# Comment Report

| | |
|---|---|
| **Project Name:** | 2021-04 Modifications to PRC-002 – Phase II \| PRC-028-1 |
| Comment Period Start Date: | 7/22/2024 |
| Comment Period End Date: | 8/12/2024 |
| Associated Ballots: | 2021-04 Modifications to PRC-002 – Phase II Implementation Plan AB 4 OT<br>2021-04 Modifications to PRC-002 – Phase II PRC-028-1 AB 4 ST |

There were 60 sets of responses, including comments from approximately 135 different people from approximately 91 companies representing 10 of the Industry Segments as shown in the table on the following pages.

**Questions**

**1. Do you agree with the modifications made in PRC-028-1?**

**2. Do you agree with the Implementation Plan for revised PRC-028-1?**

**3. Do you agree the modifications made in PRC-028-1 are cost effective at unit level cost versus plant level cost compared to the benefit to reliability?**

**4. Provide any additional comments for the standard drafting team to consider, if desired.**

| Organization Name | Name | Segment(s) | Region | Group Name | Group Member Name | Group Member Organization | Group Member Segment(s) | Group Member Region |
|---|---|---|---|---|---|---|---|---|
| Southwest Power Pool, Inc. (RTO) | Charles Yeung | 2 | MRO,NPCC,RF,SERC,SPP RE,Texas RE,WECC | SRC 2024 | Charles Yeung | SPP | 2 | MRO |
| | | | | | Ali Miremadi | CAISO | 1 | WECC |
| | | | | | Bobbi Welch | Midcontinent ISO, Inc. | 2 | MRO |
| | | | | | Greg Campoli | NYISO | 1 | NPCC |
| | | | | | Matt Goldberg | ISO New England | 2 | NPCC |
| | | | | | Helen Lainis | IESO | 2 | NPCC |
| | | | | | Elizabeth Davis | PJM | 2 | RF |
| WEC Energy Group, Inc. | Christine Kane | 3 | | WEC Energy Group | Christine Kane | WEC Energy Group | 3 | RF |
| | | | | | Matthew Beilfuss | WEC Energy Group, Inc. | 4 | RF |
| | | | | | Clarice Zellmer | WEC Energy Group, Inc. | 5 | RF |
| | | | | | David Boeshaar | WEC Energy Group, Inc. | 6 | RF |
| Exelon | Daniel Gacek | 1 | | Exelon | Daniel Gacek | Exelon | 1 | RF |
| | | | | | Kinte Whitehead | Exelon | 3 | RF |
| ACES Power Marketing | Jodirah Green | 1,3,4,5,6 | MRO,NPCC,RF,SERC,Texas RE,WECC | ACES Collaborators | Bob Soloman | Hoosier Energy Electric Cooperative | 1 | RF |
| | | | | | Kris Carper | Arizona Electric Power Cooperative, Inc. | 1 | WECC |
| | | | | | Jason Procuniar | Buckeye Power, Inc. | 4 | RF |
| | | | | | Jolly Hayden | East Texas Electric Cooperative, Inc. | NA - Not Applicable | Texas RE |
| | | | | | Scott Brame | North Carolina Electric | 3,4,5 | SERC |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Membership Corporation | | |
| | | | | | Nick Fogleman | Prairie Power, Inc. | 1,3 | SERC |
| | | | | | Amber Skillern | East Kentucky Power Cooperative | 1 | SERC |
| FirstEnergy - FirstEnergy Corporation | Mark Garza | 4 | | FE Voter | Julie Severino | FirstEnergy - FirstEnergy Corporation | 1 | RF |
| | | | | | Aaron Ghodooshim | FirstEnergy - FirstEnergy Corporation | 3 | RF |
| | | | | | Robert Loy | FirstEnergy - FirstEnergy Solutions | 5 | RF |
| | | | | | Mark Garza | FirstEnergy-FirstEnergy | 1,3,4,5,6 | RF |
| | | | | | Stacey Sheehan | FirstEnergy - FirstEnergy Corporation | 6 | RF |
| Michael Johnson | Michael Johnson | | WECC | PG&E All Segments | Marco Rios | Pacific Gas and Electric Company | 1 | WECC |
| | | | | | Sandra Ellis | Pacific Gas and Electric Company | 3 | WECC |
| | | | | | Tyler Brun | Pacific Gas and Electric Company | 5 | WECC |
| Southern Company - Southern Company Services, Inc. | Pamela Hunter | 1,3,5,6 | SERC | Southern Company | Matt Carden | Southern Company - Southern Company Services, Inc. | 1 | SERC |
| | | | | | Joel Dembowski | Southern Company - Alabama Power Company | 3 | SERC |
| | | | | | Ron Carlsen | Southern Company - Southern Company Generation | 6 | SERC |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Leslie Burke | Southern Company - Southern Company Generation | 5 | SERC |
| Black Hills Corporation | Rachel Schuldt | 6 | | Black Hills Corporation - All Segments | Micah Runner | Black Hills Corporation | 1 | WECC |
| | | | | | Josh Combs | Black Hills Corporation | 3 | WECC |
| | | | | | Rachel Schuldt | Black Hills Corporation | 6 | WECC |
| | | | | | Carly Miller | Black Hills Corporation | 5 | WECC |
| | | | | | Sheila Suurmeier | Black Hills Corporation | 5 | WECC |
| Northeast Power Coordinating Council | Ruida Shu | 1,2,3,4,5,6,7,8,9,10 | NPCC | NPCC RSC | Gerry Dunbar | Northeast Power Coordinating Council | 10 | NPCC |
| | | | | | Deidre Altobell | Con Edison | 1 | NPCC |
| | | | | | Michele Tondalo | United Illuminating Co. | 1 | NPCC |
| | | | | | Stephanie Ullah-Mazzuca | Orange and Rockland | 1 | NPCC |
| | | | | | Michael Ridolfino | Central Hudson Gas & Electric Corp. | 1 | NPCC |
| | | | | | Randy Buswell | Vermont Electric Power Company | 1 | NPCC |
| | | | | | James Grant | NYISO | 2 | NPCC |
| | | | | | Dermot Smyth | Con Ed - Consolidated Edison Co. of New York | 1 | NPCC |
| | | | | | David Burke | Orange and Rockland | 3 | NPCC |
| | | | | | Peter Yost | Con Ed - Consolidated Edison Co. of New York | 3 | NPCC |

| | | | |
|---|---|---|---|
| Salvatore Spagnolo | New York Power Authority | 1 | NPCC |
| Sean Bodkin | Dominion - Dominion Resources, Inc. | 6 | NPCC |
| David Kwan | Ontario Power Generation | 4 | NPCC |
| Silvia Mitchell | NextEra Energy - Florida Power and Light Co. | 1 | NPCC |
| Sean Cavote | PSEG | 4 | NPCC |
| Jason Chandler | Con Edison | 5 | NPCC |
| Tracy MacNicoll | Utility Services | 5 | NPCC |
| Shivaz Chopra | New York Power Authority | 6 | NPCC |
| Vijay Puran | New York State Department of Public Service | 6 | NPCC |
| David Kiguel | Independent | 7 | NPCC |
| Joel Charlebois | AESI | 7 | NPCC |
| Joshua London | Eversource Energy | 1 | NPCC |
| Jeffrey Streifling | NB Power Corporation | 1,4,10 | NPCC |
| Joel Charlebois | AESI | 7 | NPCC |
| John Hastings | National Grid | 1 | NPCC |
| Erin Wilson | NB Power | 1 | NPCC |
| James Grant | NYISO | 2 | NPCC |
| Michael Couchesne | ISO-NE | 2 | NPCC |
| Kurtis Chong | IESO | 2 | NPCC |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Michele Pagano | Con Edison | 4 | NPCC |
| | | | | | Bendong Sun | Bruce Power | 4 | NPCC |
| | | | | | Carvers Powers | Utility Services | 5 | NPCC |
| | | | | | Wes Yeomans | NYSRC | 7 | NPCC |
| Tim Kelley | Tim Kelley | | WECC | SMUD and BANC | Nicole Looney | Sacramento Municipal Utility District | 3 | WECC |
| | | | | | Charles Norton | Sacramento Municipal Utility District | 6 | WECC |
| | | | | | Wei Shao | Sacramento Municipal Utility District | 1 | WECC |
| | | | | | Foung Mua | Sacramento Municipal Utility District | 4 | WECC |
| | | | | | Nicole Goi | Sacramento Municipal Utility District | 5 | WECC |
| | | | | | Kevin Smith | Balancing Authority of Northern California | 1 | WECC |

**1. Do you agree with the modifications made in PRC-028-1?**

| | |
|---|---|
| **Thomas Foltz - AEP - 5** | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |

While requiring recording all the fault codes and fault alarms as listed in R1.2 and R1.3 is certainly well-meaning, there may be disadvantages in requiring this breadth of data capturing and provision. Functional Entities (such as Transmission Planner, Planning Coordinator, Transmission Operator, Balancing Authority, Reliability Coordinator, and the Regional Entity) may not all equally benefit from receiving every fault code and fault alarm specified in R1.2 and R1.3. Fault codes and fault alarms differ across manufacturers and devices, and this is further complicated by the lack of standardization and consistent nomenclature in this area. Also, some entities may not be able to fully understand or draw proper conclusions from some of this data, which could lead to inconsistent and undesirable interpretation and application. Rather than requiring “all” the fault codes and alarms available, might it be worth considering for the standard to specify exactly which fault codes and alarms that the SDT believes would be beneficial?

AEP strongly recommends that the STD remove the requirement to capture all fault codes and alarms on IBR Units as SER data to +/- 100 millisecond from the standard and allow the GO to address IBR Unit performance issues as required under PRC-030.

PRC-029 requires the GO to ensure the design of IBR units meets the voltage and frequency ride through requirements or notify the applicable RC, BA and TO if the IBR is technically unable to meet those requirements. PRC-030 requires the GO to develop and execute a process to analyze Real Power change events including ride-through performance and implement corrective actions to address performance issues including applicable other GO IBR facilities.

Adding the requirement to capture all fault codes and alarms on IBR Units as SER data to +/- 100 millisecond back into this standard is unreasonable as it adds significant costs to the SER system and excessive administrative burden on the GO if an event occurs. Note that large IBR facilities have hundreds of IBR Units which would require the SER system to have thousands of SER data points. Is the intent of this requirement to have the TP, PC, TO, BA, RC, Regional Entity, or NERC determine the root cause of IBR Unit performance? If so, then why, as PRC-030 clearly holds the GO responsible for performing this analysis.

When an event occurs, the GO may be requested to submit DME data as proposed in PRC-028 while also having to address performance issues as required by PRC-030. Collecting SER data from every IBR Unit will be time consuming or require an expensive automated SER data collection system. The DME data for the MPT and collector bus should allow the TP, PC, TO, BA, RC, Regional Entity, or NERC to determine performance issues down to the IBR facility level and any corrective actions required on IBR Units would be address by the GO as required by PRC-030.

AEP disagrees with the mid-ballot period removal of Transmission Owner from the list of Functional Entities. The TO may in some cases be the owner of the MPT and high side breakers.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Andy Thomas - Duke Energy - 1,3,5,6 - SERC,RF** | |
| **Answer** | No |

| | |
|---|---|
| **Document Name** | |
| **Comment** | |

A) Duke Energy agrees with and supports the following NAGF comment:

1.b. Requirement R1.1:

i. NAGF members are still not certain that use of the term “collector bus(es)” includes feeder breakers and therefore are requesting that the requirement narrative be clarified to address this issue.

