

**UNITED STATES OF AMERICA  
BEFORE THE  
FEDERAL ENERGY REGULATORY COMMISSION**

Disturbance Monitoring and Reporting )  
Requirements Reliability Standard )

Docket No. RM15-4-000

**REPLY COMMENTS OF THE  
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION**

The North American Electric Reliability Corporation (“NERC”) hereby provides reply comments in response to comments submitted by the Bonneville Power Administration (“Bonneville”) and the American Public Power Association (“APPA”) on the Federal Energy Regulatory Commission’s (“FERC” or the “Commission”) Notice of Proposed Rulemaking proposing to approve Reliability Standard PRC-002-2 – Disturbance Monitoring and Reporting Requirements.<sup>1</sup> NERC’s reply comments are intended to clarify the record and demonstrate that the Commission should approve proposed Reliability Standard PRC-002-2 without modification, consistent with the PRC-002-2 NOPR.<sup>2</sup>

**I. Background**

On December 15, 2014, NERC filed a petition with the Commission for approval of proposed Reliability Standard PRC-002-2. The purpose of proposed Reliability Standard PRC-002-2 is to have adequate data available to facilitate analysis of Bulk Electric System (“BES”) Disturbances.<sup>3</sup> Specifically, the proposed Reliability Standard addresses the sequence of events

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<sup>1</sup> *Disturbance Monitoring and Reporting Requirements Reliability Standard*, 151 FERC ¶ 61,042 (2015) (the “PRC-002-2 NOPR”).

<sup>2</sup> To the extent that the Commission’s Rules of Practice and Procedure do not expressly authorize this response, NERC respectfully submits that the Commission should consider this response, as it will aid in the decision-making process. *See Midwest Indep. Transmission Sys. Operator, Inc.*, 122 FERC ¶ 61,198 at P 17 (2008) (answer to a protest permitted where it provided information that assisted the Commission’s decision-making process).

<sup>3</sup> Unless otherwise designated, all capitalized terms shall have the meaning set forth in the *Glossary of Terms Used in NERC Reliability Standards* (“NERC Glossary”), available at [http://www.nerc.com/files/Glossary\\_of\\_Terms.pdf](http://www.nerc.com/files/Glossary_of_Terms.pdf).

recording (“SER”), fault recording (“FR”), and dynamic Disturbance recording (“DDR”) data that applicable entities must have available and the manner in which applicable entities must provide that data to others, when requested.

As relevant to these reply comments, pursuant to proposed Reliability Standard PRC-002-2, Requirement R1, Part 1.1, each Transmission Owner must identify BES buses for which SER and FR data is required by using the methodology in Attachment 1 to Reliability Standard PRC-002-2. As explained in NERC’s petition in this proceeding, Attachment 1 is designed to identify the BES buses from which it is necessary to have SER and FR data to properly analyze Disturbances across the BES, accounting for regional differences in size and system topology, while limiting the burden on applicable entities.<sup>4</sup> The standard drafting team sought to develop a methodology that would only require entities to monitor Disturbances on those BES Elements that provide the critical information necessary for event analysis purposes.

As discussed further below, Attachment 1 establishes a threshold for identifying the relevant BES buses as those BES buses that have a maximum available calculated three phase short circuit MVA of 1,500 MVA or greater. If a Transmission Owner has no such buses, it has no further obligations under the proposed Reliability Standard with respect to SER and FR data. If a Transmission Owner has one, but less than or equal to 11 such buses, SER and FR data is only required from the BES bus with the highest maximum available calculated three phase short circuit MVA. If a Transmission Owner has more than 11 such BES buses, Steps 3 through 9 in Attachment 1 set forth the steps the Transmission Owner must take to identify the subset of those buses from which SER and FR data is required.<sup>5</sup>

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<sup>4</sup> *Petition of the N. Am. Elec. Reliability Corp. for Approval of Proposed Reliability Standard PRC-002-2 at 18-23, Docket No. RD15-4-000 (Dec. 15, 2014) (“Petition”).*

<sup>5</sup> *See* Petition at 21-23.

