NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Consideration of Comments on 3rd Posting of Frequency Response SAR

The Frequency Response SAR Requesters thank all commenters who submitted comments on Draft 3 of the Frequency Response SAR. This SAR was posted for a 30-day public comment period from February 8 through March 9, 2007. The requesters asked stakeholders to provide feedback on the standard through a special standard Comment Form. There were 26 sets of comments, including comments from more than 59 different people from 39 companies representing 9 of the 10 Industry Segments as shown in the table on the following pages.

Based on the comments received, the drafting team did not make any changes to the SAR (except to update the descriptions of the Reliability Functions to match the latest version of the Functional Model) and is recommending that the Standards Committee authorize moving this SAR forward to standard drafting.

In this "Consideration of Comments" document stakeholder comments have been organized so that it is easier to see the responses associated with each question. All comments received on the standards can be viewed in their original format at:

http://www.nerc.com/~filez/standards/Frequency_Response.html

If you feel that your comment has been overlooked, please let us know immediately. Our goal is to give every comment serious consideration in this process! If you feel there has been an error or omission, you can contact the Director of Standards, Gerry Adamski, at 609-452-8060 or at gerry.adamski@nerc.net. In addition, there is a NERC Reliability Standards Appeals Process.[1]

[1] The appeals process is in the Reliability Standards Development Procedures: http://www.nerc.com/standards/newstandardsprocess.html.

The Industry Segments are:

1 — Transmission Owners
2 — RTOs, ISOs
3 — Load-serving Entities
4 — Transmission-dependent Utilities
5 — Electric Generators
6 — Electricity Brokers, Aggregators, and Marketers
7 — Large Electricity End Users
8 — Small Electricity End Users
9 — Federal, State, Provincial Regulatory or other Government Entities
10 – Regional Reliability Organizations, Regional Entities

Commenter		Organization	Industry Segment									
			1	2	3	4	5	6	7	8	9	10
1.	Dan Boezio (G8)	AEP	✓									
2.	Jason Shaver	American Transmission Co.	✓									
3.	Bart McManus	Bonneville Power Administration	✓									
4.	James Murphy	Bonneville Power Administration	✓									
5.	John Anasis	Bonneville Power Administration	✓									
6.	Brenda Anderson	Bonneville Power Administration	✓									
7.	Brent Kingsford	California ISO		✓								
8.	Ed Thompson (G2)	ConEd	✓									
9.	Michael Gildea	Constellation Generation					✓					
10.	Doug Hils (G3)	Duke Energy	✓									
11.	Howard F. Illian	Energy Mark, Inc.								✓		
12.	Steve Myers (G1)	ERCOT		✓								
13.	Bruno Jesus (G2)	Hydro One Networks	✓									
14.	Roger Champagne (G1)	Hydro Québec TransÉnergie	✓									
15.	Ron Falsetti (G1)	IESO		✓								
16.	Kathleen Goodman (G1)	ISO-NE		✓								
17.	Bill Shemley (G2)	ISO-NE		✓								
18.	Brian Thumm (G3)	ITC Transmission	✓									
19.	Jim Cyrulewski (G3)	JDRJC Associates								✓		
20.	Michael Gammon	Kansas City Power & Light	✓									
21.	Jim Useldinger	KCPL	✓									

Commenter		Organization	Industry Segment									
			1	2	3	4	5	6	7	8	9	10
	(G8)											
22.	Jason Atwood (G8)	Kelson Energy				✓						
23.	Don Nelson (G2)	MA Dept. of Tele. And Energy									✓	
24.	Robert Coish	Manitoba Hydro	✓		✓		✓	✓				
25.	Alan R. Oneal	MidAmerican Energy Co.										
26.	Jason Marshall (G3)	Midwest ISO Stakeholders Standards Collaboration Participants		✓								
27.	Herb Schrayshuen	National Grid	✓									
28.	Randy McDonald (G2)	NBSO		✓								
29.	Guy V. Zito (G2)	NPCC										✓
30.	Sydney Niemeyer	NRG Texas, Qualified Scheduling Entity					✓					
31.	Jerad Barnhart	NStar	✓									
32.	Mike Calimano (G1)	NYISO		✓								
33.	Greg Campoli (G1)	NYISO		✓								
34.	Ralph Rufrano (G2)	NYPA	✓									
35.	Theodore Papaps	NYSRC										✓
36.	Al Adamson (G2)	NYSRC										✓
37.	Pete Kuebeck (G8)	OG&E	✓									
38.	Al DiCaprio	PJM		✓								
39.	Alicia Daughtery	PJM		✓								
40.	Joseph Willson	PJM		✓								
41.	Tom Bowe	PJM		✓								
42.	Mike Pfeister	Salt River Project	✓									
43.	Jim Busbin (G6)	Southern Company Services, Inc.	✓									
44.	Marc Butts (G6)	Southern Company Services, Inc.	✓									
45.	J.T. Wood (G6)	Southern Company Services, Inc.	✓									
46.	Roman Carter	Southern Company Services, Inc.	✓									
47.	Raymond Vice	Southern Company Services, Inc.	✓									

Commenter		Organization	Industry Segment									
			1	2	3	4	5	6	7	8	9	10
48.	Jim Viikinsalo	Southern Company Services, Inc.	✓									
49.	Tom Higgins	Southern Company Services, Inc.					✓					
50.	Terry Crawley	Southern Company Services, Inc.					✓					
51.	Ron Beck	Southwestern Power Administration	✓									
52.	Bill Grant (G8)	Southwestern Public Service	✓									
53.	Wayne Galli (G8)	SPP										✓
54.	Steve Massey (G8)	Westar Energy					✓					
55.	Mich Crouch (G8)	Western Farmers	✓									
56.	Greg Pieper	Xcel Energy Services	✓									
57.	Michael Ibold	Xcel Energy Services			✓							
58.	Steve Beuning	Xcel Energy Services					✓					
59.	David Lemmons	Xcel Energy Services						✓				

I – Indicates that individual comments were submitted in addition to comments submitted as part of a group
G1 - IRC Standards Review Committee
G2 – NPCC CP9 Reliability Standards Working Group (NPCC CP9)
G3 – Midwest ISO Stakeholders Standards Collaboration Participants (MISO SSC)
G4 – TVA
G5 – Public Service Commission of SC (PSC of SC)
G6 – Southern Company Transmission (Southern Co)
G7 – MRO
G8 – Southwest Power Pool Operating Reliability Working Group

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1. **Do you agree with the reduced scope of this SAR — focusing only on the data collection needed to support the development of accurate models of Frequency Response in North America?**

Summary Consideration:

The majority of the comments agreed with the reduced scope of the SAR, which now focuses only on the data collection that is needed to support the development of accurate models of Frequency Response in North America. For most of the commenters that did not support the reduced scope, the SAR Drafting Team believes there may be a misunderstanding with respect to the use of the Target Frequency Response. The SAR Drafting Team explained to those commenters that the Target Frequency Response does not set a minimum for any particular Balancing Authority. Rather it sets a benchmark, beyond which additional data is needed from the Balancing Authority.

