Name (26 Responses)
Organization (26 Responses)
Group Name (17 Responses)
Lead Contact (17 Responses)
Question 1 (36 Responses)
Question 1 Comments (43 Responses)
Question 2 (37 Responses)
Question 2 Comments (43 Responses)
Question 3 (32 Responses)
Question 3 Comments (43 Responses)
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Question 4 Comments (43 Responses)
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Question 5 Comments (43 Responses)
Question 6 (40 Responses)
Question 6 Comments (43 Responses)
Question 7 (36 Responses)
Question 7 Comments (43 Responses)
Question 8 (37 Responses)
Question 8 Comments (43 Responses)
Question 9 (33 Responses)
Question 9 Comments (43 Responses)
Question 10 (0 Responses)
Question 10 Comments (43 Responses)

Southwest Power Pool Regional Entity
Emily Pennel
Yes
Yes
Yes
Yes
Measures are more specific and measurable than seen in the past. This is a positive improvement.
Yes
Hard to follow the language for the VSL for R1. Suggest using formulas for ease of interpretation or provide an example in the Supporting Documentation.
Yes
Yes
Yes
Need to clarify that 2012 Bias setting will be based on 1% of peak load or generation until approval of BAL-003-1 by FERC establishing the .08% of peak load or generation minimum threshold.
Yes
Bonneville Power Administration
Chris Higgins
Yes

No
Regarding R1, BPA believes that adding additional requirements in R1 by referencing Attachment A does not add clarity. FRO should be a calculation that the BA's can do themselves and included within the standard. Can Form 1 be changed outside of the standard drafting process? BPA doesn't believe that Form 1 should be allowed to be changed outside of the standard drafting process. As drafted, Requirement R1 requires Balancing Authorities or Reserve Sharing Groups (RSGs) to achieve an annual Frequency Response Measure (FRM) that is equal to or more negative than its Frequency Response Obligation (FRO). As RSGs exist today, FRM performance by an RSG is not contemplated in the definition of FRM and appears to apply more towards 'secondary response'. BPA recommends clarifying this concept and possibly including an example in the background document to help explain how this would work. Regarding R2, BPA believes each BA should be able to calculate its own frequency bias setting without ERO validation. The standard can require the BA to use Form 1, if the BA doesn't use Form 1 correctly, then the BA would be in violation of the standard. BPA believes that R3 should include a minimal amount of time (suggesting a couple of hours per year) to allow for testing other modes. Requirement R3 requires each Balancing Authority not receiving Overlap Regulation Service to operate its AGC in Tie Line Bias mode… unless such operation would have an Adverse Reliability Impact on the Balancing Authority's Area. There may be occasions in which an entity needs to perform testing or other instances where it is necessary or desirable to operate in a mode other than Tie Line Bias that does not qualify as an Adverse Reliability Impact, but never the less is necessary or desired. BPA recommends including language that would permit operation other than Tie Line Bias mode provided the Reliability Coordinator was notified. BPA seeks clarification from the drafting team as to whether or not there will be any conflicts between proposed Requirement R3 and the requirements of FERC-approved regional reliability standard BAL-004-WECC-1 – Automatic Time Error Correction. BPA agrees with the concept of R4, however, BPA again disagrees with the ERO validation of the frequency bias setting. BPA believes that reducing frequency bias obligation is detrimental to reliability. It seems that lowering the Minimum Frequency Bias Setting from 1% to .8% will result in a lower response, which in turn will lower the natural frequency response. BPA believes that over time, it would seem that this pattern would lead to poorer response. BPA believes that R5 should read "greater than or equal to one of the following" not " at least equal to". The requirement should be a part of Form 1 or included in R2. For variable bias, the minimum percentage should be based on the forecasted month peak.
Yes
No
BPA believes that historian data should be able to be used for evidence.
No
BPA believes that R1 needs to be more clear and concise as to what is being conveyed in the requirement. It is difficult to understand. The proposed VSLs for Requirement R1 treats a BA that did not meet the FRO requirement differently depending on whether or not the Interconnection met the FRO requirement. The obligation of the BA to meet its allocated FRO should be consistent regardless of what the other entities within the interconnection are doing. Suggest removing the interconnection performance from the VSLs and developing four increasing levels of BA failure to meet its FRO. BPA believes that conforming changes to the VSLs would need to be made for any changes to the Requirements as suggested in the comments to the standard.
No
BPA believes that Attachment A adds additional requirements to the standard. Confusion exists between Attachment A and the Background Document. Attachment A states peak load allocation is based on "Projected" Peak Loads and Generation, but the Background Document states it will use "historical" Peak Load and Generation. 3a: it may take longer than 8 seconds in some disturbances. This should be 10 seconds. .05 Hz Delta F is not low enough for the Western Interconnection, it should be .075Hz to ensure there is measurable frequency response for the interconnection. Also, under frequency should be set at 59.95 Hz. BPA does not believe there is a reliability need to include over frequency events. 3b: It is unclear if the 18 seconds is setting the B point. If this is the B point, BPA believes it should be changed to 25 seconds for the Western Interconnection. 4. Please define relatively steady and near 60 Hz. 6: For the Western Interconnection, BPA believes this needs to be 10 minutes at the top of the hour. As mid hour scheduling becomes more prevalent, the ramping at

the bottom of the hour will have to be taken into account. FRO for the interconnection: Starting frequency should be the FTL limit. With RBC in place, the frequency is seldom at 60 Hz. BPA understands the theory behind setting the base obligation to the values listed in table 2. BPA would like to know if there were any studies performed to validate setting the FRO for the interconnection to such a low level? BA FRO and frequency bias setting: BPA does not agree with ERO assigning a Frequency Bias setting to each BA. This calculation is indicated as the initial FRO allocation, what is the process for changing it? BPA believes this should go through the standard drafting process for any changes. The calculation should use Peak online capacity, not the installed capacity. This would lead to the denominator being 2 X Peak projected load for the interconnection. BPA has approximately 35,000 MW of installed generation, and has never seen the actual coincidental generation go over 21,000 MW. Again, BPA doesn't believe the ERO should be validating the frequency bias setting. It is unclear to BPA how variable bias is being addressed in the standard.
No
BPA understands the concept and we disagree with it. As the ERO continues to lower the required minimum frequency bias setting for an interconnection, the BA's that have frequency response higher than the 1% will have a higher percentage of the frequency response of the interconnection. Also, this standard is primarily measuring AGC response, not natural frequency response; therefore not lowering the limit is appropriate.
No
BPA believes the form is not easily understood and is overly complicated for what it is trying to accomplish. BPA believes the form might work for an internal evaluation, just not for an external audit. Compliance is based on this form. BPA believes the standard needs to be simplified and possibly returned to a data gathering standard.
BPA believes that an entity is not measuring frequency response from 20 – 52 seconds; rather, that the entity is measuring AGC response which is based on the frequency bias term. This leads to a circular argument, because that entity would be using frequency bias setting in AGC to calculate frequency bias setting for the next year. Also, because an entity is measuring AGC response and net interchange and not taking pre-disturbance ACE into account, a BA frequency response may not be reflected in the spreadsheet. Example: If the BA has a positive ACE of 300 MW and the frequency component of ACE during an event is 200MW. Immediately following the disturbance, natural frequency response will drive net interchange up by 200MW. During the time frame being measured (20-52sec), AGC response will drive the on control generation down by the original 300 MW ACE, which will look like the BA had an opposite response at the interconnections in the amount of 100MW. Form 1: It is unclear in Form 1 how variable bias BA's would implement this standard. There is a note identifying a tab to use, but it is unclear if that is the only requirement for variable bias BA's. In the comment responses to BPA, it was indicated that "the SDT will provide additional and sufficient direction related to variable bias after review of this issue during the field trial." BPA finds this response unacceptable and believes that it needs to be addressed in the standard prior to approval. BPA believes the standard should be easy to understand and implement and should not rely on the judgment of the ERO. BPA believes this standard needs to be simplified. BPA believes this standard is unclear as to if there is an upper limit to the amount of frequency response expected of the Balancing Authorities under this standard. Except for Table 2 in Attachment A, there is no discussion of an amount of Frequency Response expected on a total basis. Balancing Authorities need to know for how many tenths of a hertz they are to respond so they can determine how to plan to meet this requirement. The documents do not appear to provide any boundary on the maximum amount of Frequency Response that a BA will provide, i.e. it is not clear what will happen if an event occurs in the Eastern Interconnection that causes the frequency to drop to less than 59.6 Hz or in the Western Interconnection that causes the frequency to drop to less than 59.5 Hz, or if that event is excluded from the list used to calculate the Balancing Authorities' response or is it included with an expectation that it counts the same as any other event. Without a clear statement of what is expected, including whether there is a limit on that expectation or not, it is unclear what is expected of the Balancing Authorities. Lastly, BPA asks, why are there no requirements on governor installation, settings, and operation for a frequency response standard?
Howard F. Illian
Energy Mark, Inc.

Yes
No
Comment 1: The timing requirements for implementing the Frequency Bias Setting are not specified for BAs participating in Overlap Regulation Service. The requirements indicate the value that should be used for the Frequency Bias Setting, but they do not indicate when those settings should be implemented. Comment 2: The term "Tie Line Bias mode" in Requirement R3 is not sufficiently defined to make this requirement enforceable. Any operating mode labeled as "Tie Line Bias mode" on an EMS that uses interchange scheduled and frequency error as inputs will meet the standard requirement as stated. This loop-hole exists because the NERC definition of "Tie Line Bias" fails to define the term in enough detail to actually limit AGC operation to the specified mode of operation. One way to improve this requirement would be to redefine Tie Line Bias in the NERC Glossary as a mode that uses the NERC ACE Equation as defined in BAL-001 as the basis for AGC action when the EMS is in Tie Line Bias mode. Comment 3: The standard is silent on how a BA receiving Overlap Regulation Service should set its Frequency Bias Setting. Unless this is explicitly stated, it will be up to the auditors to determine the value of the Frequency Bias Setting for BAs receiving Overlap Regulation Service. Comment 4: In general, the requirements indicate what the responsible BAs should do and when. The requirements do not indicate what the BAs that are not responsible should do and when, ie. how they are relieved from responsibility. This may create problems when the auditors are required to interpret the standards for BAs that have appropriately shifted responsibilites to others.
No
Comment 5: See comments in the non-binding poll.
Yes
Yes
No
Comment 6: "If the ERO cannot identify in a given evaluation period 25 frequency excursion events satisfying the limits specified in criteria 3 below, then similar acceptable events from the previous evaluation period also satisfying listed criteria will be included with the data set by the ERO for determining FRS compliance." I believe that the better alternative in this case would be to use the lesser number of events. This is partly based on the consideration that if there are fewer events, the risk to the interconnection for that year was less that expected, and as a result, evaluation of fewer events will not compromise interconnection reliability. If fewer than 25 events are available in any year, the selection criteria should be adjusted to select more events. Comment 7: There are a number of problems with the use of "median" Frequency Response of the measured events. These problems make a choice other than median preferable. The following comments list some of those problems. Comment 8: The current standard uses average Frequency Response of selected events. This makes the current standard incompatible with the use of median. Comment 9: If a BA reconfigures during a measurement year, that reconfiguration will create a bi-modal distribution of the Frequency Response events. Median is incapable of representing a bi-modal distribution. The use of median will result in a standard that is incapable of measuring compliance effectively for an BA that is reconfigured during a measurement year (Dec 1 thru Nov 30). Comment 10: Any attempt to purchase additional Frequency Response from another BA for a portion of a measurement year will also cause a bi-modal distribution making the purchase of Frequency Response only effective for entire measurement years. Comment 11: Median is a non-linear measurement method. Because it is a non-linear measurement method, there is no valid way to manage partial year measurements. Comment 12: I will offer an alternative to median to the SDT before the end of the development of responses to these comments. Comment 13: The Minimum Frequency Bias Setting and the Frequency Response Obligation are both based on a method that assigns responsibility based on a Peak Load / Peak Generation share of the interconnection. However, the method used to set the Minimum Frequency Bias Setting is different than the method used to determine the Frequency Response Obligation. Using these two different methods could result in the Minimum Frequency Bias Setting being less that the FRO for a BA. The best way to correct this problem is to use that same allocation methodology for determining the FRO and the Minimum Frequency Bias Setting. This can be easily accomplished by modifying R5 to use the

FRO allocation method to determine the Minimum Frequency Bias Setting. This calculation would divide the numerator from the FRO allocation equation, divide it by two and multiply it by the percentage specified in Attachment B. In fact, the current FRS Form 1 uses this equation with projected rather than historic data. The best alternative would be to modify the R5 in the standard to match the FRO allocation method and modify FRS Form 1 to use historic data instead of projected data. This would result in only one set of Peak Load and Peak Generation data throughout the standard, rather than three different sets of data as currently written. When multiple sets of the same or similar data are used within a single standard, it only creates confusion and errors in the result.
No
Comment 14: Some of the information in this document concerning the Frequency Bias Setting for BAs participating in Overlap Regulation should be moved to the Supporting Document. This change would help in addressing Comments 3 & 4 under Question 2.
Yes
Comment 15: This Yes answer assumes that the SDT addresses Comment 13 under Question 6 in these comments.
Yes
Comment 16: In the Consideration of Comments document, the SDT stated that the regression calculation in FRS Form 1 had been corrected. The regression calculation is still incorrect. Comment 17: Attachment A contains the following statement; "**In the Base Obligation measure for Texas, 1150 MW (Load Resources triggered by Under Frequency Relays at 59.70 Hz) was reduced from its Contingency Protection Criteria level of 2750 MW to get 229 MW/0.1 Hz. This was reduced to accurately account for designed response from Load Resources within 30 cycles." This load triggered by Under Frequency Relays is a unidirectional response. It responds as frequency drops but does not provide the alternative response as frequency recovers. The result is a continuous frequency response that may be insufficient for increasing frequency events. Additionally, it is only available once even for oscillatory frequency events. This type of response is very useful to supplement the continuous, bi-directional response provided by governors, load and other resources, but its overuse can lead to reliability issues when it is relied upon too much. This standard fails to put any limit on the use of this type of unidirectional, single use resource for meeting the Frequency Response requirements in this standard. Since this kind of Frequency Response is significantly less expensive than continuous, bidirectional response, its inclusion without limitations creates a significant reliability loop hole in this standard. Although, it is unlikely that this problem can be corrected within the current standard development timeline, NERC should initiate investigations that will result in the setting of appropriate limits and valuation of the use of these types of resources before there is significant penetration to comply with this standard. Illustrating this problem is easily done by evaluating an interconnection with 100% of its Frequency Response provided by unidirectional, step response resources. An interconnection configured in this manner in unstable and cannot survive even a small disturbance. Failure to close this loophole quickly could compromise interconnection reliability. Comment 18: The problem described in Comment 17 exists partially because the FRR SDT has failed to provide a comprehensive definition of Frequency Response as part of this standard. Without a good definition, the default definition becomes "any response that improves the measurement method" as implemented. As with the previous comment, NERC should address this weakness in a timely manner. Otherwise, it may face the undesirable task of disallowing response that improves the measure or modifying the measure to prevent inappropriate abuse. For example, a step load response that occurs 15 seconds after a frequency event will improve the Frequency Response as measured by this standard, but will not contribute to limiting the Arrested Frequency Response and will have little positive affect on reliability.
Don McInnis
Florida Power & Light Company
Yes
Yes
No

Could not find the Risk Severity Levels in the documents.
No
What is meant by documented formulae for M5? Is a one time snapshoot of the AGC formual sufficien? The concept is ok but this needs clarification of proof.
No
For R1 the low and high level descriptions appear to be identical and the high level is less than the medium risk level. For R3 there should be low, medium, and high levels. One BA not operating to TLB does not jepordize the Interconnection. Additionally, computer failures, database loads etc may require some period where TLB is not in service. Suggestion would be Lower VSL operation off of TLB for more than 5 but < 8 continuous hours or accumlative during the year of more than 8 < 16 hours. Medium VSL would be operation off of TLB for more than 8 but <16 continuous hours or accumlative during the year of more than 16 <24 hours. High VSL would be operation off of TLB for more than 16 <24 continuous hours or accumlative during the year of more than 36 <48 hours. Severe VLS would be >24 continuous hours off of TLB or accumlative of > 48.
No
In the table on page2 the asterick references a statement that the 59.7Hz used in Florida is a special protection scheme. This is incorrect. The special protection scheme setting was 59.82Hz and was done away with in 2005 or earlier. The 59.7Hz setting used within the FRCC is based on FRCC TWG studies that require this level of setting to protect the state in the event of a separation and to protect nuclear equipment. FPL supports the use of the C(N-2) critiera. Additionally, the reference to the FERC714 report that is currently in the background data should be made part of attachment A not separated. FPL fully agrees with Table 1 The formula used to derive the FRO is inconsistant with the definition used for requirement R5. R5 states that the load is " within the BA's metered boundary". The load used in the formulae is taken from FERC714. The yearly peak demand used in R5 should be the peak monthly load from June, July or August as reported on FERC714 to be compatible with the FRO formula.
Yes
No
There is no technical justification provided either in the attachment or background data for the initial starting value of 0.8%. This is acceptable but is arbitary. Additionally, the last sentense on page 1 of Attachment B should be changed to read " the ERO must reduce (in absolute value) the minimum Frequency Bias Settings for BA's within that Interconnection, by 0.1 percentage point from its previous annual value, to better match the Frequency Bias Setting to the natural Frequency Response or provide technical justification for not implementing the reduction
Yes
This standard is an excellent start on a very difficult topic and the technical explainations are very sound. Requirement R1 needs to be modificed somewhat as it currently implies that if a BA is a member of a RSG the frequency response obligation automatically assumed to be a RSG obligation. The RSG role may be strictly for reserves with the members of the BA meeting their own FRO. Perhaps a footnote stating that the FRO and reserve obligations can be separated out.
Carlos J. Macias
FPL
Yes
No
3. – How many seconds of observation for “Delta F”? Does “Point C” in a. refer to “Figure 1 – Classic Frequency Excursion and Recovery” from NERC’s Survey Instructions document dated September 1,

2010? If so it should be included in this document along with the added 8 and 18 second time lines being shown. What is a “narrow range” in item b.? 4. – Better define “relatively steady” (i.e. within a specific range and state it?) Also, “near 60.000 Hz” is not precise enough (i.e. if the event begins below 60.000 Hz, what range or time error correction is to be considered acceptable?) Is the “A” value also part of the figure cited in 3? 5. - Is the “B” value also part of the figure cited in 3? 6. – Change “should be excluded” to “will be excluded”. 7. – Better explain “the cleanest 2 or 3 frequency excursion events” or remove the word “cleanest”. Page 2 paragraph 5: Provide specific dates for the “quarterly postings” and where these will be posted (i.e. Internet address or other). Clarify the December 15 ERO annual post date with the dates stated for same posting on Page 3 paragraph 5 and the BA’s January 10 deadline. The BA posts 30 days from which date? This is confusing. Page 2 Table 2: What of starting event frequencies that are < 60 Hz? Why is the “Highest UFLS” 59.6 when the Florida setting for its load is 59.7? Page 3 FRO equation: Page 4 of the “Frequency Response Standard Background Document, October 2011” also shows this equation but uses different terms. Make the same on both documents. In the Background Document each component of the numerator is explained and reference is made to FERC Form 714 to obtain these values. There is no reference to this form for the denominator values. All of this needs to be made clear with reference to FERC Form 714 on Attachment A.

