Adjusted Actual to lowercase (adjusted actual).	This is not a NERC Glossary term.
Actual Primary Frequency Response	Changed Actual to lowercase (actual)	This is not a NERC Glossary term.
Expected Primary Frequency Response (EPFR)	Changed Expected to lowercase (expected).	This is not a NERC Glossary term.
Expected Primary Frequency Response (EPFR)	Revised equations for Expected Primary Frequency Response to change HSL to MW_{GCS}	Equation was revised to align with the definition of MW_{GCS}
Expected Primary Frequency Response (EPFR) - Pre-perturbation Average Hz	Pre-perturbation Average Hz – Removed capitalization of net dependable capacity.	This term is not defined in the NERC Glossary.

Expected Primary Frequency Response (EPFR) - Pre-perturbation Average Hz	Removed capitalization of combined cycle.	This term is not defined in the NERC Glossary.
Expected Primary Frequency Response (EPFR) - Pre-perturbation Average Hz	Removed sentence: "The Capacity for wind powered generators is the real time HSL of the wind plant at the time the FME occurred."	The pre-perturbation Average Hz is different than capacity for wind. Statement is no longer needed due to updated definition of MW_{GCS} .
EPFR _{final} for Combustion Turbines and Combined Cycle Facilities	Revised equations for EPFR _{final} for combustion turbines, combined cycle facilities and steam turbines to change HSL to MW_{GCS}	The equations were revised to align with the definition of MW_{GCS} .
EPFR _{final} for Steam Turbine	Revised equations for EPFR _{final} for combustion turbines, combined cycle facilities and steam turbines to change HSL to MW_{GCS}	The equations were revised to align with the definition of MW_{GCS} .
EPFR _{final} for Steam Turbine	Removed capitalization on rated throttle pressure.	This term is not defined in the NERC Glossary.
EPFR _{final} for Steam Turbine	Removed capitalization on pressure.	This term is not defined in the NERC Glossary.
EPFR _{final} for Steam Turbine	Removed capitalization on steam flow change factor.	This term is not defined in the NERC Glossary.
III. Sustained Primary Frequency Response Calculations	Included the revised language for Requirement R10.	To be consistent with the Regional Standard.

Sustained Primary Frequency Response Performance Calculation Methodology	Changed Per Unit Sustained to lowercase (per unit sustained)	This term is not defined in the NERC Glossary.
Sustained Primary Frequency Response Performance Calculation Methodology	Changed Primary Frequency Response to the acronym (PFR).	The acronym is described in the Introduction paragraph.
Sustained Primary Frequency Response Performance Calculation Methodology	Changed Final Expected to lowercase (final expected).	This term is not defined in the NERC Glossary.
	Changed Frequency Measurable Event to acronym (FME).	The acronym is described in the Introduction paragraph.
Sustained Primary Frequency Response performance requirement	Changed Primary Frequency Response to the acronym (PFR).	The acronym is described in the Introduction paragraph.
Sustained Primary Frequency Response performance requirement	Changed Frequency Measurable Event to acronym (FME).	The acronym is described in the Introduction paragraph.

Expected Sustained Primary Frequency Response (<i>ESPFR</i>) Calculations	Changed Expected Sustained to lower case (expected sustained)	This term is not defined in the NERC Glossary.
Expected Sustained Primary Frequency Response (<i>ESPFR</i>) Calculations	Changed Primary Frequency Response to the acronym (PFR).	The acronym is described in the Introduction paragraph.
Expected Sustained Primary Frequency Response (<i>ESPFR</i>) Calculations	Changed High Sustainable Limit to the acronym (HSL)	The acronym is described in the Introduction paragraph.
Expected Sustained Primary Frequency Response (<i>ESPFR</i>) Calculations	Changed Low Sustainable Limit (LSL) to the acronym.	The acronym is described in the Introduction paragraph.
Expected Sustained Primary Frequency Response (<i>ESPFR</i>) Calculations	Removed capitalization from power augmentation capacity.	This term is not defined in the NERC Glossary.
Establishing the Ideal Expected Primary Frequency Response	Removed capitalization from expected sustained.	This term is not defined in the NERC Glossary.
Establishing the Ideal Expected Primary Frequency Response	Changed Primary Frequency Response to the acronym (PFR).	The acronym is described in the Introduction paragraph.

