

Comment Form for Second Posting of Frequency Response SAR

Please use this form to submit comments on the second draft of the Frequency Response SAR. Comments must be submitted by **May 3, 2006**. You must submit the completed form by emailing it to sarcomm@nerc.com with the words "Frequency Response" in the subject line. If you have questions please contact Maureen Long at maureen.long@nerc.net or 813-468-5998.

ALL DATA ON THIS FORM WILL BE TRANSFERRED AUTOMATICALLY TO A DATABASE.

- DO:**
- Do** enter text only, with no formatting or styles added.
 - Do** use punctuation and capitalization as needed (except quotations).
 - Do** use more than one form if responses do not fit in the spaces provided.
 - Do** submit any formatted text or markups in a separate WORD file.

- DO NOT:**
- Do not** insert tabs or paragraph returns in any data field.
 - Do not** use numbering or bullets in any data field.
 - Do not** use quotation marks in any data field.
 - Do not** submit a response in an unprotected copy of this form.

Individual Commenter Information		
(Complete this page for comments from one organization or individual.)		
Name:	Baj Agrawal	
Organization:	Arizona Public Service Co.	
Telephone:	602-371-6386	
E-mail:	bagrawal@apsc.com	
NERC Region		Registered Ballot Body Segment
<input type="checkbox"/> ERCOT	<input checked="" type="checkbox"/>	1 — Transmission Owners
<input type="checkbox"/> FRCC	<input type="checkbox"/>	2 — RTOs, ISOs, Regional Reliability Councils
<input type="checkbox"/> MRO	<input type="checkbox"/>	3 — Load-serving Entities
<input type="checkbox"/> NPCC	<input type="checkbox"/>	4 — Transmission-dependent Utilities
<input type="checkbox"/> RFC	<input checked="" type="checkbox"/>	5 — Electric Generators
<input type="checkbox"/> SERC	<input type="checkbox"/>	6 — Electricity Brokers, Aggregators, and Marketers
<input type="checkbox"/> SPP	<input type="checkbox"/>	7 — Large Electricity End Users
<input checked="" type="checkbox"/> WECC	<input type="checkbox"/>	8 — Small Electricity End Users
<input type="checkbox"/> NA – Not Applicable	<input type="checkbox"/>	9 — Federal, State, Provincial Regulatory or other Government Entities

Comment Form for Second Posting of Frequency Response SAR

Background Information

Please review the drafting team's consideration of the comments submitted with the first draft of the Frequency Response SAR and then review the drafting team's conforming changes made to SAR. Because the changes to the SAR were so extensive, there is no 'red line' version to show the changes from the first draft.

You do not have to answer all questions. Enter All Comments in Simple Text Format.

Insert a "check" mark in the appropriate boxes by double-clicking the gray areas.

1. Do you agree that comments from the first posting of the SAR were adequately addressed?

Yes

No

Comments:

2. Do you agree with the list of proposed requirements included in the detailed description of the revised SAR?

Yes

No

The requirements on individual generator are unnecessary. The requirements should be on a group of generators in a control area to achieve a desired response. Thus, one could have some generators which are being operated as non responsive and the others which are responding well to offset for those which are not responsive.

Additionally, the 10 MW size requirements are too restrictive and unnecessary. It should be plant based and should apply to plants of 100 MW or more aggregate capacity. In any realistic scenario, the smaller plants are not expected to contribute much to frequency response and hence subjecting them to frequency response requirements is uneconomic.

Comments:

3. Do you agree that the proposed standard(s) would be applicable to the Reliability Coordinator, Balancing Authority, Generator Owner, and Load-serving Entity?

Yes

No

Comments:

Comment Form for Second Posting of Frequency Response SAR

4. The current standard on Bias requires a Balancing Authority to carry a minimum bias equal to 1% of peak load. As an example, in the Eastern Interconnection, this value is double current natural frequency response. Should the standard provide an incentive, such that a Balancing Authority can use a bias equal to their natural response, but less than 1% of peak, if the response is above an acceptable target?

Yes

No

Comments:

Comment Form for Second Posting of Frequency Response SAR

5. Several commenters suggested response should be measured for an extended period after a frequency excursion, up to the point where automatic generation control (AGC) would take over. This was to ensure initial response wasn't withdrawn prematurely. Should the standard measure out to 60 seconds following an excursion?

Yes

No

Most of the frequency recovery happens in first 30 seconds. Thus anything more than 30 seconds is unnecessary. It is also seen that the response of a unit varies greatly within that 30 seconds period. Thus, it is very important that the measured response be the average response over the 30 seconds period and not be the response at 30 seconds.

Comments:

6. Do you have other comments on the SAR?

Comments:

Comment Form for Second Posting of Frequency Response SAR

Please use this form to submit comments on the second draft of the Frequency Response SAR. Comments must be submitted by **May 3, 2006**. You must submit the completed form by emailing it to sarcomm@nerc.com with the words "Frequency Response" in the subject line. If you have questions please contact Maureen Long at maureen.long@nerc.net or 813-468-5998.

ALL DATA ON THIS FORM WILL BE TRANSFERRED AUTOMATICALLY TO A DATABASE.

- DO:**
- Do** enter text only, with no formatting or styles added.
 - Do** use punctuation and capitalization as needed (except quotations).
 - Do** use more than one form if responses do not fit in the spaces provided.
 - Do** submit any formatted text or markups in a separate WORD file.

- DO NOT:**
- Do not** insert tabs or paragraph returns in any data field.
 - Do not** use numbering or bullets in any data field.
 - Do not** use quotation marks in any data field.
 - Do not** submit a response in an unprotected copy of this form.

Individual Commenter Information		
(Complete this page for comments from one organization or individual.)		
Name:	Anita Lee	
Organization:	AESO - Alberta Electric System Operator	
Telephone:	403 539 2497	
E-mail:	anita.lee@aeso.ca	
NERC Region		Registered Ballot Body Segment
<input type="checkbox"/> ERCOT	<input type="checkbox"/>	1 — Transmission Owners
<input type="checkbox"/> FRCC	<input checked="" type="checkbox"/>	2 — RTOs, ISOs, Regional Reliability Councils
<input type="checkbox"/> MRO	<input type="checkbox"/>	3 — Load-serving Entities
<input type="checkbox"/> NPCC	<input type="checkbox"/>	4 — Transmission-dependent Utilities
<input type="checkbox"/> RFC	<input type="checkbox"/>	5 — Electric Generators
<input type="checkbox"/> SERC	<input type="checkbox"/>	6 — Electricity Brokers, Aggregators, and Marketers
<input type="checkbox"/> SPP	<input type="checkbox"/>	7 — Large Electricity End Users
<input type="checkbox"/> WECC	<input type="checkbox"/>	8 — Small Electricity End Users
<input type="checkbox"/> NA – Not Applicable	<input type="checkbox"/>	9 — Federal, State, Provincial Regulatory or other Government Entities

Comment Form for Second Posting of Frequency Response SAR

*If more than one Region or Segment applies, indicate the best fit for the purpose of these comments. Regional acronyms and segment numbers are shown on the prior page.

Background Information

Please review the drafting team's consideration of the comments submitted with the first draft of the Frequency Response SAR and then review the drafting team's conforming changes made to SAR. Because the changes to the SAR were so extensive, there is no 'red line' version to show the changes from the first draft.

You do not have to answer all questions. Enter All Comments in Simple Text Format.

Insert a "check" mark in the appropriate boxes by double-clicking the gray areas.

1. Do you agree that comments from the first posting of the SAR were adequately addressed?

Yes

No

Comments:

2. Do you agree with the list of proposed requirements included in the detailed description of the revised SAR?

Yes

No

The purpose is definitely suggested for under frequency conditions. However, when specifying that the generators shall have governors with droop etc... the role of the governor is for both high and low frequency conditions and not just underfrequency FRR. In a market environment it is very possible that not every generator will provide FRR services. Thus, the governor and governor deadband should be a requirement to interconnect to a power system. Generators that provide FRR shall have responsive governor and prime mover.

The standard is based on balancing area response which will include generators and in some jurisdictions will include load. So is the intent that whatever load is considered, additional FRR resources such as generators are used to provide the required FRR?

What about load as FRR providers? Some industrial facilities are capable to dynamically vary the load of the facility to frequency (ie virtual governor). The standard should apply to FRR providers which can be generators and loads.

We agree that generator owners have an obligation to have working governors or provide explanations why not. The "10 MW" requirement should be evaluated for consistency with other standards. This should not hold up the progress of the SAR, but should be evaluated by the ultimate standard drafting team. Comments:

3. Do you agree that the proposed standard(s) would be applicable to the Reliability Coordinator, Balancing Authority, Generator Owner, and Load-serving Entity?

Comment Form for Second Posting of Frequency Response SAR

Yes

No

The Generator Operator may also have some responsibilities, such as the selection of control modes.

We're not sure what the LSE can do regarding the standard. They cannot control response from load. The exception may be coordination of frequency response with UFLS.

Planners may have some responsibilities with regard to new interconnections and also using observed frequency response in models as opposed to theoretical response. Comments:

4. The current standard on Bias requires a Balancing Authority to carry a minimum bias equal to 1% of peak load. As an example, in the Eastern Interconnection, this value is double current natural frequency response. Should the standard provide an incentive, such that a Balancing Authority can use a bias equal to their natural response, but less than 1% of peak, if the response is above an acceptable target?

Yes

No

There should be a safeguard in place, such that if frequency performance declines, the industry reverts to the 1% minimum. Comments:

Comment Form for Second Posting of Frequency Response SAR

5. Several commenters suggested response should be measured for an extended period after a frequency excursion, up to the point where automatic generation control (AGC) would take over. This was to ensure initial response wasn't withdrawn prematurely. Should the standard measure out to 60 seconds following an excursion?

Yes

No

Sixty seconds is a reasonable balance to capture the period prior to AGC response. Comments:

6. Do you have other comments on the SAR?

No Comments:

Comment Form for Second Posting of Frequency Response SAR

Please use this form to submit comments on the second draft of the Frequency Response SAR. Comments must be submitted by **May 3, 2006**. You must submit the completed form by emailing it to sarcomm@nerc.com with the words "Frequency Response" in the subject line. If you have questions please contact Maureen Long at maureen.long@nerc.net or 813-468-5998.

ALL DATA ON THIS FORM WILL BE TRANSFERRED AUTOMATICALLY TO A DATABASE.

- DO:**
- Do** enter text only, with no formatting or styles added.
 - Do** use punctuation and capitalization as needed (except quotations).
 - Do** use more than one form if responses do not fit in the spaces provided.
 - Do** submit any formatted text or markups in a separate WORD file.

- DO NOT:**
- Do not** insert tabs or paragraph returns in any data field.
 - Do not** use numbering or bullets in any data field.
 - Do not** use quotation marks in any data field.
 - Do not** submit a response in an unprotected copy of this form.

Individual Commenter Information		
(Complete this page for comments from one organization or individual.)		
Name:		
Organization:		
Telephone:		
E-mail:		
NERC Region		Registered Ballot Body Segment
<input type="checkbox"/> ERCOT	<input type="checkbox"/>	1 — Transmission Owners
<input type="checkbox"/> FRCC	<input checked="" type="checkbox"/>	2 — RTOs, ISOs, Regional Reliability Councils
<input type="checkbox"/> MRO	<input type="checkbox"/>	3 — Load-serving Entities
<input checked="" type="checkbox"/> NPCC	<input type="checkbox"/>	4 — Transmission-dependent Utilities
<input type="checkbox"/> RFC	<input type="checkbox"/>	5 — Electric Generators
<input type="checkbox"/> SERC	<input type="checkbox"/>	6 — Electricity Brokers, Aggregators, and Marketers
<input type="checkbox"/> SPP	<input type="checkbox"/>	7 — Large Electricity End Users
<input type="checkbox"/> WECC	<input type="checkbox"/>	8 — Small Electricity End Users
<input type="checkbox"/> NA – Not Applicable	<input type="checkbox"/>	9 — Federal, State, Provincial Regulatory or other Government Entities

Comment Form for Second Posting of Frequency Response SAR

Group Comments (Complete this page if comments are from a group.)