Question #1			
Commenter	**Yes**	**No**	**Comment**
SWPA		☑	The scope of this SAR is for data collection, and should not include establishing a Target Frequency Response as stated in Paragraph #5.
Response: The SAR Drafting Team appreciates your input, but disagrees with your conclusion. There should always be a purpose for going to the trouble and expense of capturing and analyzing data. The SAR Drafting Team considers the establishment of a Target Frequency Response for each Interconnection as vital for the reliability of the Interconnections and one of the two fundamental reasons why this SAR was initially drafted. The SAR Drafting Team believes there may be a misunderstanding with respect to Target Frequency Response, which does not set a minimum for any particular Balancing Authority. The Target Frequency Response sets a benchmark, beyond which additional data is needed from the Balancing Authority.			
Xcel Energy Services		☑	We agree with the proposed scope except that items 5 and 6 do not deal specifically with data collection and therefore are beyond the scope of the SAR. We are concerned over establishing a Target Frequency Response. This is presumptious in that it advances a proposed remedy before first meeting the intent of the SAR-determining the cause for the percieved decline in frequency response. We support Items 6a. and 6b. if referenced to item 4 as modified as follows: Modify 4 to require generator level reporting when the Frequency Response for a BA is less than [75]* percent of the Previous Years observed Frequency Response. Delete items 5 and 6.
Response: In response to your first comment on Paragraph 5, the SAR Drafting Team considers the establishment of a Target Frequency Response for each Interconnection as vital for the reliability of the Interconnections and one of the two fundamental reasons why this SAR was drafted initially. The reason for establishing the target frequency response is to determine the point at which additional data is needed from a given Balancing Authority. In response to your comment on Paragraph 6, the SAR Drafting Team does not view the provisions of Paragraph 6 as presumptive or proscriptive, but as a necessary step in identifying and understanding potential frequency response variations within a given Interconnection. No specific action is required by the Balancing Authority or the Generation Owner at this			

Question #1			
Commenter	**Yes**	**No**	**Comment**
point in the process beyond supplying the data needed for NERC to understand why variations in Frequency Response occur in different regions and to determine if further actions are required, via the NERC Reliability Standards Process, to address them.			
PJM		☑	The primary objective of this SAR is to collect data; to analyze the data; and only then to recommend a performance value. The SAR DT insists that collecting data is a Technical Standard. The RSDP states: "Technical standards…will contain Measures (not measuring - AMD) of physical parameters…" At this point this SAR proposal does not contain such a measure, it does not even assert that the measure is really needed (hence the need to analyze the data). Page 19 (of 43) of the RSPM states "The drafting team may recommend the scope of the standard be reduced to allow the effort to move forward, while still remaining within the scope of the SAR. Reducing the scope of the SAR is acceptable if the drafting team finds, for instance, THAT ADDITIONAL TECHNICAL RESEARCH IS NEEDED PRIOR TO DEVELOPING (emphasis added) a portion of the standard or issues need to be resolved before consensus can be achieved on a portion of the standard. "The highlighted section applies directly to the scope of this SAR. The SAR Team recognizes work is needed. There is no question about that. The Team should do that work BEFORE proposing a mandatory standard. PJM supports the concept of doing such a study, and would encourage NERC to assign a group to do such a study, but PJM does not agree that collecting data rises to the level of a valid NERC reliability standard.
Response: NERC's Reliability Standards Development Plan: 2007 - 2009 describes the characteristics of a Reliability Standard as follows: " Although reliability standards have a common format and process, several types of reliability standards may exist, each with a different approach to measurement: ▪ **Technical standards** related to the provision, maintenance, operation, or state of bulk power systems will likely contain measures of physical parameters and will often be technical in nature. ▪ **Performance standards** related to the actions of entities providing for or impacting the reliability of the bulk power systems will likely contain measures of the result of such actions, or the nature of the performance of such actions". Collecting, correlating and analyzing data on a continental scale is not a simple matter. The SAR Drafting Team believes that the scale of this project and the potential importance of the conclusions to be developed per the specifications in Paragraphs 5 and 6 more than warrant the use of the NERC Reliability Standards Process to address them. Directed research can be			

Question #1			
Commenter	**Yes**	**No**	**Comment**
investigated during the standard development effort.			
IESO		☑	We do not agree with the reduced scope of this SAR. It does not require a standard to enable a data collection task(s). Data collection procedures and processes, charged by a standing committee, e.g. the OC, or respective working groups, would be more than sufficient.
Response: The SAR Drafting Team believes that the scale of this project, the ongoing nature, and the potential importance of the conclusions to be developed per the specifications in Paragraphs 5 and 6 more than warrant the use of the NERC Reliability Standards Process to address them. We believe the Standing Committees would play a vital role in evaluating the initial results of the standard.			
SPP ORWG		☑	Do not agree with the notion in point 5 regarding the need for a Target Frequency Response for each interconnection at this time. It is beyond the scope of this technical SAR to propose anything other than collection of data to support the study. Do not agree with point 6 of the description. In order to get a handle on what is really going on, all Balancing Authorities should be required to produce data valid to the study. Also the language in point 6 is poorly worded compared to the right wording in 6a and 6b. 6a and 6b should be included in the SAR and 6 should be removed.
Response: The SAR Drafting Team appreciates your input, but disagrees with your conclusion. The SAR Drafting Team considers the establishment of a Target Frequency Response for each Interconnection as vital for the reliability of the Interconnections and one of the two fundamental reasons why this SAR was drafted initially. The reason for establishing the target frequency response is to determine the point at which additional data is needed from a given Balancing Authority. With respect to your comment on Paragraph 6, the SAR Drafting Team does not view the provisions of Paragraph 6 as presumptive or proscriptive, but as a necessary step in identifying and understanding potential frequency response variations within a given Interconnection. No specific action is required by the Balancing Authority or the Generation Owner at this point in the process beyond supplying the data needed for NERC to understand why variations in Frequency Response occur in different regions and to determine if further actions are required, via the NERC Reliability Standards Process, to address them. The intent of the Target Frequency Response is to determine the point where additional data is required. The SAR Drafting Team does not recognize the specific wording that you are referring to in Paragraph 6 and request clarification.			
KCP&L		☑	Do not agree with the notion in point 5 regarding the need for a Target Frequency Response for each interconnection at this time. It is presumptuous to advance a remedy prior to determining cause of the perceived decline in frequency response. Allow the techincal SAR to perform its function to determine cause. Any appropriate remedy in operating standards should become apparent. Do not agree with point 6 of the description. In order to get a handle on what is really

