

Template for Quality Review of NERC Reliability Standard BAL-003-1 – Frequency Response and Frequency Bias Setting

Basic Information:

Project number: 2007-12

Project title: Frequency Response

Standard number: BAL-003-1

Standard Title: Frequency Response and Frequency Bias Setting

Coordinator's name: Darrel Richardson

Draft date: January 30, 2012

Draft Number: 3

Date of review: January 31, 2012

Reviewer's Name:

Mark Cole – GSOC outside attorney

Ken McIntyre - ERCOT

Maureen Long - NERC

Summary of Observations:

The QR team felt that overall this was a well-written standard.

The overarching concern is with the standard and the attachments. There appear to be requirements within the attachments for the BA's and FRSG that do not appear in the requirements. This creates an auditing concern. Is there information that can be put into the standard from the attachments? One of the reviewers felt it would be helpful if the tables were in the standard.

Also, is there a way to make it more clear what the responsibilities of the BA and FRSG are and what is the ERO's responsibility?

- The SDT has added language to the Applicability Section to provide clarity to the BA and FRSG responsibilities. The SDT has also removed Attachment B and moved it into a Procedure for the ERO to follow in supporting the standard.

Purpose – ‘supporting frequency until the frequency is restored’ – How can you support until restored? Is this two different actions? Is this supporting frequency until it can be stabilized?

- The SDT has modified the purpose statement to provide additional clarity.

Applicability - The team has added the term, “Frequency Response Sharing Group” to the list of applicable entities and has not provided confirmation that adding this term is acceptable to the compliance registration folks.

- Darrel Richardson spoke with Jack Wiseman (NERC Compliance) regarding your concern. He indicated that there would be no problem with adding this group to the compliance registry.

Requirement R1:

- Suggest clarifying R1 to make it clear that each BA must comply – either by acting alone or by acting as part of a FRSG. . .
 - The SDT has added language to the Applicability Section to provide clarity to the BA and FRSG responsibilities.
- The use of the word, ‘or’ between BA and FRSG is not correct – they both must comply
 - The SDT has added language to the Applicability Section to provide clarity to the BA and FRSG responsibilities.
- How do you hold FRSG responsible in audit? Wording suggestion - Each BA (individually or as part of a FRSG). In auditing this would show FRSG achieved.
 - The SDT has added language to the Applicability Section to provide clarity to the BA and FRSG responsibilities.
- The phrase, “adequate level” of FR is ambiguous – however this ambiguity is in the measurability of the reliability outcome, not in the required performance.
 - The SDT agrees with you. The SDT believes that the portion of the sentence you are referencing could be removed from the standard with no adverse effects. The SDT only added this in response to a QR request.
- The references to Attachment A are confusing as they reference “calculated and reported” – but the section of Attachment 1 relative to FRM is written in passive language and doesn’t identify what functional entity is responsible for the tasks – and is written so that the mandatory performance is unclear. `
 - The SDT has modified the reference in the requirement to provide further clarity.
- Attachment A page 3 ** refers to Texas should this be ERCOT?
 - This has been changed.
- Unclear if Attachment A and B can only be changed within standard process?

- It is the belief of the SDT that an Attachment that is referenced in a standard would have to go through the Standards Development Process to make any changes. In addition, The SDT has also removed Attachment B and moved it into a Procedure for the ERO to follow in supporting the standard. The SDT has also added language within the Procedure to detail the process that would be followed to modify the document.
- Unclear if FRS Forms 1 and 2 are physical attachments to the standard (and can only be changed within standard process) or if they can be changed by ERO.
 - It is the intent of the SDT for these spreadsheets become part of the standard and would therefore need to go through the Standards Development Process to make any modifications.
- Attachment A does not identify how FRO is calculated for the FRSG.
 - The SDT has added language to the Attachment explaining the calculation.
- (as detailed in Attachment A, and calculated and reported in accordance with the methods and formats specified in Attachment A) This appears to be adding obligations to the entities via Attachment A and are two separate activities that are not explicitly spelled out in the requirement.
 - The SDT has made modifications to the Requirement(s) and the Attachment A to clarify the activities being discussed.