Group Name: CP9, Reliability Standards Working Group
Lead Contact: Guy V. Zito
Contact Organization: Northeast Power Coordinating Council
Contact Segment: 2
Contact Telephone: 212-840-1070
Contact E-mail: gzito@npcc.org

Additional Member Name	Additional Member Organization	Region*	Segment*
Kathleen Goodman	ISO-New England	NPCC	2
Ed Thompson	ConEdison	NPCC	1
Peter Lebro	National Grid US	NPCC	1
Al Adamson	New York State Rel. Council	NPCC	2
Bill Shemley	ISO-New England	NPCC	2
Ron Falsetti	The IESO, Ontario	NPCC	2
Murale Gopinathan	Northeast Utilities	NPCC	2
Ralph Rufrano	New York Power Authority	NPCC	1
Roger Champagne	TransEnergie HydroQuebec	NPCC	1
David Kiguel	Hydro One Networks	NPCC	2
Greg Campoli	New York ISO	NPCC	2
Jim Ingleson	New York ISO	NPCC	2
Alden Briggs	New Brunswick System Operator	NPCC	2
Donald Nelson	MA Dept of Tel. and Energy	NPCC	9
Guy Zito	Northeast Power Coord. Council	NPCC	2

*If more than one Region or Segment applies, indicate the best fit for the purpose of these comments. Regional acronyms and segment numbers are shown on the prior page.

Comment Form for Second Posting of Frequency Response SAR

Background Information

Please review the drafting team's consideration of the comments submitted with the first draft of the Frequency Response SAR and then review the drafting team's conforming changes made to SAR. Because the changes to the SAR were so extensive, there is no 'red line' version to show the changes from the first draft.

You do not have to answer all questions. Enter All Comments in Simple Text Format.

Insert a "check" mark in the appropriate boxes by double-clicking the gray areas.

1. Do you agree that comments from the first posting of the SAR were adequately addressed?

Yes

No

No - The intent of this SAR is unclear which highlights that this issue requires additional studies and investigation. In the future, it may be beneficial to develop a standard after a reliability issue is identified, and a specific standard can be developed and implemented to address the issue.
Comments:

2. Do you agree with the list of proposed requirements included in the detailed description of the revised SAR?

Yes

No

The proposed requirements nor the White Paper adequately make the case that there is a need for a frequency response standard at this time. However, it is recommended that the subject be further investigated. The analysis should evaluate if a frequency response standard that addresses the three major short term frequency control components (inertial response, governor response, and automatic generation control) are required. The report writers should include a broad range of participants including (at least) 3 OEM's (original equipment manufacturers) representing steam, gas and hydro generation control. Some specific issues that should be addressed are:

1. Inertial Response: Evaluate historical changes in the inertial response of the electric grid as a result of changing power equipment designs and types of load. For example, the addition of new industrial and aero-derivative turbine-generators have lower inertia-power ratios than traditional nuclear/fossil units and, in addition, they are not base loaded (as a result of more efficient dispatching and improved power plant controls).

3. Governor Response: Evaluate generation governor performance as a result of newer, more configurable prime mover controls. Digital controls provide increased plant reliability, however, this may be at the expense of decreased governor response. For example, the use of main steam pressure controls on steam units and low NOx controls on gas turbines may produce unexpected droop output responses.

3. Automatic Generation Control (AGC): Perform a control area survey to determine if there is sufficient regulation capacity within control areas to maintain generation and load balance. Include a review of incentives and

Comment Form for Second Posting of Frequency Response SAR

penalties for generators to respond accurately and reliably to AGC signals.
Comments:

3. Do you agree that the proposed standard(s) would be applicable to the Reliability Coordinator, Balancing Authority, Generator Owner, and Load-serving Entity?

Yes

No

If required. Comments:

4. The current standard on Bias requires a Balancing Authority to carry a minimum bias equal to 1% of peak load. As an example, in the Eastern Interconnection, this value is double current natural frequency response. Should the standard provide an incentive, such that a Balancing Authority can use a bias equal to their natural response, but less than 1% of peak, if the response is above an acceptable target?

Yes

No

Comments:

Comment Form for Second Posting of Frequency Response SAR

5. Several commenters suggested response should be measured for an extended period after a frequency excursion, up to the point where automatic generation control (AGC) would take over. This was to ensure initial response wasn't withdrawn prematurely. Should the standard measure out to 60 seconds following an excursion?

Yes

No

This question is not clear. AGC control pulses generation every 5 seconds, therefore, the measurement should be based on the amount of time it takes to restore the generation load balance. Comments:

6. Do you have other comments on the SAR?

Comments:

Comment Form for Second Posting of Frequency Response SAR

Please use this form to submit comments on the second draft of the Frequency Response SAR. Comments must be submitted by **May 3, 2006**. You must submit the completed form by emailing it to sarcomm@nerc.com with the words "Frequency Response" in the subject line. If you have questions please contact Maureen Long at maureen.long@nerc.net or 813-468-5998.

ALL DATA ON THIS FORM WILL BE TRANSFERRED AUTOMATICALLY TO A DATABASE.

- DO:**
- Do** enter text only, with no formatting or styles added.
 - Do** use punctuation and capitalization as needed (except quotations).
 - Do** use more than one form if responses do not fit in the spaces provided.
 - Do** submit any formatted text or markups in a separate WORD file.

- DO NOT:**
- Do not** insert tabs or paragraph returns in any data field.
 - Do not** use numbering or bullets in any data field.
 - Do not** use quotation marks in any data field.
 - Do not** submit a response in an unprotected copy of this form.

Individual Commenter Information		
(Complete this page for comments from one organization or individual.)		
Name:		
Organization:		
Telephone:		
E-mail:		
NERC Region		Registered Ballot Body Segment
<input type="checkbox"/> ERCOT	<input type="checkbox"/>	1 — Transmission Owners
<input type="checkbox"/> FRCC	<input type="checkbox"/>	2 — RTOs, ISOs, Regional Reliability Councils
<input type="checkbox"/> MRO	<input type="checkbox"/>	3 — Load-serving Entities
<input type="checkbox"/> NPCC	<input type="checkbox"/>	4 — Transmission-dependent Utilities
<input type="checkbox"/> RFC	<input type="checkbox"/>	5 — Electric Generators
<input type="checkbox"/> SERC	<input type="checkbox"/>	6 — Electricity Brokers, Aggregators, and Marketers
<input type="checkbox"/> SPP	<input type="checkbox"/>	7 — Large Electricity End Users
<input type="checkbox"/> WECC	<input type="checkbox"/>	8 — Small Electricity End Users
<input type="checkbox"/> NA – Not Applicable	<input type="checkbox"/>	9 — Federal, State, Provincial Regulatory or other Government Entities

Comment Form for Second Posting of Frequency Response SAR

Group Comments (Complete this page if comments are from a group.)			
Group Name:		PJM - Corporate Development Division	
Lead Contact:		Albert DiCaprio	
Contact Organization:		PJM	
Contact Segment:		2	
Contact Telephone:		610 - 666 - 8854	
Contact E-mail:		dicapram@PJM.com	
Additional Member Name	Additional Member Organization	Region*	Segment*
Joseph D. Willson	PJM	RFC	2
Mark Kuras	PJM	RFC	2

*If more than one Region or Segment applies, indicate the best fit for the purpose of these comments. Regional acronyms and segment numbers are shown on the prior page.

Comment Form for Second Posting of Frequency Response SAR

Background Information

Please review the drafting team's consideration of the comments submitted with the first draft of the Frequency Response SAR and then review the drafting team's conforming changes made to SAR. Because the changes to the SAR were so extensive, there is no 'red line' version to show the changes from the first draft.

You do not have to answer all questions. Enter All Comments in Simple Text Format.

Insert a "check" mark in the appropriate boxes by double-clicking the gray areas.

1. Do you agree that comments from the first posting of the SAR were adequately addressed?

Yes

No

The Resources Subcommittee in a response to the first draft states "A primary purpose of this standard is to collect information so informed decisions can be made before there is a problem." It is clear from that reply that the Resources Subcommittee wishes to undertake an analysis of the system and needs to collect additional information. This data collection effort may be laudable but it does not rise to the level of being a federally enforced mandatory standard. What if later on the 'data' were to show there is no problem, then there will be a need to rescind the standard and repay those who were non-compliant to a data collection effort.

In their response to the first draft, the Resources Subcommittee cite a WECC study. But they have no similar study for the East. The Resources Subcommittee still has not shown that the decrease in sub-minute response is either (1) a problem or (2) nothing more than an indication that a larger system has more inertia and therefore less response than the smaller system in the past.

This SAR, with its present theoretical focus, posits the BA as the responsible entity for governor response. Even those who agreed with the first posting that Frequency Response is an important issue - stated that a standard cannot define fixed norms (MRO, NYISO, IESO(2)). The BA is not responsible to instantaneous response -at best it can establish a capacity obligation but it can't guarantee continuous response.

Comments:

2. Do you agree with the list of proposed requirements included in the detailed description of the revised SAR?

Yes

No

The SAR is still not clear about what is to be developed in the standard. Of the ten bulleted items several seem to show a misunderstanding between a sub-minute frequency response obligation and Automatic Generation control. The RS must make clear what it wants to do. Sub-minute frequency response occurs with or without frequency bias; sub-minute frequency response is not helped or hurt by having AGC. This is a major problem with the proposal. It is not clear and it is not definitive.

Comment Form for Second Posting of Frequency Response SAR

Item 1 indicates the standard will be a Report

Item 2 states the standard will be flexible (that is mandated in the Process Manual)

Item 3 seems to indicate that non-compliance will be met with a requirement to analyze the incident (if this is standard is so important why isn't every event critical?)

Item 5 is the most unusual - the standard will not mandate a response but will provide "LONG-TERM" targets (how is it that a sub-minute response gets translated into a long-term target?)

Item 6 is to mandate AGC. This is not related to sub-minute frequency response.

Item 7 is to mandate a post-incident survey. Again this is a good idea but it a data collection mandate - it is not a frequency response standard. The RS has the tools to collect that information today, without the need to resort to mandatory penalties.

Item 10 will allow generators to seek exceptions (which means that the RS will allow a generator to opt out and still require the BA to comply. In the absurd case that all generators opt out (let's say the BA has only nuclear units) then according to the RS, the BA is held non-compliant. This is just not a good idea.

In summary: #1 is a calculation and report on response but no measure of performance; #3 requires a BA and the RRO to perform an analysis if response is measurable (by what amount) below the norm (which is a constantly moving value); #4 is the only possibility for true standard; #9 generators must have governors is more a certification issue than a BA standard. Three of the bullets are not requirements (#2, #5, and #10). Two of the bullets are already in other standards while two of the bullets duplicate each other. The SAR team needs to better describe exactly what is being proposed to be in the standard so that the industry can evaluate the proposal. The industry does not need to get involved in a research project. Comments:

3. Do you agree that the proposed standard(s) would be applicable to the Reliability Coordinator, Balancing Authority, Generator Owner, and Load-serving Entity?

Yes

No

This question would require an assumption of what the standard would be. If the standard is to provide sub-minute frequency response, then the only entity should be the generator owner.