Establishing the Ideal Expected Primary Frequency Response	Revised calculations for establishing the ideal Expected Sustained Primary Frequency Response	Equations were revised to align with the definition of MW_{GCS}
Establishing the Ideal Expected Primary Frequency Response	Changed net dependable capacity to the acronym (NDC).	The acronym is described previously.
Establishing the Ideal Expected Primary Frequency Response	Removed the sentence: The capacity for wind powered generators is the real-time HSL of the wind plant at the time the FME occurred.	The pre-perturbation Average Hz is different than the capacity for wind. Statement is no longer needed due to updated definition of MW_{GCS}
Establishing the Ideal Expected Primary Frequency Response	Changed HSL to MW_{GCS} .	Equation was revised to align with the definition of MW_{GCS}
ESPFR _{final} for Combustion Turbines and Combined Cycle Facilities	Revised equations for EPFR _{final} for Combustion Turbines and Combined Cycle Facilities to change HSL to MW_{GCS}	Equation was revised to align with the definition of MW_{GCS}
ESPFR _{final} for Steam Turbine	Revised equations for EPFR _{final} for Steam Turbine to change HSL to MW_{GCS}	Equation was revised to align with the definition of MW_{GCS}
ESPFR _{final} for Steam Turbine	Changed rated throttle pressure to lowercase.	This term is not defined in the NERC Glossary.
ESPFR _{final} for Steam Turbine	Changed pressure to lowercase.	This term is not defined in the NERC Glossary.
ESPFR _{final} for Steam Turbine	Changed minimum throttle pressure to lowercase.	This term is not defined in the NERC Glossary.

IV. Limits on Calculation of Primary Frequency Response Performance (Initial and Sustained):	Changed HSL to MW_{GCS} Added “or a BESS is operating within 2% or 3MW of its MW_{GCS}”	Equations were revised to align with the definition of MW_{GCS} 3 MW or 2% limit was the agreed limit for BESS units to be excluded from evaluation.
IV. Limits on Calculation of Primary Frequency Response Performance (Initial and Sustained):	Revised equations to change HSL to MW_{GCS}	Equation was revised to align with the definition of MW_{GCS}
IV. Limits on Calculation of Primary Frequency Response Performance (Initial and Sustained):	Added “where X is 5 MW for generating units/generating facility and 3 MW for BESS”	This language aligns with ERCOT Operating Guides.
IV. Limits on Calculation of Primary Frequency Response Performance (Initial and Sustained):	Changed Primary Frequency Response to the acronym (PFR).	The acronym is described in the Introduction paragraph.

Final Expected Primary Frequency Response (EPFR _{final}) is greater than Operating Margin:	Changed HSL to MW _{GCS}	Equation was revised to align with the definition of MW _{GCS}
Final Expected Primary Frequency Response (EPFR _{final}) is greater than Operating Margin:	Added "or a BESS is operating within 2% or 3MW of its MW _{GCS}	3 MW or 2% limit was the agreed limit for BESS units to be excluded from evaluation
Final Expected Primary Frequency Response (EPFR _{final}) is greater than Operating Margin:	Added: The BESS's pre-perturbation operating margin (appropriate for the frequency deviation direction) is greater than 2% of its (MW _{GCS} less PA Capacity) and greater than 3 MW; and	3 MW or 2% limit was the agreed limit for BESS units to be excluded from evaluation
Final Expected Primary Frequency Response (EPFR _{final}) is greater than Operating Margin:	Changed HSL to MW _{GCS} .	revised to align with the definition of MW _{GCS}

Final Expected Primary Frequency Response ($EPFR_{final}$) is greater than Operating Margin:	Changed initial and sustained to lower case.	These terms are not defined in the NERC Glossary.
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Attachment A

- Added LSL = Low Sustained Limit
- Added MW_{GCS} = maximum megawatt control range of the Governor control system
- Made conforming changes to the flowcharts to align with Attachment 1
- Removed capitalization from “capacity” as it is not defined in the NERC Glossary.

Attachment B

- Made conforming changes to the flowcharts to align with Attachment 1
- Removed capitalization from “capacity” as it is not defined in the NERC Glossary.