B) R1 Sections 1.2 & 1.3, 1.2.3 and 1.2.4, 1.3.3 & 1.3.4 require a mode status; this request is not a function of the recorders. In the technical rationale, please address this requirement or change standard to record voltage and frequency values instead of mode.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |

**Brian Van Gheem - Radian Generation - NA - Not Applicable - NA - Not Applicable**

| | |
|---|---|
| **Answer** | No |
| **Document Name** | |
| **Comment** | |

1. Based on the latest draft, the Standards Drafting Team (SDT) has removed the Transmission Owner from this Reliability Standard’s applicability. Part 1.1 of Requirement R1 states a Generator Owner is required to retain sequence of event recording (SER) data for the circuit breaker positions associated with main power transformers, collector buses, shunt static and dynamic reactive devices, and AC-DC and DC-AC converters, if any, in case of VSC HVDC systems. Following the removal of the Transmission Owner, we believe the inclusion of circuit breaker positions for AC-DC and DC-AC converters is now misplaced and should also be removed.
2. Requirement R1 will require a Generator Owner to retain SER data. When applied to Parts 1.2 and 1.3, a Generator Owner is then required to perform a second action, which is to retain data for each individual IBR unit. The concept of the individual IBR unit was recently abandoned by the SDT in the previously proposed draft. We believe this is a reversal in the direction for Generator Owners to adopt this Reliability Standard. Nonetheless, we propose removing the phrases “shall be recorded” and “all” in these parts for clarity. We instead recommend rephrasing these parts to “…the following recorded data when triggered by ride-through operation or tripping of an IBR unit: fault codes, fault alarms, high and low voltage ride-through mode statuses, and high and low frequency ride-through mode statuses.”
3. Part 1.3 allows for an exclusion to Generator Owners if the IBR Facility is incapable to record sequence of event data for each individual IBR unit. We believe the measure for this requirement should be expanded so Generator Owners can document this incapability as evidence.
4. Based on the latest draft, the SDT expanded the requirements of a Generator Owner to retain fault recording (FR) data for each collector feeder breaker. While data may exist, the purpose of the Protection Systems associated with each feeder breaker is to protect the collector bus from a Fault and the possibility of a failure within the feeder breaker. These Protection Systems use existing voltage and current sensing devices already on-site as Protection System Components. However, the SDT also proposes triggering the recording of FR data on each collector feeder breaker based on overfrequency and underfrequency events. The SDT assumes existing Protection Systems are capable of being reprogrammed to include this functionality. However, some microprocessor relays associated with each collector feeder breaker may not have such functionality available.
5. Part 3.2.3 identifies settings when fault recording devices are triggered to begin recording data. We believe each of the individual triggers currently listed should also have a statement identifying only if such capabilities exist. A similar statement should also be added to the measure for this requirement to support this as evidence.
6. Requirement R6 will require a Generator Owner to retain time synchronized data within a device clock accuracy of ± 1 milliseconds of Coordinated Universal Time (UTC). In this recently proposed draft, the SDT has added a requirement that each IBR unit’s device clock

accuracy must have its accuracy within ± 100 milliseconds of UTC. This new requirement was embedded within Part 6.2 as a separate sentence and suggests each IBR unit must be synchronized to a clock source. For existing facilities, this capability may not be possible. We further believe this approach opens a gap and data associated with IBR units would then be required to have a device clock accuracy of ± 1 milliseconds of UTC. We propose the following approach to revising this requirement. First, remove the phrase "all" in reference to SER, FR, and dynamic disturbance recording (DDR) data in Requirement R6. Second, revise Part 6.2 to "Synchronized device clock accuracy within ± 100 milliseconds of UTC when applied on IBR unit recorded data or within ± 1 milliseconds of UTC."

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Adam Burlock - Adam Burlock On Behalf of: Ashley Scheelar, TransAlta Corporation, 5; - Adam Burlock**

| | |
|---|---|
| **Answer** | No |
| **Document Name** | |

**Comment**

TransAlta supports the comment provided by AEP regarding the recording of all the fault codes and fault alarms as listed in R1.2 and R1.3.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Wayne Sipperly - North American Generator Forum - 5 - MRO,WECC,Texas RE,NPCC,SERC,RF**

| | |
|---|---|
| **Answer** | No |
| **Document Name** | |

**Comment**

The *NAGF provides the following comments for consideration:*

*a. Applicability Section 4.2.2 – recommend that the term "Non-BES Inverter-Based Resources" be revised to "Non-BES Inverter-Based Resource(s)" to be consistent with other IBR standards.*

*b. Requirement R1.1:*

*i. NAGF members are still not certain that use of the term "collector bus(es)" includes feeder breakers and therefore are requesting that the requirement narrative be clarified to address this issue.*

*c. Requirement 3.2.1 – NAGF members have noted that existing IBR facilities do not have the capability to provide a fault recording data record length of 2 seconds as defined in this requirement.*

d. *Requirement 6.2 – NAGF members have indicated that individual IBR units do not have the ability to meet the +- 100 millisecond accuracy threshold.*

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Alison MacKellar - Constellation - 5** | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |

This latest revision re-introduced the non-BES IBRs and FR per collector feeder which were removed from the previous version. The implementation costs for PRC-028-1 are still appreciably higher than PRC-002.

Alison Mackellar on behalf of Constellation Segments 5 and 6

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Megan Melham - Decatur Energy Center LLC - 5** | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |

Capital Power supports the NAGF's comments:

*The NAGF provides the following comments for consideration:*

*a. Applicability Section 4.2.2 – recommend that the term “Non-BES Inverter-Based Resources” be revised to “Non-BES Inverter-Based Resource(s)” to be consistent with other IBR standards.*

*b. Requirement R1.1:*

*i. NAGF members are still not certain that use of the term “collector bus(es)” includes feeder breakers and therefore are requesting that the requirement narrative be clarified to address this issue.*

*c. Requirement 3.2.1 – NAGF members have noted that existing IBR facilities do not have the capability to provide a fault recording data record length of 2 seconds as defined in this requirement.*

*d. Requirement 6.2 – NAGF members have indicated that individual IBR units do not have the ability to meet the +- 100 millisecond accuracy threshold.*

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

| Response | |
|---|---|
| | |
| **Richard Vendetti - NextEra Energy - 5** | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |

R1.

For IBRs – the OEMs are responsible for **SER** data only.  The question OEMs have been having is "*what is a ride through operation*", to define what triggers capturing a ride through event. Its an ambiguous term where p.u. parameters and time duration need to be explicitly defined to be set at the IBR.

{C}1.1   there is no clarity on data that needs to be collected. Do we collect all listed or a single source? This should be stated within the requirement.

Recommendation to remove 1.3 since the requirements are the same as 1.2 except for the timing of COD with respect to when the Standard becomes effective. Requirement 1.3 appears to be reactive in nature. This timing may be better addressed as part of the implementation plan.

R2

The standard does not provide clarity on if collector feeder data is needed from all units or specific units. It is important to note that information is only available on the high side, nothing on the low side.

Recommendation to remove footnote 3 as IBR unit is not a defined term found in the NERC Glossary of Terms.

R3

For DFRs in the substation – there was a change adding MV "collector breakers" to record fault reporting data. No project today or E&C best practices recommend 34.5KV fault reporting with 64 samples/cycle.

Need clarification on whether data should be only for high side, whether for anything that tripped, or for the entire event.  Our recommendation would be to focus on the high side of GSU only.

R6

IBRs must be time synchronized to +/- 100milliseconds which implies PTP or installing a GPS clock at each inverter.

Recommend Footnote 4 revised to "interchange" not "exchange."

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Kimberly Turco - Constellation - 6** | |
| **Answer** | No |

| | |
|---|---|
| **Document Name** | |
| **Comment** | |

This latest revision re-introduced the non-BES IBRs and FR per collector feeder which were removed from the previous version. The implementation costs for PRC-028-1 are still appreciably higher than PRC-002.

Kimberly Turco on behalf of Constellation Energy Segments 5 and 6.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |

**Christine Kane - WEC Energy Group, Inc. - 3, Group Name** WEC Energy Group

| | |
|---|---|
| **Answer** | No |
| **Document Name** | |
| **Comment** | |

R1.3:

This requirement must be more specific with use of word “if capable”. Consider providing a clear exemption.

R2.1.3, R2.2.3, and R3.2.3

The protective devices with FR capabilities cannot capture Real and Reactive quantities. These quantities are typically calculated by using captured voltage and current quantities. SDT should clarify and state if calculated P and Q values are acceptable. If calculated P & Q values are not acceptable, then this requirement will have to be satisfied by installing dedicated fault recorders which can be a substantial burden on cost and implementation plan.

R3:

While WEC Energy Group fully supports triggering FR at proposed locations, WEC has a concern with 2 seconds recording requirement and 64 samples per cycle recording rate.

Most of the older microprocessor based protective relays do not have 2 seconds recording capabilities. The DT recognized this as well in the Technical Rationale document *(“Multiple records allow for legacy microprocessor relays which, when time synchronized to a common clock, can provide adequate fault data but are not capable of providing fault data in a single record with 120 continuous cycles total.”*). Note that microprocessor relays cannot record back to back events if the trigger is not active. This requirement, as currently written, will trigger costly upgrades. WEC suggest that SDT evaluates protective devices capabilities for most common relay manufacturers and reduces the recording requirement to 1 second.

Most of the older microprocessor based protective relays only have 4 or 8 samples/cycle sampling rate and do not have 64 samples per cycle recording rate capabilities. This requirement, as currently written, will trigger costly upgrades. WEC suggest that SDT evaluates protective devices capabilities for most common relay manufacturers and reduces the sampling rate below 64 samples per cycle.

These requirements seem to be more restrictive than PRC-002.

If recording and sampling requirement cannot be reduced, then existing FR equipment in commercial operation before the effective date of this standard should be exempted from 2 second recording requirement and 64 samples per cycle recording rate.

R3.1.3, R3.2.3, and R3.3.3:

SDT should determine pickups for the triggers. As currently written, entity could set pickups way too high or low and FR could never get recorded. For example, we can set 65Hz pickup for over-frequency. By the time we reach 65Hz, the event could be over.

R.6.2:

WEC Energy Group recommends that synchronized clock accuracy match PRC-002, which is +/- 2 milliseconds. An exception should be granted to IBR units in commercial operation before the effective date of this standard if synchronized signal at the IBR is not available or its accuracy cannot meet 100ms requirements.

R7:

WEC Energy Group suggests that R7 requirements match PRC-002 requirements.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Steven Taddeucci - NiSource - Northern Indiana Public Service Co. - 3**

| | |
|---|---|
| **Answer** | No |
| **Document Name** | |

**Comment**

NIPSCO recommends that the STD remove the requirements R1.2 and R1.3, to capture all fault codes and alarms on IBR Units as SER and allow the GO to address IBR Unit performance issues as required under PRC-030.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Scott Thompson - PNM Resources - 1,3,5 - WECC**

| | |
|---|---|
| **Answer** | No |
| **Document Name** | |

| **Comment** | |
|---|---|
| Please consider the following:<br><br>Define the term IBR Unit - rather than in footnotes<br><br>Following the removal of the Transmission Owner, we believe the inclusion of circuit breaker positions for AC-DC and DC-AC converters is now misplaced and should also be removed.<br><br>Clarifying the term “collector bus(es)” to include feeder breakers.<br><br>Many IBR units do not have the ability to meet the +- 100 millisecond accuracy threshold, considerably higher than PRC-002. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Pamela Hunter - Southern Company - Southern Company Services, Inc. - 1,3,5,6 - SERC, Group Name** Southern Company | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |
| R1.2 and R1.3 can involve hundreds of data points for a large facility if “all fault” and “all alarm” codes are included for every IBR unit on a site. Southern Company requests the SDT to consider adding verbiage to limit monitoring requirements to a sample of the IBR units within a facility.<br><br>What (who) determines criteria of “if capable” in R1.3? Southern Company requests the SDT to consider updating M1 to include documentation explaining the IBR unit is not capable of providing the data for recording.<br><br>Industry may require clarification of the term “ride through mode status” in R1.2 and R1.3. Southern Company requests the SDT to consider providing the necessary clarification.<br><br>Southern Company believes R7.2 needs to be changed back to 30 days. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Colin Chilcoat - Invenergy LLC - 5,6** | |
| **Answer** | No |
| **Document Name** | |

**Comment**

In response to many industry comments regarding the burdens and equipment limitations involved with previously proposed IBR Unit level monitoring requirements, the SDT responded in the Consideration of Comments issued on May 31, 2024, stating, “the SDT has reviewed the NERC disturbance reports, consulted with manufacturers, and considered the burden to industry. The data requirements are addressed in the PRC-028 Technical Rationale. All individual unit requirements have been removed from the latest draft, and meeting these requirements should be less of an issue with equipment used to monitor at the plant level.”

