Comment Report

Project Name:	2021-04 Modifications to PRC-002-2 | IRPTF SAR
Comment Period Start Date:	6/14/2021
Comment Period End Date:	7/13/2021
Associated Ballots:	

There were 23 sets of responses, including comments from approximately 50 different people from approximately 44 companies representing 7 of the Industry Segments as shown in the table on the following pages.

Questions

1. Do you agree with the proposed scope as described in the SAR? If you do not agree, or if you agree but have comments or suggestions for the project scope please provide your recommendation and explanation.

2. Provide any additional comments for the SAR 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
MRO	Kendra Buesgens	1,2,3,4,5,6	MRO	MRO NSRF	Bobbi Welch	Midcontinent ISO, Inc.	2	MRO
					Christopher Bills	City of Independence Power & Light	4	MRO
					Fred Meyer	Algonquin Power Co.	1	MRO
					Jamie Monette	Allete - Minnesota Power, Inc.	1	MRO
					Jodi Jensen	Western Area Power Administration - Upper Great Plains East (WAPA)	1,6	MRO
					John Chang	Manitoba Hydro	1,3,6	MRO
					Larry Heckert	Alliant Energy Corporation Services, Inc.	4	MRO
					Marc Gomez	Southwestern Power Administration	1	MRO
					Matthew Harward	Southwest Power Pool, Inc.	2	MRO
					LaTroy Brumfield	American Transmission Company, LLC	1	MRO
					Bryan Sherrow	Kansas City Board Of Public Utilities	1	MRO
					Terry Harbour	MidAmerican Energy	1,3	MRO
					Jamison Cawley	Nebraska Public Power	1,3,5	MRO
					Seth Shoemaker	Muscatine Power & Water	1,3,5,6	MRO

					Michael Brytowski	Great River Energy	1,3,5,6	MRO
					Jeremy Voll	Basin Electric Power Cooperative	1,3,5	MRO
					Joe DePoorter	Madison Gas and Electric	4	MRO
					David Heins	Omaha Public Power District	1,3,5,6	MRO
					Bill Shultz	Southern Company Generation	5	MRO
Duke Energy	Kim Thomas	1,3,5,6	FRCC,RF,SERC,Texas RE	Duke Energy	Laura Lee	Duke Energy	1	SERC
					Dale Goodwine	Duke Energy	5	SERC
					Greg Cecil	Duke Energy	6	RF
FirstEnergy - FirstEnergy Corporation	Mark Garza	1,3,4,5,6		FE Voter	Julie Severino	FirstEnergy - FirstEnergy Corporation	1	RF
					Aaron Ghodooshim	FirstEnergy - FirstEnergy Corporation	3	RF
					Robert Loy	FirstEnergy - FirstEnergy Solutions	5	RF
					Ann Carey	FirstEnergy - FirstEnergy Solutions	6	RF
					Mark Garza	FirstEnergy- FirstEnergy	4	RF

1. Do you agree with the proposed scope as described in the SAR? If you do not agree, or if you agree but have comments or suggestions for the project scope please provide your recommendation and explanation.

Daniela Atanasovski - APS - Arizona Public Service Co. - 1,3,5,6

Answer	No
Document Name	

Comment

AZPS does not support the scope of the SAR submitted by the NERC Inverter-based Resource Performance Task Force (IRPTF) because is too broad and does not provide specific information on the changes to be addressed by the standard drafting team. Additionally, AZPS does not agree that the IRPTF White Paper provides sufficient justification for revising the standard. AZPS's experience has shown that any significant inverter based resources tie into large substations for which the MVA requirement would cover the need for monitoring.

Likes 0	
Dislikes 0	

Response

Scott Langston - Tallahassee Electric (City of Tallahassee, FL) - 1,3,5

Answer	No
Document Name	

Comment

The City of Tallahassee (TAL) believes that requiring additional monitoring equipment is not cost-effective given the minor contribution to the BES in terms of fault current. TAL is unsure how the data collected will provide a substantial gain to the BES.