Requirement R2:

- Remove Tie line bias
 - The SDT disagrees with the suggestion to remove “Tie Line Bias” from the requirement. The SDT believes that this is a well understood term and adds value to the sentence. The SDT also believes that the portion of the sentence you are referencing could be removed from the standard with no adverse effects. The SDT only added this in response to a QR request.
- Don’t know how to measure, “until a different Frequency Bias Setting is to be implemented” – the sentence structure is a bit awkward – suggest the following: *Also see redlined standard for an additional suggestion.*

Each Balancing Authority that uses a fixed Frequency Bias Setting and does not receive Overlap Regulation Service shall implement the Frequency Bias Setting determined subject to Attachment B and validated by the ERO, into its Area Control Error (ACE) calculation, and shall use this Frequency Bias Setting until directed to change by the ERO to ensure effectively coordinated control.

 - The SDT has made the modifications you suggested.
- Attachment B does not identify how the ERO validates data.
 - The SDT purposely only referenced the ERO “validating” data but did not define how the ERO should validate data. The SDT believes that there are multiple

methods for validation of data and this is a process that should be developed by the entity doing the validation.

- Auditing for Attachments A and B – How do you audit BA for items the ERO should do? Should the ERO’s responsibilities be in the standard? Maybe it should be part of definitions.
 - The SDT has moved functions that are being performed by the ERO into a Procedure for the ERO to follow in supporting the standard.
- Attachment A, page 4 gives reporting obligation for the BA. Should that be in the requirement?
 - The SDT has modified the language in the Attachment to no longer “require” the entity to perform a certain function.

Requirement R3:

- What is the reliability outcome? Is it to ensure effectively coordinated controls?
 - The SDT has completely re-written the requirement to provide additional clarity.
- Consider revising the sequence of phrases in the requirement as shown below: *Also see redlined standard for an additional suggestion.*

Each Balancing Authority that uses a variable Frequency Bias Setting and does not receive Overlap Regulation Service shall implement the variable Frequency Bias Setting into its Area Control Error calculation either:

- The SDT has completely re-written the requirement to provide additional clarity.
- What does previous and current year refer to – calendar or rolling 12 months? Suggested wording ‘Previous annual evaluation period or current annual evaluation period.’
 - The SDT has completely re-written the requirement to provide additional clarity.

Requirement R4:

- The phrases “being combined” and “being controlled” are both passive – revise to remove the passive language.
 - The SDT has completely re-written the requirement to provide additional clarity.
- In order to make it clear the FRSG is a responsible entity, see change made to R4.
 - The FRSG is not a responsible entity for this requirement.

Measures:

- Ensure the verb that was used in the requirements is used in the measures.
 - The SDT has modified the proposed measures to provide additional clarity.
- M1 should say Each BA and each FRSG . . .

- The SDT has modified the proposed measures to provide additional clarity.
- Measures should be modified to conform to adjustments made to the requirements – if the FRSG is added to R2-4, the FRSG should be added to the measures . . .
 - The FRSG is not an applicable entity for Requirements R2, R3 or R4.

Compliance Monitoring and Assessment Processes

- The “Periodic Data Submittal” was identified as a method of monitoring compliance but there is no additional language in the “Additional Compliance Information” section telling what or when the periodic data must be submitted – not sure if the team did intend to have a periodic data submittal for compliance purposes or if the periodic data submittal was intended to provide the ERO with data to establish the FRO . . .
 - The suggested modification has been made.
- Minor edits shown in redline to match latest default language . . .
 - The suggested modification has been made.

Time Horizons

- For R1, although the calculation is done after the fact, is the calculation based on the summation of real-time performance? If yes, then should there be an additional time horizon for real-time operations?
 - The SDT has modified the Time Horizon to be Real Time Operations
- If the responsible entity has to change its FBS in real-time then shouldn't R3 and R4 have an additional time horizon (a requirement may have more than one time horizon) for real-time operations?
 - Modifications to the Frequency Bias Setting are typically only done once each year. This is not a continuously occurring task.