Question #1			
Commenter	**Yes**	**No**	**Comment**
			going on, all Balancing Authorities should be required to produce data valid to the study. Also the language in point 6 is poorly worded compared to the right wording in 6a and 6b. 6a and 6b should be included in the SAR and 6 should be removed.
Response: We appreciate your input, but disagree with your conclusion. The SAR Drafting Team considers the establishment of a Target Frequency Response for each Interconnection as vital for the reliability of the Interconnections and one of the two fundamental reasons why this SAR was drafted initially. The reason for establishing the target frequency response is to determine the point at which additional data is needed from a given Balancing Authority. In response to your comment on Paragraph 6, the SAR Drafting Team does not view the provisions of Paragraph 6 as presumptive or proscriptive, but as a necessary step in identifying and understanding potential frequency response variations within a given Interconnection. No specific action is required by the Balancing Authority or the Generation Owner at this point in the process beyond supplying the data needed for NERC to understand why variations in Frequency Response occur in different regions and to determine if further actions are required, via the NERC Reliability Standards Process, to address them. The intent of the Target Frequency Response is to determine the point where additional data is required. The SAR Drafting Team does not recognize the specific wording that you are referring to in Paragraph 6 and request clarification.			
Hydro Québec TransÉnergie	☑	☑	HQT believe there might be other means than Reliability Standards to accomplish this data collection.
Response: The SAR Drafting Team agrees that there may be methods other than the use of the NERC Reliability Standards Process to address this issue. However, due to the scale of this project and the potential importance of the conclusions to be developed per the specifications in Paragraphs 5 and 6, the SAR Drafting Team believes that the use of the NERC Reliability Standards Process is appropriate.			
NPCC CP9	☑	☑	Many of NPCC's participating members believe there are other means to accomplish this phase of the initiative and that appropriate revisions to existing standard(s) may address the issue determined by the data analysis could be proposed.
Response: The SAR Drafting Team agrees that there may be methods other than the use of the NERC Reliability Standards Process to address this issue. However, due to the scale of this project and the potential importance of the conclusions to be developed per the specifications in Paragraphs 5 and 6, the SAR Drafting Team believes that the use of the NERC Reliability Standards Process is appropriate.			
NYISO	☑	☑	The NYISO is uncertain if this is the appropriate means to require data collection for purposes of developing models. A review should be made to be certain that this proposed scope meets the criteria for a standard.
Response: The SAR Drafting Team agrees that there may be methods other than the use of the NERC Reliability Standards Process to address this issue. However, due to the scale of this project and the potential importance of the conclusions to be developed per the specifications in Paragraphs 5 and 6, the SAR Drafting Team believes that the use of the NERC Reliability Standards Process is appropriate. Note that the NERC Standards Committee and the industry as a whole are currently performing just such a review, as you request, by commenting on this draft SAR.			

Question #1			
Commenter	**Yes**	**No**	**Comment**
Energy Mark, Inc.	☑		At this time information is not available that would provide a sound technical basis for the development of a performance standard. However, with the recent increased interest in Frequency Response, new data and analysis could become available at any time that would change the focus from a technical standard to a performance standard. If new information and analysis becomes available during the development of the technical standard, consideration should be given to how the development of the technical standard could delay the development and implementation of a performance standard. Must the technical standard be completed and approved before work can start on a performance standard?
Response: The SAR Drafting Team agrees that there may be technical issues which may allow the Standard Drafting Team to accomplish the functional purpose of this SAR differently than anticipated by the SAR Drafting Team. This is allowed for in the NERC Reliability Standards Process Manual, page 19, as noted by PJM above. It is anticipated by the SAR Drafting Team that the work set forth in the SAR will aid in determining if a Performance Standard is required and, if so, how the standard should be structured. A SAR for a Frequency Response Performance Standard can be written and submitted to the NERC Standards Committee at any time.			
MidAmerican Energy Co.	☑		This standard would be a start, at least, at bringing to light where and why response is being lost. It may well be that exposure and peer pressure, as well as the tiered reporting requirements, will keep plant and operations personnel abreast of their obligations for providing reserves of all types.
Response: The SAR Drafting Team appreciates your support.			
Southern	☑		Frequency response and its dynamic behavior is a complex issue that requires detailed analysis and study to understand. This in turn requires sufficient high quality data be obtained to support the development of models and concepts. The data could be collected voluntarily, but without the force of NERC standards behind it not many people are going to devote the resources required to collect the data. We strongly support this effort.
Response: The SAR Drafting Team appreciates your support.			
ISO New England	☑		
Bonneville Power Administration	☑		
American Transmission Co.	☑		
CAISO	☑		
ERCOT	☑		

Question #1			
Commenter	**Yes**	**No**	**Comment**
Manitoba Hydro	☑		
MISO	☑		
NRG Texas	☑		
NYSRC	☑		
Salt River Project	☑		
American Electric Power	☑		
ITC Transco	☑		

2. The proposed standard would have requirements for the following functional entities: Reliability Coordinator, Balancing Authority, Generator Owner, Generator Operator, and Load-serving Entity. Do you agree that these are the right functional entities for the proposed standard?

Summary Consideration:

The majority of the commenters supported the functional entities for which the proposed standard would be applicable, specifically the Reliability Coordinator, Balancing Authority, Generator Owner, Generator Operator, and Load-Serving Entity. All commenters that responded that they did not agree to the proposed functional entities requested clarification on the applicability to a Load-serving Entity (LSE).

The SAR Drafting Team explained that the LSE functional entity was added in response to stakeholder comments received on the first draft of the SAR. The SAR Drafting Team also explained to commenters that various industry experts estimate that as much as 1/3 of the total Interconnection Frequency Response may be supplied by Load Frequency Response (the other 2/3 is supplied from Turbine Governor Support). Thus information from the LSE concerning the composition and variations of load served within the Interconnection can be critical in understanding total Interconnection Frequency Response.

One commenter suggested that if there is a future performance standard, it would be unreasonable to implement a technical standard that requires functional entities to provide data. The SAR Drafting Team does not see the linkage between requiring data from entities in order to qualify and quantify Frequency Response with the interconnections and NOT including all these entities in a Frequency Response Performance Standard.

Question #2			
Commenter	**Yes**	**No**	**Comment**
PJM		☑	The proposal as written appears to be headed towards mandating a given unit response. As such there would be an obligation on the Generator Operator - there does not seem to be any requirements that would apply to the Generator Owner - unless of course the requestor includes a requirement to install a governor (this has, to date, be an implied obligation just as having a turbine has been an implied obligation). If the requestor does intend to assert an obligation on the Generator Owner to install a governor then the question arises should that be a standard or should that be a part of the Certification of a GO? It is not clear what the LSE requirements are in this proposal.
Response: The stated purpose of this SAR is to collect and analyze data in order to determine the Frequency Response for each Interconnection, recommend a target Frequency Response for each Interconnection and determine the cause of any significant variations in Frequency Response within each of the Interconnections. In response to your comment on applicability to LSEs, various industry experts estimate that as much as 1/3 of the total Interconnection Frequency Response may be supplied by Load Frequency Response (the other 2/3 is supplied from Turbine			

Question #2			
Commenter	**Yes**	**No**	**Comment**
Governor Support). Thus information from the LSE concerning the composition and variations of load served within the Interconnection can be critical in understanding total Interconnection Frequency Response. The applicability to LSEs was added at the specific request of commenters in a previous version of the SAR.			
SWPA		☑	Load serving entities should not be included due to the characteristics of load and frequency. Load Serving Entities should contribute data to determine FRC.
Response: Various industry experts estimate that as much as 1/3 of the total Interconnection Frequency Response may be supplied by Load Frequency Response (the other 2/3 is supplied from Turbine Governor Support). Thus information from the LSE concerning the composition and variations of load served within the Interconnection can be critical in understanding total Interconnection Frequency Response. The applicability to LSEs was added at the specific request of commenters in a previous version of the SAR. Note that your two statements seem to contradict each other.			
NPCC CP9		☑	NPCC participating members question the need to include the applicability to the LSEs in this SAR and requests the drafting team to explain this.
Response: Various industry experts estimate that as much as 1/3 of the total Interconnection Frequency Response may be supplied by Load Frequency Response (the other 2/3 is supplied from Turbine Governor Support). Thus information from the LSE concerning the composition and variations of load served within the Interconnection can be critical in understanding total Interconnection Frequency Response. The applicability to LSEs was added at the specific request of commenters in a previous version of the SAR.			
NYSRC		☑	Explain the applicability of the SAR to LSEs.
Response: Various industry experts estimate that as much as 1/3 of the total Interconnection Frequency Response may be supplied by Load Frequency Response (the other 2/3 is supplied from Turbine Governor Support). Thus information from the LSE concerning the composition and variations of load served within the Interconnection can be critical in understanding total Interconnection Frequency Response. The applicability to LSEs was added at the specific request of commenters in a previous version of the SAR.			
SPP ORWG		☑	A standard can not be imposed on the response of load to frequency. Load Serving Entities can only provide data.
Response: The SAR Drafting Team agrees that the role of the LSE will primarily be to supply data concerning the composition and variations of load served within the Interconnection. There is nothing in the SAR imposing a response requirement on any of the functional entities.			
Hydro Québec TransÉnergie		☑	We question the need to include the applicability to the LSEs in this SAR and requests the drafting team to explain the purpose.
Response: Various industry experts estimate that as much as 1/3 of the total Interconnection Frequency Response may be supplied by Load Frequency Response (the other 2/3 is supplied from Turbine Governor Support). Thus information from the LSE concerning the composition and variations of load served within the Interconnection can be critical in understanding total Interconnection Frequency Response. The applicability to LSEs was added at the specific request of commenters in a previous version of the SAR.			