Likes 0	
Dislikes 0	

Response

Andrea Jessup - Bonneville Power Administration - 1,3,5,6 - WECC

Answer	No
Document Name	

Comment

BPA disagrees with this project scope. PRC-002-2 Attachment 1, Step 8 already says "the additional BES buses are selected, at the Transmission Owner's discretion, to provide maximum wide-area coverage for SER and FR data." It then provides recommendations for selecting additional bus locations. We do not only rely on PRC-002-2 to require disturbance monitoring and recording. We have our own requirements for when to install

disturbance monitoring and recording and the TO should know their system well enough to know when and where they need to monitor. In order to completely eliminate the possibility of not having data available for event analysis, you'd have to require monitoring and recording at every substation which may or may not be possible. The SAR mentions the IBRs don't provide enough fault current, thus they can contribute to a fault. PRC-002 is for wide area faults and reconstructing them. This SAR may be better applied to PRC-023 or another protection standard. The owners need to update their own standards for SER/FR equipment or at least protective systems (most offer both limited SER/FR capability).	
Likes 0	
Dislikes 0	
Response	
Carl Pineault - Hydro-Qu?bec Production - 1,5	
Answer	Yes
Document Name	
Comment	
No comment	
Likes 0	
Dislikes 0	
Response	
Kim Thomas - Duke Energy - 1,3,5,6 - SERC,RF, Group Name Duke Energy	
Answer	Yes
Document Name	
Comment	
Duke Energy does not have comments at this time.	
Likes 0	
Dislikes 0	
Response	
Thomas Foltz - AEP - 3,5,6	
Answer	Yes
Document Name	
Comment	

AEP believes there may be benefit in pursuing this SAR, however we do not believe that the burden to install SER, FR, and DDR should be placed on the Transmission Owner. Rather, any such obligations to do so should be placed solely on the Generator Owner of those resources.

We believe Attachment One should be revised to make it absolutely clear that it governs Transmission assets only. Generation resources deserve their own distinct selection criteria for R1 and R3, one that is inclusive of both synchronous generation and inverter based generation. Generator Owners should be able to make their determination on which assets require FR and SER solely on the resource in question, and not based on analysis regarding how that asset is compared to others. One suggested method to consider would be establishing individual and aggregate thresholds for when SER and FR would need to be installed.

While both the IRPTF SAR and the Glencoe Power and Light SAR each focus on revising PRC-002, their perceived needs and expressed goals are quite different. Because only one single SAR governs a project at any point in time, and because the unique efforts for the IRPTF SAR will likely be met with much more resistance than the Glencoe SAR, AEP recommends breaking this project into multiple phases, each with its own SAR governance. The Glencoe SAR will likely encounter less resistance from industry than the IRPTF SAR, so we recommend that the Glencoe SAR govern the first phase of the project. Once that phase is complete, the second phase could then begin with the IRPTF SAR governing Phase 2. Pursuing Project 2021-04 this way would be much more efficient, allow progress to be made more quickly on the purpose and goal on the Glencoe SAR, and without potential delay associated to any resistance to efforts related to the IRPTF SAR.

Likes 0	
Dislikes 0	

Response

Kendra Buesgens - MRO - 1,2,3,4,5,6 - MRO, Group Name MRO NSRF

Answer	Yes
Document Name	

Comment

Step 8 in Attachment 1 for R1 already provides a means by which bus locations not captured in the highest 10% bus fault current calculations are selected for SER and FR data monitoring to achieve the 20% total. Locations with Inverter Based Resources can be added to the list of recommended locations.