On April 16, 2015, the Commission issued the PRC-002-2 NOPR proposing to approve Reliability Standard PRC-002-2. The Commission stated that proposed Reliability Standard PRC-002-2 will enhance reliability by imposing mandatory requirements concerning the monitoring, recording and reporting of Disturbance data and providing greater continent-wide consistency regarding collection methods for data used in the analysis of Disturbances on the Bulk-Power System.<sup>6</sup> Specifically, the Commission maintained, proposed Reliability Standard PRC-002-2 enhances reliability by consistently requiring covered entities to collect time-synchronized information and to report Disturbances on the Bulk-Power System.<sup>7</sup> On June 22, 2015, Bonneville and APPA submitted comments on the PRC-002-2 NOPR, as discussed in the following section.

## **II. Bonneville and APPA Comments**

Both Bonneville's and APPA's comments focus on the methodology in Attachment 1 to the proposed Reliability Standard. Bonneville asserts that the Attachment 1 methodology is not technically justified and does not adequately allow for consideration of the unique characteristics of an individual utility's system. In particular, Bonneville maintains that the 1,500 MVA threshold in Step 2 of Attachment 1 is arbitrary and that use of other criteria, namely, the number of lines connected to a bus, would be more appropriate for identifying the buses from which SER and FR data should be required. While Bonneville acknowledges that Attachment 1 allows Transmission Owners to use their engineering judgment to select buses based on the characteristics of their systems, Bonneville raises concerns as to how such discretion will be audited. Bonneville suggests that it would be more appropriate to identify buses using criteria from other Reliability Standards, namely, the impact rating criteria under Attachment 1 to Reliability Standard CIP-002-5.1.

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<sup>6</sup> PRC-002-2 NOPR at P 11.

<sup>7</sup> *Id.*

APPA's comments relate to the costs to smaller Transmission Owners of implementing and complying with the requirements in the proposed Reliability Standard, claiming that: (1) the Commission's Regulatory Flexibility Act analysis is incorrect; (2) small entities' buses would not be selected under Attachment 1 if they were included in a larger data set that is analyzed on a wide-area basis; and (3) the Attachment 1 methodology is unduly discriminatory against small entities. APPA seems to imply that the Attachment 1 methodology is discriminatory because it allows larger entities with more than 11 qualifying buses "to reduce the number of SER and FR devices on their system by as much as 90%" whereas smaller entities with only one or two qualifying buses cannot make the same percentage reduction.<sup>8</sup> APPA argues that, if the intent of the proposed Reliability Standard is to install SER and FR devices at a subset of buses with the highest maximum available calculated three phase short circuit MVA, the methodology in Attachment 1 is flawed as the analysis is not conducted at a regional or sub-regional level, but by each Transmission Owner. If the Attachment 1 methodology was performed at the regional or sub-regional level, APPA contends, many of the smaller Transmission Owners would not have qualifying buses. Thus, APPA is seeking an alternative methodology to reduce the impact on smaller entities.

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<sup>8</sup> APPA Comments at 4. APPA's statement that a large Transmission Owner may reduce their number of buses from which SER and FR data is required by as much as 90% is misleading. Under Step 7, if an entity has more than 11 buses with a maximum available calculated three phase short circuit MVA of 1,500 MVA or greater, the Transmission Owner must identify at least 10% of the buses identified under Step 6 for which SER and FR data is required. Under Step 8, however, an entity is obligated to select an additional 10% of the buses identified under Step 6 such that the total number of buses for which SER and FR data is required will be at least 20% of the BES buses identified under Step 6. Step 6 provides that Transmission Owners with more than 11 buses that meet the 1,500 MVA threshold may reduce the buses on their list to only those that have a maximum available calculated three phase short circuit MVA higher than the greater of: (1) 1,500 MVA, or (2) 20% of the median MVA level determined in Step 5.