Comments:

4. The current standard on Bias requires a Balancing Authority to carry a minimum bias equal to 1% of peak load. As an example, in the Eastern Interconnection, this value is double current natural frequency response. Should the standard provide an incentive, such that a Balancing Authority can use a bias equal to their

Comment Form for Second Posting of Frequency Response SAR

natural response, but less than 1% of peak, if the response is above an acceptable target?

Yes

No

The RS again is avoiding the issue of what sub-minute frequency response it MUST mandate. The 1% is related to the frequency bias setting (basically a long term average response). The BRD deals with the longer term issue of frequency response - this standard was designed for the shorter-term response.

If the RS is willing to accept under-biased systems then it would seem to be going against conventional wisdom, and should explain why it would even consider such an idea. If the real intent of this frequency SAR is to establish a minimum frequency response value then the SAR needs to state that.

Perhaps the SAR should establish a minimum 1 minute response for every generator (if they can't provide it they are obligated to contract for it from another unit) and maybe a 1 minute average over a week, month, or year if a longer term value is needed. However, since the SAR authors state the problem is sub-minute response, it is suggested that the long term response is better be addressed by the BRD standard.

In addition the SAR does not adequately address the load portion of the frequency response. The standard seems to presuppose the solution is having governors.

Comments:

Comment Form for Second Posting of Frequency Response SAR

5. Several commenters suggested response should be measured for an extended period after a frequency excursion, up to the point where automatic generation control (AGC) would take over. This was to ensure initial response wasn't withdrawn prematurely. Should the standard measure out to 60 seconds following an excursion?

Yes

No

Unsure as to what is being suggested here. The SAR drafters need to be specific about what requirements are needed and how they will be measured. The details contained in the white paper are supporting information but they do not define the standard that is being proposed. Comments:

6. Do you have other comments on the SAR?

Please be clear about the terminology. Frequency response comes in many flavors - sub-minute; several minutes; and hours. The RS seems to touch on all of them in this proposal.

Comments:

Comment Form for Second Posting of Frequency Response SAR

Please use this form to submit comments on the second draft of the Frequency Response SAR. Comments must be submitted by **May 3, 2006**. You must submit the completed form by emailing it to sarcomm@nerc.com with the words "Frequency Response" in the subject line. If you have questions please contact Maureen Long at maureen.long@nerc.net or 813-468-5998.

ALL DATA ON THIS FORM WILL BE TRANSFERRED AUTOMATICALLY TO A DATABASE.

- DO:**
- Do** enter text only, with no formatting or styles added.
 - Do** use punctuation and capitalization as needed (except quotations).
 - Do** use more than one form if responses do not fit in the spaces provided.
 - Do** submit any formatted text or markups in a separate WORD file.

- DO NOT:**
- Do not** insert tabs or paragraph returns in any data field.
 - Do not** use numbering or bullets in any data field.
 - Do not** use quotation marks in any data field.
 - Do not** submit a response in an unprotected copy of this form.

Individual Commenter Information		
(Complete this page for comments from one organization or individual.)		
Name:		
Organization:		
Telephone:		
E-mail:		
NERC Region		Registered Ballot Body Segment
<input type="checkbox"/> ERCOT	<input type="checkbox"/>	1 — Transmission Owners
<input type="checkbox"/> FRCC	<input type="checkbox"/>	2 — RTOs, ISOs, Regional Reliability Councils
<input type="checkbox"/> MRO	<input type="checkbox"/>	3 — Load-serving Entities
<input type="checkbox"/> NPCC	<input type="checkbox"/>	4 — Transmission-dependent Utilities
<input type="checkbox"/> RFC	<input type="checkbox"/>	5 — Electric Generators
<input type="checkbox"/> SERC	<input type="checkbox"/>	6 — Electricity Brokers, Aggregators, and Marketers
<input type="checkbox"/> SPP	<input type="checkbox"/>	7 — Large Electricity End Users
<input type="checkbox"/> WECC	<input type="checkbox"/>	8 — Small Electricity End Users
<input type="checkbox"/> NA – Not Applicable	<input type="checkbox"/>	9 — Federal, State, Provincial Regulatory or other Government Entities

Comment Form for Second Posting of Frequency Response SAR

Group Comments (Complete this page if comments are from a group.)

Group Name: Midwest Reliability Organization (MRO)
Lead Contact: Terry Bilke
Contact Organization: Midwest ISO
Contact Segment: 2
Contact Telephone: 317-249-5463
Contact E-mail: tbilke@midwestiso.org

Additional Member Name	Additional Member Organization	Region*	Segment*
Al Boesch	NPPD	MRO	2
Robert Coish	MHEB	MRO	2
Dennis Florom	LES	MRO	2
Ken Goldsmith	ALT	MRO	2
Todd Gosnell	OPPD	MRO	2
Wayne Guttormson	SPC	MRO	2
Darrick Moe, Chair	WAPA	MRO	2
Tom Mielnik	MEC	MRO	2
Pam Oreschnick	XEL	MRO	2
Dick Pursley	GRE	MRO	2
Dave Rudolph	BEPC	MRO	2
Jim Maenner	WPS	MRO	2
Joe Knight, Secretary	MRO	MRO	2
27 Additional MRO Members	Companies Not Named Above	MRO	2

*If more than one Region or Segment applies, indicate the best fit for the purpose of these comments. Regional acronyms and segment numbers are shown on the prior page.

Comment Form for Second Posting of Frequency Response SAR

Background Information

Please review the drafting team's consideration of the comments submitted with the first draft of the Frequency Response SAR and then review the drafting team's conforming changes made to SAR. Because the changes to the SAR were so extensive, there is no 'red line' version to show the changes from the first draft.

You do not have to answer all questions. Enter All Comments in Simple Text Format.

Insert a "check" mark in the appropriate boxes by double-clicking the gray areas.

1. Do you agree that comments from the first posting of the SAR were adequately addressed?

Yes

No

Comments:

2. Do you agree with the list of proposed requirements included in the detailed description of the revised SAR?

Yes

No

In particular we agree that generator owners have an obligation to have working governors or provide explanations why not. The 10 MW requirement should be evaluated for consistency with other standards. This should not hold up the progress of the SAR, but should be evaluated by the ultimate standard drafting team. Comments:

3. Do you agree that the proposed standard(s) would be applicable to the Reliability Coordinator, Balancing Authority, Generator Owner, and Load-serving Entity?

Yes

No

The Generator Operator may also have some responsibilities, such as the selection of control modes.

We're not sure what the LSE can do regarding the standard. They cannot control response from load. The exception may be coordination of frequency response with UFLS.

Planners may have some responsibilities with regard to new interconnections and also using observed frequency response in models as opposed to theoretical response. Comments:

4. The current standard on Bias requires a Balancing Authority to carry a minimum bias equal to 1% of peak load. As an example, in the Eastern Interconnection, this value is double current natural frequency response. Should the standard provide an incentive, such that a Balancing Authority can use a bias equal to their

Comment Form for Second Posting of Frequency Response SAR

natural response, but less than 1% of peak, if the response is above an acceptable target?

Yes

No

There should be a safeguard in place, such that if frequency performance declines, the industry reverts to the 1% minimum. Comments:

Comment Form for Second Posting of Frequency Response SAR

5. Several commenters suggested response should be measured for an extended period after a frequency excursion, up to the point where automatic generation control (AGC) would take over. This was to ensure initial response wasn't withdrawn prematurely. Should the standard measure out to 60 seconds following an excursion?

Yes

No

This is a significant issue, because if the governor system withdraws the unit's support prior to the recovery of frequency, this does have a problematic impact. A period of at least 60 seconds should be considered, and 60 seconds may not be adequate as often frequency recovery of the interconnection extends beyond the initial 60 seconds. Comments:

6. Do you have other comments on the SAR?

Comments:

Comment Form for Second Posting of Frequency Response SAR

Please use this form to submit comments on the second draft of the Frequency Response SAR. Comments must be submitted by **May 3, 2006**. You must submit the completed form by emailing it to sarcomm@nerc.com with the words "Frequency Response" in the subject line. If you have questions please contact Maureen Long at maureen.long@nerc.net or 813-468-5998.

ALL DATA ON THIS FORM WILL BE TRANSFERRED AUTOMATICALLY TO A DATABASE.

- DO:**
- Do** enter text only, with no formatting or styles added.
 - Do** use punctuation and capitalization as needed (except quotations).
 - Do** use more than one form if responses do not fit in the spaces provided.
 - Do** submit any formatted text or markups in a separate WORD file.

- DO NOT:**
- Do not** insert tabs or paragraph returns in any data field.
 - Do not** use numbering or bullets in any data field.
 - Do not** use quotation marks in any data field.
 - Do not** submit a response in an unprotected copy of this form.

Individual Commenter Information		
(Complete this page for comments from one organization or individual.)		
Name:	Ron Falsetti	
Organization:	IESO	
Telephone:	905-855-6187	
E-mail:	ron.falsetti@ieso.ca	
NERC Region		Registered Ballot Body Segment
<input type="checkbox"/> ERCOT	<input type="checkbox"/>	1 — Transmission Owners
<input type="checkbox"/> FRCC	<input checked="" type="checkbox"/>	2 — RTOs, ISOs, Regional Reliability Councils
<input type="checkbox"/> MRO	<input type="checkbox"/>	3 — Load-serving Entities
<input checked="" type="checkbox"/> NPCC	<input type="checkbox"/>	4 — Transmission-dependent Utilities
<input type="checkbox"/> RFC	<input type="checkbox"/>	5 — Electric Generators
<input type="checkbox"/> SERC	<input type="checkbox"/>	6 — Electricity Brokers, Aggregators, and Marketers
<input type="checkbox"/> SPP	<input type="checkbox"/>	7 — Large Electricity End Users
<input type="checkbox"/> WECC	<input type="checkbox"/>	8 — Small Electricity End Users
<input type="checkbox"/> NA – Not Applicable	<input type="checkbox"/>	9 — Federal, State, Provincial Regulatory or other Government Entities

Background Information

Please review the drafting team's consideration of the comments submitted with the first draft of the Frequency Response SAR and then review the drafting team's conforming changes made to SAR. Because the changes to the SAR were so extensive, there is no 'red line' version to show the changes from the first draft.

You do not have to answer all questions. Enter All Comments in Simple Text Format.

Insert a "check" mark in the appropriate boxes by double-clicking the gray areas.

1. Do you agree that comments from the first posting of the SAR were adequately addressed?

Yes

No

Yes, with respect to the responses to the IESO's comments. However, the revised SAR appears to get somewhat mixed up between sub-minute frequency response performance with a longer term (> 1 minute) performance, and lacks clarity on what the proposed standard is intended to stipulate.

Is the proposed standard intended to stipulate:

(a) a minimum frequency response performance level with which to determine if follow-up analysis is to be conducted, or,

(b) requirements for calculating, measuring, reporting and analyzing frequency response, or,

(c) both, in addition to,

(d) requirements for generators to be equipped with governors and if so, the target to be responding to?

If (a) is not specified in the standard, we see a difficulty in stipulating the threshold for (b) and the target for (d).

From the SDT's response to our previous comments ("The new requirements may need to be field tested for an extended duration before compliance with the requirements becomes mandatory. A long field test with extensive data collection may be needed before justifiable minimum performance standards can be identified"). It is our belief the standard is intended to stipulate (b) only. We see this as a necessary first step. However, it may then beg the question of the need of having a standard to develop the basis for a future standard. Might there not be other alternatives to achieve (b) such as by means of a request from the standing committees or NERC to the BAs and the regions to compile this information? Comments:

2. Do you agree with the list of proposed requirements included in the detailed description of the revised SAR?

Yes

No

The intent of some of the requirements is again unclear to the IESO, for example.