Yes

Yes

Last paragraph: As stated, would that make the Minimum Frequency Bias Setting 0.7% of peak load or generation? A numerical example shown would help clarify this paragraph.

No

FRS Form 2 – Two-second Sample Data Instructions tab/worksheet: What is referred to as or meant by the ‘master event list’? 4. – Regarding 2 second sample rate for 25 minutes starting 2 minutes before event begins and 15 minutes after it begins, does this add up to 25 minutes or are additional minutes being required for collection? Also, FPL can report frequency at this rate, but can only report load in MW every four seconds. Move to 4 second sample rate. 6-8. – Possible to add button to auto-populate cells C8 and C11 in ‘Entry Data’ tab from the new column C and cell identifying the desired frequency change time and simplify these steps? 10. – Clarify where the “Copy” button is. Is it the one in the ‘Data’ tab or worksheet? Entry Data tab/worksheet: Step 6 should also be or be moved to the “Instructions” worksheet. Are the values in column C in the “Data” worksheet labeled “Total Lost Generation” the same as those in column AQ in the “Evaluation” worksheet? If so, why are they not both labeled “Net Actual Interchange”? What is the definition of “Non Conforming Load” in column E?

FRS Form 1 – Eastern Interconnection Instructions tab/worksheet: Step 4 – Send to whom and to what address at NERC?

Mauricio Guardado

Los Angeles Department of Water and Power

No

LADWP recommends the following change to the definition of Frequency Bias Setting (replace the word "discourage" with the word "prevent"). LADWP believes that this change increases the clarity of the definition: Original A number, either fixed or variable, usually expressed in MW/0.1 Hz, included in a Balancing Authority’s Area Control Error equation to account for the Balancing Authority’s Frequency Response contribution to the Interconnection, and discourage response withdrawal through secondary control systems. Proposed Change A number, either fixed or variable, usually expressed in MW/0.1 Hz, included in a Balancing Authority’s Area Control Error equation to account for the Balancing Authority’s Frequency Response contribution to the Interconnection, and prevent response withdrawal through secondary control systems

No

LADWP has a concern with Requirement 3. The requirement should provide allowance for legitimate circumstances when an entity cannot run on Tie Line Bias mode and not have an Adverse Reliability Impact on the Balancing Authority’s Area. An entity should not be penalized when these legitimate circumstances occur. LADWP believes that the Frequency Response Standard Background Document, on Page 8, lists examples of legitimate circumstances: - Telemetry problems that lead the operator to believe ACE is significantly in error. - The frequency input to AGC is not reflective of the BA’s true

frequency (such as if the control center were operating a local generator and disconnected from the Interconnection). - During restoration (where one BA might be controlling frequency while another to which it is connected is managing interchange between them). - For training purposes. - Many AGC systems will automatically switch to an alternate mode if the EMS determines Tie Line Bias control could lead to problems. LADWP believes that the language in Requirement 4 needs to be clarified and recommends the following change: - R4. Each Balancing Authority that is performing Overlap Regulation Service shall modify its Frequency Bias Setting in its ACE calculation to be equivalent to either (i) the sum of the Frequency Bias Settings of the participating Balancing Authorities as validated by the ERO, or (ii) the Frequency Bias Setting as calculated 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] LADWP believes the language in Requirement 5 needs to be modified to be consistent with that of the second paragraph of Attachment B. LADWP recommends the addition of “natural frequency response” as a third bullet item to Requirement 5. The revised requirement would read: - 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: [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. • The natural frequency response
Yes
LADWP agrees with the following VRFs: - R1 - Medium - R2 - Medium - R3 - Medium - R4 - Medium - R5 - Medium
No
LADWP recommends that the Measures for Requirement 3 and Requirement 5 reflect their comments to Question 2.
No
LADWP recommends that either the VSL for Requirement 3 reflects its comments to Question 2, or that these comments be addressed as an exception in the Measure for Requirement 3.
No
LADWP considers the increase in number of events to analyze (now 25) to be excessive. Previous years analyses typically involved 4-6 events; a permanent five-fold increase is not justified. LADWP suggests reducing the baseline number of events from 25 to 12 per year. Analysis of a larger number of events could be requested on a year-by-year basis if conditions warrant, but should not be mandatory for all regions in all years.
Yes
LADWP notes that the document “BAL-003-1 Background Document” seems to be reasonable.
Yes
LADWP notes that Attachment B seems to be reasonable
No
LADWP notes that Form 2 is not compatible with prior versions of Excel—it won’t even open in Excel 2003 (which is still widely used)—and requests that all spreadsheets and calculation tools developed under 2007-12 be revised to support common software of the past 10 years.
LADWP supports project 2007-12’s general approach to frequency response, and is prepared to support the ballot once several problematic details are corrected. LADWP notes that the time allowed to analyze the final “official” set of 25 events for each year, from Dec 15 to Jan 10, is relatively short and coincides with the holiday vacation season. Could this time either be extended by 2-4 weeks or shifted to another part of the year (in addition to reducing the number of events to be analyzed)? LADWP would like to see addressed in the Standard how the case is to be addressed where a BA simply has no frequency response information to provide, as could happen for a small 1-2 generator BA which has its generators out of service for an extended period for maintenance or upgrades. Assuming the BA purchases frequency response services from another entity during this period, is the BA out of compliance with the proposed Standard simply because it has no data report? And how is its next-year obligation to be computed? These issues should be addressed in the Measures or Additional

Compliance information. If these are issues for “lawyers” as the Standards Drafting Team indicated during the November 14, 2011, webinar then the team should engage a NERC lawyer to resolve them prior to releasing the Standard for ballot.
Thomas Washburn
FMPP
Yes
No
• R1. Each Balancing Authority (BA) or Reserve Sharing Group (RSG) shall achieve an annual Frequency Response Measure (FRM) (as detailed in Attachment A and calculated 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 BA or RSG to maintain an adequate level of Frequency Response in the Interconnection. [Risk Factor: Medium][Time Horizon: Operations Assessment] The BA does not have control over the frequency responsive generation. There needs to be a requirement that the GOP shall set frequency response for the generators as directed by the BA. • R5. In order to ensure adequate control response, each Balancing Authority shall use a monthly average Frequency Bias Setting whose absolute value is {greater than or (<= add these words)} {at least (<= delete these words)} 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.
Yes
Yes
Yes
No
• Item 2 should be changed as follows: The ERO will identify at least 25 frequency excursion events in each Interconnection for calculating the Frequency Bias Setting and the FRM. If the ERO cannot identify in a given evaluation period 25 frequency excursion events satisfying the limits specified in criteria 3 below, then similar acceptable events from the previous evaluation period also satisfying listed criteria will be included with the data set by the ERO for determining FRS compliance. (as written this item could cause double jeopardy for event from the previous period) • Under FRO for the Interconnection the first sentence should be changed as follows: “The ERO {Each Interconnection (delete these words)} will establish target contingency protection criteria for each Interconnection.” (each Interconnection is not a governing entity) • The footnote under Table 2 of Attachment A should be changed as follows: The Eastern Interconnection set point listed is a compromise value for the highest UFLS step setting of 59.5Hz used in the east and the {special protection scheme’s (delete these words)} highest UFLS step setting of 59.7Hz used in Florida. It is extremely unlikely that an event elsewhere in the Eastern Interconnection would cause the Florida UFLS {special protection scheme (delete these words)} to “false trip”. (this is not a special protection system; it is just an UFLS)
Yes
Yes
Yes
Alice Ireland

Xcel Energy
Yes
No
R1- It is not clear what is intended by "Reserve Sharing Group" in this context. As RSGs exist today, FRM performance by an RSG is not contemplated in the definition of FRM and appears to apply more towards 'secondary response'. Recommend clarifiying this concept and possibly include an example in the background document to help explain how this would work. R3 - recommend modifying the language to permit AGC out of TLB mode if the RC is notified; also remove the "to ensure coordinated control" as this is not essential for the requirement. Our reasoning behind the suggested change to notification of the RC is that there are occassions where an entity would need to perform testing, etc and it could be argued that testing would not be sufficient justification for meeting the Adverse Reliability Impact definition. Here is proposed revised language: Each Balancing Authority not receiving Overlap Regulation Service shall operate its Automatic Generation Control (AGC) in Tie Line Bias mode, unless the Balancing Authority's Reliability Coordinator has been informed and the duration is [insert time constraint language here].
No
Based on our suggested changes to R3 in response to Question 2, the drafting team should modify M3 to be consistent with the proposed language.
Yes
No
Confusion exists around the “peak load” in that the Attachment A states the allocation is based on Projected Peak Loads and Generation but the Background Document states it will use a historical Peak and Generation to make the allocation. Also, for the BA installed capacity, where does that value come from and does NERC obtain that from FERC form data or does the BA provide that information somewhere specific to this effort? Additionally, there appears to be a difference in how FRO is calculated in Attachment A and what is described in the Background Document. These differences should be reconciled such that both documents address the same approach. If installed capacity is used in the equation, how are variable/intermittent resources (e.g. wind, solar) accounted for? At full capacity?
No
Same comment here as the one in question 6.
No
There could be some confusion caused by the Attachment B due to the use of the word “initially” when the reference is made to the current standard. The drafting team should change the word “initially” to “currently” or strike it to avoid the potential confusion.
Yes
It would be useful if the drafting team could develop a completed form as an example to help entities better understand the methodologies used in the form.
It is not clear if there is an upper limit to the amount of frequency response expected of the Balancing Authorities under this standard. Except for Table 2 in Attachment A, there is no discussion of an amount of FR expected on a total basis. Balancing Authorities need to know for how many tenths of a hertz they are to respond so they can determine how to plan to meet this requirement. The documents do not appear to provide any boundary on the maximum amount of FR that a BA will provide, i.e. it is not clear what will happen if an event occurs in the Eastern Interconnection that causes the frequency to drop to less than 59.6 Hz (e.g. what if freq dips to 59.0? Is the BA expected to provide a limitless amount of frequency response?). Also, is that event excluded from the list used to calculate the Balancing Authorities’ response or is it included with an expectation that it counts the same as any other event. Without a clear statement of what is expected, including whether there is a limit on that expectation or not, the Balancing Authorities can not know what is expected of them and therefore can not plan appropriately.
Kathleen Goodman

ISO New England Inc
No
The FRM definition should not refer to FORM 1. Also, we offer the following alternative wording for frequency bias setting; “A number, either fixed or variable, usually expressed in MW/0.1 Hz, included in a Balancing Authority’s Area Control Error equation to approximate the frequency response provided by the assets within the respective Balancing Authority’s area.”
No
We do not agree with placing a requirement on Balancing Authorities, as generators are the main supplier of “discretionary” frequency response. Also, the requirement refers to an attached form, which is not part of the standard and therefore not enforceable.
Yes
No
The sampling interval needs to be tuned on a per Interconnection basis to support HQTE’s characteristics
No
The violation severity levels for R1 seem to be reasonable. However, the technical writing needs to be enhanced for clarity
No
We suggest the SDT to first determine if the materials in the revised Attachment A & B are “Guideline” or Technical Background”, or are they “requirements”. If it is the former, then Requirement R1 should not mention Attachment A at all. If it is the latter, then the as-written Attachment A is a mix bag as it on the one hand describes the ERO’s process for supporting the Frequency Response Standard (FRS), in other words, the method and criteria it uses to calculate the frequency bias settings and the FRM, and on the other hand the BA’s obligations to support this process. We strongly disagree that the latter requirements be imbedded in an attachment, especially one that is supposed to provide the technical background and guideline for another entity which, by the way, is not held responsible for complying with the proposed method. An appendix is not regarded as a mandatory requirement. Additionally, BAL-003-1- Attachment A 1. Criterion 5 needs to be re-written for clarity. 2. Criterion 7 refers to the “cleanest events”. Perhaps a statement of what constitutes a “clean event” is needed to avoid possible controversy in the future. 3. The use of 59.6 Hz as the highest UFLS setting seems flawed. It should either be 59.7 Hz as a deliberate choice to protect Florida interests, or, it should be 59.5 Hz without concern for Florida’s unique settings. 4. In the last 2 sentences at the end of the section on Frequency Response Obligation, it refers to an Interconnection being able to offer “alternate FRO protection criteria”. It seems that the Interconnection should have been an integral part of establishing its obligation. Also, it states that the “ERO will confirm” the “alternate FRO protection criteria”. Does this mean the ERO unconditionally approves it, or evaluates with a right of rejection? Please clarify. 5. In the formula for determining the Balancing Authority’s FRO allocation, installed capacity is used. Does the industry have a clear and consistent definition for installed capacity? Also, with greater wind energy development, the delivered capacity over longer time horizons will be substantially less than nameplate machine ratings. Also, the background document refers to the use of peak generation instead of installed capacity. Which shall be used? Please clarify. 6. Very recent studies have shown that the 18-52 second sampling interval does not work well for the Quebec Interconnection, in part due to the excellent and high level of response found in that Interconnection. The standard needs to be modified such that the sampling interval is that which works the best for each individual interconnection. 7. Attachment A needs to define the point A sampling interval.
No
See first comment in 6 above. Also, Frequency Response Standard Background Document – 1. Cite Attachment B in addition to Attachment A in the discussion of requirement 1. 2. The Balancing Authority allocation method specified in this document does not agree with that in Attachment A. 3. Drop the speculation on page 4 that most Balancing Authorities will be compliant. While it may be a commonly held belief by many that there is adequate frequency response right now, that assessment should be made after a targeted level of reliability has been defined and approved. The same comment applies on page 12. 4. On page 6, drop the inappropriate recommendation of getting

frequency response through supplemental regulation. It is inappropriate to try to substitute a “minute plus” product that is deployed centrally by the Balancing Authority for a “sub-minute” product that is deployed automatically without any Balancing Authority action. When a pseudo-tie is used, changes in the ACE values due to supplemental regulation are unrelated to and not coordinated with the need to deploy frequency response. Not only should this approach not be offered as an alternative, but the FRSDT should actively conduct research to determine if supplemental regulation via a pseudo-tie should be deliberately REMOVED from any actual net interchange calculation that may include it! This comment also applies to the mentioning of supplemental regulation on page 11 as well. 5. On page 7, the reference to a 24 hour window on each side of the frequency bias setting implementation date is inconsistent with the wording of the requirement. The requirement says that any time within the designated date is acceptable. 6. On page 8, the inclusion of “for training purposes” as a reason to not operate in tie line bias control should be dropped. This sort of training can be done in a training simulator. Alternatively, if it is determined that it should be supported, then the requirement needs to be reworded to allow it explicitly. 7. On page 14, the sentence: “This approach would only provide feedback for performance during that specific event and would not provide insight into the depth of response or other limitations” is difficult to understand. The paragraph would read better by simply dropping it.
No
We suggest the SDT to first determine if the materials in the revised Attachment A & B are “Guideline” or Technical Background”, or are they “requirements”. If it is the former, then Requirement R1 should not mention Attachment A at all. If it is the latter, then the as-written Attachment A is a mix bag as it on the one hand describes the ERO’s process for supporting the Frequency Response Standard (FRS), in other words, the method and criteria it uses to calculate the frequency bias settings and the FRM, and on the other hand the BA’s obligations to support this process. We strongly disagree that the latter requirements be imbedded in an attachment, especially one that is supposed to provide the technical background and guideline for another entity which, by the way, is not held responsible for complying with the proposed method. An appendix is not regarded as a mandatory requirement.
Yes
ISO New England will not vote to approve the standard because it fails to place requirements on generators to provide frequency response. There are four substantive problems: • Using 59.6 Hz as an Eastern Interconnection UFLS instead of an actual value of either 59.5 Hz or 59.7 Hz • Using installed capacity in determining the Frequency Response Obligation • The sampling interval needs to be tuned on a per Interconnection basis to support HQTE’s characteristics • Do not advocate the use of supplemental regulation as a method of procuring frequency response Additionally, the SDT must decide on what the purpose of this standard is. If it is to respond to Order 693 then the standard misses the point of defining how often to run Frequency Response Surveys; it does not crisply define the “Interconnection” obligations. If the SDT does want to focus on performance then the issue of who is the default provider must be addressed. As the IRC has noted previously, all BAs do not own the service providers. To create standards that apply to entities that are dependent on other function entities to comply with a standard requirement is of great concern.
Imperial Irrigation District
Jesus Sammy Alcaraz
Yes
Yes
Yes
Yes
Yes

Yes
Yes
Yes
Yes
No Additonal Comments
Salt River Project
Cindy Oder
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
John Tolo
Tucson Electric Power
Yes
No
R1: TEP feels that the FRO should be able to be calculated by the BA and that Form 1 changes should be treated via the Standard drafting process. R2: TEP feels that use Form 1 should be required by the Standard. Further, BAs should calculate its own frequency bias setting without ERO intervention. R3: Operating outside Tie Line Bias mode should be allowed during a year to allow for the testing of other modes. R4: Agree with the concept, but without ERO intervention. R5: Should read "greater than or equal to".
Yes
No
It should be clear that historical data may be used to show compliance.
No
VSL's could be clearer and simpler. Allowance for the testing of other AGC modes should be considered.
No

Attachment A creates additional requirements to the BAL-003-1 Standard. The arrested value of frequency observed within 8 seconds may not be long enough in some instances. The delta F in the West should be greater than 0.05 Hz to ensure a measurable frequency response. West Under Frequency should be set at 59.95 Hz. There is no reliability concern for Over Frequency. Does 18 seconds after the start of the disturbance set point B? Pre-disturbance frequency should be relatively steady and near 60.000 Hz is vague. TEP feels that the ERO should not need to validate a BAs frequency bias setting.