Likes 0	
Dislikes 0	

Response

Leonard Kula - Independent Electricity System Operator - 2

Answer	Yes
Document Name	

Comment

N/A

Likes 0	
Dislikes 0	
Response	
Dwanique Spiller - Berkshire Hathaway - NV Energy - 5 - WECC	
Answer	Yes
Document Name	
Comment	
The rationale for R1 on page 22 explains in detail the data analysis efforts which have gone into developing a methodology for identifying optimum number of buses. The study established a strong correlation between the short circuit MVA level available at a bus and its relative size based on voltage level, no. of transmission lines and other BES elements connected have an impact on system reliability. BES buses with a large short circuit MVA level are BES Elements that have a significant effect on System reliability and performance. Conversely, BES buses with very low short circuit MVA levels seldom cause wide-area or cascading System events, so SER and FR data from those BES Elements are not as significant. After analyzing and reviewing the collected data submittals from across the continent, the threshold MVA values were chosen to provide sufficient data for event analysis using engineering and operational judgment. Though entities could cover the inverter-based resources under optional buses in Step 8 of the algorithm in attachment 1 of the standard.	
Likes 0	
Dislikes 0	
Response	
Anthony Jablonski - ReliabilityFirst - 10	
Answer	Yes
Document Name	
Comment	
The existing standard targets BES elements with short circuit MVA in the top 20% which could leave out inverter-based resources. Recent events involving inverter-based resources (IBR), such as the Blue Cut Fire and Canyon 2 Fire, have demonstrated the need to monitor some inverter-based resources. The Project 2021-04 SAR (the portion written by the IRPTF) addresses the need to monitor some IBRs.	
Likes 0	
Dislikes 0	
Response	
Richard Jackson - U.S. Bureau of Reclamation - 1,5	
Answer	Yes
Document Name	

Comment
Reclamation agrees with the addition of a requirement to further enhance SER/FR and DDR equipment in facilities on the premise that the information obtained not only enhances BES reliability but also enhances an entity's ability to troubleshoot and repair Facilities, further reduce operating costs, and increase reliability. Reclamation recommends the scope of the SAR also include the items described in the response to Question 2.

Likes 0	
Dislikes 0	

Response

Alan Kloster - Great Plains Energy - Kansas City Power and Light Co. - 1,3,5,6 - MRO	
Answer	Yes
Document Name	

Comment
Evergy supports and incorporates by reference Edison Electric Institute's (EEI) response to Question 1.

Likes 0	
Dislikes 0	

Response

Shannon Ferdinand - Decatur Energy Center LLC - 5	
Answer	Yes
Document Name	

Comment
Capital Power (CP) (on behalf of Decatur Energy Center LLC and other MRRE group 80 assets) supports the NAGF submitted comments on this item.

Likes 0	
Dislikes 0	

Response

Donald Lock - Talen Generation, LLC - 5	
Answer	Yes
Document Name	

Comment

Likes 0	
Dislikes 0	
Response	
Maryanne Darling-Reich - Black Hills Corporation - 1,3,5,6 - MRO,WECC	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Donna Wood - Tri-State G and T Association, Inc. - 1,3,5	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Mark Garza - FirstEnergy - FirstEnergy Corporation - 1,3,4,5,6, Group Name FE Voter	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

David Jendras - Ameren - Ameren Services - 1,3,6	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Lindsay Wickizer - Berkshire Hathaway - PacifiCorp - 6	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Allie Gavin - International Transmission Company Holdings Corporation - 1 - MRO,RF	
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	
Brad Harris - CenterPoint Energy Houston Electric, LLC - 1 - Texas RE	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Mark Gray - Edison Electric Institute - NA - Not Applicable - NA - Not Applicable	
Answer	
Document Name	
Comment	
EEI supports the concerns identified in the IRPTF SAR that current processes contained within PRC-002-2 (Attachment 1) used to identify BES buses where sequence of event (SER) and fault recording (FR) equipment are to be installed generally do not require the placement of this equipment on buses where IBR resources are prevalent. The SAR SDT should consider the potential fault recording differences that may be required by IBRs, such as the possible need for faster sampling rates for IBRs, while providing little value for synchronous resources. EEI also suggests SER and FR equipment might be efficiently placed at the point of aggregation where this information would be more useful. Additionally, given the parallel posting of both the IRPTF and Glencoe Light SARs, consideration should be given to addressing these two SAR under a single project but through a multi-phased approach with the Glencoe Light scope SAR being addressed in the first phase.	
Likes 0	
Dislikes 0	
Response	