Comment Form for Second Posting of Frequency Response SAR

(i) Does Bullet #2 mean the flexibility in the calculation and reporting process or in the target/minimum frequency response level?

(ii) Assuming Bullet #4 a requirement, and one which relates to the minimum level of frequency response, how is this requirement stipulated at this time while data collection and follow-up analysis are to be proposed as standard requirements and field testing has yet to commence? Same comment applies to Bullet #9.

(iii) Bullet #6 appears to go beyond the sub-minute time frame. Further, we are unable to understand the leading sentence "Will not mandate a given amount of frequency response". We feel it is important that if poor frequency response performance in the sub-minute time frame is to be assessed and improved, specific target which may well be the minimum amount of frequency recovery would need to be stipulated.

(iv) Bullet #7 also appears to be beyond the sub-minute time frame, which is to mandate AGC but which should be covered by other BAL standards.

(v) Bullets #8 and #1 appear to be the main requirements for the proposed standard that are achievable at this time.

(vi) As mentioned in (ii) above, we are unable to visualize how the range and target of response be stipulated in the standard before Bullets #1 and #8 are implemented.

(v) If generators are allowed to seek exception, the standard should provide some basic premise that bounds the exception cases rather than leaving the door wide open and the decision solely to the judgment of the BAs and RROs.
Comments:

3. Do you agree that the proposed standard(s) would be applicable to the Reliability Coordinator, Balancing Authority, Generator Owner, and Load-serving Entity?

Yes

No

Not having a good handle on what the standard is intended to achieve and stipulate, we are unable to comment on whom the standard should apply to. Among the ones included in the question, we are unclear on the role of the RC in requiring anyone to install devices or take actions to improve frequency response in day to day operation.

Comments:

4. The current standard on Bias requires a Balancing Authority to carry a minimum bias equal to 1% of peak load. As an example, in the Eastern Interconnection, this value is double current natural frequency response. Should the standard provide an incentive, such that a Balancing Authority can use a bias equal to their natural response, but less than 1% of peak, if the response is above an acceptable target?

Yes

Comment Form for Second Posting of Frequency Response SAR

No

(i) The question seems to get the sub-minute and longer-term targets intertwined. We are unclear on which "standard be provided an incentive". Is it the proposed sub-minute standard which has yet to be determined or the current standard on Bias? If it is the former, then this question seems a bit premature as we don't even know what the performance target for sub-minute response should be. If it's the latter, then the issue belongs to other BAL standards.

Comments:

Comment Form for Second Posting of Frequency Response SAR

5. Several commenters suggested response should be measured for an extended period after a frequency excursion, up to the point where automatic generation control (AGC) would take over. This was to ensure initial response wasn't withdrawn prematurely. Should the standard measure out to 60 seconds following an excursion?

Yes

No

This should cover the entire spectrum of immediate response before AGC kicks in. Comments:

6. Do you have other comments on the SAR?

(i) The SAR does not address the load portion of the frequency response but it indicates that the standard would apply to the LSEs as well. Please clarify or eliminate LSE from the Reliability Function check list.

(ii) We feel that the SAR needs to be very clear on what the proposed standard is intended and what will be included. Conducting calculation, measuring and report on frequency excursion events followed by analysis would help to ascertain whether or not poor performance exists. However, the determination of poor performance also relies on having a minimally acceptable level to gauge. If the standard is to provide requirements for calculation, reporting and conducting analysis only, then there needs to be some general guideline on the threshold for reporting and analyzing, which in turn begs the question of should this "guideline" be included as the initial standard, whose compliance would not be enforced until sufficient experience has been gained and field test conducted, with possible revision as experience and field test so suggest. Absent a minimum performance level, the requirements for governor setting would be difficult to determine. Comments:

Comment Form for Second Posting of Frequency Response SAR

Please use this form to submit comments on the second draft of the Frequency Response SAR. Comments must be submitted by **May 3, 2006**. You must submit the completed form by emailing it to sarcomm@nerc.com with the words "Frequency Response" in the subject line. If you have questions please contact Maureen Long at maureen.long@nerc.net or 813-468-5998.

ALL DATA ON THIS FORM WILL BE TRANSFERRED AUTOMATICALLY TO A DATABASE.

- DO:**
- Do** enter text only, with no formatting or styles added.
 - Do** use punctuation and capitalization as needed (except quotations).
 - Do** use more than one form if responses do not fit in the spaces provided.
 - Do** submit any formatted text or markups in a separate WORD file.

- DO NOT:**
- Do not** insert tabs or paragraph returns in any data field.
 - Do not** use numbering or bullets in any data field.
 - Do not** use quotation marks in any data field.
 - Do not** submit a response in an unprotected copy of this form.

Individual Commenter Information		
(Complete this page for comments from one organization or individual.)		
Name:	Howard F. Illian	
Organization:	Energy Mark, Inc.	
Telephone:	847-913-5491	
E-mail:	howard.illian@energymark.com	
NERC Region		Registered Ballot Body Segment
<input type="checkbox"/> ERCOT	<input type="checkbox"/>	1 — Transmission Owners
<input type="checkbox"/> FRCC	<input type="checkbox"/>	2 — RTOs, ISOs, Regional Reliability Councils
<input type="checkbox"/> MRO	<input type="checkbox"/>	3 — Load-serving Entities
<input type="checkbox"/> NPCC	<input type="checkbox"/>	4 — Transmission-dependent Utilities
<input type="checkbox"/> RFC	<input type="checkbox"/>	5 — Electric Generators
<input type="checkbox"/> SERC	<input type="checkbox"/>	6 — Electricity Brokers, Aggregators, and Marketers
<input type="checkbox"/> SPP	<input type="checkbox"/>	7 — Large Electricity End Users
<input type="checkbox"/> WECC	<input type="checkbox"/>	8 — Small Electricity End Users
<input checked="" type="checkbox"/> NA – Not Applicable	<input checked="" type="checkbox"/>	9 — Federal, State, Provincial Regulatory or other Government Entities

Comment Form for Second Posting of Frequency Response SAR

Background Information

Please review the drafting team's consideration of the comments submitted with the first draft of the Frequency Response SAR and then review the drafting team's conforming changes made to SAR. Because the changes to the SAR were so extensive, there is no 'red line' version to show the changes from the first draft.

You do not have to answer all questions. Enter All Comments in Simple Text Format.

Insert a "check" mark in the appropriate boxes by double-clicking the gray areas.

1. Do you agree that comments from the first posting of the SAR were adequately addressed?

Yes

No

There is an expectation apparent in the first set of responses that indicates that the drafting team believes they have more knowledge of the solutions that will be required than the final standard will contain. The two greatest areas of insufficient understanding lie in the measurement of Frequency Response at less than the full interconnection level and the effect of the standard as envisioned on markets. These two problems are addressed in the comments to later questions in this comment form. Comments:

2. Do you agree with the list of proposed requirements included in the detailed description of the revised SAR?

Yes

No

Requirements that apply to individual generators cannot be implemented as indicated in the standard without failing to comply with Market Interface Principle 2. Frequency Response (Governor Response) have economic costs associated with standing ready to supply. These costs have been documented in EPRI Reports on Ancillary Services. If any generator is given an exception to not provide a response, that generator will also be given a market advantage resulting from the savings they will receive by not providing a response. The SAR as currently written will create a market advantage for all generators below 10 MW and all generators that are given an exception to the governor response requirement. The alternatives to these generator requirements are either not have a competitive market and decide the provision of frequency response administratively (the old VIU method), or determine who provides frequency response through a competitive market process. Comments:

3. Do you agree that the proposed standard(s) would be applicable to the Reliability Coordinator, Balancing Authority, Generator Owner, and Load-serving Entity?

Yes

No

Comment Form for Second Posting of Frequency Response SAR

The requirements applicable to the Generator Owner and Load-serving Entity may only include requirements for measurement processes, not necessarily requirements to provide any frequency response. Comments:

4. The current standard on Bias requires a Balancing Authority to carry a minimum bias equal to 1% of peak load. As an example, in the Eastern Interconnection, this value is double current natural frequency response. Should the standard provide an incentive, such that a Balancing Authority can use a bias equal to their natural response, but less than 1% of peak, if the response is above an acceptable target?

Yes

No

There is a minimum frequency response below which the interconnection will be less reliable than acceptable. We currently do not know what this value is but we do know that a value exists. We also know that this value is less than the 1% of peak load specified in the current standards. A standard that arbitrarily requires a 1% of peak load response without a technical justification based on reliability cannot be called a reliability standard. However, even though we do not know the minimum frequency response below which the interconnection will be less reliable than acceptable, we can perform the work necessary to estimate a reasonable value for a minimum frequency response and assign responsibility for that response among the Balancing Authorities on an interconnection. A Frequency Response Standard without this characteristic cannot maintain reliability of the interconnection. Comments:

Comment Form for Second Posting of Frequency Response SAR

5. Several commenters suggested response should be measured for an extended period after a frequency excursion, up to the point where automatic generation control (AGC) would take over. This was to ensure initial response wasn't withdrawn prematurely. Should the standard measure out to 60 seconds following an excursion?

Yes

No

There are two issues associated with this question. The first is that the change in instantaneous frequency be limited to within a range that limits the risk of a cascading outage on the interconnection. The second is that each generation technology provides a different response characteristic within the first minute after a sudden frequency excursion. Work performed at NIPSCO and published by IEEE indicated that a measurement interval of one to two minutes worked well for the measurement of frequency response. Without specific knowledge of the nature of the individual responses that make up the sustained frequency response to an excursion, it may be difficult to justify the selection of a measurement interval shorter than one-minute that might put some generation technologies at a disadvantage with respect to the measurement method. This is a subject that the drafting team should technically evaluate before including a specific measurement period in the standard. Comments:

6. Do you have other comments on the SAR?

The current measurement methods for determining individual Balancing Authority Frequency Response may not be reliable. This is because the current measurement methods only capture a small sample of the frequency responses provided limited to only several minutes per year. The metering methods we currently use on the interconnection can shed some light on this problem. Since the each BA measures its Tie Line Error with common metering with adjacent BAs, the sum of the Tie Line Errors over the total interconnection must equal zero at all times. Each tie line has a positive error for one BA and a negative error of equal value to the other BA that the tie line connects. If the errors must sum to zero, then the change in errors must also sum to zero between any two points in time. Since the Frequency on an interconnection is the same throughout the interconnection at any point in time for the purpose of the frequency response measurement, the change in frequency between two points in time must also be the same throughout the interconnection. Therefore, the change in tie-line error divided by the change in frequency must indicate a total frequency response for the interconnection as measured by the sum of the individual BA frequency responses must be equal to zero. In other words, there is a BA or a set of BAs that cause each frequency response on the interconnection. Only knowledge of the distribution of individual frequency responses among BAs will provide the necessary information to determine whether or not the frequency response indicated by current measurement methods will maintain adequate reliability. It may not be the average frequency response to large events that indicates interconnection reliability, but the distribution of frequency responses among BAs including both the positive and negative responses. Therefore, the measurement methods included in the standard should have the goal of

Comment Form for Second Posting of Frequency Response SAR

capturing the distribution of both positive and negative frequency responses over the entire range of frequency operation should be a goal of standard. The measurement methods suggested will not accomplish this goal.
Comments:

Comment Form for Second Posting of Frequency Response SAR

Please use this form to submit comments on the second draft of the Frequency Response SAR. Comments must be submitted by **May 3, 2006**. You must submit the completed form by emailing it to sarcomm@nerc.com with the words "Frequency Response" in the subject line. If you have questions please contact Maureen Long at maureen.long@nerc.net or 813-468-5998.