In Draft 4, not only have the IBR Unit level monitoring requirements been reinserted, but they have also been expanded to include monitoring at every IBR Unit. This sudden reversal of course runs counter to the previous three rounds of industry comment, and the SDT’s own responses to those comments. Can the SDT provide additional justification or comment on the reasoning behind this change of course?

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Rhonda Jones - Invenergy LLC - 5,6**

| | |
|---|---|
| **Answer** | No |
| **Document Name** | |

**Comment**

In response to many industry comments regarding the burdens and equipment limitations involved with previously proposed IBR Unit level monitoring requirements, the SDT responded in the Consideration of Comments issued on May 31, 2024, stating, “the SDT has reviewed the NERC disturbance reports, consulted with manufacturers, and considered the burden to industry. The data requirements are addressed in the PRC-028 Technical Rationale. All individual unit requirements have been removed from the latest draft, and meeting these requirements should be less of an issue with equipment used to monitor at the plant level.”

In Draft 4, not only have the IBR Unit level monitoring requirements been reinserted, but they have also been expanded to include monitoring at every IBR Unit. This sudden reversal of course runs counter to the previous three rounds of industry comment, and the SDT’s own responses to those comments. Can the SDT provide additional justification or comment on the reasoning behind this change of course?

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Charles Yeung - Southwest Power Pool, Inc. (RTO) - 2 - MRO,WECC,Texas RE,NPCC,SERC,RF, Group Name** SRC 2024

| | |
|---|---|
| **Answer** | No |
| **Document Name** | |

**Comment**

In its June 14 comments, the ISO/RTO Council (IRC) Standards Review Committee (SRC) requested that inverter-level requirements be reinstated in PRC-028 and applied to all future IBR installations, at a minimum. The SRC provided numerous reasons for why the removal of these requirements is problematic and could impact reliability. The SRC understands from the SDT's consideration of this comment that the IBR unit SER data requirement was a compromise in lieu of the FR data. However, the SRC is still concerned that the FR data is limited to what the SER would provide as recommended in NERC's September 2019 guideline.

The SRC has noted since the initial draft that the DDR installation requirements proposed in PRC-028 should be considered in meeting DDR coverage requirements of PRC-002. Even though the SDT cites an example where there is not any overlap of DDR coverage between the 2 standards, the SRC believes the standard needs to allow for considerations of system topography in certain areas today where there is significant IBR penetration and possible DDR coverage overlap. The SRC believes the 2 standards need to be able to reconcile the possibility of overlapping coverage Footnote, ISO NE does not support this portion of the response to Q1.

Parts 2.2 and 3.2 are new and require a GO to have FR data for Collector Feeder breakers. Without a clear definition of "Collector Feeder" it is unclear whether this will be applicable only to generators that are configured to directly energize a Collector Feeder as part of a distribution network or whether R3.2 would include any non-BES distribution facilities (such as those located within a plant)?

The SRC also believes that Requirement R1, Parts 1.2 and 1.3 should also apply to broader impacts, including momentary cessation or any other abnormal behavior during events, and should therefore be revised to read as follows.

1.2. For IBR units in commercial operation after the effective date of this standard,

the following data shall be recorded when triggered by ride-through operation,

tripping, or longer-term disturbance response and recovery of an IBR unit including.

1.2.1. All fault codes.

1.2.2. All fault alarms.

1.2.3. High and low voltage ride-through mode status.

1.2.4. High and low frequency ride-through mode status.

1.2.5 Momentary cessation

1.2.6 Other abnormal behavior during events

1.3. For IBR units in commercial operation before the effective date of this standard,

the following data shall be recorded, if capable, when triggered by ride-through operation, tripping, or longer-term disturbance response and recovery of an IBR unit including.

1.3.1. All fault codes.

1.3.2. All fault alarms.

1.3.3. High and low voltage ride-through mode status.

1.3.4. High and low frequency ride-through mode status.

1.3.5 Momentary cessation

1.3.6 Other abnormal behavior during events

Because the “IBR Unit” definition will not be moving forward, it appears each standard seeking to acquire IBR unit information, such as Parts 1.2 and 1.3, will need to define what IBR unit means within the standard. In the case of PRC-028, the SRC understands that footnote 2 serves this purpose, and asks that the drafting team confirm whether the SRC’s understanding is correct.

The SRC supports Parts 2.2 and 3.2 primarily as a starting point for gathering collector feeder breaker FR data in this version of the standard. The SRC believes there is potential for future expansion of these requirements if they are found to be inadequate in the course of investigating the root causes of IBR performance issues.

Part 6.2 currently reads, “Synchronized device clock accuracy within ± 1 milliseconds of UTC. The IBR units shall have synchronized device clock accuracy within ± 100 milliseconds of UTC.”

The SRC seeks clarification from the SDT as to why 100 milliseconds was chosen for Part 6.2 when IEEE uses 100 microseconds. Currently, there are Generator Interconnection Agreements that require 1 millisecond time synchronization for plant- and unit-level device clock accuracy. Many entities are considering adopting the IEEE requirements, so an explanation for this difference is critical.

Additionally, the SRC recommends that PRC-028 be revised to require recording of inverter-level oscillography. As demonstrated throughout the 2022 Odessa Disturbance report, it is evident that inverter-level oscillography is readily available and critical to proper event analysis in cases where individual inverters trip offline even though frequency and voltage at the plant level remain in the must-ride-through zone. This is a known issue where terminal voltages and frequency measurements can vary greatly from the plant-level measurements due to the collector system and step-up transformer designs. In many cases this oscillography is available but just needs to be enabled and adequate storage made available. Table 19 in Section 11 of IEEE 2800 already requires recording of such information at the IBR unit level as well. Such a requirement could be applied to new units and to existing units that already have that capability available and simply need to enable it.

NERC recommended the following in the 2022 Odessa disturbance report for the SDT to consider (emphasis added).

“Monitoring Data ERCOT and the GOs in the Texas Interconnection ***have extensive data*** that is ***critical for root cause analysis***. This ***data includes*** plant-level high resolution oscillography data, plant SCADA data, and ***inverter-level*** sequence of events recording (e.g., fault codes) and ***oscillography data***. ***These types of measurements should be standard across industry for the purposes of event analysis and reducing the risk to plant performance***. The IRPS submitted a SAR, ***and Project 2021-04 is working on enhancements to PRC-002-2 to ensure this type of data is available at BES resources.”***

Footnote: MISO is a party to these comments but does not support the comments in response to Q1.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Kennedy Meier - Electric Reliability Council of Texas, Inc. - 2**

| | |
|---|---|
| **Answer** | No |
| **Document Name** | |

**Comment**

ERCOT joins the comments submitted by the ISO/RTO Council (IRC) Standards Review Committee (SRC) and adopts them as its own.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Jennifer Neville - Western Area Power Administration - 1,6**

| | |
|---|---|
| **Answer** | No |
| **Document Name** | |

**Comment**

Support MRO NSRF comments

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Steven Rueckert - Western Electricity Coordinating Council - 10**

| | |
|---|---|
| **Answer** | No |
| **Document Name** | |

**Comment**

As written, Requirement R1 brings ambiguity with the use of “IBR unit” with the footnote definition. Additionally, what is a “ride-through operation”? For example- As written, the entity will need to record all aspect/Parts of R1.2 and R1.3 assuming the location failed the Ride-through definition or tripped offline. The discussion will be is it “all fault codes” of the inverter, converter, wind turbine generator, or high voltage direct current converter individually (as applicable)? Or something else? Requirement 1 Part 1.2 and Part 1.3 (including all sub Parts for both)- Capitalize “ride-through” as it is a defined term in another related Project.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Kenisha Webber - Entergy - NA - Not Applicable - SERC**

| | |
|---|---|
| **Answer** | No |
| **Document Name** | |

**Comment**

| | |
|---|---|
| Likes 0 | |

| | |
|---|---|
| Dislikes 0 | |
| **Response** | |
| | |
| **Rob Robertson - Leeward Renewable Energy - 5** | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Robert Follini - Avista - Avista Corporation - 3** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| N/A | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Mark Garza - FirstEnergy - FirstEnergy Corporation - 4, Group Name** FE Voter | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| FirstEnergy finds no objection to this standards' proposed draft. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |

| Donna Wood - Tri-State G and T Association, Inc. - 1 | |
|---|---|
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| Tri-State agrees with the comments provided by the MRO NSRF. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |

| Marcus Bortman - APS - Arizona Public Service Co. - 6 | |
|---|---|
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| None | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |

| Ruchi Shah - AES - AES Corporation - 5 | |
|---|---|
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| AES CE does not agree that SER data at every IBR Unit is necessary to meet the objectives of the Standard. Past revisions contained more reasonable solutions such as SER data at the end of each feeder. We believe this middle solution will have a significant positive impact on system reliability, while adding this data at every single IBR Unit offers only an incremental improvement in ability to analyze system disturbances at a huge burden to GOs. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |

**Kristine Martz - Edison Electric Institute - NA - Not Applicable - NA - Not Applicable**

| | |
|---|---|
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| EEI supports the changes made to PRC-028-1 (Draft 4). | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Nick Leathers - Nick Leathers On Behalf of: David Jendras Sr, Ameren - Ameren Services, 3, 6, 1; - Nick Leathers** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| Ameren agrees with and supports EEI's comments. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Selene Willis - Edison International - Southern California Edison Company - 5** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| "Please see EEI Comments" | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Bobbi Welch - Midcontinent ISO, Inc. - 2** | |
| **Answer** | Yes |
| **Document Name** | |

| Comment | |
|---|---|
| MISO supports the requirements (Parts 1.2 and 1.3) for IBR unit data. We also observe that, as the “IBR Unit” definition will not be moving forward, it appears each standard seeking to acquire IBR unit information, will need to define what IBR unit means within the standard. In the case of PRC-028, this is footnote 3. Is that correct?<br><br>MISO supports Parts 2.2 and 3.2 as a starting point to gather collector feeder breaker FR data. That said, we also support the potential for future expansion of these requirements if they are found to be inadequate when investigating the root cause of IBR performance issues.<br><br>**Part 6.2.** “Synchronized device clock accuracy within ± 1 milliseconds of UTC. The IBR units shall have synchronized device clock accuracy within ± ***100 milliseconds*** of UTC.”<br><br>Regarding Part 6.2., MISO is requesting clarification as to why the SDT chose 100 milliseconds when IEEE uses 100 microseconds. Currently, MISO’s Generator Interconnection Agreement requires 1 millisecond time synchronization for plant and unit level device clock accuracy. As MISO is considering adopting the IEEE requirements, please explain the reason for the differential. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Ayslynn Mcavoy - Arkansas Electric Cooperative Corporation - 3** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Rachel Coyne - Texas Reliability Entity, Inc. - 10** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |

| Bruce Walkup - Arkansas Electric Cooperative Corporation - 6 | |
|---|---|
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Jennifer Weber - Tennessee Valley Authority - 1,3,5,6 - SERC** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Rachel Schuldt - Black Hills Corporation - 6, Group Name** Black Hills Corporation - All Segments | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Cain Braveheart - Bonneville Power Administration - 1,3,5,6 - WECC** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Jessica Cordero - Unisource - Tucson Electric Power Co. - 1**

| | |
|---|---|
| **Answer** | Yes |
| **Document Name** | |

**Comment**

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Michael Johnson - Michael Johnson On Behalf of: Marco Rios, Pacific Gas and Electric Company, 3, 1, 5; Sandra Ellis, Pacific Gas and Electric Company, 3, 1, 5; - Michael Johnson, Group Name** PG&E All Segments

| | |
|---|---|
| **Answer** | Yes |
| **Document Name** | |

**Comment**

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Tim Kelley - Tim Kelley On Behalf of: Charles Norton, Sacramento Municipal Utility District, 3, 6, 4, 1, 5; Foung Mua, Sacramento Municipal Utility District, 3, 6, 4, 1, 5; Kevin Smith, Balancing Authority of Northern California, 1; Nicole Looney, Sacramento Municipal Utility District, 3, 6, 4, 1, 5; Ryder Couch, Sacramento Municipal Utility District, 3, 6, 4, 1, 5; Wei Shao, Sacramento Municipal Utility District, 3, 6, 4, 1, 5; - Tim Kelley, Group Name** SMUD and BANC