Yes

No

Reducing a BAs frequency bias setting may have an adverse impact on recovering from a frequency event once you get past the first 8-10 seconds. A larger bias will allow for actual and sustained AGC generator responses. Industry focus should be on generator governor response within the first 8-10 seconds.

No

TEP feels that Form 2 is a useful tool for internal BA use and should not be used for compliance purposes.

The BAL-003-1 Standard should be simplified and should not rely on the judgement of the ERO. Thanks to the drafting team for their efforts and for taking on this important aspect of Interconnection reliability.

Dennis Sismaet

Seattle City Light

No

LADWP and SCL recommend the following change (in red) to the definition of Frequency Bias Setting. LADWP believes that this change increases the clarity of the definition: Original A number, either fixed or variable, usually expressed in MW/0.1 Hz, included in a Balancing Authority's Area Control Error equation to account for the Balancing Authority's Frequency Response contribution to the Interconnection, and discourage response withdrawal through secondary control systems. Proposed Change A number, either fixed or variable, usually expressed in MW/0.1 Hz, included in a Balancing Authority's Area Control Error equation to account for the Balancing Authority's Frequency Response contribution to the Interconnection, and discourage prevent response withdrawal through secondary control systems

No

• LADWP and SCL have a concern with Requirement 3. The requirement should provide allowance for legitimate circumstances when an entity cannot run on Tie Line Bias mode and not have an Adverse Reliability Impact on the Balancing Authority's Area. An entity should not be penalized when these legitimate circumstances occur. LADWP believes that the Frequency Response Standard Background Document, on Page 8, lists examples of legitimate circumstances: - Telemetry problems that lead the operator to believe ACE is significantly in error. - The frequency input to AGC is not reflective of the BA's true frequency (such as if the control center were operating a local generator and disconnected from the Interconnection). - During restoration (where one BA might be controlling frequency while another to which it is connected is managing interchange between them). - For training purposes. - Many AGC systems will automatically switch to an alternate mode if the EMS determines Tie Line Bias control could lead to problems. • LADWP and SCL believe that the language in Requirement 4 needs to be clarified and recommends the following change (in red): R4. Each Balancing Authority that is performing Overlap Regulation Service shall modify its Frequency Bias Setting in its ACE calculation to be equivalent to either (i) the sum of the Frequency Bias Settings of the participating Balancing Authorities as validated by the ERO, or (ii) calculate the Frequency Bias Setting as calculated 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] • LADWP and SCL believes the language in Requirement 5 needs to be modified to be consistent with that of the second paragraph of Attachment B. SCL recommends the addition of "natural frequency response" as a third bullet item to Requirement 5 (in red). The revised requirement would read: 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: [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. • The natural frequency response
Yes
LADWP and SCL agree with the following VRFs: - R1 - Medium - R2 - Medium - R3 - Medium - R4 - Medium - R5 - Medium
No
LADWP and SCL recommend that the Measures for Requirement 3 and Requirement 5 reflect their comments to Question 2.
No
LADWP and SCL recommend that either the VSL for Requirement 3 reflects its comments to Question 2, or that these comments be addressed as an exception in the Measure for Requirement 3.
No
• LADWP and SCL consider the increase in number of events to analyze (now 25) to be excessive. Previous years analyses typically involved 4-6 events; a permanent five-fold increase is not justified. SCL suggests reducing the baseline number of events from 25 to 12 per year. Analysis of a larger number of events could be requested on a year-by-year basis if conditions warrant, but should not be mandatory for all regions in all years.
Yes
• LADWP and SCL note that the document "BAL-003-1 Background Document" seems to be reasonable.
Yes
• LADWP and SCL note that Attachment B seems to be reasonable.
No
• LADWP and SCL note that Form 2 is not compatible with prior versions of Excel—it won't even open in Excel 2003 (which is still widely used)—and requests that all spreadsheets and calculation tools developed under 2007-12 be revised to support common software of the past 10 years.
• LADWP and SCL support project 2007-12's general approach to frequency response, and is prepared to support the ballot once several problematic details are corrected. • LADWP and SCL note that the time allowed to analyze the final "official" set of 25 events for each year, from Dec 15 to Jan 10, is relatively short and coincides with the holiday vacation season. Could this time either be extended by 2-4 weeks or shifted to another part of the year (in addition to reducing the number of events to be analyzed)? • LADWP and SCL would like to see addressed in the Standard how the case is to be addressed where a BA simply has no frequency response information to provide, as could happen for a small 1-2 generator BA which has its generators out of service for an extended period for maintenance or upgrades. Assuming the BA purchases frequency response services from another entity during this period, is the BA out of compliance with the proposed Standard simply because it has no data report? And how is its next-year obligation to be computed? These issues should be addressed in the Measures or Additional Compliance information. If these are issues for "lawyers" as the Standards Drafting Team indicated during the November 14, 2011, webinar then the team should engage a NERC lawyer to resolve them prior to releasing the Standard for ballot. • Finally, SCL points out that the proposed Standard introduces a new obligation on applicable entities to maintain frequency responsive reserves. Although this obligation does not appear to be unreasonable or problematic in general, compliance may prove difficult for some entities and in some localized areas.
Progress Energy
Jim Eckelkamp
No
PGN supports the collective comments of SERC members.We feel that the last phrase of the definition of Frequency Bias Setting is more of an explanation of a function rather than a definition. While the SERC OC Standards Review Group understands the statement, we do not feel it belongs in the definition of the Frequency Bias Setting and a period should be inserted after the word "Interconnection". Should the definition for Frequency Response Measure (FRM) be specific to the BA,

similar to the definition for Frequency Response Obligation (FRO)?
No
PGN supports the collective comments of SERC members.We feel that the utilization of the term, “Reserve Sharing Group”, is not consistent with the definition in the NERC Glossary of Terms, and should be deleted, applicability should be clarified or replaced with a new term, such as “Frequency Response Sharing”. R4 should clarify that a BA performing Overlap Regulation Service should still be required to operate its AGC in “Tie Line Bias” mode
Yes
No
See comments in Question 2 regarding utilization of the term “Reserve Sharing Group”.
No
See comments in Question 2 regarding utilization of the term “Reserve Sharing Group”.
Yes
Yes
No
PGN supports the collective comments of SERC members. We suggest the SDT consider a term other than “Initial’ in the title for Table 1. We suggest “Proposed Frequency Bias Setting” for Table 1
Yes
PGN Supports the collective comments of SERC members. We feel that frequency response is a function of a contingency event and the Purpose Statement should recognize this relationship. We suggest the following Purpose Statement. Purpose: To require sufficient Frequency Response from the Balancing Authority to maintain Interconnection Frequency within predefined bounds by arresting frequency deviations due to a contingency event and supporting frequency until the frequency is restored. To provide consistent methods for measuring Frequency Response and determining the Frequency Bias Setting.
Michael Falvo
Independent Electricity System Operator
No
In our previous comments, we suggested to drop the definitions for the terms FRM and FRO in favor of providing the needed wording in the standard itself to take care of the specific details. The SDT did not adopt our suggestion with the reason that these definitions will be used by other standards in the future. That’s fair enough. However, the FRM definition: “The median of all the Frequency Response observations reported annually on FRS Form 1” is problematic. It references an FRS Form 1 which is not included in the definition itself but is in fact an attachment to a standard. In the current NERC Glossary of Terms, there is no such precedence that a definition must rely on the requirements or details in a standard for completeness. Also, it is very cumbersome that when changes are made to FRS Form 1, the definition must be posted for industry comment and balloting, and vice versa. When other standards begin using the term, there will be cross references between standards. This further complicates the update/maintenance problem without any appreciable value. Once again, we strongly urge the SDT to consider dropping these definitions, and have the details fully specified in the standard body. This will eliminate the cross reference issues. After all, the definition for FRM is a simple sentence and does not provide any clarity or specific details that cannot be addressed by providing the appropriate wording in a requirement. With this cross-reference issue, combined with the issues associated with Attachments A and B (see our comments under Q6, below), we are unable to support this standard at this time.
Yes
Yes

No
M4: This measure does not read quite right. Something seems to be missing in the part that says: "…showing when Overlap Regulation Service is provided including Frequency Bias Setting calculation to demonstrate compliance with Requirement R4." This part might have read something like: "…showing that when it performed Overlap Regulation Service, it modified its Frequency Bias Setting in its ACE calculation or it calculated the Frequency Bias Setting meeting the conditions specified in Requirement R4."
Yes
We do not have any issues with the VSLs, but wonder if the wording for R1 should have been "…Reserve Sharing Group's…". Alternatively, the wording after "interconnection's FRO" could be revised to: "…and the Balancing Authority's or the Reserve Sharing Group's FRM was…"
No
Despite the SDT's good faith effort to convert the previous Attachment A into two separate documents (Attachments A and B), the modified Attachment A is problematic. As many commenters indicated, the previous Attachment A, other than the section providing guidance on event selection, appears to be explanatory, contextual, and instructional in content. These aspects are important, but do not rise up to the level of requirements to drive reliability performance/outcome. Attachment A should include only the event selection process and calculations associated with the requirements, including an explanation of what is necessary if variable Frequency Bias Settings are implemented. If other "requirements" need to be specified, such as the reporting time frame stipulated on page 3 of Attachment A, they should be moved to the standard itself but not imbedded in an attachment. We suggest the SDT to first determine if the materials in the revised Attachment A (and Attachment B) are "Guideline" or "Technical Background", or are they "requirements". If it is the former, then Requirement R1 should not mention Attachment A at all. If it is the latter, then the as-written Attachment A is a mix bag as it on the one hand describes the ERO's process for supporting the Frequency Response Standard (FRS) (in other words, the method and criteria it uses to calculate the frequency bias settings and the FRM), and on the other hand the BA's obligations to support this process. We strongly disagree that the latter requirements be imbedded in an attachment, especially one that is supposed to provide the technical background and guideline for another entity which, by the way, is not held responsible for complying with the proposed method. Further, there are no measures developed for the requirements stipulated/imbedded in Attachment A so how can the Responsible Entity (BA, in this case) be assessed for compliance? We suggest the SDT to move those requirements on the BA to the main standard, and turn Attachment A into an appendix describing the calculation process. An appendix is not regarded as a mandatory requirement. Similar comments apply to Attachment B. Finally, the two Attachments are listed in Section F – Associated Documents. This Section is generally used to list reference documents that are NOT standard requirements. We suggest the SDT review and revise this listing depending on its final determination of the status of the two Attachments (or their revisions, where appropriate).
We do not have an opinion on whether or not the Background Document provides sufficient clarity to the development of the standard. We do, however, suggest that the SDT consider our comments in Q6 above, and move some of the information from Attachments A and B to or combine with the Background Document, to provide all the technical basis and background behind the elements stipulated in the requirements.
No
Please see our comments under Q6. In brief, we do not agree with including a process description type of document as part of the standard requirement.
No
If we are not mistaken, Form 2 is added as the last sheet in the Form 1 spreadsheet file. Apart from that, however, there are other sheets added to the previous Form 1. But this Comment form makes no mention of the changes, nor is there a question on the additional information requested. We have a concern over this omission of attention or oversight. Compared to the previous version, Form 1 has been significantly expanded to include not only additional sheets but much more comprehensive data requirements even on the Data Entry sheet itself. This makes data submission a very time-consuming task but the justification for requiring detailed data entry has not been provided. We question the need for such expansion on data entry requirements. We have yet to see the reason for expanding Form 1 in assisting a BA to provide the data needed to comply with the standard, hence we do not

see how adding a Form 2 can help in that regard. We suggest the SDT to look at the basic need for data submission that would suffice to support the FRS reporting process. Where the SDT deems additional data entry sheets to be necessary, it should provide the rationale for expanding from a 2 sheet form into a multiple sheet form for additional data collection.
The proposed implementation plan conflicts with Ontario regulatory practice respecting the effective date of the standard. It is suggested that this conflict be removed by appending to the implementation plan wording, after “applicable regulatory approval” in Section 1.3 and 1.4 of the draft standard, and in the two bullets in the draft implementation plan, to the following effect: “, or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities.”
Northeast Power Coordinating Council
Guy Zito
No
The FRM definition should not refer to FORM 1. Also, suggest the following wording for frequency bias setting: “A number, either fixed or variable, usually expressed in MW/0.1 Hz, included in a Balancing Authority’s Area Control Error equation to approximate the frequency response provided by the assets within the respective Balancing Authority’s area.”
No
The requirements should not be directed at Balancing Authorities, as generators are the main supplier of “discretionary” frequency response. Requirement R1 refers to an attached form, which is not part of the standard and therefore not enforceable.
Yes
No
The sampling interval needs to be tuned on a per Interconnection basis to support HQTE’s characteristics.
No
The violation severity levels for R1 are reasonable. The technical writing needs to be enhanced for clarity.
No
The SDT has to first determine if the materials in the revised Attachment A & B are “Guideline” or Technical Background”, or are they “requirements”. If it is the former, then Requirement R1 should not mention Attachment A at all. If it is the latter, then the as written Attachment A is confusing as it describes the ERO’s process for supporting the Frequency Response Standard (FRS) (the method and criteria it uses to calculate the frequency bias settings and the FRM), and at the same time the BA’s obligations to support this process. The latter requirements should not be imbedded in an attachment, especially one that is supposed to provide the technical background and guideline for another entity which is not held responsible for complying with the proposed method. An appendix is not regarded as a mandatory requirement. Additionally, regarding BAL-003-1- Attachment A 1. Criterion 5 needs to be re-written for clarity. 2. Criterion 7 refers to “cleanest events”. A statement of what constitutes a “clean event” is needed to avoid possible controversy in the future. 3. The use of 59.6 Hz as the highest UFLS setting is flawed. It should either be 59.7 Hz as a deliberate choice to protect Florida interests, or it should be 59.5 Hz without concern for Florida’s unique settings. 4. In the last 2 sentences at the end of the section on Frequency Response Obligation, it refers to an Interconnection being able to offer “alternate FRO protection criteria”. The Interconnection should have been an integral part of establishing its obligation. It is stated that the “ERO will confirm” the “alternate FRO protection criteria”. Does this mean the ERO unconditionally approves it, or evaluates with a right of rejection? Please clarify. 5. In the formula for determining the Balancing Authority’s FRO allocation, installed capacity is used. Does the industry have a clear and consistent definition for installed capacity? Also, with greater wind energy development, the delivered capacity over longer time horizons will be substantially less than nameplate machine ratings. The background document refers to the use of peak generation instead of installed capacity. Which shall be used? Please clarify. 6. Recent studies have shown that the 18-52 second sampling interval does not work well for the Quebec Interconnection, in part due to the excellent and high level of response found in that Interconnection. The standard needs to be modified such that the sampling interval is that which works the best for each individual interconnection. 7. Attachment A needs to define the point A