### III. Reply Comments

a. Attachment 1 is Based on Technical Data and Establishes an Appropriate Method for Obtaining Sufficient SER and FR Data Across North America

As explained in NERC's petition,<sup>9</sup> SER and FR data for the analysis, reconstruction, and reporting of Disturbances is essential for ensuring a robust and effective post-event analysis. Knowing the exact time of a breaker change of state and the waveforms of voltage and current for individual circuits, for instance, allows the precise reconstruction of events for both localized and wide-area Disturbances. Analyses of wide-area Disturbances often begin with an evaluation of SER data to help determine the initiating event(s) and to follow the Disturbance propagation. SER data also helps to determine the interruption of line flows at a particular bus. FR data augments SER data in evaluating circuit breaker operation.

As such, a central question before the standard drafting team for the proposed Reliability Standard was the proper method for identifying locations at which SER and FR data should be required to assist in event analysis. The standard drafting team realized that it was neither practical nor necessary to obtain data from every BES Element. The standard drafting team sought to develop a method for identifying the subset of BES Elements from which to obtain the necessary data for reconstructing significant events. Attachment 1 provides the uniform methodology to identify those BES Elements and is based on an analysis of technical data provided by Transmission Owners and Generators Owners during standard development, as discussed below.

The drafting team concluded that, to conduct an effective Disturbance analysis, it was most important to have data from those BES Elements that, if involved in a Disturbance, could have a significant effect on BES reliability. Data from these BES Elements would enable entities to

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<sup>9</sup> Petition at 19.

understand how those BES Elements respond to other BES Disturbances. Further, the data obtained from those Elements provides the foundation of accurate data from which contributions from, and effects on, other Elements can be determined by knowing Element characteristics (configuration, impedances, voltage level, etc.).

Bonneville's assertion to the contrary notwithstanding, identifying BES buses having high three phase fault MVA levels represents a technically sound basis for identifying the BES Elements at which SER and FR data should be required. As stated in the Petition, based on technical data provided by a number of entities, the standard drafting team recognized that there was a strong correlation between the available short circuit MVA at a Transmission bus and its relative size and importance to the Bulk-Power System based on: (i) its voltage level; (ii) the number of Transmission Lines and other Elements connected to the BES bus; and (iii) the number and size of generating units connected to the bus.<sup>10</sup> Buses with a large short circuit MVA level are Elements that have a significant effect on system reliability and performance. Conversely, buses with very low short circuit MVA levels seldom cause wide-area or Cascading Disturbances such that SER and FR data from those Elements are not as significant for Disturbance analysis. It is more important to obtain SER and FR data at BES buses with larger impact on the BES because it is necessary to determine how BES Elements responded to large impact Disturbances, which create greater stresses on BES Elements. Further, the data obtained from the buses with the higher short circuit MVA levels gives the foundation of accurate data from which contributions from, and effects on, lower MVA level buses can be determined by knowing Element characteristics.

Simply relying on the number of Transmission Lines connected to a bus, as Bonneville suggests, would not be an appropriate approach as it would likely exclude locations at which the

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<sup>10</sup> Petition at 19.

capture of SER and FR data should be required while including locations at which such data is not critical. As noted above, MVA levels more accurately measure the reliability impact of a particular bus. Although it is often the case that BES buses with a large number of Transmission Lines have higher MVA levels, the number of Transmission Lines is not always determinative. The standard drafting team recognized that there are circumstances under which a bus may have only three connected Transmission Lines, for instance, but, due to other factors, have a higher MVA level than a bus with 10 connected Transmission Lines. Because MVA levels are consistently more determinative as to reliability impact across the continent, it would not be appropriate to set an arbitrary number of connected Transmission Lines as the continent-wide threshold for Disturbance monitoring.

After establishing that BES buses with large short circuit MVA levels were the most appropriate locations from which to have Disturbance monitoring data, the standard drafting team sought to establish a bright-line threshold MVA level for identifying the locations at which SER and FR data should be required. The standard drafting team recognized that a challenge with establishing a continent-wide threshold is variability in size and system topology across the BES. The standard drafting team recognized that to provide for adequate data capture, the threshold for qualifying buses needed to be low enough to capture the key buses across the BES while high enough to exclude buses that are not central to event analysis. To obtain the necessary technical data to establish the appropriate threshold, the standard drafting team sent an information request to all Transmission Owners and Generator Owners requesting data on bus fault magnitude for three

phase bolted faults on buses operated at 100kV and higher in their areas.<sup>11</sup> 98 entities from various regions responded to the request for data.