Question #2			
Commenter	**Yes**	**No**	**Comment**
IESO		☑	For the purpose of data collection, assigning responsibility to the Balancing Authority, Generator Operator and Load-serving Entity would suffice.
Response: Most of the data will be collected from the entities you list. However, the SAR Drafting Team believes the other entities included in the SAR have some of the data that is needed for this standard. For example the Generator Owner might have relevant data that may not be available from the Generator Operator.			
ISO New England		☑	ISO New England does not see a need to include the applicability to the LSEs in this SAR and requests the drafting team to explain this.
Response: Various industry experts estimate that as much as 1/3 of the total Interconnection Frequency Response may be supplied by Load Frequency Response (the other 2/3 is supplied from Turbine Governor Support). Thus information from the LSE concerning the composition and variations of load served within the Interconnection can be critical in understanding total Interconnection Frequency Response. The applicability to LSEs was added at the specific request of commenters in a previous version of the SAR.			
American Transmission Co.		☑	ATC does not see the need to identify the Load Serving Entity in the Applicability section. The SDT should provide an explanation as to the reasoning behind the selection of Load Serving Entities.
Response: Various industry experts estimate that as much as 1/3 of the total Interconnection Frequency Response may be supplied by Load Frequency Response (the other 2/3 is supplied from Turbine Governor Support). Thus information from the LSE concerning the composition and variations of load served within the Interconnection can be critical in understanding total Interconnection Frequency Response. The applicability to LSEs was added at the specific request of commenters in a previous version of the SAR.			
Energy Mark, Inc.	☑	☑	I agree that the proposed list includes those entities that would be affected by a technical standard. However, there are many questions that must be resolved before any standard that affects the Generation Owner, Generation Operator or Load-serving Entity can be implemented. These questions relate to how a performance standard can or should be implemented. If there is no reasonable expectation that they would be included in a future performance standard, it would be unreasonable to implement a technical standard that requires these three functional entities to provide data. In a fair market that allows voluntary participation by Generation Owners, Generation Operators and Load-serving Entities, the direct application of a Frequency Response Performance Standard to these entities is not currently possible without creating unreasonable inequities in the market. Any standard applied directly to one generator but not another will create unreasonble inequities in a market. Since each generation technology has different Frequency Response capabilities, only a solution that provides Frequency Response through a market based mechanism can be fairly implimented in a market. Under these conditions, the measurement methods and data collection for a technical standard should only be applied to those entities that would have resposibilities under a

Question #2			
Commenter	**Yes**	**No**	**Comment**
			performance standard. The correct alternative for collecting data from these entities is to collect it indirectly through the Balancing Authority or Reliability Coordinator that would be directly affected by a performance standard. The inclusion of Generation Owner, Generation Operator, and Load-serving Entity directly in the data collection will lead to the development of data collection systems that will need to be replaced, if and when, a performance standard is developed. This is an inefficient way to develop the technology for a new standard.
Response: The SAR Drafting Team appreciates your input, but disagrees with some of your conclusions. The SAR Drafting team does not see the linkage between requiring data from entities in order to qualify and quantify Frequency Response with the interconnections and NOT including all these entities in a Frequency Response Performance Standard. Available Frequency Response and its distribution within an Interconnection may require that certain generators be treated differently than others due to their location and electrical characteristics. How this difference is compensated is neither within the scope of this SAR nor within NERC's authority. The SAR drafting team agrees with your statement about the data collection being performed in the most efficient manner.			
Salt River Project	☑		Ultimately there may be some impact to the Planning Coordinator and/or Resource Planner if a frequency response requirement is specified. Could there be an extreme scenario where an entity would have to consider shedding load to meet some frequency reserve criteria?
Response: The SAR Drafting Team does not anticipate that the standard resulting from this SAR will contain any requirement for specific Frequency Responses from the Interconnections or the Balancing Authorities. Future standards are beyond the scope of this SAR. The SAR Drafting Team would expect that in any standard (whether dealing with transmission, dynamics or reserves) load shedding only makes sense if the entity cannot withstand the next contingency.			
Xcel Energy Services	☑		To the extent information is needed from these entities, they are appropriate to list. It is possible that the LSE is not required.
Response: Various industry experts estimate that as much as 1/3 of the total Interconnection Frequency Response may be supplied by Load Frequency Response (the other 2/3 is supplied from Turbine Governor Support). Thus information from the LSE concerning the composition and variations of load served within the Interconnection can be critical in understanding total Interconnection Frequency Response. The applicability to LSEs was added at the specific request of commenters in a previous version of the SAR.			
American Electric Power	☑		The role of the load serving entity in item 6b is unclear.
Response: Various industry experts estimate that as much as 1/3 of the total Interconnection Frequency Response may be supplied by Load Frequency Response (the other 2/3 is supplied from Turbine Governor Support). Thus information from the			

Question #2			
Commenter	**Yes**	**No**	**Comment**
LSE concerning the composition and variations of load served within the Interconnection can be critical in understanding total Interconnection Frequency Response. The applicability to LSEs was added at the specific request of commenters in a previous version of the SAR.			
ERCOT	☑		
CAISO	☑		
Bonneville Power Administration	☑		
KCP&L	☑		
Manitoba Hydro	☑		
MidAmerican Energy Co.	☑		
MISO	☑		
NRG Texas	☑		
NYISO	☑		
Southern	☑		
ITC Transco	☑		

3. The SAR drafting team modified the SAR to clarify that data will be collected to model up to 5 minutes of frequency response. This should help identify the window of time where frequency response appears to be masked by AGC action. Do you agree with this clarification?

Summary Consideration:

Most comments agreed that the clarification helped to identify the window of time when frequency response appears to be masked by AGC action. Several commenters requested more specific information on the sample rates and the specific data that would be collected. The SAR Drafting Team explained that this type of information will be developed in the standard development process and not captured in the SAR. The SAR drafting team agreed to forward these comments to the Director of Standards Development so that they can be addressed by the Frequency Response Standard Drafting Team.