ALL DATA ON THIS FORM WILL BE TRANSFERRED AUTOMATICALLY TO A DATABASE.

- DO:**
- Do** enter text only, with no formatting or styles added.
 - Do** use punctuation and capitalization as needed (except quotations).
 - Do** use more than one form if responses do not fit in the spaces provided.
 - Do** submit any formatted text or markups in a separate WORD file.

- DO NOT:**
- Do not** insert tabs or paragraph returns in any data field.
 - Do not** use numbering or bullets in any data field.
 - Do not** use quotation marks in any data field.
 - Do not** submit a response in an unprotected copy of this form.

Individual Commenter Information		
(Complete this page for comments from one organization or individual.)		
Name:		
Organization: Southern Company Transmission		
Telephone:		
E-mail:		
NERC Region		Registered Ballot Body Segment
<input type="checkbox"/> ERCOT	<input checked="" type="checkbox"/>	1 — Transmission Owners
<input type="checkbox"/> FRCC	<input type="checkbox"/>	2 — RTOs, ISOs, Regional Reliability Councils
<input type="checkbox"/> MRO	<input type="checkbox"/>	3 — Load-serving Entities
<input type="checkbox"/> NPCC	<input type="checkbox"/>	4 — Transmission-dependent Utilities
<input type="checkbox"/> RFC	<input type="checkbox"/>	5 — Electric Generators
<input checked="" type="checkbox"/> SERC	<input type="checkbox"/>	6 — Electricity Brokers, Aggregators, and Marketers
<input type="checkbox"/> SPP	<input type="checkbox"/>	7 — Large Electricity End Users
<input type="checkbox"/> WECC	<input type="checkbox"/>	8 — Small Electricity End Users
<input type="checkbox"/> NA – Not Applicable	<input type="checkbox"/>	9 — Federal, State, Provincial Regulatory or other Government Entities

Comment Form for Second Posting of Frequency Response SAR

Background Information

Please review the drafting team's consideration of the comments submitted with the first draft of the Frequency Response SAR and then review the drafting team's conforming changes made to SAR. Because the changes to the SAR were so extensive, there is no 'red line' version to show the changes from the first draft.

You do not have to answer all questions. Enter All Comments in Simple Text Format.

Insert a "check" mark in the appropriate boxes by double-clicking the gray areas.

1. Do you agree that comments from the first posting of the SAR were adequately addressed?

Yes

No

Comments:

2. Do you agree with the list of proposed requirements included in the detailed description of the revised SAR?

Yes

No

Comments:

3. Do you agree that the proposed standard(s) would be applicable to the Reliability Coordinator, Balancing Authority, Generator Owner, and Load-serving Entity?

Yes

No

Comments:

4. The current standard on Bias requires a Balancing Authority to carry a minimum bias equal to 1% of peak load. As an example, in the Eastern Interconnection, this value is double current natural frequency response. Should the standard provide an incentive, such that a Balancing Authority can use a bias equal to their natural response, but less than 1% of peak, if the response is above an acceptable target?

Yes

No

The 1% minimum frequency bias is obsolete and does not take into account the changes in interconnection frequency response over recent years. If not modified, it will lead to increased frequency oscillations within the interconnections and needless maneuvering of generating assets with associated wear and tear on these assets.

Comments:

Comment Form for Second Posting of Frequency Response SAR

5. Several commenters suggested response should be measured for an extended period after a frequency excursion, up to the point where automatic generation control (AGC) would take over. This was to ensure initial response wasn't withdrawn prematurely. Should the standard measure out to 60 seconds following an excursion?

Yes

No

AGC response begins within only a few seconds after the disturbance with a maximum ramp rate achieved within three to five minutes. Governor response and load frequency response typically peak within 30 seconds. There is some logic to monitoring governor response for sustainability past its initial peak, but we have not seen anything about that in this SAR.

Comments:

6. Do you have other comments on the SAR?

In our opinion, this SAR, or one like it, is required to ensure that the primary frequency response of the interconnections and the BAs do not deteriorate to a point where 1) the interconnection can not adequately respond to major generator trips (including potential multiple contingencies which, though rare, do happen) and 2) primary frequency response of the BAs is inadequate to support islanding during severe local disturbances, thus allowing local disturbances to cascade into regional or interconnection wide disturbances. Primary frequency response is declining in at least the Eastern and Western Interconnections. WECC has taken a proactive approach to addressing this problem, but there is no similar work being done in the Eastern Interconnection. This SAR, or one like it, is needed to take the best practices in the industry, wherever they may be found, and utilize them to protect the interconnections from disturbances that could be avoided if we take action now rather than waiting until the problems actually occur.

Comments:

Comment Form for Second Posting of Frequency Response SAR

Please use this form to submit comments on the second draft of the Frequency Response SAR. Comments must be submitted by **May 3, 2006**. You must submit the completed form by emailing it to sarcomm@nerc.com with the words "Frequency Response" in the subject line. If you have questions please contact Maureen Long at maureen.long@nerc.net or 813-468-5998.

ALL DATA ON THIS FORM WILL BE TRANSFERRED AUTOMATICALLY TO A DATABASE.

- DO:**
- Do** enter text only, with no formatting or styles added.
 - Do** use punctuation and capitalization as needed (except quotations).
 - Do** use more than one form if responses do not fit in the spaces provided.
 - Do** submit any formatted text or markups in a separate WORD file.

- DO NOT:**
- Do not** insert tabs or paragraph returns in any data field.
 - Do not** use numbering or bullets in any data field.
 - Do not** use quotation marks in any data field.
 - Do not** submit a response in an unprotected copy of this form.

Individual Commenter Information		
(Complete this page for comments from one organization or individual.)		
Name:	Jeff Baker	
Organization:	Duke Energy Midwest	
Telephone:	513-287-3368	
E-mail:	jeff.baker@duke-energy.com	
NERC Region		Registered Ballot Body Segment
<input type="checkbox"/> ERCOT	<input checked="" type="checkbox"/>	1 — Transmission Owners
<input type="checkbox"/> FRCC	<input type="checkbox"/>	2 — RTOs, ISOs, Regional Reliability Councils
<input type="checkbox"/> MRO	<input checked="" type="checkbox"/>	3 — Load-serving Entities
<input type="checkbox"/> NPCC	<input type="checkbox"/>	4 — Transmission-dependent Utilities
<input checked="" type="checkbox"/> RFC	<input type="checkbox"/>	5 — Electric Generators
<input type="checkbox"/> SERC	<input checked="" type="checkbox"/>	6 — Electricity Brokers, Aggregators, and Marketers
<input type="checkbox"/> SPP	<input type="checkbox"/>	7 — Large Electricity End Users
<input type="checkbox"/> WECC	<input type="checkbox"/>	8 — Small Electricity End Users
<input type="checkbox"/> NA – Not Applicable	<input type="checkbox"/>	9 — Federal, State, Provincial Regulatory or other Government Entities

Comment Form for Second Posting of Frequency Response SAR

Group Comments (Complete this page if comments are from a group.)
Group Name: N/A
Lead Contact:
Contact Organization:
Contact Segment:
Contact Telephone:
Contact E-mail:

Additional Member Name	Additional Member Organization	Region*	Segment*

*If more than one Region or Segment applies, indicate the best fit for the purpose of these comments. Regional acronyms and segment numbers are shown on the prior page.

Comment Form for Second Posting of Frequency Response SAR

Background Information

Please review the drafting team's consideration of the comments submitted with the first draft of the Frequency Response SAR and then review the drafting team's conforming changes made to SAR. Because the changes to the SAR were so extensive, there is no 'red line' version to show the changes from the first draft.

You do not have to answer all questions. Enter All Comments in Simple Text Format.

Insert a "check" mark in the appropriate boxes by double-clicking the gray areas.

1. Do you agree that comments from the first posting of the SAR were adequately addressed?

Yes

No

Comments:

2. Do you agree with the list of proposed requirements included in the detailed description of the revised SAR?

Yes

No

Not totally, I need to understand more of what would be required to meet the obligation of Generator owners to equip generating units with nameplate ratings of 10 MW or greater, with a governor capable of providing immediate and sustained response to frequency deviations. Comments:

3. Do you agree that the proposed standard(s) would be applicable to the Reliability Coordinator, Balancing Authority, Generator Owner, and Load-serving Entity?

Yes

No

Comments:

4. The current standard on Bias requires a Balancing Authority to carry a minimum bias equal to 1% of peak load. As an example, in the Eastern Interconnection, this value is double current natural frequency response. Should the standard provide an incentive, such that a Balancing Authority can use a bias equal to their natural response, but less than 1% of peak, if the response is above an acceptable target?

Yes

No

I believe that an incentive should be included in the standard Comments:

Comment Form for Second Posting of Frequency Response SAR

5. Several commenters suggested response should be measured for an extended period after a frequency excursion, up to the point where automatic generation control (AGC) would take over. This was to ensure initial response wasn't withdrawn prematurely. Should the standard measure out to 60 seconds following an excursion?

Yes

No

I did not provide an answer but believe that this is a decision that could be made over time and not necessarily with the inception of the standard..

Comments:

6. Do you have other comments on the SAR?

I believe we have to address the frequency issue, but feel that it can be developed over time proactively. Comments:

Comment Form for Second Posting of Frequency Response SAR

Please use this form to submit comments on the second draft of the Frequency Response SAR. Comments must be submitted by **May 3, 2006**. You must submit the completed form by emailing it to sarcomm@nerc.com with the words "Frequency Response" in the subject line. If you have questions please contact Maureen Long at maureen.long@nerc.net or 813-468-5998.

ALL DATA ON THIS FORM WILL BE TRANSFERRED AUTOMATICALLY TO A DATABASE.

- DO:**
- Do** enter text only, with no formatting or styles added.
 - Do** use punctuation and capitalization as needed (except quotations).
 - Do** use more than one form if responses do not fit in the spaces provided.
 - Do** submit any formatted text or markups in a separate WORD file.

- DO NOT:**
- Do not** insert tabs or paragraph returns in any data field.
 - Do not** use numbering or bullets in any data field.
 - Do not** use quotation marks in any data field.
 - Do not** submit a response in an unprotected copy of this form.

Individual Commenter Information		
(Complete this page for comments from one organization or individual.)		
Name:		
Organization:		
Telephone:		
E-mail:		
NERC Region		Registered Ballot Body Segment
<input type="checkbox"/> ERCOT	<input type="checkbox"/>	1 — Transmission Owners
<input type="checkbox"/> FRCC	<input type="checkbox"/>	2 — RTOs, ISOs, Regional Reliability Councils
<input type="checkbox"/> MRO	<input type="checkbox"/>	3 — Load-serving Entities
<input type="checkbox"/> NPCC	<input type="checkbox"/>	4 — Transmission-dependent Utilities
<input type="checkbox"/> RFC	<input type="checkbox"/>	5 — Electric Generators
<input type="checkbox"/> SERC	<input type="checkbox"/>	6 — Electricity Brokers, Aggregators, and Marketers
<input type="checkbox"/> SPP	<input type="checkbox"/>	7 — Large Electricity End Users
<input type="checkbox"/> WECC	<input type="checkbox"/>	8 — Small Electricity End Users
<input type="checkbox"/> NA – Not Applicable	<input type="checkbox"/>	9 — Federal, State, Provincial Regulatory or other Government Entities

Comment Form for Second Posting of Frequency Response SAR

Group Comments (Complete this page if comments are from a group.)	
Group Name:	WECC Reliability Coordination Subcommittee
Lead Contact:	Terry Baker
Contact Organization:	WECC
Contact Segment:	2
Contact Telephone:	970-229-5341
Contact E-mail:	bakert@prpa.org

Additional Member Name	Additional Member Organization	Region*	Segment*
Nancy Bellows	WACM	WECC	1
Tom Botello	SCE	WECC	1
Rich Cornelius	RDRC	WECC	2
Robert Johnson	PSC	WECC	1
Bert Peters	APS	WECC	1
Greg Tillitson	CMRC	WECC	2

*If more than one Region or Segment applies, indicate the best fit for the purpose of these comments. Regional acronyms and segment numbers are shown on the prior page.