sampling interval.
No
Refer to the first comment in Question 6. For the Frequency Response Standard Background Document – 1. Cite Attachment B in addition to Attachment A in the discussion of requirement R1. 2. The Balancing Authority allocation method specified in this document does not agree with that in Attachment A. 3. Drop the speculation on page 4 that most Balancing Authorities will be compliant. While it may be a commonly held belief by many that there is adequate frequency response right now, that assessment should be made after a targeted level of reliability has been defined and approved. The same comment applies on page 12. 4. On page 6, drop the inappropriate recommendation of getting frequency response through supplemental regulation. It is inappropriate to try to substitute a “minute plus” product that is deployed centrally by the Balancing Authority for a “sub-minute” product that is deployed automatically without any Balancing Authority action. When a pseudo-tie is used, changes in the ACE values due to supplemental regulation are unrelated to and not coordinated with the need to deploy frequency response. Not only should this approach not be offered as an alternative, but the FRSDT should actively conduct research to determine if supplemental regulation via a pseudo-tie should be deliberately REMOVED from any actual net interchange calculation that may include it. This comment also applies to the mentioning of supplemental regulation on page 11 as well. 5. On page 7, the reference to a 24 hour window on each side of the frequency bias setting implementation date is inconsistent with the wording of the standard. The standard states that any time within the designated date is acceptable. 6. On page 8, the inclusion of “for training purposes” as a reason to not operate in tie line bias control should be dropped. This training can be done in a training simulator. If it is determined that it should be supported, then the requirement needs to be reworded to allow it explicitly. 7. On page 14, the sentence: “This approach would only provide feedback for performance during that specific event and would not provide insight into the depth of response or other limitations” is difficult to understand. The paragraph would read better by simply deleting the sentence.
No
Refer to the first comment in Question 6.
Yes
This standard as written does not place requirements on generators to provide frequency response. There are four substantive problems: • Using 59.6 Hz as an Eastern Interconnection UFLS instead of an actual value of either 59.5 Hz or 59.7 Hz. • Using installed capacity in determining the Frequency Response Obligation. • The sampling interval needs to be tuned on a per Interconnection basis to support HQTE’s characteristics. • Do not advocate the use of supplemental regulation as a method of procuring frequency response. It must be decided as to what the purpose of this standard is. If it is to respond to Order 693 then the standard misses the target of defining how often to run Frequency Response Surveys; it does not crisply define the “Interconnection” obligations. If performance is the focus, then the issue of who is the default provider must be addressed. All BAs do not own the service providers. To create standards that apply to entities that are dependent on other functional entities to comply with a standard requirement is of great concern. FRS Form 1 is listed as being an Associated Document. Will it be attached to the standard? The acronym FRS is used in the standard. FRS should be spelled out before its acronym is used. If FRS Form 1 will not be an appendix or an attachment to the document, then a link should be provided to it, or instructions given on how to find it.
John Bussman
Associated Electric Cooperative Inc
Yes
The FRO definition incorrectly applies the historically narrow Balancing Authority scope of responsibility, while the FRM definition does not address applicability at all. But the BAL-003-1 Standard itself identifies RSGs (where applicable) and BAs as the Responsible Entities within scope of this standard. For consistency, AECI recommends using “Responsible Entities (e.g. Reserve Sharing Groups - where applicable, and Balancing Authorities)” in both the FRO and FRM definitions. Rationale: This change should help future-proof the definition, should more specific “frequency response” or “spinning reserve” sharing groups later surface within our industry. AECI agrees with the Frequency Bias Setting definition’s inclusion of a bit more functionality than typical. We however recommend replacing “to account for the Balancing Authority’s Frequency Response contribution to

the Interconnection, and discourage response withdrawal through secondary control systems", with "to support their Frequency Response contribution to the Interconnection". Rationale: Readability, and clarity on the "discouraging withdrawal…" phrase, which should reside in the Background document.
Yes
Yes
Yes
Yes
The VSLs appear reasonable for the risk and particularly where they assess higher severity when the BA or RSG Interconnection's performance was sub-standard as well.
Yes
Yes
Yes
This is a very important document, providing bounds and rationale for and future changes, as well as initial settings going into ballot. As such, it is AECI's understanding that, upon going into effect, this BAL-003-1 will utilize these initial settings.
No
AECI believes the SDT could spare our industry both confusion and inconsistency, by specifying that identified Interconnection Disturbances include both Point A and Point B to the hour, minute, and second. While this introduces some risk of Entities over-automating their data-reports, the benefits for Eastern Interconnection respondents would be tremendous. Cautions and disclaimers should be placed on both Form 1 and Form 2, to assure respondents manually inspect their frequency data and pinpoint the specific inflection-point samples.
SDT Webinar responses, this standard still needs to address: 1) anticipated shifts in an Entity's FRO, due to large changes in base generation or load, and 2) likely non-compliance for single-unit generation-only BAs (R5.2?) Please address prior to second ballot.
Rich Salgo
NV Energy
Yes
No
Requirement 1 seems to be the only one that has any applicability to an RSG; however, it is unclear under what circumstances this requirement applies to an RSG. Suggest changing the R1 to be addressed solely to BA's or alternatively, explain under Applicability section 1.2 what "where applicable" means.
Yes
Medium appears to be reasonable and appropriate.
Yes
No
For R1, suggest that the VSL's not be dependent upon the aggregate performance of the BA's within an interconnection.
No
It is not clear whether the calculation of FRO is to utilize projections of BA load as in Att A, or past data reported in FERC Form 1 as per the Background Document.
Yes
This is a good reference; however see response to Question 6 in that there appears to be a

discprepancy between Att A and the Background Document with regard to FRO calculation.
No
In Attachment B, it seems unclear whether the initial FB setting is supposed to be 1% of BA peak load or 0.8% as shown in the table. In general, I was extremely confused about what the required FB setting should be. R5 indicates a percentage of load found in Att B, but Att B indicates the greater of Natural Frequency Response or 1% of peak, and then the table that follows indicates 0.8%. At this point, I have no idea what is being stated for the requirement.
Yes
Thad Ness
American Electric Power
No
R1: Clarification is needed regarding the responsibility of a BA that is a member of a Reserve Sharing Group. R2 and R3: What does “coordinated control” mean? There no leverage for the BA to require the generator to carry their burden of addressing governor settings or droop settings, yet the BA is obligated to meet some performance measures. This revision adds new performance measure responsibilities on the BA who likely has no direct control over every resource affecting their performance within their footprint. We are not necessarily challenging the performance measures themselves, nor their underlying objectives, however AEP views this as a gap in responsibilities which potentially effects reliability.
Yes
No
It is not clear for R1 what the exact delineations are among Lower, Medium, High, and Severe VSL’s.
Yes
A frequency response observation should not be used spanning multiple years, or if there does, there should at least be a reset period.
Yes
Yes
Arizona Public Service Company
Janet Smith, Regulatory Affairs Supervisor
1. The specified time interval from 20 seconds to 52 seconds for SEFRD measurement ignores the primary frequency response which happens in first 20 seconds and is responsible for arresting the frequency dip. We suggest using the average over the complete interval of 0 to 52 seconds. 2. The difference between Low and High VSL for R1 is not clear. Similarly the difference between Medium

and Severe is not clear.
RoLynda Shumpert
South Carolina Electric and Gas
No
The last phrase of the definition of Frequency Bias Setting is more of an explanation of a function rather than a definition. Therefore, we do not feel it belongs in the definition of the Frequency Bias Setting and a period should be inserted after the word “Interconnection”. Should the definition for Frequency Response Measure (FRM) be specific to the BA, similar to the definition for Frequency Response Obligation (FRO)?
No
The utilization of the term, “Reserve Sharing Group”, is not consistent with the definition in the NERC Glossary of Terms, and should be deleted, applicability should be clarified or replaced with a new term, such as “Frequency Response Sharing”. R4 should clarify that a BA performing Overlap Regulation Service should still be required to operate its AGC in “Tie Line Bias” mode.
Yes
No
See comments in Question 2 regarding utilization of the term “Reserve Sharing Group”.
No
See comments in Question 2 regarding utilization of the term “Reserve Sharing Group”.
Yes
Yes
No
We suggest the SDT consider a term other than “Initial’ in the title for Table 1. We suggest “Proposed Frequency Bias Setting” for Table 1
Yes
We feel that frequency response is a function of a contingency event and the Purpose Statement should recognize this relationship. We suggest the following insertion in the Purpose Statement. Purpose: To require sufficient Frequency Response from the Balancing Authority to maintain Interconnection Frequency within predefined bounds by arresting frequency deviations (due to a contingency event) and supporting frequency until the frequency is restored. To provide consistent methods for measuring Frequency Response and determining the Frequency Bias Setting.
Louis C. Guidry
Cleco Corporation
Yes
Yes
No
Please note Cleco does not use the VRFs therefore we feel too much energy and time is spent on the VRFs. The SDT needs to concentrate on the requirements and measurements.
Yes
No
The VSLs for R2 are based on 5, 15 and 25 days. What was the justification for these values? Could we just as well use 10, 20 and 30 or some other set of values? In R3, we understand that brief periods of operation outside of TLB control are allowable providing 1) continued operation in TLB control would create ARI on the Interconnection or 2) that justification is provided for the periods

when TLB is not used. For example, if something happens within our EMS that disables TLB control we are compliant if we document the period as an EMS malfunction?
Yes
We appreciate the effort of the SDT in developing Attachment A. It was very helpful in weeding through BAL-003.
Yes
We appreciate the effort of the SDT in developing the Background Document. It provided insight on how the SDT got the proposed standard to where it is with this posting.
Yes
Yes
Requirement 5, bullet 2 does not make any allowance for a single generator generator-only BAs. If that BAs generator is out-of-service, the BA cannot satisfy this requirement. This could also apply to other generation-only BAs which have a very limited number of generating units. Also, RSGs/BAs which experience resource changes throughout the year have no mechanism for adjusting their FRO.
MRO NSRF
Will Smith
No
The FRM definition: “The median of all the Frequency Response observations reported annually on FRS Form 1” is problematic. It references an FRS Form 1 which is not included in the definition itself but is in fact an attachment to a standard. In the current NERC Glossary of Terms, there is no such precedence that a definition must rely on the requirements or details in a standard for completeness. Additionally, the definition of Frequency Bias Setting should focus on what it is. Balancing Authorities do not supply energy. Suggest revising it to: Frequency Bias Setting A number, either fixed or variable, usually expressed in MW/0.1 Hz, included in a Balancing Authority’s Area Control Error equation to approximate the expected natural response provided by the assets within the respective Balancing Authority’s area.
No
R1- It is not clear what is intended by "Reserve Sharing Group" in this context. As RSGs exist today, FRM performance by an RSG is not contemplated in the definition of FRM and appears to apply more towards 'secondary response'. Recommend clarifiying this concept and possibly include an example in the background document to help explain how this would work. R2 - Please add the word “range” in-between the words “date” and “specified”. The background document specifies that there is a 72-hour period to implement the FBS setting (See Background document Page 7). R2, as written, does not reflect the period for which an entity may implement the ERO validated Bias into ACE. Also see our comment on #7 as to the length of the comment period. Question 7 comment is provided to assist the SDT; Note from question 7: (Page 7 (3rd paragraph) of the Background document states “Given the fact that BA’s can encounter staffing or EMS change issues coincident with the date the ERO sets for new Frequency Bias Setting implementation, the standard provides a 24 hour window on each side of the target date. 1. The Standard itself does not state this provision (24 hour window on each side of target date) as indicated. 2. The SDT accurately addresses the fact that BA’s could have EMS or staffing issues during implementation of the ERO validated FBS. The current stated 72-hour window is not long enough for implementation of the FBS as there may be a host of issues that could impact implementation. We suggest that a seven day window be used for implementation of the FBS.) R3 – Recommend the term “Adverse Reliability Impact” be removed from Requirement 3. Based on the NERC definition of the term, a smaller entity could never operate its AGC outside of TLB mode due to their impact on the BES not likely to result in “instability or Cascading”. To ensure a more consistent and equitable approach when applying this Requirement, recommend the drafting team incorporate the reliability reasons listed within the Background Document into the actual Requirement. Additionally, the phrase “effectively coordinated control” should be removed as this is not essential to the Requirement and introduces ambiguity in its application. To this end, the following revisions are proposed: 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

meets one or more of the following conditions. • Telemetry problems that lead the operator to believe ACE is significantly in error. • The frequency input to AGC is not reflective of the BA's true frequency (such as if the control center were operating a local generator and disconnected from the Interconnection). • During restoration (where one BA might be controlling frequency while another to which it is connected is managing interchange between them). • For training purposes. • Many AGC systems will automatically switch to an alternative mode if the EMS determines Tie Line Bias control could lead to problems. • For single BA Interconnections, Flat Frequency and Tie Line Bias are equivalent. • The Reliability Coordinator has been informed and the duration is [insert time constraint language here]. R5 – Recommend to delete the phrase "In order to ensure control response". Such phrases can be needless causes of debate. If a BA uses one of the bulleted methods but does not get "adequate response" then is the BA non-compliant? What is "adequate response"? Who decides if the response is adequate? Please clarify.
Yes
No
Based on suggested changes to R3 in response to Question 2, the drafting team should modify M3 to be consistent with the proposed language. Additionally, M1 should be revised to not reference a specific Form. The Form may be the format of choice but it should not be an implied requirement. Measures 3 and 4 identify the use of "operating logs" as evidence. Measure 2 identifies hard copy and electronic evidence, "or other evidence". We suggest calling out specifically "operator logs" for M2 also, in case there are system problems in capturing hard copy or electronic evidence during the short time window for implementation.
No
The proposed VSLs for Requirement R1 treats a BA that did not meet the FRO requirement differently depending on whether or not the Interconnection met the FRO requirement. The obligation of the BA to meet its allocated FRO should be consistent regardless of what the other entities within the interconnection are doing. Suggest removing the interconnection performance from the VSLs and developing four increasing levels of BA failure to meet the FRO.
No
Confusion exists around the "peak load" in that Attachment A states the allocation is based on Projected Peak Loads and Generation but the Background Document states it will use a historical Peak and Generation to make the allocation. Also, for the BA installed capacity, where is that value derived from and does NERC obtain that from FERC form data or does the BA provide that information somewhere specific to this effort? Additionally, there appears to be a difference in how FRO is calculated in Attachment A and what is described in the Background Document. These differences should be reconciled such that both documents address the same approach. If installed capacity is used in the equation, how are variable/intermittent resources (e.g. wind, solar) accounted for? At full capacity? Please clarify. We suggest the SDT clarify if the materials in the revised Attachment A (and Attachment B) are "Guideline" or "Technical Background", or "requirements
No
the MRO NSRF has restated the same answer as in question 6 on purpose. Confusion exists around the "peak load" in that Attachment A states the allocation is based on Projected Peak Loads and Generation but the Background Document states it will use a historical Peak and Generation to make the allocation. Also, for the BA installed capacity, where is that value derived from and does NERC obtain that from FERC form data or does the BA provide that information somewhere specific to this effort? Additionally, there appears to be a difference in how FRO is calculated in Attachment A and what is described in the Background Document. These differences should be reconciled such that both documents address the same approach. If installed capacity is used in the equation, how are variable/intermittent resources (e.g. wind, solar) accounted for? At full capacity? Please clarify. Page 7 (3rd paragraph) of the Background document states "Given the fact that BA's can encounter staffing or EMS change issues coincident with the date the ERO sets for new Frequency Bias Setting implementation, the standard provides a 24 hour window on each side of the target date. 1) The Standard itself does not state this provision (24 hour window on each side of target date) as indicated. 2) The SDT accurately addresses the fact that BA's could have EMS or staffing issues during implementation of the ERO validated FBS. The current stated 72-hour window is not long enough for implementation of the FBS as there may be a host of issues that could impact implementation. We

suggest that a seven day window be used for implementation of the FBS.
No
: There could be some confusion caused by the Attachment B due to the use of the word “initially” when the reference is made to the current standard. The drafting team should change the word “initially” to “currently” or strike it to avoid the potential confusion. The second paragraph of Attachment B (which contains the two bullets): The words “initially 1%” in the second bullet contradict with the Table 1 on Attachment B, which states “Initial” and “0.8%”. Suggest deleting the parenthetical in the second bullet as when BAL-003-1 is effective it would be referencing an old Standard version. If the initial minimum is intended to be 1% say so in the Table 1.
Yes
: It would be useful if the drafting team could develop a completed form as an example to help entities better understand the methodologies used in the form
It is not clear if there is an upper limit to the amount of frequency response expected of the Balancing Authorities under this standard. Except for Table 2 in Attachment A, there is no discussion of an amount of FR expected on a total basis. Balancing Authorities need to know for how many tenths of a hertz they are to respond so they can determine how to plan to meet this requirement. The documents do not appear to provide any boundary on the maximum amount of FR that a BA will provide, i.e. it is not clear what will happen if an event occurs in the Eastern Interconnection that causes the frequency to drop to less than 59.6 Hz (e.g. what if freq dips to 59.0? Is the BA expected to provide a limitless amount of frequency response?). Also, is that event excluded from the list used to calculate the Balancing Authorities’ response or is it included with an expectation that it counts the same as any other event. Without a clear statement of what is expected, including whether there is a limit on that expectation or not, the Balancing Authorities cannot know what is expected of them and therefore cannot plan appropriately. In the first paragraph of R5 delete “at least” and replace with “greater than or”. This phrase would now read “…absolute value is greater than or equal to one of the following:” “Equal to or greater than” accurately identifies the expectation, the current phrasing will lead to confusion and mis-interpretation. Bullet #1 of R5: The minimum % is based upon the “estimated yearly Peak Demand”. During the NERC webinar it was mentioned that this minimum would move to being based on historical reporting of Peak Demand. Where does the SDT stand on this item? Please provide clarification.
SERC OC Standards Review Group
Gerald Beckerle
No
We feel that the last phrase of the definition of Frequency Bias Setting is more of an explanation of a function rather than a definition. While the SERC OC Standards Review Group understands the statement, we do not feel it belongs in the definition of the Frequency Bias Setting and a period should be inserted after the word “Interconnection”. Should the definition for Frequency Response Measure (FRM) be specific to the BA, similar to the definition for Frequency Response Obligation (FRO)?
No
We feel that the utilization of the term, “Reserve Sharing Group”, is not consistent with the definition in the NERC Glossary of Terms, and should be deleted, applicability should be clarified or replaced with a new term, such as “Frequency Response Sharing”. R2 exempts BAs participating in Overlap Regulation Service from implementing the Frequency Bias Setting on the date specified by the ERO, and R4 states how the BA performing Overlap Regulation Service will modify its Frequency Bias Setting but does not state when the setting will be implemented. The exemption for BAs participating in Overlap Regulation Service should either be deleted from R2 or language stating the implementation date of the frequency bias setting needs to be included in R4. R4 should clarify that a BA performing Overlap Regulation Service should still be required to operate its AGC in “Tie Line Bias” mode.
Yes
No
See comments in Question 2 regarding utilization of the term “Reserve Sharing Group”.
No