2. Provide any additional comments for the SAR drafting team to consider, if desired.

Mark Gray - Edison Electric Institute - NA - Not Applicable - NA - Not Applicable

Answer	
Document Name	

Comment

EEI looks forward to reviewing a future Project 2021-04 SAR, which contains elements of both SARs.

Likes 0	
Dislikes 0	

Response

Shannon Ferdinand - Decatur Energy Center LLC - 5

Answer	
Document Name	

Comment

Capital Power (CP) (on behalf of Decatur Energy Center LLC and other MRRE group 80 assets) supports the NAGF submitted comments on this item.

In addition, CP supports Reclamation's recommendation of the following (modified slightly):

PRC-002 SAR should include provisions to modify Section 4.1, Requirement R1, Requirement R5, and Requirement R12 to address the following items:

- In the Western Interconnection, entities also receive notifications from the Planning Coordinator. Therefore, Section 4.1.3 should be revised to include Planning Coordinators.
- Requirement R1.3 should be modified to state the timeframe / implementation period within which entities must be compliant with R2, R3, R4, R10, and R11 for any equipment added as a result of the TO's re-evaluation (i.e., within 3 years following the notification by the TO).
    - This is particularly important when it comes to newly identified BES buses in remote areas where DDR equipment may not already be on-site and will need to be designed, procured, and installed.
- Requirement R5.4 should be modified to state the timeframe within which entities must be compliant with R6, R7, R8, R9, R10, and R11 for any equipment added as a result of the Responsible Entity's re-evaluation (i.e., within 3 years following the notification by the Responsible Entity that re-evaluated the list). Alternatively, each requirement (R6 through R11) should state the time period after notification within which the required activity must be completed as a result of changes to the TO's or Responsible Entity's list.
- The addition of a requirement allowing exemption based on equipment limitation, age of asset etc. If a newly identified BES Bus happens to be connected to an existing asset nearing the end of its useful life, the cost / benefit of the installation of additional DDR equipment should be considered.

Likes 0	
Dislikes 0	

Response

Alan Kloster - Great Plains Energy - Kansas City Power and Light Co. - 1,3,5,6 - MRO	
Answer	
Document Name	
Comment	
Evergy supports and incorporates by reference Edison Electric Institute's (EEI) response to Question 2.	
Likes 0	
Dislikes 0	
Response	
Andrea Jessup - Bonneville Power Administration - 1,3,5,6 - WECC	
Answer	
Document Name	
Comment	
In general, PRC-002 is loosely written. BPA has submitted questions to WECC for clarification. R4.3 states "Trigger settings for at least the following: 4.3.1 Neutral (residual) over current. 4.3.2 Phase undervoltage or overcurrent"; this can be interpreted that the XFMR can have a phase undervoltage trigger even though R3 states: "3.1 phase- to neutral voltage for each phase of each specified BES bus. 3.2 Each phase current and the residual or neutral current for the following BES Elements: 3.2.1 Transformers that have a low-side operating voltage of 100kV or above. 3.2.2 Transmission Lines."	
Likes 0	
Dislikes 0	
Response	
Richard Jackson - U.S. Bureau of Reclamation - 1,5	
Answer	
Document Name	
Comment	
Reclamation recommends the PRC-002 SAR include provisions to modify Section 4.1, Requirement R1, Requirement R5, and Requirement R12 to address the following items: • In the Western Interconnection, entities also receive notifications from the Planning Coordinator. Therefore, Section 4.1.3 should be revised to include Planning Coordinators. • Requirement R1.3 should be modified to state the timeframe within which entities must be compliant with R2, R3, R4, R10, and R11 for any equipment added as a result of the TO's re-evaluation (i.e., within 3 years following the notification by the TO).	