Question #3			
Commenter	**Yes**	**No**	**Comment**
SWPA		☑	Need more specific information regarding sample rates. The 5-minutes of frequency response should identify time periods prior to and after the event.
Response: The SAR Drafting Team agrees with the comment. Specific information, such as sampling rate and specific data requirements, will be developed in the standard development process and not captured in the SAR. The five minute period was proposed based on comments to a prior version of the SAR. Some commenters were concerned that governors were withdrawing response shortly after the initial excursion. The SAR drafting team will forward these comments to the Director of Standards so that they can be addressed by the Frequency Response Standard Drafting Team. We expect the data sampling rate to be on existing SCADA periodicity.			
SPP ORWG		☑	The 5 minute time is adequate, but it lacks substance. Small changes in load and generation due to frequency response are very difficult to separate from normal load changes and AGC action on generation units (as was pointed out). It is important to include in the description of data collection that the 5 minutes should include 1 minute of data prior to a study event and 4 minutes after a study event. It is also important to include a sample rate, such as 4 seconds (obviously, faster samples are better, but may not be practical). The SAR, as written, lacks specifics on what data is required to perform a valid study. Some examples of necessary data may include, but are not limited to, AGC pulses, special protection systems, generator MW, tie line MW, frequency, etc.
Response: The SAR Drafting Team agrees with the comment. Specific information, such as sampling rate and specific data requirements, will be developed in the standard development process and not captured in the SAR. The five minute period was proposed based on comments to a prior version of the SAR. Some commenters were concerned that governors were withdrawing response shortly after the initial excursion. The SAR drafting team will forward these comments to the Director of Standards so that they can be addressed by the Frequency Response Drafting Team. We expect the data sampling rate to			

Question #3			
Commenter	**Yes**	**No**	**Comment**
be on existing SCADA periodicity.			
Xcel Energy Services		☑	Further clarification is needed around the time period for which data will be collected. It important to note that description of the 5 minutes data collection period should include 1 minute before and 4 minutes after the event.
Response: In response to your first comment, the SAR Drafting Team agrees with the comment. Specific information, such as sampling rate and specific data requirements, will be developed in the standard development process and not captured in the SAR. The five minute period was proposed based on comments to a prior version of the SAR. Some commenters were concerned that governors were withdrawing response shortly after the initial excursion. The SAR drafting team will forward these comments to the Director of Standards so that they can be addressed by the Frequency Response Standard Drafting Team. We expect the data sampling rate to be on existing SCADA periodicity. In response to your second comment, the SAR Drafting team agrees that data is required both before and after the contingency to be analyzed.			
ITC Transco		☑	Five minutes of data seems arbitrary. If the collection period were extended to 15 minutes, it would coincide with the Disturbance Control period.
Response: Thank you for your comment. The SAR Drafting Team agrees with the comment. Specific information, such as sampling rate and specific data requirements, will be developed in the standard development process and not in the SAR. The five minute period was proposed based on comments to a prior version of the SAR. Some commenters were concerned that governors were withdrawing response shortly after the initial excursion. The SAR drafting team will forward these comments to the Director of Standards so that they can be addressed by the Frequency Response Drafting Team. We expect the data sampling rate to be on existing SCADA periodicity.			
PJM		☑	As noted above PJM does not consider collecting data in order to decide what a requirement should be as grounds for a standard. Thus the sampling period which is outside of a NERC standard, can be defined in whatever way the group doing the sampling desires.
Response: Specific information, such as sampling rate and specific data requirements, will be developed in the standard development process and not captured in the SAR. The five minute period was proposed based on comments to a prior version of the SAR.			
NYSRC		☑	It is not clear what type of data is going to be collected from this requirement. AGC response is continuous. What is the justification for the specific "five minutes" reffered to? Since AGC control is every 4 seconds, five minutes appears to be too long a period to collect this data. Imposing this requirement will require the installation of local data storage retention facilities & telemetering equipment that may not be necessary.
Response: The SAR Drafting Team agrees with the comment. Specific information, such as sampling rate and specific data requirements, will be developed in the standard development process and not captured in the SAR. The five minute period was proposed based on comments to a prior version of the SAR. Some commenters were concerned that governors were			

Question #3			
Commenter	**Yes**	**No**	**Comment**
withdrawing response shortly after the initial excursion. The SAR drafting team will forward these comments to the Director of Standards so that they can be addressed by the Frequency Response Standard Drafting Team. We expect the data sampling rate to be on existing SCADA periodicity.			
NPCC CP9		☑	It is not clear what type of data is going to be collected from this requirement. AGC response is continuous. What is the justification for the specific "five minutes" referred to? Since AGC control is every 4 seconds, five minutes appears to be too long a period to collect this data. Imposing this requirement will require the installation of local data storage retention facilities & telemetering equipment that may not be necessary and NPCC participating members would like the drafting team to explain why 5 minutes is necessary. Also, when requesting data from a generator what is expected scan-rate/exception reporting clarity of the data?
Response: The SAR Drafting Team agrees with the comment. Specific information, such as sampling rate and specific data requirements, will be developed in the standard development process and not in the SAR. The five minute period was proposed based on comments to a prior version of the SAR. Some commenters were concerned that governors were withdrawing response shortly after the initial excursion. The SAR drafting team will forward these comments to the Director of Standards so that they can be addressed by the Frequency Response Standard Drafting Team. We expect the data sampling rate to be on existing SCADA periodicity.			
KCP&L		☑	The 5 minute time is adequate, but it lacks substance. Small changes in load and generation due to frequency response are very difficult to separate from normal load changes and AGC action on generation units (as was pointed out). It is important to include in the description of data collection that the 5 minutes should include 1 minute of data prior to a study event and 4 minutes after a study event. It is also important to include a sample rate, such as 4 seconds (obviously, faster samples are better, but may not be practical).
Response: The SAR Drafting Team agrees with the comment. Specific information, such as sampling rate and specific data requirements, will be developed in the standard development process and not captured in the SAR. The five minute period was proposed based on comments to a prior version of the SAR. Some commenters were concerned that governors were withdrawing response shortly after the initial excursion. The SAR drafting team will forward these comments to the Director of Standards so that they can be addressed by the Frequency Response Standard Drafting Team. We expect the data sampling rate to be on existing SCADA periodicity.			
Energy Mark, Inc.	☑	☑	I agree with the concept of measuring Frequency Response for an extended period after a disturbance, but I do not agree that the reason is related to masking by AGC action. If the Frequency Bias for a Balancing Authority is set to a value that approximates the actual Frequency Response, the AGC action will always provide the correct response for