Violation Risk Factors

- R1 - Explanation for meeting NERC's VRF Guideline 1 should be expanded to also include the FRSG. (If the FRSG is added to other requirements, it should be added to the VRF explanations)
 - The Correction has been made. The RSG is not an applicable entity for Requirements R2, R3 or R4.
- The following language in the VRF explanation for R1 seems misleading – while evidence may be paper-based, isn't the required performance to make adjustments associated with frequency?

This Requirement is more administrative in nature requiring calculated FRM to be equal to or more negative than FRO.

 - The justification has been modified.

- Same observation for VRF explanation for all other requirements . . .
 - **The justifications have been modified.**

Violation Severity Levels

- VSLs for R1 add language to the VSL that does not exist in the requirement (VSL ties to Interconnection FRO and requirement is tied to individual BA or FRSG FRO)
 - **The SDT has modified the language in Requirement R1 to now reference Interconnection Frequency Response Obligation.**
- VSLs for R2 – suggest adding more clarity to the time period so that it is easier to determine which VSL applies by adding words such as those shown in green: . . . but did so within 5 calendar days from the last date of the implementation period specified by the ERO.
 - **The SDT has modified the VSLs to provide additional clarity.**
- VSLs for R3 – add the phrase, “not receiving Overlap Regulation Service and using a variable Frequency Bias Setting”
 - **The SDT has modified the VSLs to provide additional clarity.**
- VSLs for R3 and R4 use increments of 10% rather than increments of 5% for noncompliant performance – this can be acceptable if the SDT provides a clear justification, but this has not been provided. (Violates NERC’s VSL Guidelines)
 - **The SDT has modified the VSLs to provide additional clarity.**

Implementation Plan

- The Implementation Plan should identify that FRSGs must be added to the NERC compliance registry criteria before the standard can become effective.
 - **The Implementation Plan has been modified.**
- The SDT should add an explanation for what responsible entities should do to work towards becoming compliant during the delay between the approval and effective dates.
 -
- The SDT needs to ask stakeholders (through the comment form) if they agree that the modification to the definition of Frequency Bias Setting does not modify the intent of the requirements in the following standards:
 - BAL-001-0.1a Real Power Balancing Control Performance
 - BAL-004-0 Time Error Correction
 - BAL-004-1 Time Error Correction
 - BAL-005-0.1b Automatic Generation Control

- The SDT has already asked this question in earlier versions of the proposed standard.

Other Issues:

Attachment A is very confusing as it mixes statements of required performance for the BA with process steps for the ERO. Attachment A should be revised for clarity and to make it possible for responsible entities to understand the required performance.

- Attachment A includes the following language that appears to be required performance, but there is no link between these and any requirement:

Balancing Authorities that merge or that transfer load or generation need to notify the ERO of the change in footprint and corresponding changes in allocation such that the net obligation for the Interconnection remains the same and so that CPS limits can be adjusted.

If the SDT intends the above to be mandatory and enforceable, then there needs to be a link to a requirement in the standard. As currently written, the only link between mandatory requirements and Attachment A is associated with Requirement 1 relative to achieving an FRM.

- The SDT has modified the language to no longer require an entity to notify the ERO. The SDT believes that if an entity failed to notify the ERO of a change in their footprint the Interconnection would still be whole as one entity may be overstating while the other entity would be understating.

- Attachment A includes the following:

An Interconnection may propose alternate FRO protection criteria to the ERO. The ERO will confirm the proposed alternate FRO protection criteria.

It isn't clear what process an Interconnection would use to propose an alternative FRO protection criteria . . . nor clear how the ERO would confirm the proposed alternative criteria. . . The process should be documented somewhere – suggest including in a procedure that is a reference document associated with the standard.

- The SDT has modified the above referenced language to provide clarity.

- The following is included in Attachment A:

Until the BAL-003-1 process outlined in Attachment 1 is implemented, Balancing Authorities can approximate their FRO by multiplying their Interconnection's FRO by their share of Interconnection Bias. The data used for this calculation should be for the most recently filed

Form 714. As an example, a report to NERC in January 2013 would use the Form 714 data filed in 2012, which utilized data from 2011.