| | |
|---|---|
| **Answer** | Yes |
| **Document Name** | |

**Comment**

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

| | |
|---|---|
| **Casey Jones - Berkshire Hathaway - NV Energy - 5 - WECC** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Hayden Maples - Hayden Maples On Behalf of: Jeremy Harris, Evergy, 3, 5, 1, 6; Kevin Frick, Evergy, 3, 5, 1, 6; Tiffany Lake, Evergy, 3, 5, 1, 6; - Evergy - 1,3,5,6 - MRO** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Anna Martinson - MRO - 1,2,3,4,5,6 - MRO** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Israel Perez - Israel Perez On Behalf of: Laura Somak, Salt River Project, 3, 6, 5, 1; Mathew Weber, Salt River Project, 3, 6, 5, 1; Thomas Johnson, Salt River Project, 3, 6, 5, 1; Timothy Singh, Salt River Project, 3, 6, 5, 1; - Israel Perez** | |
| **Answer** | Yes |
| **Document Name** | |

| Comment | |
|---|---|
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Hillary Creurer - Allete - Minnesota Power, Inc. - 1** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Carver Powers - Utility Services, Inc. - 4** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Mohamad Elhusseini - DTE Energy - Detroit Edison Company - 3,5** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |

| | |
|---|---|
| **Mike Magruder - Avista - Avista Corporation - 1** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Jennifer Bray - Arizona Electric Power Cooperative, Inc. - 1** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Jodirah Green - ACES Power Marketing - 1,3,4,5,6 - MRO,WECC,NPCC,SERC,RF, Group Name** ACES Collaborators | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Daniel Gacek - Exelon - 1, Group Name** Exelon | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Marty Hostler - Northern California Power Agency - 4**

| | |
|---|---|
| **Answer** | |
| **Document Name** | |

**Comment**

We do not disagree with modifications that have been made and we do not object to FERC order 901.

However, we do not believe this standard will improve reliability as the GO/GOP IBR entites would have to share data with (BAs, PAs, RCs, TOPs) only if they ask for said data. And those entities do not have any obligations to do anything with the data which GO/GOP IBRs would be required to provided them.

Consequently, we are unclear as to how GO/GOP IBRs that are required to procure and install a bunch of recording data and share recordings with entities, only if those entities ask for it, will do anything to improve reliability. As written this proposal looks like an expense to GO/GOPs with no reliability benefits.

All entities that GO/GOP IBRs are required to provide data to need to have requirements within this standard version detailing what they are to do with said data in order to improve reliability.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Patricia Lynch - NRG - NRG Energy, Inc. - 5,6**

| | |
|---|---|
| **Answer** | |
| **Document Name** | |

**Comment**

NRG Energy Inc is in support of the comments made by EPSA.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Martin Sidor - NRG - NRG Energy, Inc. - 5,6**

| | |
|---|---|
| **Answer** | |
| **Document Name** | |
| **Comment** | |
| NRG agrees with the EPSA comments. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |

**2. Do you agree with the Implementation Plan for revised PRC-028-1?**

**Steven Rueckert - Western Electricity Coordinating Council - 10**

| | |
|---|---|
| **Answer** | No |
| **Document Name** | |

**Comment**

PRC-029 and PRC-030 hinge on the Implementation Plan (IP) for PRC-028. The inconsistent approach ("design"/"operation" aspects of Requirements in PRC-029/030 IPs) and use of "commercial operations date" in PRC-028 IP does not provide clarity. The DTs did not define what the design and operation aspects of PRC-030 are so compliance monitoring will be difficult if at all achievable until ALL parts of PRC-028 are applicable (essentially 2030). The use of commercial operation date is inconsistent with reliability and differs across the United States. There are no compliance evaluations that can be done for non-BES IBRs until after Jan 1, 2030.

For the following Implementation Plan requirement, the DT needs to be extremely clear that the 15 calendar months is ONLY applicable to the "effective date of the standard" portion of the phrase and not the "commercial operation date":

"For non-BES Inverter-Based Resources in commercial operation after May 2026: Entities shall comply with Requirements R1 through R7 within 15 calendar months following the effective date of the standard or the commercial operation date, whichever is later. "

Does the DT confirm that interpretation of the phrase is correct? Effective date of standard plus 15 calendar months OR commercial operation date whichever is later is the correct way to read that phrase.

Most implemtation plans are effective on the first day of a quarter. If May is actually the desired month, the IP should not simply say "May 2026" it should be specivic such as May 1, May 15, or May 31, 2026.

Having a process for extension of compliance embedded within an Implementation Plan is not conducive or supportive to reliability. As written, this will be an administrative effort with NO defined timeline in sight and no process to support it. The ERO Enterprise should utilize the current processes in place. That is, if the entity, who has had years to be ready, is noncompliant they self-report the issue and follow the mitigation process. Putting this process in place requires a second set of books for compliance determination and status. The Implementation Plan (and the dependence of other Implementation Plans) does not set any expectation for IBRs to be compliant by any set date and does not support FERC's intention of having Standards applied to IBRs no later than 2030. What happens if the entity does not provide information or provides information that is found to be incorrect and the CEA does not approve the extension? What happens if the entity does not supply the extension request in less time than "required" (i.e., "no later than three months prior to the compliance date")? FERC recently ruled on cold weather standards regarding Corrective Action Plans being too long. The timing for these exemptions is non-existent and provides a compliance loophole that can be easily exploited by entities not addressing reliability in an effective manner. Those entities invested in reliability should be working towards implementation of these Requirements now. Unfortunately, the system is experiencing entities that are more interested in the bottom line versus reliability. Implementation Plans are not enforceable but set dates for enforcement based on the Standard Requirement language. No extension process should be considered. The electrical ecosystem has been experiencing IBR issues for a decade already and the risk this technology has exposed can not continue by allowing extensions. This again begs for a timeline diagram for the implementation of these 3 Standards (PRC-028/029/030) so that everyone knows the exact expectations for compliance dates.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Jennifer Neville - Western Area Power Administration - 1,6**

| | |
|---|---|
| **Answer** | No |
| **Document Name** | |
| **Comment** | |
| Support MRO NSRF comments | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Scott Thompson - PNM Resources - 1,3,5 - WECC** | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |
| Please consider the following:<br><br>Clarification regarding the Compliance Enforcement Authority (CAE) process to be used for evaluating a PRC-028 compliance date extension request.<br><br>DME equipment installation time needs to be considered during implementation. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Steven Taddeucci - NiSource - Northern Indiana Public Service Co. - 3** | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |
| NIPSCO agrees with the majority of the implementation plan but still has concerns with the “15 calendar months following the effective date of the standard” requirement for inverter-based resources entering commercial operation after the effective date, and believes that more time is needed to properly budget, modify designs and procure equipment for projects already under development. NIPSCO proposes modifying the following language: For inverter-based resources entering commercial operation after the effective date: Entities shall comply with Requirements R1 through R7 within “36 calendar months following the effective date of the standard or by" the commercial operation date, whichever is later. | |
| Likes 0 | |
| Dislikes 0 | |

| Response | |
|---|---|
| | |
| **Christine Kane - WEC Energy Group, Inc. - 3, Group Name** WEC Energy Group | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |
| Unless WEC Energy Group comments listed in #1 above are addressed, the implementation plan will be too short. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Hillary Creurer - Allete - Minnesota Power, Inc. - 1** | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |
| Minnesota Power supports MRO's NERC Standards Review Forum's (NSRF) comments. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Kimberly Turco - Constellation - 6** | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |
| Although the PRC-028 Implementation Plan mirrors PRC-002-2 Implementation Plan, PRC-028 requires all BES IBRs and many non-BES IBRs to have DME installed. If the GO has a large IBR fleet, numerous DME installations would be required with a demanding project schedule. With the large amount of DME required to be installed per PRC-028, OEMs might not be able to provide GOs with a timely supply of DME equipment.<br><br>Kimberly Turco on behalf of Constellation Energy Segments 5 and 6. | |
| Likes 0 | |

| | |
|---|---|
| Dislikes 0 | |
| **Response** | |
| | |
| **Richard Vendetti - NextEra Energy - 5** | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |
| For the implementation plan, we recommend focusing on those sites with a COD post the Standard becoming effective. Having an implementation for units with a COD prior to the Standard becoming effective does not appear consistent with implementation of other Standards, being retroactive, and will create undue burden to IBR owners who will need to perform rework on existing sites, as vendors have already indicated the equipment to meet compliance will not be available until 2026. In addition, we note the duration to implement has become an issue as the timeline has shifted by one year and the deadline to fully implement remains by 2030. NextEra recommends an implementation of 2032 to be fully compliant, providing reasonable time for the first 50% and the remainder of the sites. While we appreciate the Implementation Plan's note recognizing the potential supply chain issues and the potential for registered entities to address delays outside of their control, we do not think addressing these known issues as part of Compliance and Enforcement is the most effective for both industry and the ERO. As currently written, not only will we have further supply chain issues generated from the timeline reduction and the retroactive nature of requirement 1.3. but additional administrative burden post Standards development. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Anna Martinson - MRO - 1,2,3,4,5,6 - MRO** | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |
| PRC-002 allowed ~6 years for implementation. It appears that PRC-028 will allow ~3.5 years for non-BES IBR owners to meet compliance following the registration deadline and ~4.5 years assuming an effective date of 7/1/25 for BES owners. If non-BES or BES owners have multiple existing facilities to update for compliance this may be difficult. Consider giving a similar time window of ~6 years to meet compliance. It seems larger facilities meeting this standard would be more beneficial than the numerous non-BES facilities. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Alison MacKellar - Constellation - 5** | |

| | |
|---|---|
| **Answer** | No |
| **Document Name** | |

**Comment**

Although the PRC-028 Implementation Plan mirrors PRC-002-2 Implementation Plan, PRC-028 requires all BES IBRs and many non-BES IBRs to have DME installed. If the GO has a large IBR fleet, numerous DME installations would be required with a demanding project schedule. With the large amount of DME required to be installed per PRC-028, OEMs might not be able to provide GOs with a timely supply of DME equipment.

Alison Mackellar on behalf of Constellation Segments 5 and 6

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Adam Burlock - Adam Burlock On Behalf of: Ashley Scheelar, TransAlta Corporation, 5; - Adam Burlock**

| | |
|---|---|
| **Answer** | No |
| **Document Name** | |

**Comment**

TransAlta supports the comments provided by Radian Generation regarding requesting an extension.