See comments in Question 2 regarding utilization of the term “Reserve Sharing Group”. VSL for R1: The draft VSLs for R1 uses the summation of FRM for all BAs within an Interconnection as a factor in determining the applicable VSL. This does not seem consistent with R1. R1 is about a single BA and the individual BA’s frequency response performance as measured by the FRM for that specific BA. Including the FRM summation of the Interconnection expands R1. It appears that a BA that is non-compliant with R1 could end up with either a Low/Medium or High/Severe VSL based upon the FRO performance of the Interconnection. The FRM performance of the Interconnection is beyond the knowledge and control of a single BA and should not be a determinate of the applicable VSL. Is there a technical basis for selection of the 1%, 30% and 15MW/.1 Hz VSL breakpoints? Does the Lower VSL give a 1% dead band to a BA’s FRO? If so, will this be acceptable to NERC/FERC? VSL for R2: The VSL should reflect the language used in the requirement. R2 says a BA “not participating in Overlap Regulation service shall ….”, while the VSL says a BA “not receiving Overlap Regulation Service…..” The VSL language is not consistent with the requirement. VSLs for R5: Since Frequency Bias Setting is expressed as a negative value, the terms “absolute value” and “less than” must be used carefully. Wouldn’t the “absolute value” of a BA’s Frequency Bias Setting always be positive and thus it could never be less than the minimum specified by the ERO (a negative value)?
No
The definition of Single Event Frequency Response Data (SEFRD) was struck from the draft standard but still appears in Attachment A. Since R1 of the standard references Attachment A, would the definition of SEFRD still be applicable? If the definition is to be totally struck, we don’t think the term should be used in Attachment A.
No
Portions of the Background Document do not appear to be complete or finished. The Background Document should be edited to be consistent with changes made to the standard or other related documents (eg. elimination of the definition of SEFRD and any revisions to the draft BAL-003-1).
No
We suggest the SDT consider a term other than “Initial’ in the title for Table 1. We suggest “Proposed Frequency Bias Setting” for Table 1
Yes
We feel that frequency response is a function of a contingency event and the Purpose Statement should recognize this relationship. We suggest the following insertion (in quotation marks) in the Purpose Statement: Purpose: To require sufficient Frequency Response from the Balancing Authority to maintain Interconnection Frequency within predefined bounds by arresting frequency deviations “due to a contingency event” and supporting frequency until the frequency is restored. To provide consistent methods for measuring Frequency Response and determining the Frequency Bias Setting.
Southern Company
Antonio Grayson
No
We suggest adding BA to the definition of Frequency Response Measure (FRM), similar to the definition for Frequency Response Obligation (FRO).
Yes
No
VSL for R2: We suggest the language in the VSL be consistent with the language used in the Requirement. The VSL for R2 says a BA ‘not receiving Overlap Regulation Service…….’ R2 says a BA ‘not participating in Overlap Regulation service shall …….’ VSLs for R5: Since Frequency Bias Setting is expressed as a negative value, the terms “absolute value” and “less than” must be used carefully. This VSL uses “absolute value” when referring to the BA’s Frequency Bias Setting, but does not use “absolute value” when referring to the Frequency Response Obligation, or minimum value specified by the ERO. Consider revising this VSL so that a true comparison can be made.
No

We suggest increasing the delta f for the East to be the same value as the West or larger. The reason for this is that the 0.04Hz suggested is too close to the governor deadbands of .036Hz. This would potentially omit frequency response that some units may provide for a larger excursion but not for those close to the deadband.
No
We suggest the Background Document should be edited to be consistent with changes made to the standard or other related documents (eg. Any revisions to draft BAL-003-1 and removal of the definition of SEFRD).
No
We suggest using the words, 'Proposed Frequency Bias Setting' in the Title of Table 1 instead of the word, 'Initial'.
Yes
We suggest adding the words, 'due to a contigency event', after the word, 'deviations', in the Purpose statement because we feel that frequency response occurs due to a contigency event.
SPP Standards Review Group
Robert Rhodes
Yes
Yes
Yes
Yes
No
The VSLs for R2 are based on 5, 15 and 25 days. What was the justification for these values? Could we just as well use 10, 20 and 30 or some other set of values? In R3, we understand that brief periods of operation outside of TLB control are allowable providing 1) continued operation in TLB control would create ARI on the Interconnection or 2) that justification is provided for the periods when TLB is not used. For example, if something happens within our EMS that disables TLB control are we compliant if we document the period as an EMS malfunction?
Yes
We appreciate the effort of the SDT in developing Attachment A. It was very helpful in weeding through BAL-003.
Yes
We also appreciate the effort of the SDT in developing the Background Document. It provided insight on how the SDT got the proposed standard to where it is with this posting.
Yes
Yes
Requirement 5, bullet 2 does not make any allowance for a single generator, generator-only BA. If that BA's generator is out-of-service, the BA cannot satisfy this requirement. This could also apply to other generation-only BAs which have a very limited number of generating units. Also, RSGs/BAs which experience resource changes (permanently removing generation from service) throughout the year have no mechanism for adjusting their FRO during the year.
H. Steven Myers
ERCOT
No
RE: Frequency Response Obligation (FRO) definition: ERCOT suggests changing "Balancing

Authority's" to "Balancing Authority Area's" as follows: The Balancing Authority Area's share of the required Frequency Response needed for the reliable operation of an Interconnection. A BA that does not own generation resources cannot provide Frequency Response, it can only schedule and dispatch available resources capable of such; . The BA should be responsible for taking action to schedule resources that are capable of frequency response, and monitoring to assure frequency response performance. The GOP (possibly the LSE when demand side performance is involved) must be accountable for performing. However, there is nothing in this requirement to encourage the owner of a resource who chooses not to provide frequency response to come to the table. There is nothing in this standard that uniformly requires all frequency response providers to perform. This is likely to be detrimental to the performance of a BAA and unfairly sanctions those willing to perform to to assure reliability while others are not required to perform.

No

Measure should be modified to align with revised Requirements per ERCOT's comments on #1.

No

Refer to comments in #1.

No

While there is no problem with the calculation involved, it is unclear why the SDT elected to assign a grid performance element in this standard to the ERO, who has no functional (registered) role in grid performance. Since this is a cook-book calculation and transfer of data on frequency performance, why not assign it to the BA?

Kasia Mihalchuk

Manitoba Hydro

No

It is not clear why the term "Single Event Frequency Response Data (SEFRD)" has been removed from the standard but is still used and defined in the Background Document and Attachment A.

No

Regarding R1: 1. Neither R1 nor the referenced Attachment A clarifies the FRM requirements for an RSG to comply versus a BA. In particular (i) At p.3, Attachment A states that the ERO is responsible for "annually assigning an FRO and Frequency Bias Setting to each BA." No mention is made of RSGs. (ii) Attachment A only references RSGs in the context of reporting obligations for Form 1 (at p.4) and (iii) Compared to BAL-002-0 R1.1, which clearly states that the BA may elect to fulfill its obligation through an RSG and that in such cases the RSG has the same responsibilities as each BA (that is a participant in the RSG). 2. It should be clarified that this requirement applies to a BA, where the BA doesn't belong to an RSG, OR to an RSG. As it is currently drafted, the standard applies to each BA and each RSG. It is redundant in that each BA would need to comply, whether or not they are a member of an RSG that would also be required to comply. Further, the NERC Glossary definition of an RSG is a group of BAs that collectively maintain, allocate and supply operating reserves. No mention is made of the agreement including the sharing or delegation of responsibility related to FRM. Accordingly, the standard should only reference a BA being able to delegate responsibility to an RSG if the RSG Agreement allows for such delegation. 3. R1 does not specify where or how the FRO is determined. Presumably this would be determined by the ERO pursuant to Attachment A. 4. The phrase "to ensure that sufficient Frequency Response …" should be separated from the requirement as it is (i) not descriptive of the required actions; (ii) redundant with the stated purpose at the beginning of the standard. In general, such a drafting technique should be avoided as it may allow Responsible Entities to argue that a violation has not occurred where the specific action that is described has not been taken, but the purpose referenced in the requirement has been met. Regarding R2: 1. It is not clear from R2 who determines the Frequency Bias Setting for "validation" by the ERO and how the FBS is determined. (Presumably done by the BA in accordance with

Attachment B). Based on Background document, should refer to those “published” by ERO. The BA’s FBS may not be validated, and may be modified before posting. 2. Attachment B does not refer to the ERO “validating” FBS. 3. Attachment B refers to an RSG calculating FBS, but the standard does not.
Yes
No
It should be clarified that R1 requirement applies to a BA, where the BA doesn’t belong to an RSG, or to an RSG. As it is currently drafted, the standard applies to each BA and each RSG. It is redundant in that each BA would need to comply, whether or not they are a member of an RSG that would also be required to comply. Further, the NERC Glossary definition of an RSG is a group of BAs that collectively maintain, allocate and supply operating reserves. No mention is made of the agreement including the sharing or delegation of responsibility related to FRM. Accordingly, the standard should only reference a BA being able to delegate responsibility to an RSG if the RSG Agreement allows for such delegation.
No
The Violation Severity Levels for R1 penalize entities more severely depending on how the interconnection as a whole has performed. MH believes that BAs should only be held accountable for issues within their control and that the VSLs for R1 should be revised accordingly.
No
1. p.2 refers to each “Interconnection” establishing target contingency protection criteria. However, an “Interconnection” as defined in the NERC Glossary is an electrical system, not a Responsible Entity. This should be revised to clarify which Responsible Entities must establish the protection criteria. 2. Table 2, although entitled “Interconnection Frequency Response Obligations” does not use the term FRO in the Table itself. This terminology should be consistent. 3. There is no clear statement in Attachment A identifying the significance of Table 2. The previous paragraph identifies Table 2 as listing “default targets”, but how does this relate to the FRO referenced in R1? 4. The “Note” on p.2 regarding the ERO being able to use additional events that don’t satisfy the criteria is unreasonable as drafted. Since these events are used to calculate the Frequency Bias Setting and FRM (as per p.1, s.2), the selection of events should not be at the unfettered discretion of the ERO. As drafted, no grounds or criteria must be satisfied.
Yes
Please see MH’s response to Question 1 regarding the term Single Event Frequency Response Data. Additionally, the discussion in this document is useful in clarifying the intent of the drafting team, but some of this clarification would best be incorporated into the Standard itself. Ex. RSG requirement on page 6. Also on page 7 Attachment A does not specify what validation is and how it is done. Attachment A refers to BA providing FBS data to ERO which then validates and publishes. This should be reflected in R2.
Yes
Yes
The Applicability of BAL-003-1 should be clarified. Specifically, Section 1.2 should be changed from “Reserve Sharing Groups (where applicable)” to “Reserve Sharing Group whose intent includes meeting Frequency Response Obligations”. Regarding Data Retention: 1. As the standard is currently drafted, both the BA and the RSG would be required to retain data or evidence to show compliance with requirements R1 and M1. It is unclear whether this is the intention, or whether it would be acceptable that just one or the other would maintain such records. 2. In the first and second paragraph, the reference to ‘three calendar years’ should be specified to be the ‘previous three calendar years’. 3. In the third paragraph, it should be clarified who is required to keep information related to non compliance if the BA belongs to an RSG – the BA or the RSG or both. 4. In the fourth paragraph, it should be clarified for what length of time the last audit records must be retained.
Western Electricity Coordinating Council
Steve Rueckert
Yes

No
Agree with the changes made to this latest version of BAL-003-1. However, additional clarity could be added by addressing the following: R1- It is not clear what is intended by "Reserve Sharing Group". As RSGs exist today, FRM performance by an RSG is not contemplated in the definition of FRM and appears to apply more towards 'secondary response'. Recommend clarifiying this concept and possibly include an example in the background document to help explain how this would work. R3 - There may be occasions in which an entity has a legitimate reason or a need to operate in a mode other than Tie Line Bias but that does not qualify as an Adverse Reliability Impact. Recommend including language that would permit limited operation in a mode other than Tie Line Bias mode provided the Reliability Coordinator was notified. R3 – Has the drafting team considered whether or not the language of Requirement R3 will have any conflict or coordination issue with the FERC-approved regional reliability standards BAL-004-WECC-1 – Automatic Time Error Correction? R5 – Suggest changing the language “at least equal to” to “greater than or equal to” for clarity.
No
The proposed VSLs for Requirement R1 treat a BA that did not meet the FRO requirement differently depending on whether or not the Interconnection met the FRO requirement. The obligation of the BA to meet its allocated FRO should be consistent regardless of what the other entities within the interconnection are doing. Suggest removing the interconnection performance from the VSLs and developing four increasing levels of BA failure to meet its FRO.
No
There is disagreement between Attachment A and the Background Document. Attachment A states peak load allocation is based on “Projected” Peak Loads and Generation, but the Background Document states it will use “historical” Peak Load and Generation. The allocation methodology of FRO among the BAs in the equation on page 3 of Attachment A favors BAs with more load than more installed capacity. Peak load is served but not all installed capacity is always dispatched.
No
See response to question 6.
Reducing frequency bias obligation is detrimental to reliability. Lowering the Minimum Frequency Bias Setting from 1% to .8% (as identified in Table 1, Attachment B) will result in a lower value being used by those Balancing Authorities with a natural frequency response below the current required 1%, which in turn will lower the natural frequency response. Over time it seems this pattern would lead to poorer response. Is there an upper limit to the amount of frequency response expected of the Balancing Authorities? How many tenths of a hertz is a Balancing Authority or Reserve Sharing Group expected to respond to. The documents do not appear to provide any boundary on the maximum amount of Frequency Response that a BA will provide. It is not clear what will happen if an event occurs in the Eastern Interconnection that causes the frequency to drop to less than 59.6 Hz or in the Western Interconnection that causes the frequency to drop to less than 59.5 Hz. Will that event be excluded from the list used to calculate the Balancing Authorities’ response? Will it be included with an expectation that it counts the same as any other event? Without a clear statement of what is expected, including whether there is a limit on that expectation or not, it is unclear what is expected of the Balancing Authorities. As Drafted, is there the possibility that a Balancing Authority may fail to meet their FRO if surrounding BAs provide significantly more than required. Can over performers cause average performers to fail when they would have otherwise met their requirement. The documents do not provide guidance on how intermittent or variable generation is to be treated Referencing Attachment A may be adding requirements. You may wish to consider adding language in Requirement R1 that specifically requires the completion of the Attachments or Forms. There are no requirements on governor installation, settings, or operation. Addition of governor operation requirements seems essential for a frequency response standard. Without some sort of governor response to require the individual generators to perform, a Balancing Authority with significant amounts of generation for which it has no control over is at a disadvantage.
Curtis Crews

Texas Reliability Entity

Yes

We suggest that the Severe VSL for R3 is confusing and should be clarified as follows: “A Balancing Authority not receiving Overlap Regulation service failed to operate AGC in Tie Line Bias mode, when operation in Tie Line Bias mode would not have had an Adverse Reliability Impact on the Balancing Authority’s Area.”

No

We have a number of concerns regarding Attachment A which are set forth below: 1. Regarding the formula for “Initial FRO Allocation” on page 3 of Attachment A, the terms for “BA installed capacity” and “Interconnection installed capacity” are undefined and could be subject to manipulation and dispute. We suggest that this formula be revised to mirror the calculation based on well-established FERC Form 714 data that is discussed in the Background document, which is based on actual generation output. 2. In Attachment A, all references to “Texas” should be changed to “ERCOT” as a reference to the Interconnection or the Region (including tables). 3. Regarding the Event Selection Criteria in Attachment A: in item 2, consider whether certain events, such as DCS events, should be required to be included in the FRM analysis. 4. Regarding the Event Selection Criteria in Attachment A: item 7 provides that the selected frequency excursion events are to be selected so that they are evenly distributed seasonally. Consider adding the seasonal distribution concept to item 2, particularly if it becomes necessary to include events from the previous evaluation period. 5. In Attachment A, page 1 says the ERO is to post the final list of frequency excursion events by December 15, but on page 3 it suggests that the list will be posted by December 10. These references should be made consistent. 6. Attachment A states, on page 3, “the ERO will use FRS Form 1 data to post the following information for each Balancing Authority for the upcoming year: Frequency Bias Setting and Frequency Response Obligation (FRO).” What is meant by “the upcoming year”? Is the BA supposed to implement the new FBS immediately, or wait until the beginning of the next evaluation period on December 1? Note that if the new FRO and FBS are implemented immediately (e.g. in March), then the FRO will change in the middle of an evaluation period. This will complicate the comparison of FRM and FRO as required by R1.

No

There is an inconsistency between the Background Document and Attachment A. Attachment A only proposes event criteria based on “the largest category C (N-2) event identified,” but the Background Document says: “Attachment A proposes the following Interconnection event criteria as a basis to determine an Interconnection’s Frequency Response Obligation: - Largest category C loss-of-resource (N-2) event; - Largest total generating plant with common voltage switchyard; - Largest loss of generation in the interconnection in the last 10 years.”