The above is unclear. The heading for this section of the attachment states that the ERO establishes FRO – but the performance described is assigned to the BA.

- This has been removed from the Attachment.

- The following is included in Attachment A:

Each Balancing Authority shall report 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.

The text above is written as though it were a requirement (use of the 'shall' word), but its link to R1 is not clear. If the SDT intends the above to be mandatory and enforceable, then there needs to be a link to a requirement in the standard. As currently written, the only link between mandatory requirements and Attachment A is associated with Requirement 1 relative to achieving an FRM.

- The language has been modified to remove the term "shall".

- The following is included in Attachment A:

Balancing Authorities that provide Overlap Regulation will submit a FRS Form 1 that represents both the provider's and the recipient(s)' footprint.

If the SDT intends the above to be mandatory and enforceable, then there needs to be a link to a requirement in the standard.

- The SDT has modified the requirement to provide additional clarity.

- The instructions for calculating FRM never identify that it is the ERO that must do this – these instructions should be clarified to remove the passive language and clarify that the ERO is the responsible entity.

Does the set of requirements in Attachment A address all the variations necessary with respect to how the various BAs implement their Frequency Bias Settings in their ACE equations?

- [A BA receiving Overlap Regulation Service does not need to have an ACE equation or Frequency Bias Setting and therefore does not need to comply with R2, R3 and R4.](#)

- [R2 and R3 are applicable to BAs that are "receiving" ORS and R4 is for BAs that are "providing" ORS – are these the correct verbs? If it is necessary to have two requirements for the BAs that are "receiving" ORS \(one for fixed and one for variable Frequency Bias Settings\) is it sufficient to have only 1 requirement for the BAs that are "providing" ORS?](#)

Should R4 identify that it is applicable to BAs using both fixed and variable Frequency Bias Settings?

- [A BA receiving Overlap Regulation Service does not need to have an ACE equation or Frequency Bias Setting and therefore does not need to comply with R2, R3 and R4.](#)



- Is there a BA receiving Overlap Regulation Service and using a variable frequency bias setting? If yes, do we need a requirement to specify how they implement their Frequency Bias Setting in their ACE equation?

- [A BA receiving Overlap Regulation Service does not need to have an ACE equation or Frequency Bias Setting and therefore does not need to comply with R2, R3 and R4.](#)



- Is there a BA receiving Overlap Regulation Service and using a variable Frequency Bias Setting?

- [A BA receiving Overlap Regulation Service does not need to have an ACE equation or Frequency Bias Setting and therefore does not need to comply with R2, R3 and R4.](#)



FRS Form 2

- The FRS Form 2 instructions are clearly written for the BA, but nowhere in the standard or the Attachments is it clear that the BA has to complete FRS Form 2. If the team wants this to be enforceable, it needs to be linked to a requirement.

- The SDT has [modified the FRM section in Attachment A](#) to provide clarity.

Attachment B

- Because so much of this document is written in passive language, it is not clear what responsible entity is assigned each of the tasks. This document should be revised to remove all passive language and clearly identify which functional entity is responsible for each task.
 - The SDT has [turned Attachment B into a Procedure for the ERO to follow in supporting the standard.](#)
- Second bullet on page – “Interconnection minimum” – there should be more words after the word, “minimum” so that the intent is clear
 - This has been [removed from Attachment B now a Procedure, and added to Attachment A with additional language.](#)
- The document indicates the BA/FRSG “reports” data, but the document doesn’t identify who to report the data to and doesn’t identify how often

- The SDT has modified the Attachment B, now a Procedure, to only include the process the ERO is to follow to support the standard.
- The document addresses both the BA and FRSG, but the associated requirement is only assigned to the BA
 - Attachment B, now a Procedure, has been modified to no longer reference a FRSG. The procedure only addresses the process the ERO is to follow to support the standard.
- Table 1 Chart should use same labels as charts in Attachment A for TX – looks like this was changed to “ERCOT” in Attachment A but not in Attachment B
 - This has been corrected.
- The use of the word, “may” in the very last sentence begs additional clarity. Entities will want to know what criteria will be used to make this determination . . .
 - This has been modified.