- Requirement R5.4 should be modified to state the timeframe within which entities must be compliant with R6, R7, R8, R9, R10, and R11 for any equipment added as a result of the Responsible Entity's re-evaluation (i.e., within 3 years following the notification by the Responsible Entity that re-evaluated the list). Alternatively, each requirement (R6 through R11) should state the time period after notification within which the required activity must be completed as a result of changes to the TO's or Responsible Entity's list.
- Reclamation recommends adding the sharing of protection system data when requested by the entity performing the R1 evaluation.
- Requirement R12 should be modified to add a required time limit within which to notify the Regional Entity(ies) of a failure of the recording capability. Regional Entities need to know as soon as the failure occurs or is discovered, not up to 90 days later.

Likes 0	
Dislikes 0	

Response

Daniela Atanasovski - APS - Arizona Public Service Co. - 1,3,5,6

Answer	
Document Name	

Comment

None

Likes 0	
Dislikes 0	

Response

Dwanique Spiller - Berkshire Hathaway - NV Energy - 5 - WECC

Answer	
Document Name	

Comment

The proposal from IRPTF does not address following issues, which the Standards Drafting Team (SDT) should consider.

- The requirement R1.1 should address step 8 of the algorithm in attachment 1 of the standard. For example, step 8 does not necessarily include the case of growing inverter-based resource monitoring. It has been noticed that while applying step 1-step7, the applicable buses tend to concentrate in the high MVA zones and distributed monitoring across the network does not occur. The standard or the algorithm need to be tweaked to address this issue.
- The algorithm could adopt the weighted points technique considering MVA, Voltage, NO. of lines, IROL (Interconnection Reliability Operating Limit) and SOL (Stability Operating Limit), UVLS schemes, and Vegetation parameters to derive a distributed FR/SER/DDR monitoring.
- Standard should address follow through action by notified entities participating in interconnection with the notifying entity in a time bound way to ensure adequate FR/SER/DDR monitoring in zones, where multiple entities are involved. DDR notification by Reliability Coordinators (RC) should have more details justifying the DDR requirement than merely quoting the requirement nos. in the notification document.

Likes 0	
Dislikes 0	
Response	
Mark Garza - FirstEnergy - FirstEnergy Corporation - 1,3,4,5,6, Group Name FE Voter	
Answer	
Document Name	
Comment	
N/A	
Likes 0	
Dislikes 0	
Response	
Leonard Kula - Independent Electricity System Operator - 2	
Answer	
Document Name	
Comment	
N/A	
Likes 0	
Dislikes 0	
Response	
Kendra Buesgens - MRO - 1,2,3,4,5,6 - MRO, Group Name MRO NSRF	
Answer	
Document Name	
Comment	
Expand the scope to add an implementation period for newly identified BES buses. During five year reviews, new BES buses are identified, and particularly in the case of BES buses like ones that may be identified as a result of this SAR that are interconnected at remote areas of the system, DDR equipment may not already be on-site and will need to be designed, procured, and installed.	
Likes 0	

Dislikes 0	

Response

Kim Thomas - Duke Energy - 1,3,5,6 - SERC,RF, Group Name Duke Energy	
Answer	
Document Name	

Comment
Duke Energy does not have comments at this time.