No

1. In Attachment B, we suggest removing the paragraph beginning “The BA calculates . . .” because it appears to be background information that conflicts with the methods provided in this version of the standard for determining minimum bias settings. 2. Attachment B, Table 1, refers to “0.8% of peak load or generation.” If a BA has both load and generation, will its minimum Frequency Bias Setting be based on its load, its generation, or can it pick the value that it prefers to use?

Mark B Thompson

Alberta Electric System Operator

No

The FRO definition is specific to BAs. The Appendix 1, which is incorporated in the standard, uses this definition in relation to requirements of the Interconnection. The SDT should consider a revision of this definition that accounts for the requirements of the Interconnection versus the BA obligation to the Interconnection.

No

The language used in the requirements is superfluous. This could result in confusion and incorrect assumptions being made. In R1, the comment within brackets “(as detailed in Attachment A and calculated on FRS Form 1)”, is not necessary as it is already part of the FRM definition. We suggest removing this bracketed text from the requirement. Also in R1, the phrase “to ensure that sufficient Frequency Response is provided by each BA or RSG to maintain an adequate level of Frequency response in the Interconnection” is a high level objective that does not add clarity to this requirement. We suggest removing this from the requirement. R2, R3 and R5 use similar language e.g. “to ensure effectively coordinated Tie Line Bias control”, “to ensure adequate control response” etc. Although it provides background information, this does not add clarity to the requirement. We suggest removing these from the requirements.

No

These documents not only provide additional clarity but also specify additional requirements, such as FRS Form 1 annual reporting by January 10. All the enforceable requirements should be included in the body of the standard. 1. Attachment A uses the terms "delta F (change in frequency)", "arresting frequency (Point C)", "B Value", "A Value". These terms are not properly defined or described in this document as drafted. The AESO suggests adding a description or definitions for clarity in this document. 2. The standard gives 2 sets of values for Interconnection Frequency Response Obligation in Table 2, (1) Base Obligation and (2) the obligation including 25% Safety Margin (which seems to be implied by the "contingency protection criterion"). The Attachment A does not specifiy whether the Base Obligation or the 25% Safety Margin value will be used to allocate the Interconnection FRO to the BAs. Please clarify which value will be used to calculate the BA Frequency Response Obligation (FRO) in the Interconnection FRO allocation formula in Attachment A. 3. The "initial FRO allocation" formula in Attachment A uses Peak Load. The term Peak Load is not used in the standard nor is it a defined term in the NERC Glossary. The standard uses Peak Demand, which is defined in the Glossary Is "Peak Load" synonymous with "Peak Demand"? If so, Peak Demand should be used in the formula instead. Otherwise Peak Load should be clearly defined in this document. 4. Is "Projected" in the FRO allocation formula synonymous with "Forecasted"? If so, Forecasted should be used for consistency. Otherwise "Projected" or the context in which it appears must be defined.

No

The Background Document uses BA Peak Generation in the BA FRO allocation formula. Attachment A uses BA Installed Capacity. The AESO suggests making the two formulae consistent.

Besides the standard, the posting has two attachments, supporting material and two forms. It is not clear how enforcement will be applied given the array of explicit and implicit requirements throughout this package, and the use of undefined terminology, which will be subject to interpretations. In the SDT response to our comments to the first draft of this standard it was stated that “The expectation is events will be selected by the Balancing Authorities. The Balancing Authority may exclude events from consideration for specific conditions such as data quality issues. “ Based on the SDT’s response, it is our understanding that, for the purpose of the FRM calculation, BAs could exclude or include events based on specific conditions consideration, such as data quality or event suitability (e.g. BA separation from the Interconnection). However, the standard as currently drafted, does not have any provisions to this effect. Please include such provisions in the body of the standard.

Anthony Jablonski

ReliabilityFirst

No

ReliabilityFirst thanks the SDT for their effort on this project. ReliabilityFirst has a number of concerns/questions related to the draft BAL-003-1 VSLs which include the following: 1. General VSL Comment – For consistency with other standards, each VSL should begin with the phrase “The Responsible Entity…” or “The Balancing Authority”. This is consistent with the language of the requirement and correctly pinpoints the appropriate responsible entity. 2. VSL R1 Comment – Based on the FERC Guideline #3 “Violation Severity Level Assignment Should Be Consistent with the Corresponding Requirement”. ReliabilityFirst suggests the following modification: a. Lower VSL - The Responsible Entity achieved an annual FRM within an Interconnection that was equal to or more negative than the Interconnection’s FRO and the Responsible Entity’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 b. Medium VSL - The Responsible Entity achieved an annual FRM within an Interconnection that was equal to or more negative than the Interconnection’s FRO and the Responsible Entity’s FRM was less negative than its FRO by more than 30% or by more than 15 MW/0.1 Hz, whichever one is the greater deviation from its FRO c. High VSL - The responsible entity failed to achieve an annual FRM that is equal to or more negative than its FRO and the Responsible Entity’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 d. Severe VSL - The responsible entity failed to achieve an annual FRM that is equal to or more negative than its FRO and the Responsible Entity’s FRM was less negative than its FRO by more than 30% or by more than 15 MW/0.1 Hz, whichever one is the greater deviation from its FRO 3. VSL R4 Comment – Based on the FERC Guideline #3 “Violation Severity Level Assignment Should Be Consistent with the Corresponding Requirement”. ReliabilityFirst suggests the following modification: a. Example for Lower VSL which should be carried throughout all four VSLs - The Balancing Authority incorrectly modified the Frequency Bias Setting value used in its ACE calculation when providing Overlap Regulation Services with combined footprint setting-error less than 5% of the validated or calculated value 4. VSL R5 Comment – Based on the FERC Guideline #3 “Violation Severity Level Assignment Should Be Consistent with the Corresponding Requirement”. ReliabilityFirst suggests the following modification: a. Example for Lower VSL which should be carried throughout all four VSLs - The Balancing Authority used a monthly average Frequency Bias Setting whose absolute value was less than or equal to 5% below the minimum specified by the ERO.
ReliabilityFirst thanks the SDT for their effort on this project. ReliabilityFirst has a number of concerns/questions related to the draft BAL-003-1 standard which include the following: 1. General Comment – ReliabilityFirst is unsure how a Reserve Sharing Group (RSG) would be capable of establishing a correct Frequency Response Measure (FRM) and Frequency Response Obligation (FRO) as a RSG. Frequency Response and Frequency Bias are unique values established for each Balancing Authority (BA), is the intent to require a RSG response to establish and maintain a certain frequency response based upon the members and size of the RSG? From a monitoring perspective and without more guidance it is unclear what or how these values will be determined. 2. General Comment – ReliabilityFirst believes the proposed definitions for Frequency Response Measure (FRM) and Frequency Response Obligation (FRO) are unclear. For example, ReliabilityFirst is unclear what is meant by the term “observations” in the FRM definition. ReliabilityFirst also believes the terms “reliable operation of an Interconnection” is ambiguous and seeks further clarification to its meaning. 3. General Comment – ReliabilityFirst recommends including Attachment A, Attachment B, FRS Form 1 and FRS Form 2 into the standard itself. These attachments and forms are referenced in the requirements (and definitions) and therefore should be appropriately embodied within the standard. 4. General Comment – ReliabilityFirst believes the last fragment of words in Requirement R1 through R4 (and first fragment of words in Requirement R5) is more of a justification for the requirement rather than a requirement itself. ReliabilityFirst believes this justification should be moved to a “Rationale Text Box”. For example, the first set of words in Requirement R5 states: “In order to ensure adequate control response”. This language is really explaining why this requirement is needed. ReliabilityFirst believes this should be removed, further expanded upon and placed in a “Rationale Text Box”.
Florida Municipal Power Agency

Frank Gaffney

No

We thank the SDT for their hard work and diligence in moving this Project forward. However, we have some concerns that cause us to not support the standard in its current form. In general, we believe that there has not been sufficient prudency review for the standard, especially R1, to justify a performance based standard around a Frequency Response Measure. We also believe that the proposed standard does not meet all of the conditions of the Final SAR and Supplemental SAR. The "Final SAR" was to develop methods by which a performance based standard would eventually be developed. The Final SAR states: "The proposed standard's intent is to collect data needed to accurately model existing Frequency Response. There is evidence of continuing decline in Frequency Response in the three Interconnections over the past 10 years, but no confirmed reason for the apparent decline. The proposed standard requires entities to provide data so that Frequency Response in each of the Interconnections can be modeled, and the reasons for the decline in Frequency Response can be identified. Once the reasons for the decline in Frequency Response are confirmed, requirements can be written to control Frequency Response to within defined reliability parameters." BAL-003-1 does not seem to complete the scope of this "Final SAR". For instance, "the reasons for the decline in Frequency Response" were not confirmed to our knowledge; and the field trial is not completed to our knowledge. The Supplemental SAR adds to the scope of the Final SAR: "To provide a minimum Frequency Response Obligation for the Balancing Authority to achieve, methods to obtain Frequency Response and provide a consistent method for calculating the Frequency Bias Setting for a Balancing Authority. In addition, the standard will specify the optimal periodicity of Frequency Response surveys." The Supplemental SAR does not eliminate the pre-requisite contained in the Final SAR to determine the reasons for the decline in frequency response and confirm them before establishing "defined reliability parameters". In addition, the standard does not complete the requirement of the Supplemental SAR to identify "methods to obtain Frequency Response". For instance, neither the BA nor the RSG have authority over governor and other generator settings. There should be a requirement for GOPs to incorporate setting changes directed by the BA, otherwise the standard establishes requirements that BAs and RSGs may not have the authority to achieve. There is no consideration of "footprint" changes of the BA resulting in different allocation from the ERO during a year. The standard and Attachments seem to specify an annual process with due dates in December and January with no allowance for mid-year changes and associated allocation changes. If a standard has a requirement for the ERO, who will audit the ERO for compliance? If the ERO does not meet its obligations, can an entity still be found non-compliant, especially on a schedule basis? Wasn't there an issue of assigning standards to RROs, e.g., the fill-in-the-blank standards? Are there similar issues with assigning requirements to the ERO? Is the ERO a "user, owner or operator" of the BPS under Section 215, e.g., at (b)(1)"… All users, owners and operators of the bulk-power system shall comply with the reliability standards that take effect under this section." We question how this would work from a compliance perspective.

No

On Event Selection Criteria, bullet 2, if 25 events cannot be identified then the ERO can go back in time to the previous year. This creates a double jeopardy to R1 of the standard. It also may include irrelevant data if there have been changes from one year to the next in FRO or Bias settings assigned by the ERO. On Frequency Response Obligation, first paragraph states that "Each Interconnection will establish target contingency protection criteria"; however, the Interconnection is not a decision-making body. Does this really mean the ERO will establish FRO for each Interconnection? The single asterisk note for the table on page 2 states: "It is extremely unlikely that an event elsewhere in the Eastern Interconnection would cause the Florida UFLS special protection scheme to "false trip".", "Special protection scheme" should be stricken from this sentence, Florida has just a regional difference in its UFLS program.

No

The document does not discuss how the new reliability parameter will affect BAs

On R5, the wording should be changed from “absolute value is at least equal to” to “absolute value is greater than or equal to”
Brenda Powell
Constellation Energy Commodities Group
No
The Frequency Response Obligation has two components based on Attachment 1 - an Interconnection FRO and a BA FRO. The proposed definition captures only the BA FRO.
No
R1 should accommodate agreements between multiple BAs and RSGs in achieving the annual Frequency Response Measure. See proposed modification below: R1. Each Balancing Authority shall achieve an annual Frequency Response Measure (FRM) (as detailed in Attachment A and calculated on FRS Form 1) that is equal to or more negative than its Frequency Response Obligations (FRO) to ensure that sufficient Frequency Response is provided by each BA. Either the Balancing Authority individual FRM, multiple Balancing Authority’s FRM per written agreement, or the FRM of the Reserve Sharing Group must be equal to or more negative than the applicable Frequency Response Obligations (FRO) for a single Balancing Authority or the aggregate of multiple Balancing Authorities or RSGs. -In R2, “Each Balancing Authority not participating in Overlap Regulation Service” should state “Each Balancing Authority, not receiving Overlap Regulation, shall implement the appropriate 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 coordinated Tie Line Bias control”. -In R3, the explanatory language about why to operate in Tie Line Bias mode should be deleted. See proposed modification below: R3. Each Balancing Authority not receiving Overlap Regulation Service shall operate its Automatic Generation Control (AGC) in Tie Line Bias mode, unless such operation would have an Adverse Reliability Impact on the Balancing Authority’s Area. -R5 should be modified to state only that the FBS is specified by the ERO in accordance with Attachment B. As drafted the Requirement is in conflict with Attachment B because the Requirement mandates a minimum and does not allow for a reduction to the minimum but it references Attachment B which is titled “Process for Adjusting Minimum Frequency Bias Setting”. See proposed modification below: R5. In order to ensure adequate control response, each Balancing Authority shall use a monthly average Frequency Bias Setting whose absolute value is as specified by the ERO in accordance with Attachment B. -There should be a Requirement specifically stating there is an obligation to complete and submit FRS Form 1 by January 10th each year for clarity. -The requirements should be re-ordered to reflect the chronology of the process for frequency calculation, implementation and performance measurement. The recommended order is as follows: R5 which defines the minimum Frequency Bias Setting (FBS) for a Balancing Authority R4 which describes how the minimum FBS may be altered through Overlap Regulation Service R2 which identifies the coordination required around implementation R3 which requires operation in Tie Line Bias mode R1 which establishes the performance obligation
Yes
No
Based on language modifications proposed to the Requirements, the measures should be revisited.
No
The language in the VSLs for R1 should be revisited based on the proposed language modifications above and should also clearly look to the FRM of a BA, group of BAs or RSG against the BA FRO not an Interconnection FRO.
Yes
Additional information relating to defining the FRO for the Interconnection would be helpful as would an example for calculating the BA FRO.
Yes
Should be revisited based on the propposed modifications to the requirements.
No
Should be revisited based on the proposed modifications to the requirements.

Yes

JEA Electric Compliance

Thomas McElhinney

No

We thank the SDT for their hard work and diligence in moving this Project forward. However, we have some concerns that cause us to not support the standard in its current form. In general, we believe that there has not been sufficient prudency review for the standard, especially R1, to justify a performance based standard around a Frequency Response Measure. We also believe that the proposed standard does not meet all of the conditions of the Final SAR and Supplemental SAR. The "Final SAR" was to develop methods by which a performance based standard would eventually be developed. The Final SAR states: "The proposed standard's intent is to collect data needed to accurately model existing Frequency Response. There is evidence of continuing decline in Frequency Response in the three Interconnections over the past 10 years, but no confirmed reason for the apparent decline. The proposed standard requires entities to provide data so that Frequency Response in each of the Interconnections can be modeled, and the reasons for the decline in Frequency Response can be identified. Once the reasons for the decline in Frequency Response are confirmed, requirements can be written to control Frequency Response to within defined reliability parameters." BAL-003-1 does not seem to complete the scope of this "Final SAR". For instance, "the reasons for the decline in Frequency Response" were not confirmed to our knowledge; and the field trial is not completed to our knowledge. The Supplemental SAR adds to the scope of the Final SAR: "To provide a minimum Frequency Response Obligation for the Balancing Authority to achieve, methods to obtain Frequency Response and provide a consistent method for calculating the Frequency Bias Setting for a Balancing Authority. In addition, the standard will specify the optimal periodicity of Frequency Response surveys." The Supplemental SAR does not eliminate the pre-requisite contained in the Final SAR to determine the reasons for the decline in frequency response and confirm them before establishing "defined reliability parameters". In addition, the standard does not complete the requirement of the Supplemental SAR to identify "methods to obtain Frequency Response". For instance, neither the BA nor the RSG have authority over governor and other generator settings. There should be a requirement for GOPs to incorporate setting changes directed by the BA, otherwise the standard establishes requirements that BAs and RSGs may not have the authority to achieve. There is no consideration of "footprint" changes of the BA resulting in different allocation from the ERO during a year. The standard and Attachments seem to specify an annual process with due dates in December and January with no allowance for mid-year changes and associated allocation changes. If a standard has a requirement for the ERO, who will audit the ERO for compliance? If the ERO does not meet its obligations, can an entity still be found non-compliant, especially on a schedule basis? Wasn't there an issue of assigning standards to RROs, e.g., the fill-in-the-blank standards? Are there similar issues with assigning requirements to the ERO? Is the ERO a "user, owner or operator" of the BPS under Section 215, e.g., at (b)(1)"… All users, owners and operators of the bulk-power system shall comply with the reliability standards that take effect under this section." We question how this would work from a compliance perspective.

No

The proposed VSLs for Requirement R1 treats a BA that did not meet the FRO requirement differently depending on whether or not the Interconnection met the FRO requirement. The obligation of the BA to meet its allocated FRO should be consistent regardless of what the other entities within the interconnection are doing. Suggest removing the interconnection performance from the VSLs and developing four increasing levels of BA failure to meet its FRO.