Standard

MEL1 – Requirement R1

Per David Cook we are not allowed to use this acronym in the body of a standard.

- This has been modified.

BN2 – Requirement R1

Is there a better place to put this? It could be put in definition or requirement.

Suggested rewording.

Calculated and reported in accordance with Attachment A

- This has been modified.

MEL3 – Requirement R2

This is passive and not clear how this is determined or if this is important - if this is per the attachments, then is the phrase, "until a different Frequency Bias Setting is to be implemented" needed?

- This has been modified to the suggested wording.

BN4 – Requirement R4

To make it clear FRSG is a responsible entity.

- The FRSG is not an applicable entity.

BN5 – Requirement R4

To add specificity to 'area'

- This has been modified.

BN7 – Additional Compliance

Flat frequency is not a defined term and should not be capitalized. Should this be explained here?

- The modification has been made. This term is very well understood within the industry and therefore does not need to be defined.

BN8 – Additional Compliance

If not already in Background Document, should this be in it also? Think would be helpful for auditors also as background info.

- This term is very well understood within the industry and therefore does not need to be defined.

MEL9 – Associated Documents

These are part of the standard and will be attached in final format – they are not associated documents.

- The SDT agrees and has made the suggested modification.

Comment Report

Question 1

MEL1 – Seattle City Light

The standard has been posted twice, and neither one of the posted versions included the word, “prevent” so this response must be changed.

- The SDT has modified the response.

MEL2 – Alliant Energy

The drafting team can always ask for approval of a supplemental SAR if needed.

- The SDT understands it has that option. However, the SDT does not believe that it can expand the scope of the current project if it has any intention of meeting the May filing deadline.

MEL3 – Progress Energy

The team made significant changes to the definition of Frequency Bias Setting – so this response must be changed.

- The SDT is only proposing a minor change to the modification from the last posting.

MEL4 – Associated Electric

Their suggestion was to add the term “RSG” to the definition of FRO – so the response should indicate whether the team did add RSG (now FRSG) to the definition of FRO.

- The SDT has modified the response.

Question 2

MEL5 – Public Utility District No. 1

I could not find this commitment is not in Attachment B

- The SDT has modified the Attachment (now a Procedure).

MEL6 – FMPP

This is the same suggestion as made by WECC on the following page – the suggestion on the following page is easier to read . . .

- The SDT has modified the response.

MEL7 – WECC

There is no response to this suggestion . . .

- The SDT has modified the response.

MEL8 – MidAmerican Energy

No response to this comment

- The SDT does not believe that this is a “stand alone” comment. This comment is only providing clarifying language for the comment above concerning a “upper limit”

MEL9 – Constellation Energy

This revision won't satisfy their concern that without adding some commas, it is difficult to understand the sentence.

- The SDT has modified the language in the proposed requirement.

MEL10 – Tucson Electric

This has been suggested by a couple of stakeholders – the response from the SDT below doesn't really show consideration of this suggestion – it does look like the proposed wording would help clarify the requirement (now R3).

- The SDT has modified the response.

MEL11 – Manitoba Hydro

None of the above however, and none of the edits to Attachment A identify how the FRO is determined for an FRSG. . .

- The SDT has modified Attachment A to explain the calculation.

MEL12 – Manitoba Hydro

Although the SDT made adjustments to Attachment B – the revised attachment does not mention the ERO's "validation" of any data provided by a BA or FRSG. . . . And the revised standard doesn't add the FRSG to any requirement other than R1

- The SDT has added language in Attachment A and modified the response.

MEL 13 – Beaches Energy Services

This is not responsive to the specific suggestion.

- The SDT has modified the response.

Question 4

MEL14 – Summary

This should identify why the SDT did not adopt this suggestion when it moved R5 into R2 and R3 – the phrase, "natural Frequency Response" is not used in the revised standard.

- The SDT has modified the response.

MEL15 – Bonneville Power Administration

Historian is a vendor supplied software tool. The commenter should have capitalized this term to make that clear – but the response should be modified.

- The SDT has modified the response.

MEL16 – Manitoba Hydro

This does not address the concern raised – to address the concern raised, the SDT would need to modify the requirement.