Comment Form for Second Posting of Frequency Response SAR

Background Information

Please review the drafting team's consideration of the comments submitted with the first draft of the Frequency Response SAR and then review the drafting team's conforming changes made to SAR. Because the changes to the SAR were so extensive, there is no 'red line' version to show the changes from the first draft.

You do not have to answer all questions. Enter All Comments in Simple Text Format.

Insert a "check" mark in the appropriate boxes by double-clicking the gray areas.

1. Do you agree that comments from the first posting of the SAR were adequately addressed?

Yes

No

Comments:

2. Do you agree with the list of proposed requirements included in the detailed description of the revised SAR?

Yes

No

Comments:

3. Do you agree that the proposed standard(s) would be applicable to the Reliability Coordinator, Balancing Authority, Generator Owner, and Load-serving Entity?

Yes

No

The WECC RCS believes that although this SAR is applicable to the WECC Reliability Authority (RA), it is not applicable to the WECC Reliability Coordinator (RC). Surveys, etc. will be performed after-the-fact, not during real-time. Comments:

4. The current standard on Bias requires a Balancing Authority to carry a minimum bias equal to 1% of peak load. As an example, in the Eastern Interconnection, this value is double current natural frequency response. Should the standard provide an incentive, such that a Balancing Authority can use a bias equal to their natural response, but less than 1% of peak, if the response is above an acceptable target?

Yes

No

Comments:

Comment Form for Second Posting of Frequency Response SAR

5. Several commenters suggested response should be measured for an extended period after a frequency excursion, up to the point where automatic generation control (AGC) would take over. This was to ensure initial response wasn't withdrawn prematurely. Should the standard measure out to 60 seconds following an excursion?

Yes

No

Comments:

6. Do you have other comments on the SAR?

Comments:

Comment Form for Second Posting of Frequency Response SAR

Please use this form to submit comments on the second draft of the Frequency Response SAR. Comments must be submitted by **May 3, 2006**. You must submit the completed form by emailing it to sarcomm@nerc.com with the words "Frequency Response" in the subject line. If you have questions please contact Maureen Long at maureen.long@nerc.net or 813-468-5998.

ALL DATA ON THIS FORM WILL BE TRANSFERRED AUTOMATICALLY TO A DATABASE.

- DO:**
- Do** enter text only, with no formatting or styles added.
 - Do** use punctuation and capitalization as needed (except quotations).
 - Do** use more than one form if responses do not fit in the spaces provided.
 - Do** submit any formatted text or markups in a separate WORD file.

- DO NOT:**
- Do not** insert tabs or paragraph returns in any data field.
 - Do not** use numbering or bullets in any data field.
 - Do not** use quotation marks in any data field.
 - Do not** submit a response in an unprotected copy of this form.

Individual Commenter Information		
(Complete this page for comments from one organization or individual.)		
Name:		
Organization:		
Telephone:		
E-mail:		
NERC Region		Registered Ballot Body Segment
<input type="checkbox"/> ERCOT	<input checked="" type="checkbox"/>	1 — Transmission Owners
<input type="checkbox"/> FRCC	<input type="checkbox"/>	2 — RTOs, ISOs, Regional Reliability Councils
<input type="checkbox"/> MRO	<input checked="" type="checkbox"/>	3 — Load-serving Entities
<input type="checkbox"/> NPCC	<input type="checkbox"/>	4 — Transmission-dependent Utilities
<input type="checkbox"/> RFC	<input checked="" type="checkbox"/>	5 — Electric Generators
<input type="checkbox"/> SERC	<input checked="" type="checkbox"/>	6 — Electricity Brokers, Aggregators, and Marketers
<input type="checkbox"/> SPP	<input type="checkbox"/>	7 — Large Electricity End Users
<input checked="" type="checkbox"/> WECC	<input type="checkbox"/>	8 — Small Electricity End Users
<input type="checkbox"/> NA – Not Applicable	<input type="checkbox"/>	9 — Federal, State, Provincial Regulatory or other Government Entities

Comment Form for Second Posting of Frequency Response SAR

Group Comments (Complete this page if comments are from a group.)

Group Name: BPA
Lead Contact: Bart McManus
Contact Organization: BPA
Contact Segment: 1,3,5,6
Contact Telephone: 360-418-2309
Contact E-mail: bamcmanus@bpa.gov

Additional Member Name	Additional Member Organization	Region*	Segment*
John Anasis			
Lynn Aspaas			
Mike Viles			

*If more than one Region or Segment applies, indicate the best fit for the purpose of these comments. Regional acronyms and segment numbers are shown on the prior page.

Comment Form for Second Posting of Frequency Response SAR

Background Information

Please review the drafting team's consideration of the comments submitted with the first draft of the Frequency Response SAR and then review the drafting team's conforming changes made to SAR. Because the changes to the SAR were so extensive, there is no 'red line' version to show the changes from the first draft.

You do not have to answer all questions. Enter All Comments in Simple Text Format.

Insert a "check" mark in the appropriate boxes by double-clicking the gray areas.

1. Do you agree that comments from the first posting of the SAR were adequately addressed?

Yes

No

We are still concerned with a NERC standard countering some aspects of the standard we are in the process of drafting in WECC, so will continue to be active on the drafting team to insure it does not adversely impact the WECC standard. Comments:

2. Do you agree with the list of proposed requirements included in the detailed description of the revised SAR?

Yes

No

RE: bullet 2: Instead of flexibility to meet interconnection needs, each interconnection should have its own requirements on frequency response, this is due to the unique frequency response of each interconnection.

re bullet 4: This Standard will need to measure frequency response for the duration of the frequency deviation. Measuring it until frequency recovers will overlap with the Balance Resources and Demand standard slightly, but will give much better results than simply going out a few minutes.

re bullet 6: Target levels should be BA specific to insure there is not an incentive to lean on other BA's. How will the target levels be calculated?

Re bullet 7: BAs must be free to operate their automatic generation control in any method they desire. The tie-line frequency bias is used for compliance monitoring, but must not be a requirement for the actual automatic generation control algorithm. Recommend this be modified to state: Balancing Authorities will calculate an Area Control Error for monitoring purposes using tie-line frequency bias.

re bullet 8: WECC should call FRC surveys for WECC instead of NERC.

re bullet 9: Recommend generating unit nameplate of 10 MW plus multi-unit installations of 10 MW or greater be required to have a governor(s) capable of providing immediate and sustained response to frequency deviations.

Re bullets 9 and 10: Currently wind generation does not have governor response capability. Due to the amount of wind integration planned in the next decade, new installations should have a requirement for frequency responsive units. Historically, requirements have provided incentive for

Comment Form for Second Posting of Frequency Response SAR

manufacturers to modify machine design (low-voltage ride-through capability, voltage control capability) to meet the requirements.

Comments:

3. Do you agree that the proposed standard(s) would be applicable to the Reliability Coordinator, Balancing Authority, Generator Owner, and Load-serving Entity?

Yes

No

The only portion we can think of that would be applicable to the Load-serving entity is for the load-serving entity to report their underfrequency load shedding settings. We believe LSEs should be removed as applicable entities.

Comments:

4. The current standard on Bias requires a Balancing Authority to carry a minimum bias equal to 1% of peak load. As an example, in the Eastern Interconnection, this value is double current natural frequency response. Should the standard provide an incentive, such that a Balancing Authority can use a bias equal to their natural response, but less than 1% of peak, if the response is above an acceptable target?

Yes

No

The standard should not provide an incentive, but the standard should provide a methodology that would allow a Balancing Authority to calculate a bias based on their natural response, provided that response is above an acceptable target. Comments:

Comment Form for Second Posting of Frequency Response SAR

5. Several commenters suggested response should be measured for an extended period after a frequency excursion, up to the point where automatic generation control (AGC) would take over. This was to ensure initial response wasn't withdrawn prematurely. Should the standard measure out to 60 seconds following an excursion?

Yes

No

The standard should measure out to when the frequency recovers. This could be up to the 15 minute DCS limit. AGC control may or may not kick in within 60 seconds depending on deadbands, etc. However, generators on setpoint control may hold for between 10 and 60 seconds then drop back off prior to AGC pulses reaching the generator. In order to see the full response of a BA it is necessary to see data for the full event rather than just the first minute. Rather than overlapping the BRD standard, this will work hand-in-hand with this standard. Comments:

6. Do you have other comments on the SAR?

Comments:

Comment Form for Second Posting of Frequency Response SAR

Please use this form to submit comments on the second draft of the Frequency Response SAR. Comments must be submitted by **May 3, 2006**. You must submit the completed form by emailing it to sarcomm@nerc.com with the words "Frequency Response" in the subject line. If you have questions please contact Maureen Long at maureen.long@nerc.net or 813-468-5998.

ALL DATA ON THIS FORM WILL BE TRANSFERRED AUTOMATICALLY TO A DATABASE.

- DO:**
- Do** enter text only, with no formatting or styles added.
 - Do** use punctuation and capitalization as needed (except quotations).
 - Do** use more than one form if responses do not fit in the spaces provided.
 - Do** submit any formatted text or markups in a separate WORD file.

- DO NOT:**
- Do not** insert tabs or paragraph returns in any data field.
 - Do not** use numbering or bullets in any data field.
 - Do not** use quotation marks in any data field.
 - Do not** submit a response in an unprotected copy of this form.

Individual Commenter Information		
(Complete this page for comments from one organization or individual.)		
Name:	Tom Pruitt	
Organization:	Duke Energy Carolinas	
Telephone:	704-382-4676	
E-mail:	tvpruitt@duke-energy.com	
NERC Region		Registered Ballot Body Segment
<input type="checkbox"/> ERCOT	<input checked="" type="checkbox"/>	1 — Transmission Owners
<input type="checkbox"/> FRCC	<input type="checkbox"/>	2 — RTOs, ISOs, Regional Reliability Councils
<input type="checkbox"/> MRO	<input checked="" type="checkbox"/>	3 — Load-serving Entities
<input type="checkbox"/> NPCC	<input type="checkbox"/>	4 — Transmission-dependent Utilities
<input type="checkbox"/> RFC	<input checked="" type="checkbox"/>	5 — Electric Generators
<input checked="" type="checkbox"/> SERC	<input checked="" type="checkbox"/>	6 — Electricity Brokers, Aggregators, and Marketers
<input type="checkbox"/> SPP	<input type="checkbox"/>	7 — Large Electricity End Users
<input type="checkbox"/> WECC	<input type="checkbox"/>	8 — Small Electricity End Users
<input type="checkbox"/> NA – Not Applicable	<input type="checkbox"/>	9 — Federal, State, Provincial Regulatory or other Government Entities

Comment Form for Second Posting of Frequency Response SAR

Background Information

Please review the drafting team's consideration of the comments submitted with the first draft of the Frequency Response SAR and then review the drafting team's conforming changes made to SAR. Because the changes to the SAR were so extensive, there is no 'red line' version to show the changes from the first draft.

You do not have to answer all questions. Enter All Comments in Simple Text Format.

Insert a "check" mark in the appropriate boxes by double-clicking the gray areas.