No

On Event Selection Criteria, bullet 2, if 25 events cannot be identified then the ERO can go back in time to the previous year. This creates a double jeopardy to R1 of the standard. It also may include irrelevant data if there have been changes from one year to the next in FRO or Bias settings assigned

by the ERO. On Frequency Response Obligation, first paragraph states that "Each Interconnection will establish target contingency protection criteria"; however, the Interconnection is not a decision-making body. Does this really mean the ERO will establish FRO for each Interconnection? The single asterisk note for the table on page 2 states: "It is extremely unlikely that an event elsewhere in the Eastern Interconnection would cause the Florida UFLS special protection scheme to “false trip”.", "Special protection scheme" should be stricken from this sentence, Florida has just a regional difference in its UFLS program.
No
The document does not discuss how the new reliability parameter will affect BAs
On R5, the wording should be changed from “absolute value is at least equal to” to “absolute value is greater than or equal to”
Kirit Shah
Ameren
No
The Frequency Response Measure (FRM) definition should include which Entity(ies) it applies to, similar to the definition of the FRO.
No
R1.While we agree with the concept of the entire requirement and the determination of the Interconnection Frequency Response Obligation, we believe that the accurate measurement of individual BA's FRM has not yet been demonstrated. This requirement should not be part of the standard (even with the additional 12 months in the effective date) until the field trial demonstrates that each BA's FRM can be consistently calculated to a level that will not create false non-compliance to this requirement. While the calculation methodology in FRS Form 1 looks promising, with the A-value and B-value average periods, we believe successful completion of the field trial is prudent. R5. We were not sure if it was intended for this comment question to include Requirement R5, but have decided to include our comments here. While we agree with the requirement of R5, it should not be at the expense of changing the value of L10 in BAL-001, R2, which has been accepted by FERC in Order 693. An accommodation should be made so that any changes to the Frequency Bias Setting according to BAL-003, R5, should not affect the value of L10 used in BAL-001, R2.
No
This is problematic since for a single BA interconnection these could be argued to be appropriate VRFs, but is different for a multiple BA interconnection, where the risk that a single BA would pose to the interconnection would be Lower.
Yes
With the understanding that any suggested changes to the proposed requirements would come with corresponding changes to their measure.
No
It is not clear how the VSL for R1 uses the "Summation of the BA's FRM", when the requirement is BA or RSG specific.
Yes
Yes
Yes
Considering the comments made regarding R5, in question 2, above, which are: R5. While we agree with the requirement of R5, it should not be at the expense of changing the value of L10 in BAL-001, R2, which has been accepted by FERC in Order 693. An accommodation should be made so that any changes to the Frequency Bias Setting according to BAL-003, R5, should not affect the value of L10 used in BAL-001, R2.
Yes
We agree that the spreadsheet is meaningful, but still needs to be vetted through the field trial

process, with improvements made based on experience in its use.
While we are in general support of this standard and its requirements we have concerns regarding the following: •The FRM methodology has not been fully vetted through the field trial process. •Adjusting the minimum of the Frequency Bias Setting, while an appropriate adjustment for AGC control in the ACE equation, should not be at the expense of L10 as used in BAL-001, R2. •The absence of any resource specific frequency response requirement in NERC standards is an issue that must be addressed somewhere. As the resource portfolio of our industry changes(expedited by recent EPA rulemaking), the resources used for traditional primary frequency response are becoming a lower percentage of the mix. New resources and existing resources that have not provided primary frequency response need to be incorporated into the available frequency response discussion
Michael Brytowski
Great River Energy
Yes
No
R1: Including the Reserve Sharing Group (RSG) in the Frequency Response Obligation is outside of the boundaries of a RSG. Where or how would a Frequency Bias be determined for an RSG to determine their Frequency Response Obligation? Although it is apparent that frequency responds during the implementation of reserves, the intention of a RSG is not to share frequency response, but rather to share Reserves. Additionally, if the Frequency Response Obligation is not met by the RSG how are penalties assessed? Should they be assessed to the group as a whole or strictly to the generators that did not meet their individual obligation? R3: Needs to include verbiage for those circumstances when it would be necessary to run AGC out of TLB such as during necessary testing. The BA should have the option to operate out of TLB for a predetermined amount of time if needed when notification and coordination with the RC has been established.
Yes
Yes
No
The VSLs on for Requirement R1 set a previously un-established precedent of relying on the performance of other registered entities to establish the severity level of the violation. This is not appropriate. The VSLs should be rewritten to provide further gradations of the violation severity based on the BA's own performance
No
Under item 3 of the Event Selection Criteria section, the delta F and Point C should be described either in this attachment or the "Frequency Response Standard Background Document". While many in industry may understand what these terms mean, history has a way of getting lost with personnel turnover. Furthermore, this would help ensure that the auditors and industry have a duplicate understanding. In the Frequency Response Obligation section on page 2, several items require more description. Further description of why an N-2 event was chosen for the Contingency Protection Criteria should be provided and which N-2 event was selected so that industry can help validate if the correct MW value was selected. Furthermore, the document should clarify if the Contingency Protection Criteria contains the "safety margin". There is a statement in the paragraph before the table that states it does but then the table lists out a separate 25% "Safety Margin". Thus, it is not clear if the "Safety Margin" is included in the Contingency Protection Criteria value listed in the table or not. "Safety margin" should be changed to "reliability margin". Safety has a specific meaning in the electric industry and its use here is not appropriate. The Base Obligation should be explained. The explanation should include its purpose and origin.
No

We can find no document titled “BAL-003-1 Background Document”. We assume this question is referring to the “Frequency Response Standard Background Document” dated October 2011. We do not believe the document provides sufficient clarity. No explanation is provided for why RSG was added to Requirement R1. There are typos contained in the document. On page 6 in NIA, the A should be in subscript. On page 7 in bullet 4 in the first sentence, “The” should be in lowercase
Yes
Yes
The Data Retention section requires the BA to retain data or evidence for up to four years. No data that exceeds the audit cycle should be required to be retained. The audit cycle is three years.
Si Truc PHAN
Hydro-Quebec TransEnergie
No
The FRM and FRO definitions should precise that it is expressed in MW/0.1Hz. As for the Frequency Bias Setting definition, as written, would apply only to a multiple BA Interconnection. In a single BA Interconnection, the Frequency Bias translates the frequency error into a MW value that must be dispatched to bring back Frequency to desired value. Since Tie Lines are not controlled through AGC, there is no response withdrawal issue
No
The objective of R2 is that all BA’s implement their new Bias Setting at the same time, based on the previous year’s data, so that control stays the most effective throughout the Interconnection (Tie-Line Bias). In addition, the new Bias will be in effect all year long. The process is quite simple and straightforward for a fixed Bias Setting. As for Variable Bias Setting, this process is not applicable before the fact since the Bias equation can depend on real-time values that are not known in advance. In addition, the simultaneous Bias implementation is not an issue for a single BA Interconnection. Therefore, we suggest that Requirement 2 applies only to Fixed Bias Setting.
Yes
Yes
Yes
No
The Event Selection Criteria should be modified for the Quebec Interconnection. In Table 1, the change in frequency (Delta f) used for Quebec’s Event Selection Criteria should be 0,3Hz (from point “A” to point “C”) and must last for at least 7 seconds so that we don’t measure AGC action. In addition, a criterion should be added by saying that events that recovered within the 20-52 second average period for point “B” should be excluded from analysis.
Yes
No
The methodology proposed to compute the Minimum Frequency Bias Setting (in MW/0,1Hz) could be adverse for the Quebec Interconnection. Hydro-Quebec uses a variable Bias that is calculated based upon which generator is online and it’s droop setting. Under light load condition, we might have a Bias setting that would be under (in absolute value) than the FRM which is the median value, even though the Bias setting would reflect the grid’s frequency response. This method, as proposed, would mandate us to have a larger Bias that what is really needed. Unlike Eastern Interconnection, we are not over biased. By implementing this new methodology, it would make us over biased. Having a too large Bias could lead to system instability, based on the results of studies from our control specialists. The Minimum Frequency Bias Setting should take into account the wide load span that we can face. For the variable bias, we could express the Minimum Frequency Bias Setting as a function of monthly peak loads, and remove the Natural Frequency Response term. In addition, there is a gap between

Attachment B and the text in R5. See comment 10 for explanation.
Yes
There is a gap between R5, Attachment B and Form 1 next year's Bias Setting equation. Requirement 5 states that the average Frequency Bias shall be at least equal to the minimum percentage of BA's peak load or generation. In Attachment B and Form 1, the required Frequency Bias is the maximum (absolute value) between FRM, FRO and peak load+peak gen /2. As stated in comment 8, Hydro-Quebec is not in favor of adding the FRM into the minimum Frequency Bias requirement, at least for Variable Bias Setting. Due to a good frequency response, this would lead us to have a too high AGC Bias and causing potential reliability problems. In other words, this would lead us to be over-biased, which would not be a good thing for a single BA Interconnection. For a Single BA Interconnection, performance measure CPS1 tracks the performance of the variable Bias, which is enough to ensure reliability through the Interconnection. Hydro-Quebec therefore recommends the drafting team that Requirement 5 only applies to Multiple BA Interconnection. Another option is that Minimum Frequency Bias Setting could be expressed as a function of monthly peak loads, and remove the Natural Frequency Response term in the minimum Bias setting equation.
Greg Rowland
Duke Energy
No
Duke Energy would suggest removing "usually" from the Frequency Bias Setting definition, as the value in the ACE equation must be in terms of MW/0.1Hz in order for ACE to be correctly calculated. We apologize for missing this point in the last round of comments. Though some would argue that the last phrase of the definition is more of an explanation of a function rather than a definition, we support keeping the phrase inserted, as it should be recognized that the intent is to account for the frequency response contribution AND keep the FBS slightly larger (in magnitude) than the average estimated response, to better discourage withdrawal, which was also recognized by Nathan Cohn. Should the definition for Frequency Response Measure (FRM) be specific to the BA, similar to the definition for Frequency Response Obligation (FRO)?
No
Duke Energy supports the concept of a group of BAs forming a group to share in Frequency Response however it should be clear that it is an option. We feel that the utilization of the term, "Reserve Sharing Group", is not consistent with the definition in the NERC Glossary of Terms which is specific to sharing of contingency reserves, and should be replaced with a new term, such as "Frequency Response Sharing Group". R4 should clarify that a BA performing Overlap Regulation Service should still be required to operate its AGC in "Tie Line Bias" mode. Though comments are provided below on the Attachments, Duke Energy believes that all NERC Reliability Standards' requirements must reside within the standard itself (which is vetted by the Industry and subject to FERC approval), and not within Attachments that may be revised without Industry review and approval. As noted below and in prior comments, given the secondary control implications of changing the minimum Frequency Bias Setting (FBS), Duke Energy believes that subsequent revisions to the minimum FBS should be vetted through the Standards process. Duke Energy would suggest moving the details of the minimum FBS for each Interconnection into the Standard, and having the implementation plan include annual submittal of a revised minimum FBS based upon the methodology presented in Attachment B for ballot approval by the Industry.
Yes
No
See comments in Question 2 regarding utilization of the term "Reserve Sharing Group".
No
See comments in Question 2 regarding utilization of the term "Reserve Sharing Group".
No
On page 3 of the document it states "For a multiple Balancing Authority Interconnection, the Interconnection Frequency Response Obligation is allocated based upon either the Balancing Authority Peak Demand or peak generation", however, the initial FRO allocation equation shows that the BA

allocation is based upon the sum of the Projected BA Peak Load plus installed capacity, times the Interconnection FRO, and divided by the sum of the Projected Interconnection Peak Load plus Interconnection installed capacity. Is the statement in quotes correct, or is the allocation equation correct? In addition, the equation in Attachment A referencing "installed capacity" conflicts with the equation in the BAL-003-1 Background Document entitled "Frequency Response Standard Background Document" where "Peak Gen" is used. In summary, is the FRO allocation based upon an equation which a) sums the Projected BA Peak Load plus peak generation, b) sums the Projected BA Peak Load plus installed capacity, or c) uses either Projected BA Peak Load OR peak generation? All three options are currently represented in the documentation. Calculation of the FRO for the Eastern Interconnection: Duke Energy agrees with the criteria suggested for the event to be protected (4500 MW), and at this time also agrees with the "compromise" low limit of 59.6 Hz. However, knowing that another Standard is under development which may require hourly assessment of available "frequency responsive reserves", we are trying to determine what impact the choice of this methodology will have on the amount of frequency responsive reserves the industry will have to maintain – enough to cover frequency swings that only occasionally reach down to perhaps 59.9 Hz as we see on the Interconnection today (essentially the allocated FRO for a 0.1Hz deviation), enough to cover a 4500 MW loss, or whatever we deem appropriate as long as we are compliant to the FRM? We recognize that the Standard Drafting Team cannot answer this question, as the Standard under development is not within the scope of this team, however our comment is meant to illustrate the point that similar to our response to question 8, it should be recognized that elements of this Standard are tightly coupled to other current and potential Standards, and the impacts must be considered by the Industry.

No

Please see our comments to Question 6. In addition, Duke Energy disagrees with the statement on page 9 that Attachment B will "ensure there is no negative impact on other Standards" – please see our response to Question 8 for additional information.

No

Duke Energy suggests that the SDT consider a term other than "Initial' in the title for Table 1. We suggest "Proposed Frequency Bias Setting" for Table 1. Notwithstanding our suggestion that the criteria/requirements of the minimum FBS in the Attachment be incorporated into the Standard, Duke Energy has the following concerns with what is proposed: As cited in our comments to Question 8 in the last posting (extensive, so not repeated here), the secondary control measures of CPS1, CPS2 and the draft Balancing Authority ACE Limit (BAAL) are tightly coupled to the Frequency Bias Setting (FBS), and a reduction of the FBS will impact the secondary control requirements placed upon the BA. Noted in our response to Question 7 above, the statement on page 9 in the "BAL-003-1 Background Document"is not correct in stating that Attachment B will "ensure there is no negative impact on other Standards". The gradual reduction of the FBS will proportionally tighten the secondary control limits for each Balancing Authority. Even if the "natural" Frequency Response in the Eastern Interconnection remains unchanged for the next several years, under the process described allowing the ERO to annually adjust the minimum FBS for the Interconnection, the FBS will eventually be reduced to a value approximately 10% above the calculated response in magnitude, cutting the current CPS1, CPS2 and BAAL limits in the Eastern Interconnection on average by more than half. The current FBS for the Eastern Interconnection is approximately minus 6500 MW/0.1Hz, estimated "natural" Frequency Response is perhaps around minus 2400 MW/0.1Hz. Unlike CPS1 and BAAL where the measures are based upon the FBS of the BA only, CPS2 (dependent upon the FBS of the BA and the Interconnection) will be significantly limiting to the degree that no change in a BA's own Frequency Response could significantly change its CPS2 limit if the Interconnection FBS drops over time as indicated. At least under CPS1 and the draft BAAL, the BA would have an option of improving its Frequency Response, allowing it to increase its FBS and proportionally the CPS1 and BAAL bounds using the FBS. Conclusion from our last comments submitted: Duke Energy does not believe there is a reliability need pushing the industry to tighten secondary control to the degree discussed above simply as a result of reducing the Frequency Bias Setting. If the calculated Frequency Response of the Interconnection stayed at its current level, what would be the justification for tightening the secondary control requirements of CPS1, CPS2 and the proposed BAAL? Duke Energy supports taking more of the error out of the ACE equation by having the FBS closer to the estimated Frequency Response of the Balancing Authority, however, Duke Energy does not believe the result should be a significant increase in secondary control costs to meet the CPS1, CPS2, or draft BAAL requirements. Duke Energy understands the position placed upon this Standard Drafting Team- the secondary

control and reserve requirements are not under the scope of the team, however, proper consideration has not been given in Attachment B to the impact lowering the FBS will have on the industry in terms of the requirements placed upon the BA for secondary control and reserve requirements – especially for meeting CPS2. The research discussed in our comments to the last posting support that reducing the FBS while under CPS1 and the draft BAAL may be achievable, however a CPS2 bound cut potentially in half or lower will place unreasonable bounds on a BA, requiring control actions even when the BA may be operating in support of the Interconnection frequency. Given the significant impacts discussed, Duke Energy believes that additional provisions must be in place for the Industry to approve each subsequent revision to the calculation of the minimum Frequency Bias Setting, rather than leave it as a decision made only by the ERO.

Yes

Duke Energy appreciates the significant work of the Standard Drafting Team in putting together the draft Standard and extensive supporting documentation. Upon further consideration of the comments above, Duke Energy has concluded that the work of this Standard Drafting Team and that of the Balancing Authority Reliability-Based Control Standard Drafting Team under Project 2010-14 developing the Balancing Authority ACE Limit to replace CPS2, need to presented to the Industry as a package – there is too much at stake to have one Standard impact other Standards to this degree. Done in a vacuum the Industry is faced with the possibility of secondary control bounds being cut in half or more, though there is no reliability need driving such performance requirements. Thank you.

ISO/RTO Council Standards Review Committee

Al DiCaprio

No

(1) In our previous comments, we suggested to drop the definitions for the terms FRM and FRO in favor of providing the needed wording in the standard itself to take care of the specific details. The SDT did not adopt our suggestion with the reason that these definitions will be used by other standards in the future. That's fair enough. However, the FRM definition: "The median of all the Frequency Response observations reported annually on FRS Form 1" is problematic. It references an FRS Form 1 which is not included in the definition itself but is in fact an Attachment to a standard. In the current NERC Glossary of Terms, there is no such precedence that a definition must rely on the requirements or details in a standard for completeness. Also, it is very cumbersome that when changes are made to FRS Form 1, the definition must be posted for industry comment and balloting, and vice versa. When other standards begin using the term, there will be cross references between standards. This further complicates the update/approval process without any appreciable value. Once again, we strongly urge the SDT to consider dropping these definitions, and have the details fully specified in the standard body itself. This will eliminate that cross reference issue. After all, the definition for FRM is a simple sentence and does not provide any clarity or specific details that cannot be presented by using appropriate wording in a requirement. (2) The definition of Frequency Bias Setting, if retained, should focus on what it is. Balancing Authorities do not supply energy. We suggest to revise it to: Frequency Bias Setting A number, either fixed or variable, usually expressed in MW/0.1 Hz, included in a Balancing Authority's (BA's) Area Control Error (ACE) equation to approximate the expected natural response provided by the assets within the respective Balancing Authority's area.