Question #3			
Commenter	**Yes**	**No**	**Comment**
			reliable interconnection performance. The Frequency Response should be measured for an extended period after a disturbance to identify entities that are prematurely withdrawing their expected frequency response support from the interconnection. This has been demonstrated for entities that have outer loop control that only includes scheduled deliveries without adjustment for frequency response.
Response: The SAR Drafting Team agrees with the comment. Specific information, such as sampling rate and specific data requirements, will be developed in the standard development process and not captured in the SAR. The five minute period was proposed based on comments to a prior version of the SAR. Some commenters were concerned that governors were withdrawing response shortly after the initial excursion. The SAR drafting team will forward these comments to the Director of Standards so that they can be addressed by the Frequency Response Standard Drafting Team. We expect the data sampling rate to be on existing SCADA periodicity.			
Hydro Québec TransÉnergie	☑	☑	We requests clarification as to what data and at what periodicity will be collected from the identified entities.
Response: The SAR Drafting Team agrees with the comment. Specific information, such as sampling rate and specific data requirements, will be developed in the standard development process and not captured in the SAR. The five minute period was proposed based on comments to a prior version of the SAR. Some commenters were concerned that governors were withdrawing response shortly after the initial excursion. The SAR drafting team will forward these comments to the Director of Standards so that they can be addressed by the Frequency Response Standard Drafting Team. We expect the data sampling rate to be on existing SCADA periodicity.			
ISO New England	☑	☑	ISO New England requests clarification as to what data and at what periodicity will be collected.
Response: The SAR Drafting Team agrees with the comment. Specific information, such as sampling rate and specific data requirements, will be developed in the standard development process and not captured in the SAR. The five minute period was proposed based on comments to a prior version of the SAR. Some commenters were concerned that governors were withdrawing response shortly after the initial excursion. The SAR drafting team will forward these comments to the Director of Standards so that they can be addressed by the Frequency Response Standard Drafting Team. We expect the data sampling rate to be on existing SCADA periodicity.			
MISO	☑	☑	Five minutes is acceptable. There may be merit in collecting 15 minutes of data to cover the DCS window. The data should be readily available since the BAs are already examining this data to determine their compliance with the DCS standard. The final decision can be made during the standards drafting phase.
Response: The SAR Drafting Team agrees with the comment. Specific information, such as sampling rate and specific data requirements, will be developed in the standard development process and not captured in the SAR. The five minute period was proposed based on comments to a prior version of the SAR. Some commenters were concerned that governors were withdrawing response shortly after the initial excursion. The SAR drafting team will forward these comments to the Director of Standards so that they can be addressed by the Frequency Response Standard Drafting Team. We expect the data			

Question #3			
Commenter	**Yes**	**No**	**Comment**
sampling rate to be on existing SCADA periodicity.			
NYISO	☑	☑	It is not clear what type of data is going to be collected from this requirement. AGC response is continuous. What is the justification for the specific "five minutes" reffered to? Since AGC control is every 4 seconds, five minutes appears to be too long a period to collect this data. Imposing this requirement will require the installation of local data storage retention facilities & telemetering equipment that may not be necessary and NPCC participating members would like the drafting team to explain why 5 minutes is necessary. Also, when requesting data from a generator what is expected scan-rate/exception reporting clarity of the data?
Response: The SAR Drafting Team agrees with the comment. Specific information, such as sampling rate and specific data requirements, will be developed in the standard development process and not captured in the SAR. The five minute period was proposed based on comments to a prior version of the SAR. Some commenters were concerned that governors were withdrawing response shortly after the initial excursion. The SAR drafting team will forward these comments to the Director of Standards so that they can be addressed by the Frequency Response Standard Drafting Team. We expect the data sampling rate to be on existing SCADA periodicity.			
ERCOT	☑		This time frame should be sufficient for determination of frequency response. If it is intended that this data should also be useful for evaluating generating unit governor functioning, a longer time may be appropriate.
Response: The SAR Drafting Team agrees with the comment. Specific information, such as sampling rate and specific data requirements, will be developed in the standard development process and not captured in the SAR. The five minute period was proposed based on comments to a prior version of the SAR. Some commenters were concerned that governors were withdrawing response shortly after the initial excursion. The SAR drafting team will forward these comments to the Director of Standards so that they can be addressed by the Frequency Response Standard Drafting Team. We expect the data sampling rate to be on existing SCADA periodicity.			
Manitoba Hydro	☑		Ten minutes might be more useful, especially in any areas where it appears to take a long time to settle down after a frequency deviation event. This could be left up to the discretion of operators and balancing authorities in any areas where slow or bumpy returns to normal frequency levels are experienced.
Response: The SAR Drafting Team agrees with the comment. Specific information, such as sampling rate and specific data requirements, will be developed in the standard development process and not in the SAR. The five minute period was proposed based on comments to a prior version of the SAR. Some commenters were concerned that governors were withdrawing response shortly after the initial excursion. The SAR drafting team will forward these comments to the Director of Standards Development so that they can be addressed by the Frequency Response Drafting Team. We expect the data sampling rate to be on existing SCADA periodicity.			

Question #3			
Commenter	**Yes**	**No**	**Comment**
Salt River Project	☑		
Southern	☑		
NRG Texas	☑		
MidAmerican Energy Co.	☑		
IESO	☑		
Bonneville Power Administration	☑		
CAISO	☑		
American Electric Power	☑		

4. Should a field trial be initiated, whereby a set of events for each Interconnection is posted throughout the year, to be used by BAs to calculate their 2007 Frequency Response?

Summary Consideration:

Most commenters indicated that a field trial should be initiated whereby a set of events for each Interconnection is posted throughout the year, to be used by Bias to calculate their 2007 Frequency Response.

Question #4			
Commenter	**Yes**	**No**	**Comment**
Manitoba Hydro			Only if field trials are deemed to have very high probability of not causing significant difficulties on overly sensitive network area.
Response: The SAR Drafting Team agrees that no field trial should adversely impact the reliability of the Bulk Power System.			
MidAmerican Energy Co.		☑	This is not a new concept. I support institution of the standard as written so a start can be made to identify and, with luck, remediate the decline in frequency response.
Response: Thank you for your support.			
Bonneville Power Administration		☑	BPA does not believe a field trial is needed for this standard. The standard should be written and implemented with the levels of noncompliance structured around data submittal.
Response: Thank you for your support.			
PJM		☑	There are field trials for standards (which this question is directed) and there are field trials for good ideas. This proposed SAR would seem to fall into the second category; and while posting events is interesting, it does not rate being a NERC standard. Collecting and posting data can be effected without a standard.
Response: Thank you for your comment.			
NYSRC		☑	
Energy Mark, Inc.	☑	☑	This would be a good way to insure that every entity select a similar set of events for calculation of their Frequency Response, but it will not insure conformity of the results. The difficulty with any method for selecting a common set of events is that each of those events is caused by a disturbance within one or more of the Balancing Authorities on the interconnection. Those entities that cause the disturbance will experience a different frequency response than those entities that are responding. The net effect is that the sum of the responses for all of the entities on the interconnection must sum to zero. This means that each entity must eliminate those disturbances for which they are the cause, from the set of disturbances they use to estimate their response. The real advantage is an entity cannot influence the results of the measurement through selection of the events they choose to include in the calculation.