- The SDT modified the Applicability Section and the response to provide additional clarity.

Question 5

MEL17 – Summary

This is a rational discussion to justify the proposed VSLs, however the proposed VSLs don't meet FERC's VSL guidelines as they expand on the performance required.

- The SDT modified the Requirement and the response to provide additional clarity.

MEL18 – Public Utility District No. 1

While this is a good explanation of what the team did, the VSLs, as proposed don't meet FERC's guidelines as they expand on the language in the requirement. If you revise the requirement to tie performance to Interconnection frequency response then this approach for setting VSLs could work.

- The SDT modified the Requirement and the response to provide additional clarity.

MEL19 – SERC OC Standards Review

No response to this comment

- The SDT provided a response to the comment.

MEL20 – SERC OC Standards Review

The SDT deleted R5 so this response needs to be revised.

- The SDT modified the response to the comment.

MEL21 – Southern Company

The SDT deleted R5 so this response needs to be revised.

- The SDT modified the response to the comment.

MEL22 – ISO/RTO Standards Review

This change wasn't shown . . .

- The SDT modified the VSL.

Question 6

MEL23 – Summary

Attachment A still contains language that is written as though it is a requirement for the BA to file FRS Form 1 by a specific date . . .the language says, "Each BA shall . . ." just like a requirement.

- The SDT removed the term "shall" and revised the language in the Attachment.

MEL24 – Summary

This is incomplete . . .

- The SDT corrected this error.

MEL25 – Alliant Energy

Please verify this is true – the actual language in Attachment A says:...” the calculation of the BA response to such an event will be adjusted to show a frequency change only to the Target Minimum Frequency (or a high frequency amount of an equal quantity).”

- The SDT modified the response and the language in Attachment A.

MEL26 – Beaches Energy Services

This clarification was not made.

- The SDT modified the language in Attachment A.

MEL27 – FPL

No graph was added to Attachment A

- The SDT modified the response to the comment.

MEL28 – FPL

No changes were made to criterion 4 . . .or to criterion 5.

- The SDT modified the response to the comment.

MEL29 – Bonneville Power Administration

Would be good to provide a link to the documents or to post both on the project web page.

- The SDT provided a link within the response.

MEL30 – ISO/RTO Council Standards Review

The commenter is correct – these should not be listed in Section F.

- The SDT modified the response and removed these from the Section in the standard.

MEL31 – Texas Reliability Entity

The response says this modification was made – but it does not show on the redline provided.

- The SDT modified the response.

Question 7

MEL32 – Summary

No redline of the background document was provided – so the responses following were checked only for grammar, etc – not for accuracy.

- The SDT has reviewed the responses and believes that they are correct.

MEL33 – SERC OC Standards Review

If the document was developed to support this standard, then it should be posted on the NERC web site with the approved standard so it is easy for stakeholders to find.

- The SDT modified the response to the comment.

Question 8

MEL34 – Texas Reliability Entity

This paragraph was modified, but was not deleted – this response should be changed.

- The SDT modified the Procedure (old Attachment B).

MEL35 – Duke Energy

I could not find this language in the redline provided of Attachment B.

- The SDT modified the language in the Procedure and the response to the comment.

Question 9

MEL36 – Summary

Please verify that these are done – otherwise change back to future tense. as something that the team will do in the future.

- The Excel spreadsheets have been developed. The SDT also modified responses to other comments to match the summary response.

Question 10

MEL37 – Summary

The words, “at least” were added to R3 in the revised standard.

- The SDT modified the requirement and also modified the response to the comment.

MEL38 – MRO NSRF

As noted earlier, the SDT moved the language from R5 into R3, but did not make the change requested so the response is not helpful.

- The SDT modified the requirement and also modified the response to the comment.

MEL39 – Ameren Energy Marketing

Did the SDT submit a Suggestions form so this is entered into the Issues Database?

- The SDT will submit a “Suggestion Form”.

MEL40 – EnergyMark

The SDT can assign more than one Time Horizon to a specific requirement.

- The SDT modified the Time Horizon to be “Real Time Operations)