No

General Comments The SRC offers the following general comment with regard to the SDT's proposed revisions: Gerry Cauley's Results based initiative calls for requirements that focus on performance (i.e. WHAT must be accomplished NOT on WHY it is required or HOW it should be accomplished). The SRC has found that such explanatory statements as the SDT is proposing lead to ambiguities and confusion in the compliance application. Compliance Enforcement agents must consider not just the results but must decide if the action was taken for the given reason. To avoid such confusion, the Results based approach uses reference documents to address such background material while leaving the requirement as a direct mandate. The SRC notes: • All NERC Reliability Standards' requirements must reside within the standard itself (which is vetted by the Industry and subject to FERC approval). • Data requirements are better handled through NERC's Rules of Procedure Section 1600 than by mandating that ad hoc Forms be submitted. • Definitions should be generic, and should be self-contained (i.e. should not reference an external document). • The decisions regarding alternative

methodologies should be decided by the Industry not by the SDT. The SDT should make its case and ask the Industry for its approval. Regarding Order 693 directives, the SRC notes that there are three directives as follows: (1) To include Levels of Non-Compliance; (2) To determine the appropriate periodicity of frequency response surveys necessary to ensure that Requirement R2 and other requirements of the Reliability Standard are being met, and to modify Measure M1 based on that determination and (3) To define the necessary amount of Frequency Response needed for Reliable Operation for each balancing authority with methods of obtaining and measuring that the frequency response is achieved. The SRC suggests that Directive 2 be handled directly as a mandate that the ERO conduct a fixed number of Frequency Response Surveys for randomly selected events. Discussion of the number and the methodology can be explained in a reference document and leave the specifics to the requirement. Directive 3 is critical to the Industry as it relates to who is the Applicable Entity. The SDT addresses Directive 3 by mandating Balancing Authorities meet an objective. The directive is to define that Objective, but there is no requirement associated with that Objective. There is an attachment and there are discussions of what "may" be done, but there is no requirement in the Standard itself. The reference to the BA as the provider of Frequency Response (i.e. Primary Control response) runs counter to other FERC directives that mandate obligated entities be able to self-serve or to interchange provision of services. In this case the BA per se has no assets and cannot self-serve, moreover the primary response service providers have no obligations to provide the service, thus the BA potentially could face a situation where there is no physical service to be purchased but there is a federally mandated standard to comply with. The idea of creating a Primary Response Market as some have proposed does not work without an obligation on some entity to physically provide that service. One final note, the SRC points out that the ACE is an error signal used to drive secondary response; it is not a signal to drive primary response. Thus the use of the Frequency Bias setting is not for control, it is for "adjusting" the error measure that is analyzed after the fact. This standard needs: • a requirement on the ERO to compute the Obligation on each Interconnection • a requirement on the ERO to conduct Frequency Response surveys (note the SRC does not support this requirement but believes that it is needed to meet the FERC directive) • a requirement on energy supply assets (both generation and load) to provide primary response (as a function of the Interconnection obligation in the first bullet) The above will allow NERC to comply with the FERC directives in a fashion consistent with the processes and procedures approved by FERC. Specific recommendations: The SRC proposes that R1 be deleted based on the facts that: • It imposes an obligation on an entity that has no capability to comply • There is an internal conflict with imposing penalties on a deterministic basis (compliance with a fixed set of events) for a statistical service (primary response is a function of the assets operating state and not a fixed service of the asset). In any case, all of the words after FRO should be deleted. The words are not needed for the requirement and if left in can become a source of contention between auditors and registered entities. R3 – delete the added phrase "mode to effectively coordinate control". The phrase "would have an Adverse Impact on the BA's area" needs further discussion. Who makes the decision that operating on AGC will have adverse impact must be defined. R5 – delete the phrase "In order to ensure control response". Such phrases can be needless causes of debate. If a BA uses one of the bulleted methods but does not get "adequate response" then is the BA non-compliant? What is "adequate response"? Who decides if the response is adequate?
Yes
No
M1: The measure should not be tied to a specific Form. If a BA has the evidence but does not provide it on a given Form, how is the reliability of the Power System impacted? The Form may be the format of choice but it should not be an implied requirement. M4: This measure does not read quite right. Something seems to be missing in the part that says: "…showing when Overlap Regulation Service is provided including Frequency Bias Setting calculation to demonstrate compliance with Requirement R4." This part might have read something like: "…showing that when it performed Overlap Regulation Service, it modified its Frequency Bias Setting in its ACE calculation or it calculated the Frequency Bias Setting meeting the conditions specified in Requirement R4."
Yes
We do not have any issues with the VSLs, but wonder if the wording for R1 should have been "…Reserve Sharing Group's…". Alternatively, the wording after "interconnection's FRO" could be revised to: "…and the Balancing Authority's or the Reserve Sharing Group's FRM was…"

No
Despite the SDT's good faith effort to convert the previous Attachment A into two separate documents (Attachments A and B), the modified Attachment A is problematic. As many commenters indicated, the previous Attachment A, other than the section providing guidance on event selection, appears to be explanatory, contextual, and instructional in content. These aspects are important, but do not rise up to the level of requirements to drive reliability performance/outcome. Attachment A should include only the event selection process and calculations associated with the requirements, including an explanation of what is necessary if variable Frequency Bias Settings are implemented. If other "requirements" need to be specified, such as the reporting time frame stipulated on P. 3 of Attachment A, they should be moved to the standard itself but not imbedded in an attachment. We suggest that the SDT first determine if the materials in the revised Attachment A (and Attachment B) are "Guideline" or Technical Background", or are they "requirements". If it is the former, then Requirement R1 should not mention Attachment A at all. If it is the latter, then the as-written Attachment A is a mix bag as it on the one hand describes the ERO's process for supporting the Frequency Response Standard (FRS), in other words, the method and criteria it uses to calculate the frequency bias settings and the FRM, and on the other hand the BA's obligations to support this process. We strongly disagree that the latter requirements be imbedded in an attachment, especially one that is supposed to provide the technical background and guideline for another entity which is not held responsible for complying with the proposed method. Further, there are no measures provided for the requirements stipulated/imbedded in Attachment A so how can the Responsible Entity (BA, in this case) be assessed for compliance? We suggest the SDT move those requirements on the BA to the main standard, and turn Attachment A into an appendix describing the calculation process. An appendix is not regarded as a mandatory requirement. Similar comments apply to Attachment B. Moreover, if the Attachments are to be integral to the standards, the terminology "may" must be replaced with "shall". Finally, the two Attachments are listed in Section F – Associated Documents. This Section is generally used to list reference documents that are NOT standard requirements. We suggest the SDT review and revise this listing depending on its final determination of the status of the two Attachments (or their revisions, where appropriate).
We do not have an opinion on whether or not the Background Document provides sufficient clarity to the development of the standard. We do, however, suggest that the SDT consider our comments in Q6, above, and move some of the information from Attachments A and B to or combine with the Background Document, to the Background Document to provide all the technical basis and background behind the elements stipulated in the requirements.
No
Please see our comments under Q6. In brief, we do not agree with including a process description type of document as part of the standard requirement. Process description should be regarded guideline document and not a part of the standard requirement.
No
If we are not mistaken, Form 2 is added as the last sheet in the Form 1 spreadsheet file. Apart from that, however, there are other sheets added to the previous Form 1. But this Comment form makes no mention of the changes, nor is there a question in the Comment Form asking whether the additional information should be requested. We believe this is a significant change to the standard and many commenters may have missed the opportunity to comment on it. Compared to the previous version, Form 1 has been significantly expanded to include not only additional sheets but much more comprehensive data requirements even on the Data Entry sheet itself. This makes data submission a very time-consuming task but the justification for requiring detailed data entry has not been provided. We question the need for such expansion on data entry requirements. We have yet to see the reason for expanding Form 1 in assisting a BA to provide the data needed to comply with the standard, hence we do not see how adding a Form 2 can help in that regard. We suggest the SDT to keep data requirements to only what is minimally needed to support the FRS reporting process. Where the SDT deems additional data entry sheets to be necessary, it should provide the rationale for expanding from a 2 sheet form into a multiple sheet form for additional data collection. Where the SDT deems the additional data sheet or information not necessary to support FRS reporting, then we suggest the SDT to hide those pages not required for the standard so as to avoid confusion, and/or to remove those analytical pages not directly used in the standard.
Finally, we ask the SDT to clarify what the primary purpose of this standard is. If it is to respond to Order 693 then the standard misses the point of defining how often to run Frequency Response

Surveys; it does not crisply define the “Interconnection” obligations. If the SDT wants to focus on AGC (which it seems to try to do) then the focus should be on the equations and variables and not on the response performance. If the SDT does want to focus on performance then the issue of who is the default provider must be addressed. As the SRC has noted previously, BAs do not own any generating facilities or service providers. To create standards that apply to entities that are completely dependent on other functional entities (facility owners or service providers) to comply with a requirement is simply improper. The Industry structure has changed but these requirements have not and still assume old industry relationships between BAs and GOs. This issue of who needs to be held responsible for performing the required reliability tasks and services/products must be explicitly cited in the standards and posted for the industry to debate and decide.
ACES Power Marketing Standards Collaborators
Jason L. Marshall
Yes
No
Requirement 1 should not apply to a Reserve Sharing Group. Reserve Sharing Groups (RSG) are designed to share Contingency Reserves and/or Operating Reserves not Frequency Response. While these reserves may be frequency responsive, they are not being shared for the purpose of expanding frequency response. Furthermore, while reserve sharing groups may calculate a joint ACE by summing its individual BA ACE values, RSGs do not have a Frequency Bias Setting which is necessary to assess a Frequency Response Obligation.
Yes
Yes
No
The VSLs on for Requirement R1 set a previously un-established precedent of relying on the performance of other registered entities to establish the severity level of the violation. This is not appropriate. The VSLs should be rewritten to provide further gradations of the violation severity based on the BA’s own performance.
No
Under item 3 of the Event Selection Criteria section, the delta F and Point C should be described either in this attachment or the “Frequency Response Standard Background Document”. While many in industry may understand what these terms mean, history has a way of getting lost with personnel turnover. Furthermore, this would help ensure that the auditors and industry have a duplicate understanding. In the Frequency Response Obligation section on page 2, several items require more description. Further description of why an N-2 event was chosen for the Contingency Protection Criteria should be provided and which N-2 event was selected so that industry can help validate if the correct MW value was selected. Furthermore, the document should clarify if the Contingency Protection Criteria contains the “safety margin”. There is a statement in the paragraph before the table that states it does but then the table lists out a separate 25% “Safety Margin”. Thus, it is not clear if the “Safety Margin” is included in the Contingency Protection Criteria value listed in the table or not. “Safety margin” should be changed to “reliability margin”. Safety has a specific meaning in the electric industry and its use here is not appropriate. The Base Obligation should be explained. The explanation should include its purpose and origin.
No
We can find no document titled “BAL-003-1 Background Document”. We assume this question is referring to the “Frequency Response Standard Background Document” dated October 2011. We do not believe the document provides sufficient clarity. No explanation is provided for why RSG was added to Requirement R1. There are typos contained in the document. On page 6 in NIA, the A should be in subscript. On page 7 in bullet 4 in the first sentence, “The” should be in lowercase.
Yes

The Data Retention section requires the BA to retain data or evidence for up to four years. No data that exceeds the audit cycle should be required to be retained. The audit cycle is three years.
Robert Blohm
Keen Resources Asia Ltd.
No
In the Standard, the definition of Frequency Response Measure (FRM) is statistically wrong. The median is an improper statistical measure of Frequency Response because --it truncates large excursions which are the specific subject of Frequency Response control, not normal operating frequency errors which are self-correcting and are the subject of CPM control; --it is non-linear; and therefore --it is non-summable over the interconnection; in other words, the individual BA medians don't add up to the interconnection median, in complete incompatibility with CPM control which requires summability of BA performances into the interconnection's performance. Moreover, it is mathematically impossible to sum the medians of the BAs in a Reserve Sharing Group (RSG) into the RSG's median: in other words, the RSG's median cannot represent the sum of the medians of its members. The last paragraph on page 5 of the Background Document is patently wrong, invented, and supported in no probability & statistics literature whatsoever. As a practicing statistician, I hereby give testimony to the utter falsehood of the statement that "In general, statisticians use the median as the best measure of central tendency when a population has outliers." (See http://www.robertblohm.com/BestStatistic.doc for an explanation of "best statistic" which is a highly technical and central topic in modern probability theory and statistics.) Also, "outliers" are falsely and rhetorically claimed to be "noise" when in fact they are the "events" that are the specific subject of Frequency Response. It is well known that they do not "fit" a normal distribution. They are distinct from the normal operating errors that are the subject of CPM control. The paragraph does correctly conclude that the linear regression more accurately incorporates outliers than the median does, although the paragraph uses rhetoric by calling this improvement "skew" as if it is distortionary when, in fact, the median distorts the reality.
Yes
Yes
Yes
Yes
No
The sample pre-selection described in Attachment A, Event Selection, Criteria 2 & 7, violates the fundamental statistical procedure of unbiased sampling. A population is governed by a single "process" which, when stationary, is represented by a fixed probability distribution. In this case the population is several years of events (which are the subject of Frequency Response), not of normal operating control errors which are the subject of CPM control. A sample is governed by a single process that approximates the process governing the population as the sample gets larger, in this case if it includes several years of data. Samples are measured "as they come", no triage/filtering allowed, and they are called "stratified" when their distribution approximates the population distribution. Unlike normal operating errors, samples of events are not evenly distributed over a year. The attempt in criteria 2 & 7 to pre-select only certain events, and not others, in such a way that the selected events occur evenly throughout the year, is papently wrong because it is trying to "fit" events into a process (even distribution over time) that does not govern events, but that instead governs normal operating errors that are the subject of CPM control, not of this Frequency Response standard. In other words, criteria 2 & 7 confuse Frequency Response with CPM, and events with normal operating errors. The result is a false, biased sample which destroys the integrity of this standard. Paragraph 4 on page 5 of the Background Document, on the other hand, provides a statistically correct description of event selection without sample pre-selection and should followed instead of the erroneous criteria 2 & 7 in Attachment A.
Yes
Paragraph 4 on page 5 of the Background Document provides a statistically correct description of

event selection without sample pre-selection and should followed instead of the erroneous criteria 2 & 7 in Attachment A. The risk-based approach to determining FRM, that the Background Document mentions in paragraph 4 of page 4 is being evaluated by the drafting team for application in this standard, should be considered for deployment as soon as possible to replace the administered method currently proposed in this standard, because the administered method lacks any technical justification. No such justification was ever attempted in the development of this standard. The administrative method of determining FRM is therefore but a highly dubious "quick fix" until the risk-based method is evaluated and implemented. The administrative method is in fact perverse because it discourages BAs from reducing their contribution to frequency error by refusing to reduce the BA's FRO accordingly, and because it encourages BAs to contribute to frequency error without increasing their FRO.

Yes

Yes

As a qualified professional statistician I attest that this standard commits two violations of fundamental statistical best practices: use of a median, and biased sample-preselection, as detailed in my answers to questions 1 and 6.

Sacramento Municipal Utility District (SMUD)

Joe Tarantino

No

As drafted, requirement R1 requires Balancing Authorities or Reserve Sharing Groups (RSGs) to achieve an annual Frequency Response Measure (FRM) that is equal to or more negative than its Frequency Response Obligation (FRO). As RSGs exist today, FRM performance by an RSG is not contemplated in the definition of FRM and appears to apply more towards 'secondary response'. Recommend clarifying this concept and possibly including an example in the background document to help explain how this would work. As drafted, in requirement R3, each Balancing Authority not receiving Overlap Regulation Service to operate its AGC in Tie Line Bias mode… unless such operation would have an Adverse Reliability Impact on the Balancing Authority's Area. There may be occasions in which an entity needs to perform testing or other instances where it is necessary or desirable to operate in a mode other than Tie Line Bias that does not qualify as an Adverse Reliability Impact, but never the less is necessary or desired. Recommend including language that would permit operation other than Tie Line Bias mode provided the Reliability Coordinator was notified. We seek clarification from the drafting team as to whether or not there will be any conflicts between proposed Requirement R3 and the requirements of FERC-approved regional reliability standard BAL-004-WECC-1 – Automatic Time Error Correction.

No

The standard is unclear as to if there is an upper limit to the amount of frequency response expected of the Balancing Authorities under this standard. Except for Table 2 in Attachment A, there is no discussion of an amount of Frequency Response expected on a total basis. Balancing Authorities need to know for how many tenths of a hertz they are to respond so they can determine how to plan to meet this requirement. The documents do not appear to provide any boundary on the maximum amount of Frequency Response that a BA will provide, i.e. it is not clear what will happen if an event occurs in the Eastern Interconnection that causes the frequency to drop to less than 59.6 Hz or in the Western Interconnection that causes the frequency to drop to less than 59.5 Hz, or if that event is excluded from the list used to calculate the Balancing Authorities' response or is it included with an expectation that it counts the same as any other event. Without a clear statement of what is expected, including whether there is a limit on that expectation or not, it is unclear what is expected of the Balancing Authorities.

No
In addition to the requirements, reducing frequency bias obligation results in generation tripping closer to the set point. It seems that Lowering the Minimum Frequency Bias Setting from 1% to .8% will result in a lower response, which in turn will lower the natural frequency response. Over time it seems this pattern would lead to poorer response.
As a final comment we believe there needs to have consideration for a coordinated response rather than a setting threshold. Coordinated response thresholds values will provide for a desired and anticipated frequency response.