Question #4			
Commenter	**Yes**	**No**	**Comment**
Response: Thank you for your comment. The SAR drafting team will forward these comments to the Director of Standards so that they can be addressed by the Frequency Response Standard Drafting Team.			
MISO	☑		This should not be a problem as BAs should already be performing this calculation in the annual determination of their frequency bias.
Response: Thank you for your comment.			
NRG Texas	☑		A field trial may indicate the need for more or different data for the proper calculation of a BAs Frequency Response.
Response: Thank you for your comment.			
ERCOT	☑		A field trial would be beneficial to ensure that no gaps in the need for data exist. This could relate to whether other data is needed or whether data for a longer time is needed.
Response: Thank you for your comment.			
IESO	☑		A field test is a must and would definitely provide useful information on the types of event that would necessiate such data collection (The threshold needs to be clarified though - e.g. should it be >10MW loss of generator or some other threshold?), and any specific areas that need to be worked on in order to ensure that all relevant and required data is collected.
Response: Thank you for your comment. The SAR Drafting Team agrees with the comment. Specific information, such as sampling rate and specific data requirements, will be developed in the standard development process and not in the SAR. The SAR drafting team will forward these comments to the Director of Standards so that they can be addressed by the Frequency Response Standard Drafting Team. We expect the data sampling rate to be on existing SCADA periodicity.			
Southern	☑		Currently BAs in the Eastern Interconnection have little, if any, way to actually calculate their frequency responses. As a result, most default to the one percent minimum. A good database of disturbance events will provide the information to calculate BA frequency response more accurately while at the same time allowing the NERC OC/RS to determine if the one percent minimum is appropriate in the EI today.
Response: Thank you for your comment.			
Hydro Québec TransÉnergie	☑		
CAISO	☑		
ISO New England	☑		
KCP&L	☑		
NPCC CP9	☑		

Question #4			
Commenter	**Yes**	**No**	**Comment**
NYISO	☑		
SPP ORWG	☑		
Salt River Project	☑		
Xcel Energy Services	☑		
American Electric Power	☑		
ITC Transco	☑		
SWPA	☑		

5. Please provide any other comments (that you have not already provided in response to the first three questions on this form) that you have on the revised SAR.

Question #5	
Commenter	**Comment**
Bonneville Power Administration	BPA agrees with the necessity of a frequency response standard. BPA highly encourages that this effort be implemented as soon as possible.
Response: Thank you for your support.	
Constellation	Specific to the Requirement 6 a which states: Each Generator Operator that operates a generator larger than [10 MW]*, shall provide data to its Balancing Authority, as required in item 6, to support this standard and for use in developing models of Frequency Response in the associated Interconnection. Balancing Authorities may seek Speed Droop characteristics for our generators. Speed Droop is a design characteristic of the steam turbine (or the prime mover's governor response in the case of a combustion turbine or diesel) . Our concern is the only data we may be able to provide would be turbine manufacturer design data. For our older units where turbine control systems have been retrofitted and upgraded with more modern controls, we may not really know the speed droop characteristic of the unit. Collecting performance data to demonstrate the speed droop is extremely difficult if not impossible on a large unit. (Requires the grid connection frequency be allowed to "droop" as the generator is loaded). Hence, as now written, Constellation Generation is not clear how we could comply.
Response: The SAR Drafting Team anticipates that Frequency Response information will be collected directly from measured quantities on the grid or the generator bus. We do not anticipate using design curves or other archival data.	
Energy Mark, Inc.	One of my concerns is a majority of entities in NERC must agree that there is a need for a standard before the standard process moves forward. This could have undesirable long-term results with respect to the quality of the standards that are developed. This standard provides a good example of this problem. From what I have observed, both the Texas and Western Interconnections have concluded that there is a reliability need for a Frequency Response Standard on their interconnections. Unfortunately, reasonable opposition from the Eastern Interconnection will prevent the development of a common standard for those two interconnections. The only alternative will be for the Texas and Western Interconnections to each develop their own standards for Frequency Response without considering ways of making those two standards similar to each other. If the Eastern Interconnection, after a few years, finds that it needs a Frequency Response Standard, it will then become necessary for a new standard to be developed that applies to all three interconnections.

Question #5	
Commenter	**Comment**
	If each interconnection has a different Frequency Response Standard, it means there is no standard at all, but three different rules for NERC. The next logical step is to develop a common standard for all three interconnections requiring the first two standards developed by the Texas and Western Interconnections separately be modified to conform to a North American Standard on Frequency Response. Combining these three separate needs into a single standard will result in a natural opposition to change by those interconnections that have already implemented an interconnection standard that meets their individual needs. This will make it very difficult to gain the support necessary to enact a common standard for NERC. This multi-step development can only be avoided by having all three interconnections participate and contribute to standards identified and developed by individual interconnections. I believe that NERC needs to find a way to address this problem. If they do not, the standard development and approval process will lead to fractured standards and an unacceptable fractured standard process for NERC. One alternative might be to find a way for all interconnections to participate in the solution of individual interconnection problems as part of the standard development process.
Response: Thank you for your comment. We believe the Standards Development Procedure provides the solution you are seeking. The proposed SAR sets the foundation for a technical standard for a common way to measure and evaluate frequency response. Should a Region or Interconnection determine they need a more stringent, performance-based standard, there is a means to pursue a difference.	
Hydro Québec TransÉnergie	Being a single Balancing Authority Interconnection, there might be a need for a «regional» difference for the Québec Interconnection when specific value will be established. Same as ERCOT, frequency response will be based on the change in generation (or load) rather than Tie-Line deviation.
Response: We agree with this comment. The SAR Drafting Team anticipates that specific regional differences will be addressed in the Standard and not in the SAR.	
IESO	While we felt that the previous SAR was unclear on the intent, this SAR has such a reduced scope that the intended task does not require a reliability standard to achieve . A task team charged by a standing committee (the OC), would suffice. The requirements proposed in the SAR can be set as conditions for completing the data collection effort by the task team.
Response: The SAR Drafting Team disagrees and believes that the scale of this project, the ongoing nature, and the potential importance of the conclusions to be developed per the specifications in Paragraphs 5 and 6 are sufficiently important to warrant the use of the NERC Reliability Standards Process.	
KCP&L	The reasoning for this technical standard is based on the perception that the frequency response of the electrical system is declining and a concern that the interconnect's ability to arrest significant system disturbances is slowly being compromised. Although it is not disagreeable that a study be conducted to determine if an actual decline in frequency response is occuring and then to determine cause, it is diagreeable to propose a potential remedy for a problem that may not exist or, dependent on the findings, in inappropriate remedy.

Question #5	
Commenter	**Comment**
	One reason a decline in frequency response may be perceived occuring is a result of more on-line generating units being fully loaded. That means when a frequency decline occurs there are less units able to respond because they are already loaded. That does not mean the interconnection is at risk. As long as Balancing Authorities are maintaining their reserve obligations, even large contingencies should be manageable. However, over the years because of the trend to get more out of invested generation resources, it would give the appearance of a decline in frequency response since most frequency degradations are a result of losses of generation and a resultant decline in system frequency and those are what is studied and scrutinized. The August 14, 2003 disturbance was an opportunity to study the frequency response of all on-line generating units due to the frequency event resulting in a high frequency. High frequency is the only event where all on-line generating units will respond. Proposing the establishment of a Target Frequency Response for the interconnect before concluding if an actual decline in frequency response is occuring and the subsequent cause(s) for the decline is finding a solution before defining the problem. Any standards involving frequency response needs to also consider the role system reserves play in the interconnect as well as the frequency response of generators and system load to frequency. As long as generating reserve obligations are being met to meet current Reliability Standards and Regional Operating Criteria there may not be a need to go further dependent on the outcome of the study proposed by this SAR.
Response: The SAR Drafting Team agrees with you speculations, but strongly believes that actual field data must be collected and analyzed to determine the specific processes impacting Frequency Response. It may well be that no further action will be required, but that is beyond the scope of this SAR.	
MidAmerican Energy Co.	I have concern about the "shall"s in the standard, in that there is no apparent enforcement behind the requirements for data submittals. If I'm wrong in this, then I would be comfortable with the effectiveness possible. If I'm right, what is to be done with an entity which finds it convenient not to report?
Response: The SAR Drafting Team anticipates that the Standard that evolves from this SAR will have measures for such things as failure to report and other practical details.	
NRG Texas	Frequency Response of Resources is vital to the reliability of an interconnection. Large differences between the measured Frequency Response of a BA, its Bias setting and the models of Frequency Response may indicate a reliability risk. Updating the models with accurate Frequency Response data will improve the evaluation of this reliability risk. Please implement this process as soon as possible.
Response: The SAR Drafting Team agrees and thanks you for your support.	
NYSRC	The results of the data collection efforts should be used to develop a standard governing frequency response.