TransAlta supports the comments provided by Berkshire Hathaway regarding implementation timelines.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Brian Van Gheem - Radian Generation - NA - Not Applicable - NA - Not Applicable**

| | |
|---|---|
| **Answer** | No |
| **Document Name** | |

**Comment**

1. We believe the Process for Requesting an Extension from Compliance Data has embedded inefficiencies that could place undue burdens on Generator Owners. As Generator Owners patiently await on an approval for an extension from their Compliance Enforcement Authority (CEA), even providing additional follow-up information requested from that CEA in a timely matter, the compliance burden still lies with the Generator Owner until such an extension is finally granted. Industry continues to see some CEAs struggle with addressing their backlogs for handling potential non-compliance of existing registered entities. Some of these registered entities have not even received a response from their CEA in years. We believe some accountable on the ERO Enterprise should be included within this Implementation Plan, whether under the Requesting an Extension Process or as a general consideration. This includes the development of a standard template that would be used across the ERO Enterprise for Generator Owners to complete when making an extension request. This template would identify all the information that is required to make the extension upfront. A completed template by the Generator Owners then would not impede the request because of

insufficient information. The process should also have some timeline constraints, such that a request is never left unanswered. This time could be reasonable to account for impacts on CEA resources, such as six months and at which time, the CEA is required to provide an update to the requesting Generator Owner on its review of the request. Failure to provide an update, or continuously extending this period for the CEA to process the request, would automatically imply the request for extension has been granted to the Generator Owner. NERC should also oversee the requesting process to ensure consistency is evenly applied by each CEA.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Casey Jones - Berkshire Hathaway - NV Energy - 5 - WECC**

| | |
|---|---|
| **Answer** | No |
| **Document Name** | |

**Comment**

PRC-002 allowed ~6 years for implementation. It appears that PRC-028 will allow ~3.5 years for non-BES IBR owners to meet compliance following the registration deadline and ~4.5 years assuming an effective date of 7/1/25 for BES owners. If non-BES or BES owners have multiple existing facilities to update for compliance this may be difficult. Consider giving a similar time window of ~6 years to meet compliance. It seems larger facilities meeting this standard would be more beneficial than the numerous non-BES facilities.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Tim Kelley - Tim Kelley On Behalf of: Charles Norton, Sacramento Municipal Utility District, 3, 6, 4, 1, 5; Foung Mua, Sacramento Municipal Utility District, 3, 6, 4, 1, 5; Kevin Smith, Balancing Authority of Northern California, 1; Nicole Looney, Sacramento Municipal Utility District, 3, 6, 4, 1, 5; Ryder Couch, Sacramento Municipal Utility District, 3, 6, 4, 1, 5; Wei Shao, Sacramento Municipal Utility District, 3, 6, 4, 1, 5; - Tim Kelley, Group Name** SMUD and BANC

| | |
|---|---|
| **Answer** | No |
| **Document Name** | |

**Comment**

SMUD agrees with the comments submitted by the MRO NSRF.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Thomas Foltz - AEP - 5**

| | |
|---|---|
| **Answer** | No |
| **Document Name** | |
| **Comment** | |

AEP supports the implementation schedule for R1-R7 for units in commercial operation prior to the effective date but requests the same implementation schedule be used for R8 as the DME system most likely will not have been installed by the effective date of R8. If the intent is to have a CAP to identify the targeted compliance date, this would create excessive administrative burden on the GO.

The example provided for compliance of IBR facilities entering commercial operation *after* the effective date does not make sense as stated. AEP recommends that the effective date for IBR facilities entering commercial operation after the effective date be required to comply with the standard within three (3) calendar years of the effective date of Reliability Standard PRC-028-1 to align with the requirements for existing IBR facilities.

For the reasons stated above, the compliance date for R8 for Non-BES IBR facilities should be the same as R1-R7.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |

**Donna Wood - Tri-State G and T Association, Inc. - 1**

| | |
|---|---|
| **Answer** | No |
| **Document Name** | |
| **Comment** | |

Tri-State agrees with the comments provided by the MRO NSRF.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |

**Rob Robertson - Leeward Renewable Energy - 5**

| | |
|---|---|
| **Answer** | No |
| **Document Name** | |
| **Comment** | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |

| | |
|---|---|
| **Ruchi Shah - AES - AES Corporation - 5** | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Kenisha Webber - Entergy - NA - Not Applicable - SERC** | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Selene Willis - Edison International - Southern California Edison Company - 5** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| "Please see EEI Comments" | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Nick Leathers - Nick Leathers On Behalf of: David Jendras Sr, Ameren - Ameren Services, 3, 6, 1; - Nick Leathers** | |
| **Answer** | Yes |
| **Document Name** | |

| | |
|---|---|
| **Comment** | |
| Ameren agrees with and supports EEI's comments. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Kristine Martz - Edison Electric Institute - NA - Not Applicable - NA - Not Applicable** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| EEI supports the proposed Implementation Plan. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Megan Melham - Decatur Energy Center LLC - 5** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| Please provide further clarification regarding the Compliance Enforcement Authority (CAE) process to be used for evaluating a PRC-028 compliance date extension request, including the proper mechanism for submitting a request and timelines involved in the evaluation process. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Wayne Sipperly - North American Generator Forum - 5 - MRO,WECC,Texas RE,NPCC,SERC,RF** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |

| |
|---|
| *The NAGF requests further clarification regarding the Compliance Enforcement Authority (CAE) process to be used for evaluating a PRC-028 compliance date extension request.* |

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Andy Thomas - Duke Energy - 1,3,5,6 - SERC,RF**

| | |
|---|---|
| **Answer** | Yes |
| **Document Name** | |

**Comment**

None.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Marcus Bortman - APS - Arizona Public Service Co. - 6**

| | |
|---|---|
| **Answer** | Yes |
| **Document Name** | |

**Comment**

None

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Mark Garza - FirstEnergy - FirstEnergy Corporation - 4, Group Name** FE Voter

| | |
|---|---|
| **Answer** | Yes |
| **Document Name** | |

**Comment**

FirstEnergy finds no objection to this standards' proposed draft.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Robert Follini - Avista - Avista Corporation - 3** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| N/A | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Kennedy Meier - Electric Reliability Council of Texas, Inc. - 2** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Bobbi Welch - Midcontinent ISO, Inc. - 2** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |

| | |
|---|---|
| **Charles Yeung - Southwest Power Pool, Inc. (RTO) - 2 - MRO,WECC,Texas RE,NPCC,SERC,RF, Group Name** SRC 2024 | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Daniel Gacek - Exelon - 1, Group Name** Exelon | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Jodirah Green - ACES Power Marketing - 1,3,4,5,6 - MRO,WECC,NPCC,SERC,RF, Group Name** ACES Collaborators | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Jennifer Bray - Arizona Electric Power Cooperative, Inc. - 1** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Rhonda Jones - Invenergy LLC - 5,6** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Mike Magruder - Avista - Avista Corporation - 1** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Colin Chilcoat - Invenergy LLC - 5,6** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Pamela Hunter - Southern Company - Southern Company Services, Inc. - 1,3,5,6 - SERC, Group Name** Southern Company | |

| | |
|---|---|
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Mohamad Elhusseini - DTE Energy - Detroit Edison Company - 3,5** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Carver Powers - Utility Services, Inc. - 4** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Israel Perez - Israel Perez On Behalf of: Laura Somak, Salt River Project, 3, 6, 5, 1; Mathew Weber, Salt River Project, 3, 6, 5, 1; Thomas Johnson, Salt River Project, 3, 6, 5, 1; Timothy Singh, Salt River Project, 3, 6, 5, 1; - Israel Perez** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Hayden Maples - Hayden Maples On Behalf of: Jeremy Harris, Evergy, 3, 5, 1, 6; Kevin Frick, Evergy, 3, 5, 1, 6; Tiffany Lake, Evergy, 3, 5, 1, 6; - Evergy - 1,3,5,6 - MRO**

| | |
|---|---|
| **Answer** | Yes |
| **Document Name** | |

**Comment**

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Michael Johnson - Michael Johnson On Behalf of: Marco Rios, Pacific Gas and Electric Company, 3, 1, 5; Sandra Ellis, Pacific Gas and Electric Company, 3, 1, 5; - Michael Johnson, Group Name** PG&E All Segments

| | |
|---|---|
| **Answer** | Yes |
| **Document Name** | |

**Comment**

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Jessica Cordero - Unisource - Tucson Electric Power Co. - 1**

| | |
|---|---|
| **Answer** | Yes |
| **Document Name** | |

**Comment**

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

| **Rachel Schuldt - Black Hills Corporation - 6, Group Name** Black Hills Corporation - All Segments | |
|---|---|
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |

| **Jennifer Weber - Tennessee Valley Authority - 1,3,5,6 - SERC** | |
|---|---|
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |

| **Bruce Walkup - Arkansas Electric Cooperative Corporation - 6** | |
|---|---|
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |

| **Rachel Coyne - Texas Reliability Entity, Inc. - 10** | |
|---|---|
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Ayslynn Mcavoy - Arkansas Electric Cooperative Corporation - 3** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Martin Sidor - NRG - NRG Energy, Inc. - 5,6** | |
| **Answer** | |
| **Document Name** | |
| **Comment** | |
| NRG agrees with the EPSA comments. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Patricia Lynch - NRG - NRG Energy, Inc. - 5,6** | |
| **Answer** | |
| **Document Name** | |
| **Comment** | |
| NRG Energy Inc is in support of the comments made by EPSA. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |

| |
|---|
| **Marty Hostler - Northern California Power Agency - 4** |

| | |
|---|---|
| **Answer** | |
| **Document Name** | |

**Comment**

This implemention plan appears more reasonable then the PRC-29 and PRC-30's six month implementation plans. We believe the implementation plans for those two standards should be the same as PRC-28.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

| **3. Do you agree the modifications made in PRC-028-1 are cost effective at unit level cost versus plant level cost compared to the benefit to reliability?** | |
|---|---|
| **Marty Hostler - Northern California Power Agency - 4** | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |
| The SDT has not provided any cost or expected reliability indices improvement estimates.  Consequently, it is impossible for entities to determine if this proposal is cost effective, or not; or to what extent, this proposal will improve reliability.<br><br>Reliability standards should not be added or changed until the SDT provides said information so that Registered Entities can make educated determinations related to the cost and benefits of reliability standard modifications or new proposals.<br><br>Basically, what we are being asked to do is to analyze the cost and reliability benefits this proposal would provide without any data.   And, ironically GO/GOP IBR Entities are being asked to spend money to procure and install a bunch of devices to record data and/or to perform new activities that may, or may not, improve reliability.  And if they do improve reliability, we don't have any idea if the reliability benefits are worth the cost.  Electricity customers Nationwide will have the rates raised and there is no justification or hard evidence related to the improved reliability increase magnitude; i.e. no cost/benefit justification to provide customers as to why then rates will be increased. | |
| Likes 1 | Utility Services, Inc., 4, Powers Carver |
| Dislikes 0 | |
| **Response** | |
| | |
| **Ayslynn Mcavoy - Arkansas Electric Cooperative Corporation - 3** | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |
| SMEs responded with the following comments:<br><br>• "The modifications will create undue burden on the utilities for likely little improvement to reliability. The study of IBRs on the grid should have taken place before the unprecedented addition of these intermittent resources without enough data to judge the impact to reliability." | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Bruce Walkup - Arkansas Electric Cooperative Corporation - 6** | |
| **Answer** | No |

| | |
|---|---|
| **Document Name** | |
| **Comment** | |
| “The modifications will create undue burden on the utilities for likely little improvement to reliability. The study of IBRs on the grid should have taken place before the unprecedented addition of these intermittent resources without enough data to judge the impact to reliability.” | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Donna Wood - Tri-State G and T Association, Inc. - 1** | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |
| Tri-State agrees with the comments provided by the MRO NSRF. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Thomas Foltz - AEP - 5** | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |
| As stated previously, adding the requirement to capture all fault codes and alarms on IBR Units as SER data to +/- 100 millisecond back into this standard is unreasonable, as it adds significant costs to the SER system and excessive administrative burden on the GO if an event occurs. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Tim Kelley - Tim Kelley On Behalf of: Charles Norton, Sacramento Municipal Utility District, 3, 6, 4, 1, 5; Foung Mua, Sacramento Municipal Utility District, 3, 6, 4, 1, 5; Kevin Smith, Balancing Authority of Northern California, 1; Nicole Looney, Sacramento Municipal Utility District, 3, 6, 4, 1, 5; Ryder Couch, Sacramento Municipal Utility District, 3, 6, 4, 1, 5; Wei Shao, Sacramento Municipal Utility District, 3, 6, 4, 1, 5; - Tim Kelley, Group Name** SMUD and BANC | |

| | |
|---|---|
| **Answer** | No |
| **Document Name** | |
| **Comment** | |

This standard makes sense for new inverter-based resources (IBRs). However, for the legacy IBRs the reliability benefits do not justify the costs. The costs to design, purchase and install the required equipment for IBRs that are 10 years old or older, does not make sense if the facility has limited or no controls compared to the modern IBR equipment being installed today. PRC-028-1 provides a limited exemption in Requirement R1 for the data to be collected, but the data could be useless if the IBR's legacy controls place hard limitations on the ability of the IBR to actually ride-through a system disturbance.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |

**Casey Jones - Berkshire Hathaway - NV Energy - 5 - WECC**

| | |
|---|---|
| **Answer** | No |
| **Document Name** | |
| **Comment** | |

PRC-028-1 will result in costs that are not in-line with the reliability benefits provided. These costs are not only for the design and implementation of the monitoring but also for new communications infrastructure for legacy locations or compliance related staff to monitor, track and maintain compliance where it was not required before. For those owners that stream PMU data this standard could add significant communications costs to upgrade older facilities. The reliability benefit of installing, maintaining, and operating monitoring capabilities on existing equipment does not justify the cost.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |

**Brian Van Gheem - Radian Generation - NA - Not Applicable - NA - Not Applicable**

| | |
|---|---|
| **Answer** | No |
| **Document Name** | |
| **Comment** | |

1. We believe the recent modifications to reintroduce the individual IBR unit to the proposed NERC Reliability Standard provide very little benefit to reliability. The information available at the IBR collector bus level and main power transformers are more than sufficient to determine how a IBR facility performed following a Disturbance. We question how operational entities would incorporate fault code and fault alarm data into their post-event analyses for improving BPS reliability. Generator Operators and Generator Owners, who are more familiar with fault codes and fault alarms, use such data for troubleshooting a localized issue detected within the IBR facility and to generate more immediate corrective actions in response.

| | |
|---|---|
| Likes 0 | |

| | |
|---|---|
| Dislikes 0 | |
| **Response** | |
| | |
| **Adam Burlock - Adam Burlock On Behalf of: Ashley Scheelar, TransAlta Corporation, 5; - Adam Burlock** | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |
| TransAlta supports the comments provided by SMUD and BANC regarding legacy IBRs. Furthermore, TransAlta does not believe the standard adequately addresses paragraph 86 from FERC Order 901, "to consider the burdens of generators collecting and providing data, while assuring that Bulk-Power System operators and planners have the data they need for accurate disturbance monitoring and analysis." | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Hayden Maples - Hayden Maples On Behalf of: Jeremy Harris, Evergy, 3, 5, 1, 6; Kevin Frick, Evergy, 3, 5, 1, 6; Tiffany Lake, Evergy, 3, 5, 1, 6; - Evergy - 1,3,5,6 - MRO** | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |
| Evergy supports and incorporates by reference the comments of the Midwest Reliability Organization's NERC Standards Review Forum (MRO NSRF) on question 3 | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Ruchi Shah - AES - AES Corporation - 5** | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |
| AES CE believes this is not a cost effective approach to meet FERC Order 901. The requirement for SER data at every IBR Unit offers marginal benefit to reliability as compared to having SER data at the end of every feeder while incurring significant additional costs. | |

| |
|---|
| AES CE recommends that the SDT leverage the expertise of Project Finance SMEs at the entities to understand the feasibility of implementing this new Standard, and the potential impacts to reliability that these additional costs could incur. |

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Wayne Sipperly - North American Generator Forum - 5 - MRO,WECC,Texas RE,NPCC,SERC,RF** | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |
| *GO/GOPs will need more information to adequately assess the cost effectiveness of the proposed approach.* | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Alison MacKellar - Constellation - 5** | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |
| Including non-BES IBRs for PRC-028-1 could present additional financial difficulties that might cause some GOs to consider other options. Due to the expenses of NERC Registry and PRC-028 requirements, non-BES IBR facilities could possibly be shut-down rather than meet the upcoming NERC requirements.<br><br>Alison Mackellar on behalf of Constellation Segments 5 and 6 | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Anna Martinson - MRO - 1,2,3,4,5,6 - MRO** | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |

PRC-028-1 will result in costs that are not in-line with the reliability benefits provided. These costs are not only for the design and implementation of the monitoring but also for new communications infrastructure for legacy locations or compliance related staff to monitor, track and maintain compliance where it was not required before. For those owners that stream PMU data this standard could add significant communications costs to upgrade older facilities. The reliability benefit of installing, maintaining, and operating monitoring capabilities on existing equipment does not justify the cost. However, MRO NSRF does agree that the requiring monitoring capabilities on new equipment moving forward may be a cost-effective method to assist in addressing the issues set forth in the SAR and NERC Reports.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Megan Melham - Decatur Energy Center LLC - 5** | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |

Capital Power will need more information to adequately assess the cost effectiveness of the proposed approach.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Kimberly Turco - Constellation - 6** | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |

Including non-BES IBRs for PRC-028-1 could present additional financial difficulties that might cause some GOs to consider other options. Due to the expenses of NERC Registry and PRC-028 requirements, non-BES IBR facilities could possibly be shut-down rather than meet the upcoming NERC requirements.

Kimberly Turco on behalf of Constellation Energy Segments 5 and 6.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |

| | |
|---|---|
| **Israel Perez - Israel Perez On Behalf of: Laura Somak, Salt River Project, 3, 6, 5, 1; Mathew Weber, Salt River Project, 3, 6, 5, 1; Thomas Johnson, Salt River Project, 3, 6, 5, 1; Timothy Singh, Salt River Project, 3, 6, 5, 1; - Israel Perez** | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |
| Feeder requirements under 3.2 are not necessary on smaller NON- BES sites. Can this requirement be updated to be applicable to only larger BES PV sites only? | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Hillary Creurer - Allete - Minnesota Power, Inc. - 1** | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |
| Minnesota Power supports MRO's NERC Standards Review Forum's (NSRF) comments. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Christine Kane - WEC Energy Group, Inc. - 3, Group Name** WEC Energy Group | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |
| WEC Energy Group does not agree that these modifications are cost effective compared to the benefit to reliability. As currently written, the Standard will trigger costly upgrades, especially to wind IBRs which were not identified as troubled equipment during the past IBR disturbances. To make it more cost effective, exceptions must be provided for certain equipment already in service. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |

| Steven Taddeucci - NiSource - Northern Indiana Public Service Co. - 3 | |
|---|---|
| **Answer** | No |
| **Document Name** | |
| **Comment** | |

Adding the requirements to capture all fault codes and alarms on IBR Units as SER data is unreasonable, as it adds significant costs and excessive administrative burden on the GO if an event occurs.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |

| Carver Powers - Utility Services, Inc. - 4 | |
|---|---|
| **Answer** | No |
| **Document Name** | |
| **Comment** | |

There are concerns about cost effectiveness if the entity is required to purchase hardware in order to reach the level of data recording suggested. If the entity is only required to update software, then the suggested updates appear cost-effective.

We recommend incorporating an exception process for smaller entities who do not have the ability to configure existing equipment to gather the requested level of data recording.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |

| Scott Thompson - PNM Resources - 1,3,5 - WECC | |
|---|---|
| **Answer** | No |
| **Document Name** | |
| **Comment** | |

The high cost of outfitting existing IBRs to comply outweighs the reliability gained.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |

| | |
|---|---|
| **Pamela Hunter - Southern Company - Southern Company Services, Inc. - 1,3,5,6 - SERC, Group Name** Southern Company | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |
| Southern Company believes the modifications made to PRC-028-1 for legacy IBRs are **not** cost effective at unit level cost versus plant level cost compared to the benefit to reliability due to R1.3 inclusion. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Colin Chilcoat - Invenergy LLC - 5,6** | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |
| The reversal of course in Draft 4 to require IBR Unit level monitoring at every IBR Unit imposes significant costs on entities without a commensurate benefit to reliability. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Rhonda Jones - Invenergy LLC - 5,6** | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |
| The reversal of course in Draft 4 to require IBR Unit level monitoring at every IBR Unit imposes significant costs on entities without a commensurate benefit to reliability. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |

| | |
|---|---|
| **Jennifer Bray - Arizona Electric Power Cooperative, Inc. - 1** | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |

AEPC has signed on to ACES comments:

ACES agrees with the approach taken by the SDT to create a new Standard to specifically address inverter-based resources; however, we disagree with making this new standard inclusive of all BES inverter-based resources regardless of risk to the BPS.

In the opinion of ACES, a blanket approach requiring every IBR to install SER, FR, and/or DDR capabilities is overly gratuitous. We believe that the industry's finite resources would best be spent by first ascertaining which inverter-based resources pose the biggest risk to the BPS, and where disturbance monitoring and reporting would provide the most benefit to the BPS, before selectively adding such capabilities.

We believe that a risk-based approach is the best and only truly cost-effective option for all applicable IBRs, we believe that this is especially true for existing IBRs. In summary, it is our recommendation that PRC-028-1 take a similar risk-based approach for IBRs as is done in PRC-002-5 for synchronous generating resources.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |

| | |
|---|---|
| **Jodirah Green - ACES Power Marketing - 1,3,4,5,6 - MRO,WECC,NPCC,SERC,RF, Group Name** ACES Collaborators | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |

ACES agrees with the approach taken by the SDT to create a new Standard to specifically address inverter-based resources; however, we disagree with making this new standard inclusive of all BES inverter-based resources **regardless of risk** to the BPS.

In the opinion of ACES, a blanket approach requiring every IBR to install SER, FR, and/or DDR capabilities is overly gratuitous. We believe that the industry's finite resources would best be spent by first ascertaining which inverter-based resources pose the biggest risk to the BPS, and where disturbance monitoring and reporting would provide the most benefit to the BPS, before selectively adding such capabilities.

We believe that a risk-based approach is the best and only truly cost-effective option for all applicable IBRs, we believe that this is especially true for existing IBRs. In summary, it is our recommendation that PRC-028-1 take a similar risk-based approach for IBRs as is done in PRC-002-5 for synchronous generating resources.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

| Response | |
|---|---|
| | |
| **Jennifer Neville - Western Area Power Administration - 1,6** | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |
| Support MRO NSRF comments | |
| Likes 0 | |
| Dislikes 0 | |

| Response | |
|---|---|
| | |
| **Kenisha Webber - Entergy - NA - Not Applicable - SERC** | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |

| Response | |
|---|---|
| | |
| **Richard Vendetti - NextEra Energy - 5** | |
| **Answer** | No |
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |

| Response | |
|---|---|
| | |
| **Rob Robertson - Leeward Renewable Energy - 5** | |
| **Answer** | No |

| | |
|---|---|
| **Document Name** | |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Mark Garza - FirstEnergy - FirstEnergy Corporation - 4, Group Name** FE Voter | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| At this time, FirstEnergy finds no issue with the cost effectiveness toward the scope of this standard | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Marcus Bortman - APS - Arizona Public Service Co. - 6** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |
| None | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Selene Willis - Edison International - Southern California Edison Company - 5** | |
| **Answer** | Yes |
| **Document Name** | |
| **Comment** | |

| |
|---|
| "Please see EEI Comments" |

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Jennifer Weber - Tennessee Valley Authority - 1,3,5,6 - SERC**

| | |
|---|---|
| **Answer** | Yes |
| **Document Name** | |

**Comment**

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Jessica Cordero - Unisource - Tucson Electric Power Co. - 1**

| | |
|---|---|
| **Answer** | Yes |
| **Document Name** | |

**Comment**

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Mohamad Elhusseini - DTE Energy - Detroit Edison Company - 3,5**

| | |
|---|---|
| **Answer** | Yes |
| **Document Name** | |

**Comment**

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

| | |
|---|---|
| **Robert Follini - Avista - Avista Corporation - 3** | |
| **Answer** | |
| **Document Name** | |
| **Comment** | |
| Cannot comment on cost effectiveness | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Rachel Schuldt - Black Hills Corporation - 6, Group Name** Black Hills Corporation - All Segments | |
| **Answer** | |
| **Document Name** | |
| **Comment** | |
| Black Hills Corporation will not comment on cost effectiveness. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Andy Thomas - Duke Energy - 1,3,5,6 - SERC,RF** | |
| **Answer** | |
| **Document Name** | |
| **Comment** | |
| Duke Energy will not submit a response to the cost effectiveness of the proposed changes. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Michael Johnson - Michael Johnson On Behalf of: Marco Rios, Pacific Gas and Electric Company, 3, 1, 5; Sandra Ellis, Pacific Gas and Electric Company, 3, 1, 5; - Michael Johnson, Group Name** PG&E All Segments | |

| | |
|---|---|
| **Answer** | |
| **Document Name** | |
| **Comment** | |
| PG&E does not have any comments as to the cost effectiveness. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Patricia Lynch - NRG - NRG Energy, Inc. - 5,6** | |
| **Answer** | |
| **Document Name** | |
| **Comment** | |
| NRG Energy Inc is in support of the comments made by EPSA. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Martin Sidor - NRG - NRG Energy, Inc. - 5,6** | |
| **Answer** | |
| **Document Name** | |
| **Comment** | |
| NRG agrees with the EPSA comments. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Nick Leathers - Nick Leathers On Behalf of: David Jendras Sr, Ameren - Ameren Services, 3, 6, 1; - Nick Leathers** | |
| **Answer** | |
| **Document Name** | |

| **Comment** | |
|---|---|
| Ameren does not have any additional comments on the cost effectiveness of this project. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Mike Magruder - Avista - Avista Corporation - 1** | |
| **Answer** | |
| **Document Name** | |
| **Comment** | |
| No comment on the cost effectiveness. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Steven Rueckert - Western Electricity Coordinating Council - 10** | |
| **Answer** | |
| **Document Name** | |
| **Comment** | |
| No comment | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |

**4. Provide any additional comments for the standard drafting team to consider, if desired.**

| **Kyle Thomas - Elevate Energy Consulting - NA - Not Applicable - NA - Not Applicable** | |
|---|---|
| **Answer** | |
| **Document Name** | |
| **Comment** | |

Elevate appreciates the opportunity to comment on the draft NERC standards, particularly those pertaining to future IBR NERC Reliability Standards, and FERC Order No. 901 directives.