As expected, the data provided by the Transmission Owners and Generators Owners indicated significant differences in short circuit MVA levels across the continent. After performing a median value analysis, the standard drafting team concluded that, given the potential impact of Disturbances occurring at buses having a three phase short circuit MVA of 1,500 MVA or greater across all systems, 1,500 MVA or greater was the appropriate level to set as the threshold for determining the buses at which to require SER and FR data across the BES. Accordingly, the standard drafting team's decision to use a maximum available calculated three phase short circuit MVA of 1,500 MVA for establishing the threshold was not arbitrary, as Bonneville asserts, but based on a thorough analysis of data that Transmission Owners and Generation Owners provided to the standard drafting team during development and with the purpose of ensuring adequate data capture across the BES.<sup>12</sup>

Bonneville also raises concerns that Attachment 1 does not allow for consideration of the unique characteristics of an individual utility's system. As Bonneville recognizes, however, the methodology does allow for engineering judgment in Step 8, which permits the selection of additional BES buses "at the Transmission Owner's discretion, to provide maximum wide-area coverage for SER and FR data." Step 8 was specifically included in Attachment 1 to account for the unique characteristics of a Transmission Owner's system and ensure that there was sufficient

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<sup>11</sup> The information request is available at [http://www.nerc.com/pa/Stand/Project%20200711%20Disturbance%20Monitoring%20DL/Project\\_2007-11\\_DM\\_Information\\_Request\\_Report\\_R3.pdf](http://www.nerc.com/pa/Stand/Project%20200711%20Disturbance%20Monitoring%20DL/Project_2007-11_DM_Information_Request_Report_R3.pdf).

<sup>12</sup> It is important to note that, as discussed above, under Attachment 1, buses that have a three phase short circuit MVA of 1,500 MVA or greater is a starting point for identifying locations at which SER and FR data is required. The proposed Reliability Standard does not require SER and FR data from all such buses. Steps 3 through 9 further narrow the scope of those buses for which SER and FR data is required.

geographic dispersion of the identified buses within that system to allow for adequate data capture for proper event analysis. NERC notes that while Step 8 is only applicable to entities with more than 11 buses that meet the 1,500 MVA threshold, entities may always obtain SER and FR data from additional buses if, in their judgment, it would be helpful for Disturbance analysis.

As to Bonneville's concerns regarding the auditability of Step 8, Step 8 specifically states that the additional buses are to be added to "provide maximum wide-area coverage." As explained in the Petition, Step 8 also provides criteria to guide an entity's decision in this regard.<sup>13</sup> Given this objective criteria, auditors will have a firm basis to assess whether the Transmission Owner satisfied its obligation under Step 8.

Lastly, the Commission should reject Bonneville's suggestion that the proposed Reliability Standard should use the impact rating criteria in CIP-002-5.1. The criteria in CIP-002-5.1 were developed to categorize BES facilities for purposes of cybersecurity and did not contemplate those optimum locations for Disturbance monitoring.

b. The Attachment 1 Methodology Does Not Unduly Impact On or Discriminate Against Smaller Entities

In response to APPA's concerns as to the impact of the proposed Reliability Standard on Transmission Owners that qualify as small entities under the Small Business Administration size standards for number of employees, NERC notes at the outset that, despite APPA assertions, the proposed Reliability Standard does not require the installation of both SER and FR devices on all buses identified as a result of applying Attachment 1. None of the requirements in the proposed Reliability Standard explicitly require the installation of equipment. Entities are only required to have SER and FR data. If a Transmission Owner could obtain the required data from other sources

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<sup>13</sup> Petition at 22-23.

(e.g., other buses), the Transmission Owner would not need to install any devices to comply with related PRC-002-2 requirements. The standard drafting team sought to provide applicable entities the flexibility to either install devices on their systems or, to reduce their financial burden, obtain the necessary data through other means (e.g., by working with their interconnected neighbors).