Question #5	
Commenter	**Comment**
Response: The SAR Drafting Team agrees and thanks you for your support.	
Southern	This SAR starts the process toward understanding frequency behavior, particularly in the Eastern Interconnection. In our opinion this is a necessary first step in determining whether we need frequency response allocations or other measures to ensure the sustained frequency performance that is required for reliable operations. Wherever possible, the scope and extent of data collection required for generators, their dynamic models including all associated control devices, and any other system data parameters covered under this SAR be limited such that it should not duplicate or exceed system modeling data requirements of any other NERC standard. One important system modeling parameter not emphasized in this SAR is the characteristic behavior of load at each substation (constant power, constant current, etc.), which would seem to have a significant effect on overall frequency response of the interconnected system. It is quite possible that advancements in consumer appliances and electronics, and their proliferation of use, have collectively changed the overall characteristics of system load to a composite state that is significantly different from modeling assumptions made within the previous few years.
Response: The SAR Drafting Team agrees and thanks you for your support.	
SPP ORWG	The reasoning for this technical standard is based on the perception that the frequency response of the electrical system is declining and a concern that the interconnect's ability to arrest significant system disturbances is slowly being compromised. Although it is not disagreeable that a study be conducted to determine if an actual decline in frequency response is occuring and then to determine cause, it is diagreeable to propose a potential remedy for a problem that may not exist or, dependent on the findings, in inappropriate remedy. Types of generating units online (e.g., wind generation, combined cycle, etc) and their subsequent loading will have an influence on the frequency response of the system. As long as Balancing Authorities are maintaining their reserve obligations, even large contingencies should be manageable. However, over the years because of the trend to get more out of invested generation resources, it would give the appearance of a decline in frequency response since most frequency degradations are a result of losses of generation and a resultant decline in system frequency and those are what is studied and scrutinized. The August 14, 2003 disturbance was an opportunity to study the frequency response of all on-line generating units due to the frequency event resulting in a high frequency. High frequency is the only event where all on-line generating units will respond. Proposing the establishment of a Target Frequency Response for the interconnect before concluding if an actual decline in frequency response is occuring and the cause(s) for the decline is finding a solution before defining the problem. Any standards involving frequency response need to also

Question #5	
Commenter	**Comment**
	consider the role system reserves play in the interconnect as well as the frequency response of generators and system load to frequency. As long as generating reserve obligations are being met in accordance with current Reliability Standards and Regional Operating Criteria there may not be a need to go further dependent on the outcome of the study proposed by this SAR.
Response: The SAR Drafting Team disagrees and believes that a fundamental understanding of frequency response in each of the Interconnections is necessary to ensure reliability of the Bulk Power System. This is particularly important as new, untested technologies are integrated into the Bulk Power System with potentially unanticipated outcomes. Although no follow up Standards may be required after the Frequency Response Standard is developed, there is a potential risk to Interconnection reliability unless we do implement this SAR and Standard and develop a firm understanding of specifically how Frequency Response operates. It appears that there is a misunderstanding of the Target Frequency Response in that this does not set a minimum for any particular Balancing Authority. The Target Frequency Response sets a benchmark, beyond which additional data is needed from the Balancing Authority.	
Salt River Project	The SAR includes some requirement language pertaining to generators greater than 10 MW. Old NERC Policy included language requiring frequency responsive governors "unless restricted by regulatory mandates". This makes sense for most nuclear facilities. Another type of restriction on governors involves small hydro units that are dependent on water order. For this type of unit there truly is no governor response yet the unit capabilities may exceed 10 MWs. Please consider these types of exemptions as work progresses on this SAR and resulting standard.
Response: Your comments are good and will be provided to the Standard Drafting Team as it wrestles with the specific details of this project. The SAR does not propose to set a mandatory level of governor response for each generator. The proposed standard requires data and an identification of which generators are not providing response should the Balancing Authority be below the Target Response.	
Xcel Energy Services	Establishing a Target Frequency Response is premature. It advances a proposed remedy in advance of first meeting the intent of the SAR-determining the cause for the percieved decline in frequency response. It is our view that the percieved decline of frequency response, if that turns out to be the confirmed as a true decline, of itself does not necessarily indicate an significantly increased threat to reliability. As long as generating reserve obligations are being met to meet Reliability Standards and the real time regulating reserves are being carried, also to meet Standards, there may not be a need to go further depending on the outcome of the study proposed by the SAR.
Response: The SAR Drafting Team does not anticipate that a Target Frequency Response will be developed until such time that it can be technically supported as required by the NERC Reliability Standards Process.	
PJM	PJM would also note that the proposal references two distinct parameters - the Natural response of a BA; and the natural response of a unit. It is not clear how the requestor intends to link the two parameters. The sum of the units' natural responses will not equal the natural response of the BA.

Question #5	
Commenter	**Comment**
	Does the requestor intend to link the two, or to keep them separate? As written it appears that the requestor intends for the BA to be held responsible for an annual measured value. The SAR DT does not recognize that during different times there are different number of units opperating and available to respond. The SAR DT makes no mention of whether or not a BA(?) would have to shed load to maintain such frequency response (for those periods when all units are at full load). The SAR DT makes no mention of distance from an event. An event in NE will effect more response in NE then in Florida - how will that be addressed? PJM would ask for clarification on what the requestor would intend to mandate. FERC has recognized the need to include suppliers that use load control - how does this SAR intend to address such 'natural response suppliers'? As written this proposal becomes an ambiguous standard as it obligates a BA to get data from a generator (as opposed to directly obligating generators to supply the data to the analysis team - this is important from the perspective of who would be non-compliant if the data were not supplied - the BA or the GO?). PJM would suggest that NERC create a Frequency Project, budget the project through its members rather then create a standard and risk imposing non-compliance penalities for what potentially could be a non-issue. Deal with this for what it is - a research activity.
Response: The SAR Drafting Team appreciates your thoughtful comments but does not agree with your conclusions. Many of the details you are concerned about will be worked out as part of the details addressed by the Standards Drafting Team. The SAR Drafting Team does not anticipate that this SAR will mandate any specific frequency response. The stated purpose of this SAR is to collect and analyze data in order to determine the Frequency Response for each Interconnection, recommend a target Frequency Response for each Interconnection and determine the cause of any significant variations in Frequency Response within each of the Interconnections. In response to your suggestion to create a Frequency Project, the NERC Standards Development Procedure Manual allows for the development of SAR/Standard to collect and analyze data as needed to ensure the reliability of Interconnections.	
SWPA	Data collection and FRC assessments should also take into account loss of load, not just loss of generation. If load is lost, causing a high frequency excursion, FRC should be observed on heavily loaded generators.
Response: You are correct; however the collection of statistically significant load loss data has proven to be very difficult, if not impossible, in the past. The SAR Drafting Team will forward your comments to the Director of Standards so that they can be addressed by the Frequency Response Standard Drafting Team.	