**Elevate continues to strongly encourage NERC to reconsider adoption of IEEE 2800-2022.** The unwillingness to adopt IEEE 2800-2022 by NERC is leading to entirely duplicative efforts that are not serving any additional value as compared to the work conducted in the IEEE 2800-2022 developments. It does not appear that a holistic approach and strategy is being taken to meet the FERC Order No. 901 directives, which is leading to very low ballot scores, significant rework, and misalignment with industry recommended practices.

**Elevate strongly recommends a single NERC standard that adopts IEEE 2800-2022 in a uniform and consistent manner.** NERC can also issue a reliability guideline or implementation guidance that supports industry implementation of the standard. Rather than recreate parts of IEEE 2800-2022 inconsistently over multiple different standards, Elevate recommends a singular standard for BPS-connected IBR capability and performance requirements related to IEEE 2800-2022. Additional NERC standards can be developed where needed in situations where they are not covered directly with IEEE 2800-2022 (e.g., NERC PRC-030).

While improvements have been made in this latest draft of the NERC PRC-028 standard, this standard is duplicative with IEEE 2800-2022 Clause 11 yet the latest draft of the standard is still missing some of the monitoring aspects covered in the IEEE 2800 standard, including power quality monitoring data and IBR unit FR/DDR data (and additional fault code types). The 2021 Odessa Disturbance report and the NERC IBR Reliability Guideline document both give a recommendation to include FR/DDR data on some IBR units on the collector busses at IBR plants, but currently the draft PRC-028 standard has no FR/DDR requirement for IBR units. This PRC-028-1 standard and other NERC IBR-focused standards should be conforming to/matching the IEEE 2800 standard.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |

| **Steven Rueckert - Western Electricity Coordinating Council - 10** | |
|---|---|
| **Answer** | |
| **Document Name** | |
| **Comment** | |

PRC-028 R1 is using “IBR unit” versus IBR and provides a “definition” in the footnote 3 (only footnoted once but used several time in Requirement). Why complicate the issue with a definition in a footnote that would not be needed if using IBR only? That lacks consistency with PRC-029 and PRC-030 (which are inconsistent between each other as well). The use of commercial operation is ambiguous. Different entities may have a

| | |
|---|---|
| different definition of "commercial operation." Suggest clarification of what commercial operation is. Suggest someting to the effect of IBRs must have these installed prior to first synch. Entities will have to maintain and provide ALL commercial operating dates for all IBRs.<br><br>The VSLs as written will require an extent of condition (entity will have to supply ALL applicable "Elements" and /or electrical quantities to determine severity level if a single issue is found with a sample.) | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Jennifer Neville - Western Area Power Administration - 1,6** | |
| **Answer** | |
| **Document Name** | |
| **Comment** | |
| Support MRO NSRF comments | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Kennedy Meier - Electric Reliability Council of Texas, Inc. - 2** | |
| **Answer** | |
| **Document Name** | |
| **Comment** | |
| ERCOT joins the comments submitted by the IRC SRC and adopts them as its own. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Charles Yeung - Southwest Power Pool, Inc. (RTO) - 2 - MRO,WECC,Texas RE,NPCC,SERC,RF, Group Name** SRC 2024 | |
| **Answer** | |
| **Document Name** | |
| **Comment** | |

Given the reliance on electronic communications for compliance such as the Secure Evidence Locker, the SRC notes that it seems inappropriate to allow for hard-copy documentation, e.g. M1:

The Generator Owner has evidence (electronic or hard copy) of data, as applicable, as specified in Requirement R1

This also seems contradictory to the more specific data format requirements contained elsewhere in the standard, such as in Parts 7.3 and 7.4, and the SRC requests that the SDT consider revising M1.

7.3. SER data shall be provided in ASCII Comma Separated Value (CSV) format

following Attachment 1.

7.4 FR data shall be provided either in CSV format with appropriate headers or in electronic files that are formatted…

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Daniel Gacek - Exelon - 1, Group Name** Exelon

| | |
|---|---|
| **Answer** | |
| **Document Name** | |

**Comment**

Exelon agrees with the EEI, Footnote 2 should be deleted from the final draft.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Jodirah Green - ACES Power Marketing - 1,3,4,5,6 - MRO,WECC,NPCC,SERC,RF, Group Name** ACES Collaborators

| | |
|---|---|
| **Answer** | |
| **Document Name** | |

**Comment**

ACES Member EKPC had the following additional comment:

"DDR data for all BES and NON-BES IBRs is a large burden. If the Standards Drafting Team finds it untenable to take a risk-based approach for all PRC-028-1 Requirements (similar to PRC-002-4), then we recommend that PRC-028-1 Requirement R4 and R5 have exclusive applicability based on a risk-based analysis performed by the Reliability Coordinator."

Thank you for the opportunity to comment.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Jennifer Bray - Arizona Electric Power Cooperative, Inc. - 1**

| | |
|---|---|
| **Answer** | |
| **Document Name** | |

**Comment**

Thank you for the opportunity to comment.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Rhonda Jones - Invenergy LLC - 5,6**

| | |
|---|---|
| **Answer** | |
| **Document Name** | |

**Comment**

**R1.2.1, R1.2.2, R1.3.1,** and **R1.3.2** are far too broad as currently drafted and must be amended to target specific categories of fault codes that the SDT deems relevant to the analysis of BES disturbances. Depending on the OEM, there may be thousands of fault codes, a vast majority of which would be entirely irrelevant to the purpose of analyzing BES disturbances.

**R6.2** should be amended to include "if capable."

Invenergy thanks the drafting team for the opportunity to provide feedback.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

| | |
|---|---|
| **Colin Chilcoat - Invenergy LLC - 5,6** | |
| **Answer** | |
| **Document Name** | |
| **Comment** | |

Invenergy thanks the drafting team for the opportunity to provide feedback.

**R1.2.1, R1.2.2, R1.3.1,** and **R1.3.2** are far too broad as currently drafted and must be amended to target specific categories of fault codes that the SDT deems relevant to the analysis of BES disturbances. Depending on the OEM, there may be thousands of fault codes, a vast majority of which would be entirely irrelevant to the purpose of analyzing BES disturbances.

**R6.2** should be amended to include "if capable."

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |

| | |
|---|---|
| **Ruida Shu - Northeast Power Coordinating Council - 1,2,3,4,5,6,7,8,9,10 - NPCC, Group Name** NPCC RSC | |
| **Answer** | |
| **Document Name** | |
| **Comment** | |

NPCC RSC supports the project.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |

| | |
|---|---|
| **Pamela Hunter - Southern Company - Southern Company Services, Inc. - 1,3,5,6 - SERC, Group Name** Southern Company | |
| **Answer** | |
| **Document Name** | |
| **Comment** | |

Southern Company does not agree with the language in PRC-028, R8 requiring a Corrective Action Plan to be submitted to the Regional Entity. If at any time a Regional Entity desires to review a TO's or GO's Corrective Action Plans, they have the authority to request them. Requiring the Corrective Action Plans to be submitted to the Regional Entity with no requirement for action by the Regional Entity is purely administrative and does nothing to improve the reliability of the Bulk Electric System. Further, the timely development and implementation of a Corrective Action Plan needed to repair equipment can be thoroughly examined during an audit engagement. This same reasoning applies to PRC-002, R12 and is also recommended to be removed.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Constantin Chitescu - Ontario Power Generation Inc. - 5**

| | |
|---|---|
| **Answer** | |
| **Document Name** | |

**Comment**

OPG supports NPCC Regional Standards Committee's comments.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Carver Powers - Utility Services, Inc. - 4**

| | |
|---|---|
| **Answer** | |
| **Document Name** | |

**Comment**

1. Based on the purpose statement, this standard appears to be creating double jeopardy. If a non-compliance occurs with PRC-028, the entity is presumably non-compliant with Modeling standards in addition to PRC-029. However, it seems that the intent of the standard is similar to PRC-002: to capture adequate data to facilitate analysis of BES System Disturbances.

2. We recommend that the DT recreate the purpose statement of PRC-028 to align with the PRC-002 purpose statement. We believe the intent of the standard is to gather the necessary event data to analyze system disturbances. PRC-002 focuses on the TO (and some large generation facilities that meet the threshold in R5) gathering the appropriate data and doing it in a manner that is consistent so it can be analyzed in a more efficient manner when a large system disturbance occurs. PRC-028 suggests that IBR's, regardless of size, have significant event recording capabilities. For the smaller IBR facilities that will inevitably be applicable to this standard, this data may not be useful at all. If this standard requires upgrades to hardware or additional hardware to meet the recording capabilities, this may not be commercially viable for these smaller entities that may not have any relevant data for analysis. Therefore, if care is not taken when further development of this standard occurs, the majority of these Requirements would end up being administrative in nature and not be beneficial for improved reliability of the BES.

3. In our entity's review of this project, we are voting in the affirmative. We understand and appreciate that this project addresses important considerations for reliability and security responsiveness. However, we also recognize that this project in its current form presents compliance and

performance risks that remain unresolved. While affirmatively supporting this project to address the immediate regulatory assignments tied to FERC Order 901, NERC and the ERO must continue a constructive dialog with industry beyond this vote to truly optimize the impacts of this project on reliability, sustainability, and affordability. We encourage NERC to permit extending the SDT team and project to offer prospective enhancements or revisions to satisfy these compliance and performance risks.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Nick Leathers - Nick Leathers On Behalf of: David Jendras Sr, Ameren - Ameren Services, 3, 6, 1; - Nick Leathers**

| | |
|---|---|
| **Answer** | |
| **Document Name** | |

**Comment**

Ameren agrees with and supports EEI's comments.

Ameren offers the following for consideration:

**R1**: Ameren recommends that the drafting team clarify what is meant by "fault codes" and "fault alarms" as applied to the standard for R1.

**R2**: The standards drafting team requires real and reactive power expressed on a three-phase basis. However, during a fault, these values would be zero. Ameren recommends that Volts and Amps are the only necessary data collected during a fault event.

**R3**, Ameren proposes 30 to 60 cycles per event with 2 cycles of pre-event data at 32 samples per cycle, which can be accomplished with most modern relays. The values for output recording rate and synchronized device clock accuracy should match PRC-002. Additionally, the number of days in R7.1 and R7.2 should also match PRC-002.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Romel Aquino - Edison International - Southern California Edison Company - 3**

| | |
|---|---|
| **Answer** | |
| **Document Name** | EEI Near Final Draft Comments _ Project 2021-04 PRC-002_028 Draft 4 _ Rev 0a __ 8_06_2024 (002).docx |

**Comment**

See comments submitted by the Edison Electric Institute in the attached file

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

| Response |
| --- |
| |

| Kristine Martz - Edison Electric Institute - NA - Not Applicable - NA - Not Applicable | |
| --- | --- |
| **Answer** | |
| **Document Name** | |
| **Comment** | |

EEI offers the following non-substantive change to PRC-028-1 for consideration:

- Footnote 2 should be deleted. "IBR unit" is no longer used in the proposed definition of IBR and therefore has no meaning within the context of this Reliability Standard, negating the need for Footnote 2.

| | |
| --- | --- |
| Likes 0 | |
| Dislikes 0 | |

| Response |
| --- |
| |

| Hillary Creurer - Allete - Minnesota Power, Inc. - 1 | |
| --- | --- |
| **Answer** | |
| **Document Name** | |
| **Comment** | |

Minnesota Power supports MRO's NERC Standards Review Forum's (NSRF) comments.

| | |
| --- | --- |
| Likes 0 | |
| Dislikes 0 | |

| Response |
| --- |
| |

| Kimberly Turco - Constellation - 6 | |
| --- | --- |
| **Answer** | |
| **Document Name** | |
| **Comment** | |

The cost and burden of the proposed PRC-028 requirements are not believed justified by the reliability benefits it would provide.