Moreover, APPA has failed to explain how the Attachment 1 methodology results in undue discrimination. APPA appears to argue that undue discrimination exists simply because Transmission Owners with more than 11 BES buses having a three phase short circuit MVA of 1,500 or higher may reduce the total number buses at which SER and FR data is required by a certain percentage, while smaller entities cannot apply the same percentage reduction in every circumstance.<sup>14</sup> A Reliability Standard, however, is not unduly discriminatory simply because entities are not treated exactly the same. So long as there is adequate justification for the differing treatment, there is no undue discrimination.<sup>15</sup> In this case, allowing larger entities to reduce the number of buses from which SER and FR is required by a certain percentage is reasonable. Large Transmission Owners may have hundreds of BES buses above the 1,500 MVA threshold. Requiring SER and FR data from each of those buses would be unduly burdensome and unnecessary for the purposes of event analysis.

Further, while the percentage reduction may not be equal, smaller Transmission Owners may also reduce the number of buses from which SER and FR is required. APPA fails to acknowledge that Transmission Owners that have one but less than or equal to 11 BES buses that

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<sup>14</sup> As noted above, APPA's assertion that large entities can reduce the monitored buses by 10% is incorrect as it fails to acknowledge the requirement in Step 8 to monitor a total of 20% of the BES buses identified in Step 6.

<sup>15</sup> See *Facilities Design, Connections and Maintenance Reliability Standards*, Order No. 705, 121 FERC ¶ 61,296 at P 58 (2007) (stating that NERC is required to provide an adequate justification for any differing treatment among the particular facilities considered in the various Reliability Standards). See also *Pub. Serv. Co. of Ind. v. FERC*, 575 F.2d 1204, 1211-12 (7th Cir. 1978); *El Paso Natural Gas Co.*, 104 FERC ¶ 61,045 at P 115 (2003) ("Discrimination is undue when there is a difference in rates or services among similarly situated customers that is not justified by some legitimate factor.").

meet the 1,500 MVA threshold need only monitor a single BES bus, which in some cases can result in a reduction greater than 10% of a Transmission Owner's qualifying buses.

More importantly, APPA has failed to explain why it is unduly burdensome or discriminatory to require smaller entities with only one or two buses meeting the 1,500 MVA level to obtain SER and FR data from one of those BES buses. Given the three phase short circuit MVA of those BES buses, data from that BES bus may play an integral role in the analysis of a Disturbance on the Transmission Owner's system and interconnected Systems. The goal of Attachment 1 is not simply to monitor only those BES buses with the highest MVA level in a given region or sub-region, but to ensure that there is sufficient dispersion across interconnected Systems to provide for adequate data coverage throughout the BES. Requiring smaller Transmission Owners to monitor their single qualifying BES bus is necessary to ensure adequate coverage and is thus not unduly discriminatory.

Additionally, APPA's suggestion that the Disturbance monitoring location should be identified at a regional or sub-regional level (e.g., by Reliability Coordinator or Planning Coordinator) is flawed. As discussed in the Petition, BES buses where SER and FR data is necessary are best selected by Transmission Owners because they have the required tools, information, and working knowledge of their systems to determine those buses.<sup>16</sup> The Transmission Owner has the granular perspective necessary to identify the appropriate BES bus. The Transmission Owners and Generator Owners that own BES Elements on those buses will have the responsibility for ensuring that adequate data is available.

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<sup>16</sup> Petition at 17.

#### **IV. Conclusion**

NERC respectfully requests that the Commission consider these comments and approve proposed Reliability Standard PRC-002-2 without modification.

Respectfully submitted,

*/s/ Shamai Elstein*

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Date: July 13, 2015

**CERTIFICATE OF SERVICE**

I hereby certify that I have served a copy of the foregoing document upon all parties listed on the official service list compiled by the Secretary in this proceeding. Dated at Washington, D.C. this 13<sup>th</sup> day of July, 2015.

/s/ Shamai Elstein  
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