1. Do you agree that comments from the first posting of the SAR were adequately addressed?

Yes

No

Comments:

2. Do you agree with the list of proposed requirements included in the detailed description of the revised SAR?

Yes

No

Generally, yes, but more clarity is desired on a number of points, e.g., who decides which generators will be granted exemptions - the BA or the RRO; who sets the criteria - BA or RRO. In addition, I think some of the proposed requirements may conflict with each other as details are driven out; if a number of a BA's generators applied for and were granted exemptions from governor response, the (anticipated) 5% droop range may need to be adjusted for the generators which do provide governor response for the BA.

Governor response is not the only equipment consideration at the plant/unit. Plant/unit control systems also should be operated so that the desired unit response will occur and be sustained. Comments:

3. Do you agree that the proposed standard(s) would be applicable to the Reliability Coordinator, Balancing Authority, Generator Owner, and Load-serving Entity?

Yes

No

However, the standard applies to each entity in different ways. The lion's share of responsibility lies with the BA to insure that the aggregate of the Gen Owners responses provide the response needed. Comments:

4. The current standard on Bias requires a Balancing Authority to carry a minimum bias equal to 1% of peak load. As an example, in the Eastern Interconnection, this value is double current natural frequency response. Should the standard provide an incentive, such that a Balancing Authority can use a bias equal to their

Comment Form for Second Posting of Frequency Response SAR

natural response, but less than 1% of peak, if the response is above an acceptable target?

Yes

No

Calculation of each BA's bias should be based on a rigorous analysis which demonstrates that the BA can provide the expected response, regardless of peak load. This is consistent with the proposed requirements - 'technically-sound calculation and report of frequency response' and 'Will not mandate a given amount of frequency response'. Comments:

Comment Form for Second Posting of Frequency Response SAR

5. Several commenters suggested response should be measured for an extended period after a frequency excursion, up to the point where automatic generation control (AGC) would take over. This was to ensure initial response wasn't withdrawn prematurely. Should the standard measure out to 60 seconds following an excursion?

Yes

No

At least. Based on the words in the SAR Purpose statement, 'this proposed standard coordinates with and complements the Balance Resources and Demand standards, which addresses Interconnection frequency control generally 5 minutes and longer', it seems that this standard should cover out to the 5 minute mark of an event. AGC actions will commence at the first scan cycle or two after the event (5 -15 secs), but the actual generation response may not settle out for several minutes, depending on the type and amount of generation on AGC at the time. Comments:

6. Do you have other comments on the SAR?

Comments:

Comment Form for Second Posting of Frequency Response SAR

Please use this form to submit comments on the second draft of the Frequency Response SAR. Comments must be submitted by **May 3, 2006**. You must submit the completed form by emailing it to sarcomm@nerc.com with the words "Frequency Response" in the subject line. If you have questions please contact Maureen Long at maureen.long@nerc.net or 813-468-5998.

ALL DATA ON THIS FORM WILL BE TRANSFERRED AUTOMATICALLY TO A DATABASE.

- DO:**
- Do** enter text only, with no formatting or styles added.
 - Do** use punctuation and capitalization as needed (except quotations).
 - Do** use more than one form if responses do not fit in the spaces provided.
 - Do** submit any formatted text or markups in a separate WORD file.

- DO NOT:**
- Do not** insert tabs or paragraph returns in any data field.
 - Do not** use numbering or bullets in any data field.
 - Do not** use quotation marks in any data field.
 - Do not** submit a response in an unprotected copy of this form.

Individual Commenter Information		
(Complete this page for comments from one organization or individual.)		
Name:	Jason Shaver	
Organization:	American Transmission Company LLC	
Telephone:	262 506 6885	
E-mail:	jshaver@atcllc.com	
NERC Region		Registered Ballot Body Segment
<input type="checkbox"/> ERCOT	<input checked="" type="checkbox"/>	1 — Transmission Owners
<input type="checkbox"/> FRCC	<input type="checkbox"/>	2 — RTOs, ISOs, Regional Reliability Councils
<input checked="" type="checkbox"/> MRO	<input type="checkbox"/>	3 — Load-serving Entities
<input type="checkbox"/> NPCC	<input type="checkbox"/>	4 — Transmission-dependent Utilities
<input checked="" type="checkbox"/> RFC	<input type="checkbox"/>	5 — Electric Generators
<input type="checkbox"/> SERC	<input type="checkbox"/>	6 — Electricity Brokers, Aggregators, and Marketers
<input type="checkbox"/> SPP	<input type="checkbox"/>	7 — Large Electricity End Users
<input type="checkbox"/> WECC	<input type="checkbox"/>	8 — Small Electricity End Users
<input type="checkbox"/> NA – Not Applicable	<input type="checkbox"/>	9 — Federal, State, Provincial Regulatory or other Government Entities

Comment Form for Second Posting of Frequency Response SAR

Background Information

Please review the drafting team's consideration of the comments submitted with the first draft of the Frequency Response SAR and then review the drafting team's conforming changes made to SAR. Because the changes to the SAR were so extensive, there is no 'red line' version to show the changes from the first draft.

You do not have to answer all questions. Enter All Comments in Simple Text Format.

Insert a "check" mark in the appropriate boxes by double-clicking the gray areas.

1. Do you agree that comments from the first posting of the SAR were adequately addressed?

Yes

No

Comments:

2. Do you agree with the list of proposed requirements included in the detailed description of the revised SAR?

Yes

No

The SAR identifies Load-Serving Entities as a function that will be affected by any requirements that are developed from this SAR. Question three, on this comment form, goes one step further and asked the industry if the proposed standard would be applicable to Load-Serving Entities. ATC was unable to determine from the detailed description section any requirements that would apply to a Load-Serving Entity. With that being said ATC suggests that language be added to the SAR that would require the Load-Serving Entities to be responsible for procurement of adequate frequency response.

ATC found bullet number six lacks a clear description of the standard that could be developed. ATC recommends that this bullet be rewritten to better inform the industry of the type of standard the SAR requestor wants developed. Is the SAR requestor requesting a standard that will not mandate frequency response, but instead recommend a frequency response? ATC, in general, feels that standards should require something not make recommendation. or, Is the SAR requestor requesting that a standard be develop that would set long-term Interconnection target levels and then require the industry to meet those target-levels? ATC is in support of a standard that would require entities to set long-term target levels and require other entities to meet the determined target levels. ATC is not in support of a standard that requires functions to set long-term target levels but not require other entities to meet those levels. Lastly, this bullet should clearly identify who are the responsible entities.

ATC is concerned that Generator Owners could be allowed to categories the same generating units differently. A Generator Owner that aggregates their units for purposes of determining a voltage schedule (VAR-001-1) should then

Comment Form for Second Posting of Frequency Response SAR

not be allowed to individualize their units for this standard to escape under the nameplate rating of 10 MW. Comments:

3. Do you agree that the proposed standard(s) would be applicable to the Reliability Coordinator, Balancing Authority, Generator Owner, and Load-serving Entity?

Yes

No

Please see comment in questions two about the Load-serving Entity.
Comments:

4. The current standard on Bias requires a Balancing Authority to carry a minimum bias equal to 1% of peak load. As an example, in the Eastern Interconnection, this value is double current natural frequency response. Should the standard provide an incentive, such that a Balancing Authority can use a bias equal to their natural response, but less than 1% of peak, if the response is above an acceptable target?

Yes

No

Although ATC is in support of this recommendation, we feel that it should be classified as an "allowable exemption" not an "incentive". Comments:

Comment Form for Second Posting of Frequency Response SAR

5. Several commenters suggested response should be measured for an extended period after a frequency excursion, up to the point where automatic generation control (AGC) would take over. This was to ensure initial response wasn't withdrawn prematurely. Should the standard measure out to 60 seconds following an excursion?

Yes

No

Comments:

6. Do you have other comments on the SAR?

Comments:

Comment Form for Second Posting of Frequency Response SAR

Please use this form to submit comments on the second draft of the Frequency Response SAR. Comments must be submitted by **May 3, 2006**. You must submit the completed form by emailing it to sarcomm@nerc.com with the words "Frequency Response" in the subject line. If you have questions please contact Maureen Long at maureen.long@nerc.net or 813-468-5998.

ALL DATA ON THIS FORM WILL BE TRANSFERRED AUTOMATICALLY TO A DATABASE.

- DO:**
- Do** enter text only, with no formatting or styles added.
 - Do** use punctuation and capitalization as needed (except quotations).
 - Do** use more than one form if responses do not fit in the spaces provided.
 - Do** submit any formatted text or markups in a separate WORD file.

- DO NOT:**
- Do not** insert tabs or paragraph returns in any data field.
 - Do not** use numbering or bullets in any data field.
 - Do not** use quotation marks in any data field.
 - Do not** submit a response in an unprotected copy of this form.

Individual Commenter Information		
(Complete this page for comments from one organization or individual.)		
Name:		
Organization: NERC Resources Subcommittee		
Telephone:		
E-mail:		
NERC Region		Registered Ballot Body Segment
<input type="checkbox"/> ERCOT	<input type="checkbox"/>	1 — Transmission Owners
<input type="checkbox"/> FRCC	<input type="checkbox"/>	2 — RTOs, ISOs, Regional Reliability Councils
<input type="checkbox"/> MRO	<input type="checkbox"/>	3 — Load-serving Entities
<input type="checkbox"/> NPCC	<input type="checkbox"/>	4 — Transmission-dependent Utilities
<input type="checkbox"/> RFC	<input type="checkbox"/>	5 — Electric Generators
<input type="checkbox"/> SERC	<input type="checkbox"/>	6 — Electricity Brokers, Aggregators, and Marketers
<input type="checkbox"/> SPP	<input type="checkbox"/>	7 — Large Electricity End Users
<input type="checkbox"/> WECC	<input type="checkbox"/>	8 — Small Electricity End Users
<input type="checkbox"/> NA – Not Applicable	<input type="checkbox"/>	9 — Federal, State, Provincial Regulatory or other Government Entities

Comment Form for Second Posting of Frequency Response SAR

Group Comments (Complete this page if comments are from a group.)

Group Name: NERC Resources Subcommittee
Lead Contact: Terry Bilke
Contact Organization: Resources Subcommittee
Contact Segment:
Contact Telephone:
Contact E-mail:

Additional Member Name	Additional Member Organization	Region*	Segment*
Raymond Vice	Southern Company	SERC	
John Tolo	TEP	WECC	
Rhett Trease	Duke Power	RFC	
Sydney Niemeyer	Texas	ERCOT	
Don Badley	RS Vice Chairman	WECC	
Carlos Martinez	CERTS		
Robert Rhodes	SPP	SPP	
Tom Vandervort	NERC		
Terry Bilke	RS Chairman	RFC	
Bill Herbslab	PJM	RFC	
Larry Akens	TVA	SERC	
Bart McManus	BPA	WECC	
Mike Potishnak	NEISO	NPCC	
Gerry Beckerle	AMREN	SERC	

Comment Form for Second Posting of Frequency Response SAR

*If more than one Region or Segment applies, indicate the best fit for the purpose of these comments. Regional acronyms and segment numbers are shown on the prior page.

Background Information

Please review the drafting team's consideration of the comments submitted with the first draft of the Frequency Response SAR and then review the drafting team's conforming changes made to SAR. Because the changes to the SAR were so extensive, there is no 'red line' version to show the changes from the first draft.

You do not have to answer all questions. Enter All Comments in Simple Text Format.

Insert a "check" mark in the appropriate boxes by double-clicking the gray areas.