Kimberly Turco on behalf of Constellation Energy Segments 5 and 6.

| | |
| --- | --- |
| Likes 0 | |

| | |
|---|---|
| Dislikes 0 | |

**Response**

**Anna Martinson - MRO - 1,2,3,4,5,6 - MRO**

| | |
|---|---|
| **Answer** | |
| **Document Name** | |

**Comment**

MRO NSRF is concerned about Regional Entities' ability to objectively and correctly evaluate requests for Seeking Extensions to Compliance Dates. MRO NSRF recommends that the SDT create clear and auditable criteria that if met, allow for the extension of compliance dates. GOs and TOs would submit notification to the Regional Entity that they will require an extension to the compliance dates, based on the met criteria. The Regional Entities' role would be to ensure that the proper criteria are indicated by the GO or TO to allow for an extension of compliance dates, rather than make subjective decisions on approval of requests. This would also eliminate concerns about differences between regions in allowing for extensions.

MRO NSRF does not agree with the language in R8 of PRC-028 and R12 of PRC-002, requiring a Corrective Action Plan to be submitted to the Regional Entity. If at any time a Regional Entity desires to review a TO's or GO's Corrective Action Plans, they have the authority to request them. Simply requiring the Corrective Action Plans to be submitted to the Regional Entity with no requirement for the Regional Entity to do something with them is purely and administrative and does nothing to improve the reliability of the Bulk Electric System.

While MRO NSRF supports much of this proposed standard, MRO NSRF does not agree with requiring the retrofitting of monitoring equipment on existing individual inverter based generating resources as included by I4, MRO NSRF does however believe that forward looking design standard addressing new installations would be reasonable.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Alison MacKellar - Constellation - 5**

| | |
|---|---|
| **Answer** | |
| **Document Name** | |

**Comment**

The cost and burden of the proposed PRC-028 requirements are not believed justified by the reliability benefits it would provide.

Alison Mackellar on behalf of Constellation Segments 5 and 6

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

| Wayne Sipperly - North American Generator Forum - 5 - MRO,WECC,Texas RE,NPCC,SERC,RF | |
|---|---|
| **Answer** | |
| **Document Name** | |
| **Comment** | |
| *The NAGF has no additional comments.* | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |

| Scott Langston - Tallahassee Electric (City of Tallahassee, FL) - 1 | |
|---|---|
| **Answer** | |
| **Document Name** | |
| **Comment** | |
| TAL understands that the committee was following previous precedent of the 20MVA or greater facilities; however, we believe this standard will create undue hardship on utilities who will be required to meet this standard. 20MVA seems like a low threshold for the size of IBRs. TAL believes the impact of IBRs as small as 20 MVA seems minimal to the integrity of the BES. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |

| Ruchi Shah - AES - AES Corporation - 5 | |
|---|---|
| **Answer** | |
| **Document Name** | |
| **Comment** | |
| 1. Many existing devices used for fault recording (SEL-351 for example) cannot meet the 2.0 second duration in R3.1.1. A duration of 1.0 second would better align with equipment capabilities. Perhaps the clause could be written that all new equipment should have the 2.0 second duration capability while existing equipment has requirements in-line with the capabilities of the equipment installed over the past few years. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |

| | |
|---|---|
| **Hayden Maples - Hayden Maples On Behalf of: Jeremy Harris, Evergy, 3, 5, 1, 6; Kevin Frick, Evergy, 3, 5, 1, 6; Tiffany Lake, Evergy, 3, 5, 1, 6; - Evergy - 1,3,5,6 - MRO** | |
| **Answer** | |
| **Document Name** | |
| **Comment** | |
| Evergy supports and incorporates by reference the comments of the Midwest Reliability Organization's NERC Standards Review Forum (MRO NSRF) on question 4 | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Adam Burlock - Adam Burlock On Behalf of: Ashley Scheelar, TransAlta Corporation, 5; - Adam Burlock** | |
| **Answer** | |
| **Document Name** | |
| **Comment** | |
| - | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Brian Van Gheem - Radian Generation - NA - Not Applicable - NA - Not Applicable** | |
| **Answer** | |
| **Document Name** | |
| **Comment** | |
| 1. Thank you for the opportunity to comment. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Chantal Mazza - Chantal Mazza On Behalf of: Nicolas Turcotte, Hydro-Quebec (HQ), 1, 5; - Chantal Mazza** | |
| **Answer** | |

| | |
|---|---|
| **Document Name** | |
| **Comment** | |

1. Purpose: we suggest harmonizing the usage of the term Inverter Based Resources and its acronym across the projects 2021-04, 202-02 and 2023-03. We suggest adding the acronym IBR in brackets after the capitalized term Inverter Based Resources, and to refer to IBR throughout the document.

2. We suggest that the drafting team modify section 4.2.2 to reflect the changes that were made to PRC-029-1 in Project 2020-02 and PRC-030-1 in project 2023-02. We suggest the following wording:

"The Elements associated with (1) Bulk Electric System (BES) IBRs and (2) Non-BES IBRs that either have or contribute to an aggregate nameplate capacity of greater than or equal to 20 MVA, connected through a system designed primarily for delivering such capacity to a common point of connection at a voltage greater than or equal to 60 kV."

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Tim Kelley - Tim Kelley On Behalf of: Charles Norton, Sacramento Municipal Utility District, 3, 6, 4, 1, 5; Foung Mua, Sacramento Municipal Utility District, 3, 6, 4, 1, 5; Kevin Smith, Balancing Authority of Northern California, 1; Nicole Looney, Sacramento Municipal Utility District, 3, 6, 4, 1, 5; Ryder Couch, Sacramento Municipal Utility District, 3, 6, 4, 1, 5; Wei Shao, Sacramento Municipal Utility District, 3, 6, 4, 1, 5; - Tim Kelley, Group Name** SMUD and BANC

| | |
|---|---|
| **Answer** | |
| **Document Name** | |
| **Comment** | |

The language in **Section 4, Applicability** does not match the language used in the latest proposed versions of PRC-029-1 and PRC-030-1.

The drafting team should remove the words "that owns equipment as identified in section 4.2" in Section 4.1.1. and ensure that the Section 4, Applicability language match the language in PRC-029-1 and PRC-030-1. The final, preferred language for Section 4, Applicability is shown below. This change is non-substantive and could be made in the final ballot.

The existing language in PRC-028-1 is as follows:

4.1. Functional Entities:

4.1.1. Generator Owner ***that owns equipment as identified in section 4.2***

4.2. Facilities:

4.2.1 BES Inverter-Based Resources

4.2.2 Non-BES Inverter-Based Resources that either have or contribute to an aggregate nameplate capacity of greater than or equal to 20 MVA, connected through a system designed primarily for delivering such capacity to a common point of connection at a voltage greater than or equal to 60 kV

SMUD's preferred language in PRC-028-1 Section 4, Applicability is as follows:

4.1 Functional Entities:

4.1.1. Generator Owner

4.2. Facilities:

4.2.1 BES Inverter-Based Resources

4.2.2 Non-BES Inverter-Based Resources that either have or contribute to an aggregate nameplate capacity of greater than or equal to 20 MVA, connected through a system designed primarily for delivering such capacity to a common point of connection at a voltage greater than or equal to 60 kV.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Michael Johnson - Michael Johnson On Behalf of: Marco Rios, Pacific Gas and Electric Company, 3, 1, 5; Sandra Ellis, Pacific Gas and Electric Company, 3, 1, 5; - Michael Johnson, Group Name** PG&E All Segments

| | |
|---|---|
| **Answer** | |
| **Document Name** | |

**Comment**

None are being provided.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Andy Thomas - Duke Energy - 1,3,5,6 - SERC,RF**

| | |
|---|---|
| **Answer** | |
| **Document Name** | |

**Comment**

Duke Energy agrees with and supports the following EEI comment:

EEI offers the following non-substantive change to PRC-028-1 for consideration:

• Footnote 2 should be deleted. "IBR unit" is no longer used in the proposed definition of IBR and therefore has no meaning within the context of this Reliability Standard, negating the need for Footnote 2.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Marcus Bortman - APS - Arizona Public Service Co. - 6**

| | |
|---|---|
| **Answer** | |
| **Document Name** | |

**Comment**

AZPS supports the following comment submitted by EEI on behalf of its members:

Footnote 2 should be deleted. "IBR unit" is no longer used in the proposed definition of IBR and therefore has no meaning within the context of this Reliability Standard, negating the need for Footnote 2.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Donna Wood - Tri-State G and T Association, Inc. - 1**

| | |
|---|---|
| **Answer** | |
| **Document Name** | |

**Comment**

Tri-State agrees with the additional comments provided by the MRO NSRF.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |

**Response**

**Mark Garza - FirstEnergy - FirstEnergy Corporation - 4, Group Name** FE Voter

| | |
|---|---|
| **Answer** | |
| **Document Name** | |

**Comment**

No additional comments at this time.

| | |
|---|---|
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Jennifer Weber - Tennessee Valley Authority - 1,3,5,6 - SERC** | |
| **Answer** | |
| **Document Name** | |
| **Comment** | |
| N/A | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Bruce Walkup - Arkansas Electric Cooperative Corporation - 6** | |
| **Answer** | |
| **Document Name** | |
| **Comment** | |
| “There are concerns about reliably modeling IBRs on the grid. With the vast amount of intermittent capacity being added each year, we are affecting the system in ways that are currently unpredictable which reduces reliability. A contributing factor to this is the vast amount of data that is expected to be stored and analyzed. Can the Standards Drafting Team explain the reasoning behind the need to store a large amount of data that will likely go unused? Data Centers create a huge draw on the electric grid so the need to retain this amount of data seems counterintuitive to improving the reliability of the grid. Would it be possible to systematically study the effects before allowing more resources to be added instead of requiring a post-mortem review?” | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Ayslynn Mcavoy - Arkansas Electric Cooperative Corporation - 3** | |
| **Answer** | |
| **Document Name** | |
| **Comment** | |

| | |
|---|---|
| SMEs responded with the folloing comments:<br><br>• "There are concerns about reliably modeling IBRs on the grid. With the vast amount of intermittent capacity being added each year, we are affecting the system in ways that are currently unpredictable which reduces reliability. A contributing factor to this is the vast amount of data that is expected to be stored and analyzed. Can the Standards Drafting Team explain the reasoning behind the need to store a large amount of data that will likely go unused? Data Centers create a huge draw on the electric grid so the need to retain this amount of data seems counterintuitive to improving the reliability of the grid. Would it be possible to systematically study the effects before allowing more resources to be added instead of requiring a post-mortem review?" | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Robert Follini - Avista - Avista Corporation - 3** | |
| **Answer** | |
| **Document Name** | |
| **Comment** | |
| N/A | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Marty Hostler - Northern California Power Agency - 4** | |
| **Answer** | |
| **Document Name** | |
| **Comment** | |
| NCPA is not voting on this proposal but has provided comments. | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Bill Zuretti - Electric Power Supply Association - 5** | |
| **Answer** | |

| | |
|---|---|
| **Document Name** | EPSA FINAL Comments on IBR Standards .pdf |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |
| **Rob Robertson - Leeward Renewable Energy - 5** | |
| **Answer** | |
| **Document Name** | PRC-028 Aug 2024.docx |
| **Comment** | |
| | |
| Likes 0 | |
| Dislikes 0 | |
| **Response** | |
| | |