Likes 0	
Dislikes 0	

Response

Donald Lock - Talen Generation, LLC - 5	
Answer	
Document Name	

Comment
PRC-002-2 says in Requirement R1.2 that TOs shall, “Notify other owners of BES Elements connected to those BES buses, if any, within 90-calendar days of completion of Part 1.1, that those BES Elements require SER data and/or FR data.” The expression “and/or” suggests that the two forms of DME might not be automatically conjoined; there could be cases in which need to install SER does not mean that FR is required also. This point is left hanging, though, in the PRC-002-2 Att. 1 methodology for selecting buses. The rules apply to, “SER and FR data,” together, not individually. The issue is not clarified until one gets to the Rationale section of PRC-002-2, which confirms that there are SER-but-not-FR exceptions, “Generator step-up transformers (GSUs) and leads that connect the GSU transformer(s) to the Transmission System that are used exclusively to export energy directly from a BES generating unit or generating plant are excluded from Requirement R3 because the fault current contribution from a generator to a fault on the Transmission System will be captured by FR data on the Transmission System, and Transmission System FR will capture faults on the generator interconnection.” Talen Energy proposes that the FR exemption for GSUs and GSU-to-TO HV lines be stated in the Applicability section of PRC-002-3. The Rationale section of the standard should explain but not modify the Requirements section.

Likes 0	
Dislikes 0	

Response

“Comments received from Jamie Johnson – California ISO”
Question 1
☒ Yes

Question 2 (no additional comments)

“Comments received from Wayne Sipperly – NAGF”
Question 1
☒ **Yes**

Comments:
The NAGF supports the SAR project scope to ensure that sequence of events recording (SER), fault recording (FR) and dynamic Disturbance recording (DDR) devices are installed and periodically assessed for certain inverter-based resources (IBRs) thus providing adequate data to facilitate analysis of BES disturbances.

Question 2 (additional comments)
Comments:
Consider modifying the scope to add an implementation period for any newly identified BES buses. During five year reviews, new BES buses may be identified. DDR equipment may not already be on site and time is required for the design, procurement of material, and for installation.

The NAGF notes that the existing PRC-002-2 Rational section regarding R3 states that an FR exception exists for “Generator step-up transformers (GSUs) and leads that connect the GSU transformer(s) to the Transmission System that are used exclusively to export energy directly from a BES generating unit or generating plant”. This needs to be clarified with regard to PRC-002-2 Requirement 1. TOs should be required to send separate SER and FR notifications, taking into account the exception for generator interconnection facilities.

“Comments received from Pamela Hunter – Southern Company”
Question 1
☒ **No**

Comments:
Changes to the standard are not necessary for IBR facilities. Step 8 in Attachment 1 for R1 already provides a means by which bus locations not captured in the highest 10% bus fault current calculations are selected for SER and FR data monitoring to achieve the 20% total. Locations with Inverter Based Resources can be added to the list of required locations at the Transmission Owner’s discretion.
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Question 2 (additional comments)
Comments:
Modify the scope to add an implementation period for any newly identified BES buses. During five-year reviews, new BES buses may be identified. DDR equipment may not already be on site and time is required for the design, procurement of material, and for installation.

“Comments received from Daniel Gacek – Exelon”
Question 1
☒ No

Comments: While Exelon does not support the SAR in its current form, Exelon does support the concerns raised by the IRPTF regarding the need to place disturbance monitoring equipment (DME) closer to inverter-based resources (IBR). In addition to placing DME closer to IBRs, the specifications of the disturbance monitor equipment for IBRs will need to be developed to ensure data is sufficient to analyze system disturbances involving IBRs. The present PRC-002 methodology and disturbance monitoring equipment technical specifications, which is being implemented, serve conventional generation and buses remote from IBR well and those specifications should be preserved. Therefore, the SAR should be revised to specifically address the changes needed for IBR without altering the specifications for other resources.

Question 2 (additional comments)
Comments:
In the interest of system reliability and event analysis the responsible entities should be required to install DMEs in locations that would render the greatest amount of data for system analysis. For installations involving multiple IBRs that location may include an aggregation point such as the Point of Interconnection (POI) with the transmission system or transmission substation beyond the POI.

“Comments received from Brandon Gleason – ERCOT
☒ Yes

Comments: None

Question 2 (None)