1. Do you agree that comments from the first posting of the SAR were adequately addressed?

Yes

No

Comments:

2. Do you agree with the list of proposed requirements included in the detailed description of the revised SAR?

Yes

No

Re Bullet 7 - BAs must be free to operate their automatic generation control in any method they desire. The tie-line frequency bias is used for compliance monitoring, but should not be a requirement for the actual automatic generation algorithm. Recommend this be modified to state : Balancing authorities will calculate an Area Control Error for compliance reporting purposes using tie-line frequency bias. Comments:

3. Do you agree that the proposed standard(s) would be applicable to the Reliability Coordinator, Balancing Authority, Generator Owner, and Load-serving Entity?

Yes

No

The proposed standards may apply to LSEs when demand side resources are utilized for frequency control, but will not apply to many of the LSEs. There may also be cases where Generator Operators have obligations under the standard. Comments:

4. The current standard on Bias requires a Balancing Authority to carry a minimum bias equal to 1% of peak load. As an example, in the Eastern Interconnection, this value is double current natural frequency response. Should the standard provide an incentive, such that a Balancing Authority can use a bias equal to their natural response, but less than 1% of peak, if the response is above an acceptable target?

Yes

No

Comment Form for Second Posting of Frequency Response SAR

The 1% minimum frequency bias should be evaluated to take into account the reliability requirements of the interconnections. frequency response over recent years. We suggest that the minimum bias be addressed during the development of the Frequency Response Standard. It is unclear what the word "incentive" means above.

Comments:

Comment Form for Second Posting of Frequency Response SAR

5. Several commenters suggested response should be measured for an extended period after a frequency excursion, up to the point where automatic generation control (AGC) would take over. This was to ensure initial response wasn't withdrawn prematurely. Should the standard measure out to 60 seconds following an excursion?

Yes

No

AGC response begins within only a few seconds after the disturbance with a maximum ramp rate achieved within three to five minutes. Governor response and load frequency response typically peak within 30 seconds. There is logic to monitoring governor response for sustainability past its initial peak and this should be investigated during standard development.

Comments:

6. Do you have other comments on the SAR?

In our opinion, this SAR, or one like it, is required to ensure that the primary frequency response of the interconnections and the BAs do not deteriorate to a point where 1) the interconnection can not adequately respond to major generator trips (including potential multiple contingencies which, though rare, do happen) and 2) primary frequency response of the BAs is inadequate to support islanding during severe local disturbances, thus allowing local disturbances to cascade into regional or interconnection wide disturbances. Primary frequency response is declining in all Interconnections, Eastern, Western and ERCOT. WECC and ERCOT have taken a proactive approach to addressing this problem, but there is no similar work being done in the Eastern Interconnection. This SAR, or one like it, is needed.

Comments:

Comment Form for Second Posting of Frequency Response SAR

Please use this form to submit comments on the second draft of the Frequency Response SAR. Comments must be submitted by **May 3, 2006**. You must submit the completed form by emailing it to sarcomm@nerc.com with the words "Frequency Response" in the subject line. If you have questions please contact Maureen Long at maureen.long@nerc.net or 813-468-5998.

ALL DATA ON THIS FORM WILL BE TRANSFERRED AUTOMATICALLY TO A DATABASE.

- DO:**
- Do** enter text only, with no formatting or styles added.
 - Do** use punctuation and capitalization as needed (except quotations).
 - Do** use more than one form if responses do not fit in the spaces provided.
 - Do** submit any formatted text or markups in a separate WORD file.

- DO NOT:**
- Do not** insert tabs or paragraph returns in any data field.
 - Do not** use numbering or bullets in any data field.
 - Do not** use quotation marks in any data field.
 - Do not** submit a response in an unprotected copy of this form.

Individual Commenter Information		
(Complete this page for comments from one organization or individual.)		
Name:	Bruce Sembrick	
Organization:	Tri-State Generation and Transmission Association	
Telephone:	303 254-3675	
E-mail:	bsembrick@tristategt.org	
NERC Region	<input type="checkbox"/>	Registered Ballot Body Segment
<input type="checkbox"/> ERCOT	<input checked="" type="checkbox"/>	1 — Transmission Owners
<input type="checkbox"/> FRCC	<input type="checkbox"/>	2 — RTOs, ISOs, Regional Reliability Councils
<input type="checkbox"/> MRO	<input type="checkbox"/>	3 — Load-serving Entities
<input type="checkbox"/> NPCC	<input type="checkbox"/>	4 — Transmission-dependent Utilities
<input type="checkbox"/> RFC	<input type="checkbox"/>	5 — Electric Generators
<input type="checkbox"/> SERC	<input type="checkbox"/>	6 — Electricity Brokers, Aggregators, and Marketers
<input type="checkbox"/> SPP	<input type="checkbox"/>	7 — Large Electricity End Users
<input checked="" type="checkbox"/> WECC	<input type="checkbox"/>	8 — Small Electricity End Users
<input type="checkbox"/> NA – Not Applicable	<input type="checkbox"/>	9 — Federal, State, Provincial Regulatory or other Government Entities

Comment Form for Second Posting of Frequency Response SAR

Background Information

Please review the drafting team's consideration of the comments submitted with the first draft of the Frequency Response SAR and then review the drafting team's conforming changes made to SAR. Because the changes to the SAR were so extensive, there is no 'red line' version to show the changes from the first draft.

You do not have to answer all questions. Enter All Comments in Simple Text Format.

Insert a "check" mark in the appropriate boxes by double-clicking the gray areas.

1. Do you agree that comments from the first posting of the SAR were adequately addressed?

Yes

No

Comments:

2. Do you agree with the list of proposed requirements included in the detailed description of the revised SAR?

Yes

No

Comments:

3. Do you agree that the proposed standard(s) would be applicable to the Reliability Coordinator, Balancing Authority, Generator Owner, and Load-serving Entity?

Yes

No

Since the standard is concerned with governor regulated frequency response of generating units that applicability should also apply to the Generator Operator (currently this box is not checked). It will ultimately be the Generator Operators responsibility to ensure frequency responsiveness of the units, e.g. ensuring that the unit is not operating in Valve Wide Open mode.

Comments:

4. The current standard on Bias requires a Balancing Authority to carry a minimum bias equal to 1% of peak load. As an example, in the Eastern Interconnection, this value is double current natural frequency response. Should the standard provide an incentive, such that a Balancing Authority can use a bias equal to their natural response, but less than 1% of peak, if the response is above an acceptable target?

Yes

No

Comments:

Comment Form for Second Posting of Frequency Response SAR

5. Several commenters suggested response should be measured for an extended period after a frequency excursion, up to the point where automatic generation control (AGC) would take over. This was to ensure initial response wasn't withdrawn prematurely. Should the standard measure out to 60 seconds following an excursion?

Yes

No

Comments:

6. Do you have other comments on the SAR?

Comments:

Comment Form for Second Posting of Frequency Response SAR

Please use this form to submit comments on the second draft of the Frequency Response SAR. Comments must be submitted by **May 3, 2006**. You must submit the completed form by emailing it to sarcomm@nerc.com with the words "Frequency Response" in the subject line. If you have questions please contact Maureen Long at maureen.long@nerc.net or 813-468-5998.

ALL DATA ON THIS FORM WILL BE TRANSFERRED AUTOMATICALLY TO A DATABASE.

- DO:**
- Do** enter text only, with no formatting or styles added.
 - Do** use punctuation and capitalization as needed (except quotations).
 - Do** use more than one form if responses do not fit in the spaces provided.
 - Do** submit any formatted text or markups in a separate WORD file.

- DO NOT:**
- Do not** insert tabs or paragraph returns in any data field.
 - Do not** use numbering or bullets in any data field.
 - Do not** use quotation marks in any data field.
 - Do not** submit a response in an unprotected copy of this form.

Individual Commenter Information		
(Complete this page for comments from one organization or individual.)		
Name:		
Organization:		
Telephone:		
E-mail:		
NERC Region		Registered Ballot Body Segment
<input type="checkbox"/> ERCOT	<input checked="" type="checkbox"/>	1 — Transmission Owners
<input type="checkbox"/> FRCC	<input type="checkbox"/>	2 — RTOs, ISOs, Regional Reliability Councils
<input type="checkbox"/> MRO	<input type="checkbox"/>	3 — Load-serving Entities
<input type="checkbox"/> NPCC	<input type="checkbox"/>	4 — Transmission-dependent Utilities
<input checked="" type="checkbox"/> RFC	<input type="checkbox"/>	5 — Electric Generators
<input type="checkbox"/> SERC	<input type="checkbox"/>	6 — Electricity Brokers, Aggregators, and Marketers
<input type="checkbox"/> SPP	<input type="checkbox"/>	7 — Large Electricity End Users
<input type="checkbox"/> WECC	<input type="checkbox"/>	8 — Small Electricity End Users
<input type="checkbox"/> NA – Not Applicable	<input type="checkbox"/>	9 — Federal, State, Provincial Regulatory or other Government Entities

Comment Form for Second Posting of Frequency Response SAR

Group Comments (Complete this page if comments are from a group.)

Group Name: ITCTransmission
Lead Contact: Jim Cyrulewski
Contact Organization: ITCTransmission
Contact Segment: Transmission Owner
Contact Telephone: 248-374-7130
Contact E-mail: jcyrulewski@itctransco.com

Additional Member Name	Additional Member Organization	Region*	Segment*
Beth Howell	ITCTransmission	RFC	1
Mike Moltane	ITCTransmission	RFC	1
Van Greening	ITCTransmission	RFC	1

*If more than one Region or Segment applies, indicate the best fit for the purpose of these comments. Regional acronyms and segment numbers are shown on the prior page.

Comment Form for Second Posting of Frequency Response SAR

Background Information

Please review the drafting team's consideration of the comments submitted with the first draft of the Frequency Response SAR and then review the drafting team's conforming changes made to SAR. Because the changes to the SAR were so extensive, there is no 'red line' version to show the changes from the first draft.

You do not have to answer all questions. Enter All Comments in Simple Text Format.

Insert a "check" mark in the appropriate boxes by double-clicking the gray areas.

1. Do you agree that comments from the first posting of the SAR were adequately addressed?

Yes

No

Comments:

2. Do you agree with the list of proposed requirements included in the detailed description of the revised SAR?

Yes

No

However some bullets need further clarification

Bullet 2: The standards process allows for regional differences. What more flexibility is needed?

Bullet 6: Keep this bullet simple by simply stating target levels will be set for BAs and RROs to take actions cited. Also a sub-bullet needs to be added on what are options to get additional frequency response; specifically for the BAs. In particular what can the BAs do if the Generation Owners do not provide adequate response. The BAs don't have generation interconnection agreements, the transmission owners do.

Comments:

3. Do you agree that the proposed standard(s) would be applicable to the Reliability Coordinator, Balancing Authority, Generator Owner, and Load-serving Entity?

Yes

No

Also pertains to Generator Operator Comments:

4. The current standard on Bias requires a Balancing Authority to carry a minimum bias equal to 1% of peak load. As an example, in the Eastern Interconnection, this value is double current natural frequency response. Should the standard provide an incentive, such that a Balancing Authority can use a bias equal to their natural response, but less than 1% of peak, if the response is above an acceptable target?

Comment Form for Second Posting of Frequency Response SAR

Yes

No

However this requirement still does not address the need for enough frequency response on the system. Comments:

Comment Form for Second Posting of Frequency Response SAR

5. Several commenters suggested response should be measured for an extended period after a frequency excursion, up to the point where automatic generation control (AGC) would take over. This was to ensure initial response wasn't withdrawn prematurely. Should the standard measure out to 60 seconds following an excursion?

Yes

No

Needs to be verified with a field trial. Comments:

6. Do you have other comments on the SAR?

Reliability and Market Interface Principles 3, 5 and 6 should be checked as well.

Comments: