

Comment Report

Project Name: 2021-04 Modifications to PRC-002 – Phase II | Draft 1
Comment Period Start Date: 8/1/2023
Comment Period End Date: 9/14/2023
Associated Ballots: 2021-04 Modifications to PRC-002 – Phase II Implementation Plan IN 1 OT
2021-04 Modifications to PRC-002 – Phase II PRC-002-5 | Non-Binding Poll IN 1 NB
2021-04 Modifications to PRC-002 – Phase II PRC-002-5 IN 1 ST
2021-04 Modifications to PRC-002 – Phase II PRC-028-1 | Non-Binding Poll IN 1 NB
2021-04 Modifications to PRC-002 – Phase II PRC-028-1 IN 1 ST

There were 71 sets of responses, including comments from approximately 182 different people from approximately 121 companies representing 10 of the Industry Segments as shown in the table on the following pages.

Questions

- 1. Do you agree with the modification in “Applicability, Section 4.2. Facilities” in PRC-002-5?**
- 2. Do you agree with the need of creating a new Standard (PRC-028-1) to address gaps the Inverter-Based Resource Performance Task Force (IRPTF) identified within the PRC-002?**
- 3. Do you agree the modifications made in PRC-002-5 and new Standard PRC-028-1 are cost effective?**
- 4. Do you agree with the Implementation Plan for revised PRC-002-5 and new Standard PRC-028-1?**
- 5. 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
BC Hydro and Power Authority	Adrian Andreoiu	1	WECC	BC Hydro	Hootan Jarollahi	BC Hydro and Power Authority	3	WECC
					Helen Hamilton Harding	BC Hydro and Power Authority	5	WECC
					Adrian Andreoiu	BC Hydro and Power Authority	1	WECC
Southwest Power Pool, Inc. (RTO)	Charles Yeung	2	MRO,SPP RE,WECC	SRC 2023	Charles Yeung	SPP	2	MRO
					Ali Miremadi	CAISO	1	WECC
					Helen Lainis	IESO	1	NPCC
					Matt Goldberg	ISONE	1	NPCC
					Bobbi Welch	Midcontinent ISO, Inc.	2	MRO
					Greg Campoli	NYISO	1	NPCC
					Elizabeth Davis	PJM	2	RF
Kennedy Meier	Electric Reliability Council of Texas, Inc.	2	Texas RE					
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
Jennie Wike	Jennie Wike		WECC	Tacoma Power	Jennie Wike	Tacoma Public Utilities	1,3,4,5,6	WECC
					John Merrell	Tacoma Public Utilities (Tacoma, WA)	1	WECC
					John Nierenberg	Tacoma Public Utilities (Tacoma, WA)	3	WECC

					Hien Ho	Tacoma Public Utilities (Tacoma, WA)	4	WECC
					Terry Gifford	Tacoma Public Utilities (Tacoma, WA)	6	WECC
					Ozan Ferrin	Tacoma Public Utilities (Tacoma, WA)	5	WECC
ACES Power Marketing	Jodirah Green	1,3,4,5,6	MRO,RF,SERC,Texas RE,WECC	ACES Collaborators	Bob Soloman	Hoosier Energy Electric Cooperative	1	RF
					Scott Brame	North Carolina Electric Membership Corporation	1,3,4,5	SERC
					Jason Procutiar	Buckeye Power, Inc.	4	RF
					Andy Fuhrman	Minnkota Power Cooperative, Inc.	1	MRO
					Amber Skillern	East Kentucky Power Cooperative	1	SERC
					Andrew Anderson	Wolverine Power Supply Cooperative, Inc.	1	RF
					Kris Carper	Arizona Electric Power Cooperative, Inc.	1	WECC
					Jolly Hayden	East Texas Electric Cooperative, Inc.	NA - Not Applicable	Texas RE
MRO	Jou Yang	1,2,3,4,5,6	MRO	MRO NSRF	Bobbi Welch	Midcontinent ISO, Inc.	2	MRO
					Chris Bills	City of Independence, Power and Light Department	5	MRO
					Fred Meyer	Algonquin Power Co.	3	MRO

Christopher Bills	City of Independence Power & Light	3,5	MRO
Larry Heckert	Alliant Energy Corporation Services, Inc.	4	MRO
Marc Gomez	Southwestern Power Administration	1	MRO
Matthew Harward	Southwest Power Pool, Inc. (RTO)	2	MRO
Bryan Sherrow	Board of Public Utilities	1	MRO
Terry Harbour	Berkshire Hathaway Energy - MidAmerican Energy Co.	1	MRO
Terry Harbour	MidAmerican Energy Company	1,3	MRO
Jamison Cawley	Nebraska Public Power District	1,3,5	MRO
Seth Shoemaker	Muscatine Power & Water	1,3,5,6	MRO
Michael Brytowski	Great River Energy	1,3,5,6	MRO
Shonda McCain	Omaha Public Power District	6	MRO
George E Brown	Pattern Operators LP	5	MRO
George Brown	Acciona Energy USA	5	MRO
Jaimin Patel	Saskatchewan Power Cooperation	1	MRO
Kimberly Bentley	Western Area Power Administration	1,6	MRO
Jay Sethi	Manitoba Hydro	1,3,5,6	MRO
Michael Ayotte	ITC Holdings	1	MRO

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
					Frank Lee	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
					Jim Howell, Jr.	Southern Company - Southern Company Generation	5	SERC
					Ron Carlsen	Southern Company - Southern Company Generation	6	SERC
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

Alain Mukama	Hydro One Networks, Inc.	1	NPCC
Deidre Altobell	Con Edison	1	NPCC
Jeffrey Streifling	NB Power Corporation	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
John Pearson	ISO New England, Inc.	2	NPCC
Harishkumar Subramani Vijay Kumar	Independent Electricity System Operator	2	NPCC
Randy MacDonald	New Brunswick Power Corporation	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
					Glen Smith	Entergy Services	4	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
					ALAN ADAMSON	New York State Reliability Council	10	NPCC
					David Kiguel	Independent	7	NPCC
					Joel Charlebois	AESI	7	NPCC
					Joshua London	Eversource Energy	1	NPCC
Stephen Whaite	Stephen Whaite			ReliabilityFirst Ballot Body Member and Proxies	Lindsey Mannion	ReliabilityFirst	10	RF
					Stephen Whaite	ReliabilityFirst	10	RF
Western Electricity Coordinating Council	Steven Rueckert	10		WECC Entity Monitoring	Steve Rueckert	WECC	10	WECC
					Phil O'Donnell	WECC	10	WECC
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
Associated Electric Cooperative, Inc.	Todd Bennett	3		AECI	Michael Bax	Central Electric Power Cooperative (Missouri)	1	SERC
					Adam Weber	Central Electric Power Cooperative (Missouri)	3	SERC
					Stephen Pogue	M and A Electric Power Cooperative	3	SERC
					William Price	M and A Electric Power Cooperative	1	SERC
					Peter Dawson	Sho-Me Power Electric Cooperative	1	SERC
					Mark Ramsey	N.W. Electric Power Cooperative, Inc.	1	NPCC
					John Sticklely	NW Electric Power Cooperative, Inc.	3	SERC
					Tony Gott	KAMO Electric Cooperative	3	SERC
					Micah Breedlove	KAMO Electric Cooperative	1	SERC
					Kevin White	Northeast Missouri Electric Power Cooperative	1	SERC
					Skyler Wiegmann	Northeast Missouri Electric Power Cooperative	3	SERC

					Ryan Ziegler	Associated Electric Cooperative, Inc.	1	SERC
					Brian Ackermann	Associated Electric Cooperative, Inc.	6	SERC
					Brad Haralson	Associated Electric Cooperative, Inc.	5	SERC

1. Do you agree with the modification in “Applicability, Section 4.2. Facilities” in PRC-002-5?

Robert Follini - Avista - Avista Corporation - 3

Answer No

Document Name

Comment

Do not agree with modification. Modification implies that inverter-based resources are to be included in the BES definition Inclusion I2. This interpretation doesn't conform with the current version of the BES definition.

Likes 0

Dislikes 0

Response

Glen Farmer - Avista - Avista Corporation - 5

Answer No

Document Name

Comment

At some utilities we record wicket gate opening % by recording the 4-2 mA gate position in series with plant instrumentation.

Likes 0

Dislikes 0

Response

Dwanique Spiller - Berkshire Hathaway - NV Energy - 5

Answer No

Document Name

Comment

Please clarify that the requirements for reporting only pertain to entities covered by the NERC standard. This can be accomplished by deleting footnote 1 and replacing the phrase “IBR generation loss” with “GO-IBR”.

Likes 0

Dislikes 0

Response

Donald Lock - Talen Generation, LLC - 5

Answer No

Document Name

Comment

Talen supports the comments of the NAGF.

Likes 0

Dislikes 0

Response

Mike Magruder - Avista - Avista Corporation - 1

Answer No

Document Name

Comment

Do not agree with modification. Modification implies that inverter-based resources are to be included in the BES definition Inclusion I2. This interpretation doesn't conform with the current version of the BES definition.

Likes 0

Dislikes 0

Response

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

Answer No

Document Name

Comment

FirstEnergy supports EEI's comments which state:

EEI does not agree with the modifications to the Applicability Section of Section 4.2 because it implies that inverter-based resources are to be included in BES Definition, Inclusion I2. This interpretation does not conform to the approved version of the Bulk Electric System Reference Document, Version 3, dated August 2018. If NERC believes that this interpretation is no longer appropriate, or otherwise invalid, they should work with the industry to modify the BES definition and associated support documents. EEI further notes that this project was not approved to Add, Modify or Retire a Glossary Term.

Likes 0

Dislikes 0

Response

Wendy Kalidass - U.S. Bureau of Reclamation - 5

Answer No

Document Name

Comment

Reclamation recommends that section 4.2 be removed as justification for limiting the inclusions from the BES Definition in the glossary of terms is not provided, limiting the scope of Disturbance Reporting.

Likes 0

Dislikes 0

Response

Rachel Schuldt - Rachel Schuldt On Behalf of: Josh Combs, Black Hills Corporation, 5, 6, 1, 3; - Rachel Schuldt

Answer No

Document Name

Comment

Black Hills Corporation agrees with NAGF comments.

Likes 0

Dislikes 0

Response

Micah Runner - Black Hills Corporation - 1

Answer No

Document Name

Comment

Black Hills Corporation agrees with NAGF comments.

Likes 0

Dislikes 0

Response

Sheila Suurmeier - Black Hills Corporation - 5

Answer No

Document Name

Comment

Black Hills Corporation agrees with NAGF comments.

Likes 0

Dislikes 0

Response

Claudine Bates - Black Hills Corporation - 6

Answer No

Document Name

Comment

Black Hills Corporation agrees with NAGF comments.

Likes 0

Dislikes 0

Response

Marty Hostler - Northern California Power Agency - 4

Answer No

Document Name

Comment

NO, NCPA supports various other opposing comments that have been submitted.

Likes 0

Dislikes 0

Response

Dennis Sismaet - Northern California Power Agency - 6**Answer** No**Document Name****Comment**

1. NCPA supports other opposing comments that have been submitted.

Likes 0

Dislikes 0

Response**Michael Whitney - Northern California Power Agency - 3****Answer** No**Document Name****Comment**

NCPA supports other opposing comments that have been submitted.

Likes 0

Dislikes 0

Response**Mark Fowler - Mark Fowler On Behalf of: David Jendras Sr, Ameren - Ameren Services, 3, 6, 1; - Mark Fowler****Answer** No**Document Name****Comment**

Ameren supports EEI's comments on this question.

Likes 0

Dislikes 0

Response**Marcus Bortman - APS - Arizona Public Service Co. - 6****Answer** No**Document Name**

Comment

AZPS supports the following comments submitted by EEI on behalf of their members:

EEI does not agree with the modifications to the Applicability Section of Section 4.2 because it implies that inverter-based resources are to be included in BES Definition, Inclusion I2. This interpretation does not conform to the approved version of the Bulk Electric System Reference Document, Version 3, dated August 2018. If the interpretation is no longer appropriate, or otherwise invalid, the BES definition and associated support documents should be revised. EEI further notes that this project was not approved to Add, Modify or Retire a Glossary Term.

Likes 0

Dislikes 0

Response

Tim Kelley - Tim Kelley On Behalf of: Charles Norton, Sacramento Municipal Utility District, 3, 6, 4, 1, 5; Fong 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 and BANC support the comments submitted by EEI.

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

No

Document Name

Comment

PG&E supports the input provided by the NAGF related to cost and EEI related to the implied inclusion of Inverter-Based Resources (IBR) as part of the BES Definition.

Likes 0

Dislikes 0

Response

Sean Bodkin - Dominion - Dominion Resources, Inc. - 6

Answer No

Document Name

Comment

Dominion Energy supports EEI comments.

Likes 0

Dislikes 0

Response

Daniel Gacek - Exelon - 1

Answer No

Document Name

Comment

Exelon supports the comments submitted by the EEI.

Likes 0

Dislikes 0

Response

Kinte Whitehead - Exelon - 3

Answer No

Document Name

Comment

Exelon supports the comments submitted by the EEI.

Likes 0

Dislikes 0

Response

Alan Kloster - Alan Kloster On Behalf of: Jennifer Flandermeyer, Evergy, 3, 6, 5, 1; Jeremy Harris, Evergy, 3, 6, 5, 1; Kevin Frick, Evergy, 3, 6, 5, 1; Marcus Moor, Evergy, 3, 6, 5, 1; - Alan Kloster

Answer	No
Document Name	
Comment	
Evergy supports and incorporates by reference the comments of the Edison Electric Institute for question #1.	
Likes 0	
Dislikes 0	
Response	
Mark Gray - Edison Electric Institute - NA - Not Applicable - NA - Not Applicable	
Answer	No
Document Name	
Comment	
EEI does not agree with the modifications to the Applicability Section of Section 4.2 because it implies that inverter-based resources are to be included in BES Definition, Inclusion I2. This interpretation does not conform to the approved version of the Bulk Electric System Reference Document, Version 3, dated August 2018. If the interpretation is no longer appropriate, or otherwise invalid, the BES definition and associated support documents should be revised. EEI further notes that this project was not approved to Add, Modify or Retire a Glossary Term.	
Likes 0	
Dislikes 0	
Response	
Alison MacKellar - Constellation - 5	
Answer	No
Document Name	
Comment	
<p>The BES Reference Document, Version 3, August 2018, verbiage and clarifying illustrations indicate that I4 was created for IBRs, and that IBRs are included within scope only by I4 and not I2. Suggest either removing references to I2 in the proposed Applicability Section 4.2, or stating without specific inclusions, e.g., "... excluding inverter-based portions of generating plants/Facilities included in the BES by meeting the BES definition."</p> <p>Alison Mackellar on behalf of Constellation Segments 5 and 6</p>	
Likes 0	
Dislikes 0	

Response	
Charles Yeung - Southwest Power Pool, Inc. (RTO) - 2 - MRO,WECC, Group Name SRC 2023	
Answer	No
Document Name	
Comment	
The SRC agrees with the modification in Section 4.2 of the Applicability section in PRC-002-5; however, consistent with the recommended modification to the Applicability section of PRC-028-1 detailed in the SRC's response to question 5 below, the SRC recommends that Section 4.2 of the PRC-002-5 Applicability section be revised to refer to the entirety of Inclusion I2 instead of only referring to I2, Part (b).	
Likes	0
Dislikes	0
Response	
Casey Perry - PNM Resources - 1,3 - WECC,Texas RE	
Answer	No
Document Name	
Comment	
PNMR is in support of the EEI comment.	
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) for this question and adopts them as its own.	
Likes	0
Dislikes	0

Response	
Kimberly Turco - Constellation - 6	
Answer	No
Document Name	
Comment	
<p>The BES Reference Document, Version 3, August 2018, verbiage and clarifying illustrations indicate that I4 was created for IBRs, and that IBRs are included within scope only by I4 and not I2. Suggest either removing references to I2 in the proposed Applicability Section 4.2, or stating without specific inclusions, e.g., "... excluding inverter-based portions of generating plants/Facilities included in the BES by meeting the BES definition."</p>	
<p>Kimberly Turco on behalf of Constellation Segments 5 and 6</p>	
Likes	0
Dislikes	0
Response	
Jeremy Lawson - Northern California Power Agency - 5	
Answer	No
Document Name	
Comment	
Likes	0
Dislikes	0
Response	
Andy Thomas - Duke Energy - 1,3,5,6 - SERC,RF	
Answer	Yes
Document Name	
Comment	
<p>None.</p>	
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

The changes make it clear that PRC-002 does not apply to IBR facilities.

Likes 0

Dislikes 0

Response

Jou Yang - MRO - 1,2,3,4,5,6 - MRO, Group Name MRO NSRF

Answer Yes

Document Name

Comment

The changes make it clear that PRC-002 does not apply to IBR facilities. The MRO NSRF would like to note the word “portions” in Applicability Section 4.2 may add confusion, consider if it can be removed or if other wording can be used.

Likes 0

Dislikes 0

Response

Leslie Hamby - Southern Indiana Gas and Electric Co. - 3,5,6 - RF

Answer Yes

Document Name

Comment

Southern Indiana Gas & Electric Company (SIGE) agrees with the modification and understands the intent of the Standard Drafting Team (SDT); however, SIGE encourages the SDT to clarify the effects of the proposed changes to the NERC Glossary Definition and BES Reference Document.

Likes 0

Dislikes 0

Response

Andy Fuhrman - Minnkota Power Cooperative Inc. - 1,5 - MRO

Answer Yes

Document Name

Comment

MPC supports comments submitted by the MRO NERC Standards Review Forum (NSRF).

Likes 0

Dislikes 0

Response

Dennis Chastain - Tennessee Valley Authority - 1,3,5,6 - SERC

Answer Yes

Document Name

Comment

None

Likes 0

Dislikes 0

Response

Ruchi Shah - AES - AES Corporation - 5

Answer Yes

Document Name

Comment

The changes make it clear that PRC-002 does not apply to IBR facilities.

Likes 0

Dislikes 0

Response

Constantin Chitescu - Ontario Power Generation Inc. - 5

Answer	Yes
Document Name	
Comment	
OPG supports the NPCC RSC's comments.	
Likes 0	
Dislikes 0	
Response	
Wendy Devries - CMS Energy - Consumers Energy Company - 1,2 - RF	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
David Vickers - David Vickers On Behalf of: Daniel Roethemeyer, Vistra Energy, 5; - David Vickers	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Duane Franke - Manitoba Hydro - 1,3,5,6 - MRO	
Answer	Yes
Document Name	
Comment	

Likes 0

Dislikes 0

Response

Thomas Foltz - AEP - 5

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

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

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Todd Bennett - Associated Electric Cooperative, Inc. - 3, Group Name AECl

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

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

Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Andrea Jessup - Bonneville Power Administration - 1,3,5,6 - WECC	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Kevin Conway - Public Utility District No. 1 of Pend Oreille County - 1,3,5,6	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Adrian Andreoiu - BC Hydro and Power Authority - 1, Group Name BC Hydro	
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

Jennie Wike - Jennie Wike On Behalf of: Hien Ho, Tacoma Public Utilities (Tacoma, WA), 1, 4, 5, 6, 3; John Merrell, Tacoma Public Utilities (Tacoma, WA), 1, 4, 5, 6, 3; Ozan Ferrin, Tacoma Public Utilities (Tacoma, WA), 1, 4, 5, 6, 3; Terry Gifford, Tacoma Public Utilities (Tacoma, WA), 1, 4, 5, 6, 3; - Jennie Wike, Group Name Tacoma Power

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Israel Perez - Israel Perez On Behalf of: Mathew Weber, Salt River Project, 3, 1, 6, 5; Sarah Blankenship, Salt River Project, 3, 1, 6, 5; Thomas Johnson, Salt River Project, 3, 1, 6, 5; Timothy Singh, Salt River Project, 3, 1, 6, 5; - Israel Perez

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Steven Rueckert - Western Electricity Coordinating Council - 10, Group Name WECC Entity Monitoring

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

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

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

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

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Allie Gavin - Allie Gavin On Behalf of: Michael Moltane, International Transmission Company Holdings Corporation, 1; - Allie Gavin

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Matt Lewis - Lower Colorado River Authority - 1

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Teresa Krabe - Lower Colorado River Authority - 5

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

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

Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Steven Taddeucci - NiSource - Northern Indiana Public Service Co. - 3	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Stephen Whaite - Stephen Whaite On Behalf of: Lindsey Mannion, ReliabilityFirst , 10; - Stephen Whaite, Group Name ReliabilityFirst Ballot Body Member and Proxies	
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

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

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Denise Sanchez - Denise Sanchez On Behalf of: Diana Torres, Imperial Irrigation District, 1, 6, 5, 3; Jesus Sammy Alcaraz, Imperial Irrigation District, 1, 6, 5, 3; Tino Zaragoza, Imperial Irrigation District, 1, 6, 5, 3; - Denise Sanchez

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

Michiko Sell - Pine Gate Renewables - 5**Answer** Yes**Document Name****Comment**

Likes 0

Dislikes 0

Response**Wayne Sipperly - North American Generator Forum - 5 - MRO,WECC,Texas RE,NPCC,SERC,RF****Answer** Yes**Document Name****Comment**

Likes 0

Dislikes 0

Response**Kacie Fischer - Kacie Fischer On Behalf of: Byron Booker, Oncor Electric Delivery, 1; - Kacie Fischer****Answer** Yes**Document Name****Comment**

Likes 0

Dislikes 0

Response**Ijad Dewan - Ijad Dewan On Behalf of: Alain Mukama, Hydro One Networks, Inc., 1, 3; - Ijad Dewan****Answer****Document Name****Comment**

No comments

Likes 0

Dislikes 0

Response

2. Do you agree with the need of creating a new Standard (PRC-028-1) to address gaps the Inverter-Based Resource Performance Task Force (IRPTF) identified within the PRC-002?

Casey Perry - PNM Resources - 1,3 - WECC,Texas RE

Answer No

Document Name

Comment

PNMR supports EEI's comment related to not being in agreement of installing disturbance monitoring equipment at all IBR locations that conform to the BES definition is necessary, nor do we agree that the SAR authorized such an expansive scope.

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 supports creating the new Standard PRC-028 focused on inverter-based resource disturbance monitoring and reporting requirements, but does not agree that all IBR facilities need DME at the substation and on each feeder circuit. Please consider the effectiveness of the application of DME only at the substation/collector bus for IBR facilities rather than on each feeder, and of limiting the facilities to which the addition of DME is required as determined by the process outlined in Question 5 below.

There is already some ability, without the addition of DME at all IBR locations, to determine the causes of inverter reactions to HV system disturbances as demonstrated in the various disturbance reports which list the various type of responses that have been published.

Likes 0

Dislikes 0

Response

Andy Fuhrman - Minnkota Power Cooperative Inc. - 1,5 - MRO

Answer No

Document Name

Comment

MPC supports comments submitted by the MRO NERC Standards Review Forum (NSRF).

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 supports the comments of the NAGF.

Likes 0

Dislikes 0

Response

Jou Yang - MRO - 1,2,3,4,5,6 - MRO, Group Name MRO NSRF

Answer

No

Document Name

Comment

The long list of possible causes of the reactions found in the multiple disturbance reports from the past 5 years indicate that sufficient data is already available to determine what is occurring at the inverter level. From the multiple disturbance evaluation reports that have been written in the past 5 years, it appears that the reaction of the inverters to system disturbances has become well understood.

It is not apparent that every IBR plant will need to have the added ability to evaluate the required data collected by the newly required monitoring specified. PRC-002-4 recognized that certain facilities are more significant to the reliability of the BES as indicated by the TO evaluation and TP evaluation included in Requirement R1 and R5 of that version. Extending this standard's requirements to all IBR facilities seems to be a bit of an over-reaction.

Likes 1

JEA, 1, McClung Joseph

Dislikes 0

Response

Michael Whitney - Northern California Power Agency - 3

Answer

No

Document Name	
Comment	
NCPA supports other opposing comments that have been submitted.	
Likes 0	
Dislikes 0	
Response	
Dennis Sismaet - Northern California Power Agency - 6	
Answer	No
Document Name	
Comment	
1. NCPA supports other opposing comments that have been submitted.	
Likes 0	
Dislikes 0	
Response	
Marty Hostler - Northern California Power Agency - 4	
Answer	No
Document Name	
Comment	
NO, NCPA supports various other opposing comments that have been submitted.	
Likes 0	
Dislikes 0	
Response	
Jennie Wike - Jennie Wike On Behalf of: Hien Ho, Tacoma Public Utilities (Tacoma, WA), 1, 4, 5, 6, 3; John Merrell, Tacoma Public Utilities (Tacoma, WA), 1, 4, 5, 6, 3; Ozan Ferrin, Tacoma Public Utilities (Tacoma, WA), 1, 4, 5, 6, 3; Terry Gifford, Tacoma Public Utilities (Tacoma, WA), 1, 4, 5, 6, 3; - Jennie Wike, Group Name Tacoma Power	
Answer	No
Document Name	
Comment	

Tacoma Power supports the MRO NSRF comments.

Likes 0

Dislikes 0

Response

Dwanique Spiller - Berkshire Hathaway - NV Energy - 5

Answer

No

Document Name

Comment

The implementation timeframe should be 24 months or the NERC GO-IBR registration deadlines, whichever is greater.

Likes 0

Dislikes 0

Response

Jeremy Lawson - Northern California Power Agency - 5

Answer

No

Document Name

Comment

Likes 0

Dislikes 0

Response

Kimberly Turco - Constellation - 6

Answer

Yes

Document Name

Comment

Constellation recommends that the Standard Drafting Team consider a similar approach for PRC-028 as in PRC-002, requiring the TO and RC to identify areas within their regions that are susceptible to disturbances (or high concentration of IBRs) that would benefit from monitoring and recording capabilities. As opposed to a blanket requirement for ALL IRB facilities to install SER, FR, and DDR equipment.

Kimberly Turco on behalf of Constellation Segments 5 and 6

Likes 0

Dislikes 0

Response

Constantin Chitescu - Ontario Power Generation Inc. - 5

Answer

Yes

Document Name

Comment

OPG supports the NPCC RSC's comments.

Likes 0

Dislikes 0

Response

Alison MacKellar - Constellation - 5

Answer

Yes

Document Name

Comment

Constellation recommends that the Standard Drafting Team consider a similar approach for PRC-028 as in PRC-002, requiring the TO and RC to identify areas within their regions that are susceptible to disturbances (or high concentration of IBRs) that would benefit from monitoring and recording capabilities. As opposed to a blanket requirement for ALL IRB facilities to install SER, FR, and DDR equipment.

Alison Mackellar on behalf of Constellation Segments 5 and 6

Likes 0

Dislikes 0

Response

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

Answer

Yes

Document Name

Comment

EEl supports the development of a new Reliability Standard to address gaps in disturbance monitoring of IBRs, however, we do not agree that installing disturbance monitoring equipment at all IBR locations that conform to the BES definition is necessary, nor do we agree that the SAR authorized such an expansive scope.

Likes 0

Dislikes 0

Response**Ruchi Shah - AES - AES Corporation - 5****Answer**

Yes

Document Name**Comment**

AES Clean Energy supports the creation of PRC-028 to address gaps identified by the IRPTF.

Likes 0

Dislikes 0

Response**Dennis Chastain - Tennessee Valley Authority - 1,3,5,6 - SERC****Answer**

Yes

Document Name**Comment**

None

Likes 0

Dislikes 0

Response

Alan Kloster - Alan Kloster On Behalf of: Jennifer Flandermeyer, Evergy, 3, 6, 5, 1; Jeremy Harris, Evergy, 3, 6, 5, 1; Kevin Frick, Evergy, 3, 6, 5, 1; Marcus Moor, Evergy, 3, 6, 5, 1; - Alan Kloster

Answer

Yes

Document Name

Comment

Energy supports and incorporates by reference the comments of the Edison Electric Institute for question #2.

Likes 0

Dislikes 0

Response**Kinte Whitehead - Exelon - 3**

Answer

Yes

Document Name

Comment

Exelon supports the comments submitted by the EEI.

Likes 0

Dislikes 0

Response**Daniel Gacek - Exelon - 1**

Answer

Yes

Document Name

Comment

Exelon supports the comments submitted by the EEI.

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

PG&E supports the SDT decision to separate the Inverter-Based Resource requirements to avoid making PRC-002 overly complicated by trying to address both synchronous and IBRs in a single 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

Mark Fowler - Mark Fowler On Behalf of: David Jendras Sr, Ameren - Ameren Services, 3, 6, 1; - Mark Fowler

Answer

Yes

Document Name

Comment

Ameren supports EEI's comments on this question.

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

The long list of possible causes of the reactions found in the multiple disturbance reports from the past 5 years indicate that sufficient data is already available to determine what is occurring at the inverter level. From the multiple disturbance evaluation reports that have been written in the past 5 years, it appears that the reaction of the inverters to system disturbances has become well understood.

It is not apparent that every IBR plant needs to have the added ability to evaluate the required data collected by the newly required monitoring. PRC-002-4 recognized that certain facilities are more significant to the reliability of the BES as indicated by the TO evaluation and TP evaluation included in Requirement R1 and R5 of that version. Extending this standard's requirements to ALL IBR facilities seems to be a bit of an over-reaction.

Likes 0

Dislikes 0

Response

Claudine Bates - Black Hills Corporation - 6

Answer

Yes

Document Name

Comment

Black Hills Corporation agrees with NAGF comments.

Likes 0

Dislikes 0

Response

Sheila Suurmeier - Black Hills Corporation - 5

Answer

Yes

Document Name

Comment

Black Hills Corporation agrees with NAGF comments

Likes 0

Dislikes 0

Response

Micah Runner - Black Hills Corporation - 1

Answer

Yes

Document Name

Comment

Black Hills Corporation agrees with NAGF comments.

Likes 0

Dislikes 0

Response

Rachel Schuldt - Rachel Schuldt On Behalf of: Josh Combs, Black Hills Corporation, 5, 6, 1, 3; - Rachel Schuldt

Answer Yes

Document Name

Comment

Black Hills Corporation agrees with NAGF comments.

Likes 0

Dislikes 0

Response

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

Answer Yes

Document Name

Comment

FirstEnergy supports EEI's comments which state:

EEI supports the development of a new Reliability Standard to address gaps in disturbance monitoring of IBRs, however, we do not agree that installing disturbance monitoring equipment at all IBR locations that conform to the BES definition is necessary, nor do we agree that the SAR authorized such an expansive scope.

Likes 0

Dislikes 0

Response

Mike Magruder - Avista - Avista Corporation - 1

Answer Yes

Document Name

Comment

PRC-028 to include requirements for adequate monitoring of IBRs as shown necessary by operational experience. PRC-002 to remain in effect for synchronous based generation for a large-scale view of system reliability.

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

Glen Farmer - Avista - Avista Corporation - 5

Answer

Yes

Document Name

Comment

PRC-028 to include requirements for adequate monitoring of IBRs as shown necessary by operational experience. PRC-002 to remain in effect for synchronous based generation for a large-scale view of system reliability.

Likes 0

Dislikes 0

Response

Robert Follini - Avista - Avista Corporation - 3

Answer

Yes

Document Name

Comment

PRC-028 to include requirements for adequate monitoring of IBRs as shown necessary by operational experience. PRC-002 to remain in effect for synchronous based generation for a large-scale view of system reliability.

Likes 0

Dislikes 0

Response

Thomas Foltz - AEP - 5

Answer

Yes

Document Name

Comment

While AEP has no objections to creating a new standard specifically for IBRs, we are concerned by the content itself which we express in our response to Question 5.

Likes 0

Dislikes 0

Response

Wendy Devries - CMS Energy - Consumers Energy Company - 1,2 - RF

Answer

Yes

Document Name

Comment

To the extent of monitoring only those IBRs that are connected directly to the BES.

Likes 0

Dislikes 0

Response

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

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Kacie Fischer - Kacie Fischer On Behalf of: Byron Booker, Oncor Electric Delivery, 1; - Kacie Fischer

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Charles Yeung - Southwest Power Pool, Inc. (RTO) - 2 - MRO,WECC, Group Name SRC 2023

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Michiko Sell - Pine Gate Renewables - 5

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	
Denise Sanchez - Denise Sanchez On Behalf of: Diana Torres, Imperial Irrigation District, 1, 6, 5, 3; Jesus Sammy Alcaraz, Imperial Irrigation District, 1, 6, 5, 3; Tino Zaragoza, Imperial Irrigation District, 1, 6, 5, 3; - Denise Sanchez	
Answer	Yes
Document Name	
Comment	
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	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

Stephen Whaite - Stephen Whaite On Behalf of: Lindsey Mannion, ReliabilityFirst , 10; - Stephen Whaite, Group Name ReliabilityFirst Ballot Body Member and Proxies

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

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

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

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

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

Sean Bodkin - Dominion - Dominion Resources, Inc. - 6

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Teresa Krabe - Lower Colorado River Authority - 5

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Matt Lewis - Lower Colorado River Authority - 1

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Allie Gavin - Allie Gavin On Behalf of: Michael Moltane, International Transmission Company Holdings Corporation, 1; - Allie Gavin

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; Fong 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

Leslie Hamby - Southern Indiana Gas and Electric Co. - 3,5,6 - RF

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

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

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Steven Rueckert - Western Electricity Coordinating Council - 10, Group Name WECC Entity Monitoring

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Israel Perez - Israel Perez On Behalf of: Mathew Weber, Salt River Project, 3, 1, 6, 5; Sarah Blankenship, Salt River Project, 3, 1, 6, 5; Thomas Johnson, Salt River Project, 3, 1, 6, 5; Timothy Singh, Salt River Project, 3, 1, 6, 5; - Israel Perez

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**Wendy Kalidass - U.S. Bureau of Reclamation - 5****Answer**

Yes

Document Name**Comment**

Likes 0

Dislikes 0

Response**Adrian Andreoiu - BC Hydro and Power Authority - 1, Group Name BC Hydro****Answer**

Yes

Document Name**Comment**

Likes 0

Dislikes 0

Response**Kevin Conway - Public Utility District No. 1 of Pend Oreille County - 1,3,5,6****Answer**

Yes

Document Name**Comment**

Likes 0

Dislikes 0

Response

Andrea Jessup - 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 - WECC

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Donald Lock - Talen Generation, LLC - 5

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Todd Bennett - Associated Electric Cooperative, Inc. - 3, Group Name AECI

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

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

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Duane Franke - Manitoba Hydro - 1,3,5,6 - MRO

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

David Vickers - David Vickers On Behalf of: Daniel Roethemeyer, Vistra Energy, 5; - David Vickers

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Ijad Dewan - Ijad Dewan On Behalf of: Alain Mukama, Hydro One Networks, Inc., 1, 3; - Ijad Dewan

Answer

Document Name

Comment

Not applicable

Likes 0

Dislikes 0

Response

3. Do you agree the modifications made in PRC-002-5 and new Standard PRC-028-1 are cost effective?

Wendy Devries - CMS Energy - Consumers Energy Company - 1,2 - RF

Answer No

Document Name

Comment

I agree that PRC-002 -5 changes are cost effective. The new PRC-028-1 standard will increase costs significantly for those utilities that have installed IBRs prior to the standards effective date.

Likes 0

Dislikes 0

Response

David Vickers - David Vickers On Behalf of: Daniel Roethemeyer, Vistra Energy, 5; - David Vickers

Answer No

Document Name

Comment

The following unnecessary equipment requirements will lead to increased project cost.

Section 2.2

2.1 PRC-002 does not require real and reactive power for FR data, the same should apply for PRC-028

2.2 There is limited value with FR data for IBRs and this requirement should be removed.

2.3 There is limited value with FR data for shunt or reactive devices and this requirement should be removed.

-This section should also exclude IBRs that were installed prior to the approved standard. Only DDR or continuous data should be required on IBRs that were installed prior approval.

Section 3 - The sample rate and record length requirements are not consistent with the requirements in PRC-002. The 128 samples per cycle recording rate and 2 second record length may not be supported by installed or available technology, especially for IBRs. Note- Vistra has been evaluating various technologies that we could use for IBRs and there are not many cost effective options for IBRs.

Section 5 The output sampling rated of 60 times per second is not consistent with the 30 times per second requirement in PRC-002

Section 7 The time period for storing events is 30 days vs the 10 days in PRC-002. Not all equipment can store DDR or continuous data for 30 days.

Likes 0

Dislikes 0

Response

Thomas Foltz - AEP - 5

Answer No

Document Name

Comment

It has been recognized in past Technical Rationale documents for PRC-002, by members of their SDT, that requiring more than 10 days of granular data retention would be expensive and unnecessary. Requiring 30 days of data retention and provision would obviously be even more expensive than ten, making the proposed revisions unreasonable and not “cost effective.”

In addition, AEP has several other concerns with the cost impact of the new Standard PRC-028-1.

* AEP does not consider the inclusion of “at least one IBR unit connected to last 10% of each collector feeder length” in PRC-028 4.2.5 as cost effective. AEP questions the reliability benefit data these BES Elements will provide when considering the proposed changes to PRC-024 to a performance-based ride-through standard that ensures generators remain connected to the BPS during system disturbances and the requirements of PRC-004, Protection System Misoperation and Correction.

* PRC-028 does not currently limit the applicability of required data, while PRC-002 provides criteria which limits the BES Elements that are required to have dynamic Disturbance recording data. Similar limitations should be placed on PRC-028 as well.

* PRC-004 excludes Protection Systems of individual dispersed power producing resources identified under Inclusion I4 of the BES definition where the Misoperations affected an aggregate nameplate rating of less than or equal to 75 MVA of BES Facilities. PRC-028 should be developed in alignment with PRC-004 by retaining these exclusions in PRC-028 in its present state, as well as in its future state.

Likes 0

Dislikes 0

Response

Glen Farmer - Avista - Avista Corporation - 5

Answer No

Document Name

Comment

Cost effectiveness cannot be known at this time.

Likes 0

Dislikes 0

Response

Dwanique Spiller - Berkshire Hathaway - NV Energy - 5

Answer	No
Document Name	
Comment	
<p>The modifications made to PRC-002 are a zero-cost item. The costs associated with PRC-028 are substantial. Some IBR facilities have a single feeder into the 34.5kv collector bus while other sites may have 12 or more feeder circuits. Requiring monitoring on each feeder is excessive.</p> <p>Requiring monitoring on wind facilities is not warranted as most of the disturbance events that have been studied have revealed that solar facilities are the most susceptible to reacting to system disturbances.</p>	
Likes	0
Dislikes	0
Response	
Donald Lock - Talen Generation, LLC - 5	
Answer	No
Document Name	
Comment	
<p>Talen supports the comments of the NAGF.</p>	
Likes	0
Dislikes	0
Response	
Mike Magruder - Avista - Avista Corporation - 1	
Answer	No
Document Name	
Comment	
<p>Cost effectiveness cannot be known at this time.</p>	
Likes	0
Dislikes	0
Response	
Mark Garza - FirstEnergy - FirstEnergy Corporation - 4, Group Name FE Voter	

Answer	No
Document Name	
Comment	
<p>Until FE understands the definition intent of inverter-based resources under these standards, we cannot determine the cost effectiveness of this project.</p> <p>In addition, FE supports EEI's comments which state:</p> <p>EEI is concerned that proposed PRC-028-1 does not align with the approved SAR scope and if approved would place unreasonable costs on registered entities without adequately balancing costs as required by the SAR. We further note that the SAR Scope states that "it is important that some of these resources and nearby BES elements are monitored with DDR devices to ensure adequate coverage for disturbance analysis while balancing cost impacts." The SAR does not intend that all IBR facilities need to have the level of monitoring proposed. To address this concern, the SDT should develop criteria that allows entities to select a representative number of sites in order to ensure adequate analysis of IBR performance.</p>	
Likes	0
Dislikes	0
Response	
Adrian Andreoiu - BC Hydro and Power Authority - 1, Group Name BC Hydro	
Answer	No
Document Name	
Comment	
<p>BC Hydro thanks the drafting team for their efforts and appreciates the opportunity to comment.</p> <p>PRC-028-1 Requirements are generally more stringent than PRC-002 requirements, particularly, fault recording (FR) sampling, FR triggering, FR length, CLK accuracy, and retrieval period requirements. Entities will have to assess if current PRC-002 monitoring solutions are capable of meeting technical requirements in PRC-028-1 as currently drafted, and may have to develop new monitoring systems if currently implemented solutions are unable to meet the increased requirements.</p> <p>While the technical justification cites IEEE 2800-2022 as a basis for the requirements, it does not appear to identify instances where Disturbance Monitoring Equipment records meeting PRC-002 requirements would have been insufficient for event or disturbance analysis, which could justify increased technical requirements in PRC-028-1 Draft 1.</p> <p>Requirement R3 asks for more data and it applies to all in scope IBR facilities, regardless of installation date whereas R1 and R2 have specific exemption criteria for existing units. Requirements R4, R5 specify DDR requirements similar to PRC-002; however as drafted these Requirements will be applicable to all in scope IBR facilities unlike Requirements R1 and R2.</p> <p>BC Hydro suggests that technical requirements for PRC-028 be specified in line with PRC-002 requirements for IBRs installed prior to the effective date of the standard. This will still constitute an improvement over the status quo for availability and quality of records, while improving cost effectiveness of the proposed changes in PRC-028.</p> <p>PRC-028-1 Requirements R1 and R2 provide an exemption to IBR units "installed" prior to the effective date of the Standard. Please provide clarity on the meaning of the term "install".</p>	
Likes	0

Dislikes 0

Response

Wendy Kalidass - U.S. Bureau of Reclamation - 5

Answer

No

Document Name

Comment

Reclamation agrees with the PRC-002-5 cost but inverter base does not apply to Reclamation.

Likes 0

Dislikes 0

Response

Rachel Schuldt - Rachel Schuldt On Behalf of: Josh Combs, Black Hills Corporation, 5, 6, 1, 3; - Rachel Schuldt

Answer

No

Document Name

Comment

Black Hills Corporation will not comment on cost effectiveness.

Likes 0

Dislikes 0

Response

Micah Runner - Black Hills Corporation - 1

Answer

No

Document Name

Comment

Black Hills Corporation will not comment on cost effectiveness.

Likes 0

Dislikes 0

Response

Sheila Suurmeier - Black Hills Corporation - 5

Answer No

Document Name

Comment

Black Hills Corporation will not comment on cost effectiveness.

Likes 0

Dislikes 0

Response

Claudine Bates - Black Hills Corporation - 6

Answer No

Document Name

Comment

Black Hills Corporation will not comment on cost effectiveness.

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:

It is ACES' opinion that the proposed changes to PRC-002 are minimal and therefore should have little to no cost to implement.

As for the proposed PRC-028-1, we agree with the approach taken by the SDT to create a new Standard to specifically address IBR facilities; however, we strongly disagree with making this new standard inclusive of all IBR facilities regardless of risk to the BES.

It is our recommendation that PRC-028 take a similar approach as PRC-002-5 and allow the TO and RC to evaluate which IBR Facilities need SER, FR, and/or DDR capabilities installed. It is our opinion that a blanket approach is cost-prohibitive whereas a risk-based approach provides a reasonable level

of information and is much more cost-effective.

Likes 0

Dislikes 0

Response

Jennie Wike - Jennie Wike On Behalf of: Hien Ho, Tacoma Public Utilities (Tacoma, WA), 1, 4, 5, 6, 3; John Merrell, Tacoma Public Utilities (Tacoma, WA), 1, 4, 5, 6, 3; Ozan Ferrin, Tacoma Public Utilities (Tacoma, WA), 1, 4, 5, 6, 3; Terry Gifford, Tacoma Public Utilities (Tacoma, WA), 1, 4, 5, 6, 3; - Jennie Wike, Group Name Tacoma Power

Answer

No

Document Name

Comment

Tacoma Power supports the MRO NSRF comments.

Likes 0

Dislikes 0

Response

Marty Hostler - Northern California Power Agency - 4

Answer

No

Document Name

Comment

NO. The proposals will result in more time and \$\$ spent on unproductive activities. SDTs should be required to provide cost/benefit analysis and prove the reliability benefits of their proposals.

Likes 0

Dislikes 0

Response

Dennis Sismaet - Northern California Power Agency - 6

Answer

No

Document Name

Comment

The proposals will result in more time and \$\$ spent on unproductive activities. SDTs should be required to provide cost/benefit analysis and prove the reliability benefits of their proposals. NO, NCPA supports other opposing comments that have been submitted.

Likes 0

Dislikes 0

Response

Jeremy Lawson - Northern California Power Agency - 5

Answer

No

Document Name

Comment

The proposals will result in more time and \$\$ spent on unproductive activities. SDTs should be required to provide cost/benefit analysis and prove the reliability benefits of their proposals.

Likes 0

Dislikes 0

Response

Michael Whitney - Northern California Power Agency - 3

Answer

No

Document Name

Comment

The proposals will result in more time and \$\$ spent on unproductive activities. SDTs should be required to provide cost/benefit analysis and prove the reliability benefits of their proposals. NCPA supports other opposing comments that have been submitted.

Likes 0

Dislikes 0

Response

Israel Perez - Israel Perez On Behalf of: Mathew Weber, Salt River Project, 3, 1, 6, 5; Sarah Blankenship, Salt River Project, 3, 1, 6, 5; Thomas Johnson, Salt River Project, 3, 1, 6, 5; Timothy Singh, Salt River Project, 3, 1, 6, 5; - Israel Perez

Answer

No

Document Name

Comment

PRC-028 -The data sampling rates seem excessive and are a significant increase from the requirements in PRC-002. These sampling rates will prevent the use of protective relaying to satisfy the standard, which will increase cost burden.

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

The modifications made to PRC-002 are a zero-cost item. The costs associated with PRC-028 are substantial. Some IBR facilities have a single feeder into the 34.5kv collector bus while other sites may have 12 or more feeder circuits. Requiring monitoring on each feeder is excessive.

Requiring monitoring on wind facilities is not warranted as most of the disturbance events that have been studied have revealed that solar facilities are the most susceptible to reacting to system disturbances.

Likes 0

Dislikes 0

Response

Jou Yang - MRO - 1,2,3,4,5,6 - MRO, Group Name MRO NSRF

Answer

No

Document Name

Comment

The modifications made to PRC-002 are a zero-cost item. The costs associated with PRC-028 are substantial. Some IBR facilities have a single feeder into the 34.5kv collector bus while other sites may have 12 or more feeder circuits. Requiring monitoring on each feeder is excessive. It is estimated that it will cost \$300-450k to install DFR equipment on each collection system feeder; with an aggregate cost of \$4.2-\$6.4 million just for that wind generation asset with at least 14 collection system feeder circuits. The MRO NSRF recommends limiting applicability to only facilities that have experienced reportable events where clear causes have not been identified and limiting the monitoring location to the BES collection bus. Another costly part depends on how exclusions are handled for older less capable equipment in PRC-028-1 R1, R2 and R3.

Requiring monitoring on wind facilities is not warranted as most of the disturbance events that have been studied have revealed that photo-voltaic facilities are the most susceptible to reacting to system disturbances.

Likes 1

JEA, 1, McClung Joseph

Dislikes 0

Response

Mark Fowler - Mark Fowler On Behalf of: David Jendras Sr, Ameren - Ameren Services, 3, 6, 1; - Mark Fowler

Answer No

Document Name

Comment

Ameren supports EEI's comments on this question.

Likes 0

Dislikes 0

Response

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

Answer No

Document Name

Comment

The SAR Scope states that “it is important that **some of these resources and nearby BES elements are monitored with DDR devices** to ensure adequate coverage for disturbance analysis while balancing cost impacts.” However, the SAR does not intend that all IBR facilities need to have the level of monitoring proposed. To address this concern, the SDT should develop criteria that allows entities to select a representative number of sites in order to ensure adequate analysis of IBR performance. Requiring monitoring at all IBR facilities would result in unnecessary costs without improving reliability.

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 supports the comments of the NAGF.

Likes 0

Dislikes 0

Response

Tim Kelley - Tim Kelley On Behalf of: Charles Norton, Sacramento Municipal Utility District, 3, 6, 4, 1, 5; Fong 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 and BANC believe that the new Standard PRC-028-1 is not cost effective and we support the comments submitted by Southern Company.

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

No

Document Name

Comment

PG&E supports the input provided by the NAGF and EEI on the potential costs of the proposed modifications.

Likes 0

Dislikes 0

Response

Andy Fuhrman - Minnkota Power Cooperative Inc. - 1,5 - MRO

Answer

No

Document Name

Comment

MPC supports comments submitted by the MRO NERC Standards Review Forum (NSRF).

Likes 0

Dislikes 0

Response

Sean Bodkin - Dominion - Dominion Resources, Inc. - 6

Answer

No

Document Name

Comment

Dominion Energy supports EEI comments

Likes 0

Dislikes 0

Response

Daniel Gacek - Exelon - 1

Answer

No

Document Name

Comment

Exelon supports the comments submitted by the EEI.

Likes 0

Dislikes 0

Response

Kinte Whitehead - Exelon - 3

Answer

No

Document Name

Comment

Exelon supports the comments submitted by the EEI.

Likes 0

Dislikes 0

Response

Alan Kloster - Alan Kloster On Behalf of: Jennifer Flandermeyer, Evergy, 3, 6, 5, 1; Jeremy Harris, Evergy, 3, 6, 5, 1; Kevin Frick, Evergy, 3, 6, 5, 1; Marcus Moor, Evergy, 3, 6, 5, 1; - Alan Kloster

Answer No

Document Name

Comment

Evergy supports and incorporates by reference the comments of the Edison Electric Institute for question #3.

In addition, Evergy estimates that the cost of installing DFR equipment on the high side of a pad mounted transformer at the base of a wind turbine in the last 10% of an existing wind turbine feeder will be \$300-450k or 2-3 times the cost of installing the same equipment in an existing substation. For example, one wind farm has 14 feeders so installing this equipment on every feeder there would cost an estimated \$4.2-6.3 million dollars for that one facility.

EIA data shows that there are currently 604 wind farms with a size of 75 MW or greater with a total 975549 MW capacity. Assuming there is a feeder for every 10-20 MW worth of wind turbines and the estimate per installation, the range between \$1.463-\$2.195 billion dollars just to install these at the end of every feeder and does not include the substation installations that would be required. This estimate is only for feeders at wind turbines and does not include any estimates for solar farms or other IBRs so the total cost could likely be double or triple this estimate. This expense has minimal or no direct benefit to grid reliability and will increase electricity costs for everyone across North America in a quest for better data. Evergy highly suggests that the drafting team consider limiting the scope of DFR installations to areas that are identified by an RC similar to what is done in PRC-002.

Likes 0

Dislikes 0

Response

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

Answer No

Document Name

Comment

It is ACES' opinion that the proposed changes to PRC-002 are minimal and therefore should have little to no cost to implement.

As for the proposed PRC-028-1, we agree with the approach taken by the SDT to create a new Standard to specifically address IBR facilities; however, we strongly disagree with making this new standard inclusive of all IBR facilities regardless of risk to the BES.

It is our recommendation that PRC-028 take a similar approach as PRC-002-5 and allow the TO and RC to evaluate which IBR Facilities need SER, FR, and/or DDR capabilities installed. It is our opinion that a blanket approach is cost-prohibitive whereas a risk-based approach provides a reasonable level of information and is much more cost-effective.

Likes 0

Dislikes 0

Response

Dennis Chastain - Tennessee Valley Authority - 1,3,5,6 - SERC

Answer No

Document Name

Comment

We recommended the drafting team consider the establishment of a minimum MW threshold to ensure very small installations, such as those that may be considered BES due to co-location with synchronous machines, are excluded to ensure cost-effectiveness.

Likes 0

Dislikes 0

Response

Ruchi Shah - AES - AES Corporation - 5

Answer No

Document Name

Comment

There should not be any cost associated with the modifications made in PRC-002-5. However, costs associated with PRC-028-1 are substantial. Depending on the configuration and equipment capability of existing operational IBR facilities, the costs associated with retrofitting hardware, software and labor will run into 6 figure amount for a single IBR site.

Likes 0

Dislikes 0

Response

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

Answer No

Document Name

Comment

The PRC-002-5 changes are cost effective.

PRC-028-1 is not cost effective and should align more with the requirements of PRC-002. Specifically, PRC-028 should be consistent with the PRC-002 data retrievability period of 10 calendar days instead of 30 calendar days (PRC-028 R7.1) especially for DDR data. PRC-028 should also let the TO and RC evaluate (as was done in PRC-002) which IBR Facilities need SER, FR, and/or DDR capabilities installed, instead of including all IBR facilities regardless of risk to the BES. PRC-028 should also follow PRC-002 FR requirements which do not require real and reactive power for FR data (PRC-028 R2.1.3) and have a minimum sample rate of 16 samples per cycle instead of 128 samples per cycle (PRC-028 R3.2.2). PRC-028 should

also be consistent with PRC-002 DDR requirements for an output recording rate of electrical quantities of at least 30 times per second instead of 60 times per second (PRC-028 R5.2).

Likes 0

Dislikes 0

Response

Denise Sanchez - Denise Sanchez On Behalf of: Diana Torres, Imperial Irrigation District, 1, 6, 5, 3; Jesus Sammy Alcaraz, Imperial Irrigation District, 1, 6, 5, 3; Tino Zaragoza, Imperial Irrigation District, 1, 6, 5, 3; - Denise Sanchez

Answer

No

Document Name

Comment

It will be costly to implement.

Likes 0

Dislikes 0

Response

Hillary Creurer - Allete - Minnesota Power, Inc. - 1

Answer

No

Document Name

Comment

Minnesota Power's comments are aligned with those of the MRO NSRF and EEI for this question. Minnesota Power reiterates that PRC-028 would result in substantial costs for entities and disagrees with the proposal to monitor all IBR facilities.

Likes 0

Dislikes 0

Response

Michiko Sell - Pine Gate Renewables - 5

Answer

No

Document Name

Comment

We are concerned that the cost and burden of the proposed PRC-028 requirements are not justified by the reliability benefits it would provide. We believe the costs and benefits of the proposed standard can be better balanced by a. only requiring data collection at generating plants larger than 500 MVA, b. requiring data collection on a single collector feeder or IBR unit instead of every collector feeder or IBR unit in the plant, and c. only applying the data collection requirements to plants that sign an interconnection agreement after the effective date of the standard. Only applying the requirements to a single IBR unit and to larger plants will make PRC-028 more comparable to the PRC-002 companion standard for synchronous generators, avoiding undue discrimination against Inverter-Based Resources (IBRs).

Regarding potential reliability benefits of the proposed standard, we agree that ride-through issues at some IBRs have presented a legitimate reliability concern. However, the recent adoption of Federal Energy Regulatory Commission (FERC) Order 2023 directly addresses many of those concerns by imposing mandatory requirements to fully ride-through grid disturbances and to accurately validate models of plant performance at the sub-second transient timescale. Prior to the adoption of Order 2023, the proposed requirements of PRC-028 may have provided a significant reliability benefit by improving understanding of the ride-through performance of IBRs, and thus helping to identify solutions to any concerns. However, now that FERC Order 2023 already solved many of those concerns by requiring ride-through performance and accurate modeling of sub-second plant performance, it is not clear what reliability benefit PRC-028 might provide.

The proposed PRC-028 requirements would impose a considerable cost and burden on generators. While R1 and the 2.2.3. subpart of R2 that requires fault recording for “DC bus current and voltage” have an exemption that “IBR units installed prior to the effective date of this standard and are not capable of recording this data are excluded,” but R3 and the other parts of R2 appear to apply retroactively to all IBR plants. Retroactive requirements impose a much greater financial burden on the generator as those costs cannot typically be recovered once a power purchase agreement has been signed, and the cost and implementation burden for retrofits is typically much higher than if the data collection equipment were planned and installed as part of initial plant construction. Moreover, retroactive requirements set a bad precedent and introduce regulatory uncertainty that makes generation investment more challenging and risky, and thus costly. In some cases the cost of installing the required data collection, storage, and transmission equipment and associated auxiliary equipment could approach \$1 million per plant, in addition to ongoing operations and maintenance and compliance costs associated with that equipment. The requirement in R3 for the fault recorder at each IBR unit (which footnote 2 defines as each inverter or wind turbine generator) to report at least 128 samples per cycle for over two seconds per event necessitates the use of expensive high-speed sensing equipment at each IBR unit, and requires each recorder to capture, store, and transmit at least 15,000 datapoints per event.

To make the cost of PRC-028 more reasonable while preserving the value of the proposed data collection, as well as avoiding undue discrimination against IBRs relative to synchronous generators, we suggest that data collection in PRC-028 only be required prospectively and not retroactively, and only at plants that are 500 MVA and greater, which is the plant size threshold at which synchronous generator data collection is required in the PRC-002 standard. If the TO or RC/PC can compellingly demonstrate that smaller new plants should be required to comply with PRC-028’s data collection requirements due to local reliability concerns, such as weak grid issues or high penetrations of IBRs in a local area, then that should be allowed.

In addition, the cost of installing a sequence of event recorder and fault recorder on the last 10% of each collector feeder per R1 and R2 is significant, as large IBR plants can each contain dozens of collector feeders. Moreover, the fact that IBR plants typically consist of multiple collector feeders with similar if not identical equipment connected to them casts further doubt on the value of installing data collection devices on each collector feeder, as the impact of the disturbance and the IBR response is likely to be similar if not identical across those feeders. Even more burdensome is that R3 requires fault recorders to be installed at each IBR unit, which footnote 2 defines as each inverter or wind turbine generator. IBR plants typically consist of dozens if not hundreds of IBR units that are essentially identical. As a result, a more reasonable requirement would be for data collection equipment to be installed on a single collector feeder or IBR unit at each plant, which should allow extrapolation of that data to other collector feeders or IBR units at the plant. If a plant contains multiple types of inverters or wind turbine generators, it may be reasonable to require data collection on each feeder or unit that uses a different inverter or generator type.

Given that there are finite resources for complying with all NERC requirements, and in light of the fact that the ride-through concerns PRC-028 is attempting to understand have already been addressed by FERC Order 2023, we are concerned that PRC-028 as proposed could actually undermine reliability by distracting from more pressing reliability needs. We believe the revisions we have proposed will result in a standard that better balances the cost of complying with standard with its reliability benefit.

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 notes that the cost to purchase and install monitoring equipment will vary by company. NAGF members estimates range from \$100,000 to \$450,000 per feeder at an IBR generation facility. High end estimate is based on having to build a new structure to house the equipment, get power and communications to it, and digging up the collector circuit to connect the equipment. Lower estimate is based on installing the recording equipment within the IBR unit, leveraging the use of existing instrument transformers, and integrating I/O from existing IBR OEM control systems. Note that having to install monitoring equipment to the IBR unit connected to last 10% of **each** collector feeder length (i.e., furthest from the collector bus) in an IBR generation facility will be expensive; a wind farm that has 14 feeders, installing DFR equipment just on those 14 feeders at that single Facility, would have an estimated cost of between \$1,400,000 – \$6,300,000. Modifications would also be needed for the associated substation to install additional metering and RTACs (along with programming work), communication wiring, etc. Considering the number of existing BES IBR generation facilities, the cost would be in the billions of dollars to install. The concern is that the reliability benefit of installing such equipment does not justify the cost.*

Likes 0

Dislikes 0

Response

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

Answer No

Document Name

Comment

EI is concerned that proposed PRC-028-1 does not align with the approved SAR scope and if approved would place unreasonable costs on registered entities without adequately balancing costs as required by the SAR. We further note that the SAR Scope states that “it is important that **some of these resources and nearby BES elements are monitored with DDR devices** to ensure adequate coverage for disturbance analysis while balancing cost impacts.” The SAR does not intend that all IBR facilities need to have the level of monitoring proposed. To address this concern, the SDT should develop criteria that allows entities to select a representative number of sites in order to ensure adequate analysis of IBR performance.

Likes 0

Dislikes 0

Response

Alison MacKellar - Constellation - 5

Answer No

Document Name

Comment

Constellation is concerned about the possible cost involved in implementing the Fault Recording (FR) sampling rate that PRC-028 is requiring. SEL-300 series relays are used extensively throughout the industry and do not meet the required sampling rate proposed by PRC-028. If PRC-028 is approved with these required parameters many BES IBR facilities would be required to upgrade to SEL-400 series relays. This wholesale replacement for relay types would also require planned outages to facilitate.

Alison Mackellar on behalf of Constellation Segments 5 and 6

Likes 0

Dislikes 0

Response**Casey Perry - PNM Resources - 1,3 - WECC,Texas RE**

Answer

No

Document Name

Comment

PNMR is in support of the EEL comment.

Likes 0

Dislikes 0

Response**Kimberly Turco - Constellation - 6**

Answer

No

Document Name

Comment

Constellation is concerned about the possible cost involved in implementing the Fault Recording (FR) sampling rate that PRC-028 is requiring. SEL-300 series relays are used extensively throughout the industry and do not meet the required sampling rate proposed by PRC-028. If PRC-028 is approved with these required parameters many BES IBR facilities would be required to upgrade to SEL-400 series relays. This wholesale replacement for relay types would also require planned outages to facilitate.

Kimberly Turco on behalf of Constellation Segments 5 and 6

Likes 0

Dislikes 0

Response

Charles Yeung - Southwest Power Pool, Inc. (RTO) - 2 - MRO,WECC, Group Name SRC 2023

Answer Yes

Document Name

Comment

Because of the reliability need to assess IBR performance during disturbances, the use of current fault recorder technology and associated cost of installation is the best solution. The staged implementation plan also allows entities five (5) years to implement changes so as not to overwhelm the supply chain or overburden staff resources.

Please note ERCOT is a member of the ISO RTO Council Standards Review Committee but for their own reasons elect not to support this response to Question #3.

Likes 0

Dislikes 0

Response

Duane Franke - Manitoba Hydro - 1,3,5,6 - MRO

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Todd Bennett - Associated Electric Cooperative, Inc. - 3, Group Name AECI

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

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

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

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

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Kevin Conway - Public Utility District No. 1 of Pend Oreille County - 1,3,5,6

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Allie Gavin - Allie Gavin On Behalf of: Michael Moltane, International Transmission Company Holdings Corporation, 1; - Allie Gavin

Answer Yes

Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Matt Lewis - Lower Colorado River Authority - 1	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Teresa Krabe - Lower Colorado River Authority - 5	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Kacie Fischer - Kacie Fischer On Behalf of: Byron Booker, Oncor Electric Delivery, 1; - Kacie Fischer	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	

Response

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

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

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

Answer

Document Name

Comment

NA

Likes 0

Dislikes 0

Response

Robert Follini - Avista - Avista Corporation - 3

Answer

Document Name

Comment

Cost effectiveness cannot be known at this time.

Likes 0

Dislikes 0

Response

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

Answer	
Document Name	
Comment	
Duke Energy's focus is to assure the effective and efficient reduction of risks to the reliability and security of the grid and will not provide comments on the cost effectiveness of the proposed changes.	
Likes 0	
Dislikes 0	
Response	
Steven Rueckert - Western Electricity Coordinating Council - 10, Group Name WECC Entity Monitoring	
Answer	
Document Name	
Comment	
WECC will not comment on the cost effectiveness, but will leave that to applicable entities.	
Likes 0	
Dislikes 0	
Response	
Ijad Dewan - Ijad Dewan On Behalf of: Alain Mukama, Hydro One Networks, Inc., 1, 3; - Ijad Dewan	
Answer	
Document Name	
Comment	
No comments	
Likes 0	
Dislikes 0	
Response	
Brad Harris - CenterPoint Energy Houston Electric, LLC - 1 - Texas RE	
Answer	
Document Name	

Comment

CenterPoint Energy Houston Electric, LLC will abstain from answering Question 3.

Likes 0

Dislikes 0

Response

Constantin Chitescu - Ontario Power Generation Inc. - 5

Answer

Document Name

Comment

OPG supports the NPCC RSC's comments.

Likes 0

Dislikes 0

Response

4. Do you agree with the Implementation Plan for revised PRC-002-5 and new Standard PRC-028-1?

Kimberly Turco - Constellation - 6

Answer No

Document Name

Comment

Although PRC-028 Implementation Plan mirrors the existing PRC-002-1 Implementation Plan, PRC-028 will require all BES IBRs to install DME. Depending on the number of BES IBR locations owned by the GO, this could possibly result in numerous new DME installations that will be more challenging to coordinate and schedule compared to the implementation of PRC-002-1.

Kimberly Turco on behalf of Constellation Segments 5 and 6

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 IRC SRC for this question and adopts them as its own.

Likes 0

Dislikes 0

Response

Casey Perry - PNM Resources - 1,3 - WECC, Texas RE

Answer No

Document Name

Comment

PNMR requests review of revised PRC-002 and PRC-028 prior to agreeing to the implementation plan.

Likes 0

Dislikes 0

Response

Charles Yeung - Southwest Power Pool, Inc. (RTO) - 2 - MRO,WECC, Group Name SRC 2023

Answer No

Document Name

Comment

The Implementation Plan should explicitly require any new interconnected facilities that fall under the PRC-028-1 Applicability section to be compliant on or before the date of commercial operations. There is no need to stage the phase-in over 5 years for new construction.

Likes 0

Dislikes 0

Response

Alison MacKellar - Constellation - 5

Answer No

Document Name

Comment

Although PRC-028 Implementation Plan mirrors the existing PRC-002-1 Implementation Plan, PRC-028 will require all BES IBRs to install DME. Depending on the number of BES IBR locations owned by the GO, this could possibly result in numerous new DME installations that will be more challenging to coordinate and schedule compared to the implementation of PRC-002-1.

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 No

Document Name

Comment

The NAGF provides the following implementation plan comments for consideration:

- a. *General: Request the SDT to consider revising the Implementation Plan to address when a new IBR generation facility is to be compliant with PRC-028-1.*
- b. *Page 2, "Compliance Date for PRC-028-1 Requirements R1-R7" section:*
 - i. *Recommend revising the first paragraph such that the time period for 100% of an entities IBR generation facility to be compliant is three (3) years instead of the proposed two (2) year time limit.*
 - ii. *Recommend deleting the third paragraph as it does not provide any value for the implementation plan.*

Likes 0

Dislikes 0

Response

Michiko Sell - Pine Gate Renewables - 5

Answer

No

Document Name

Comment

For PRC-028 we are concerned with availability of needed devices for installation. Consider adding an additional tranch and extend full implementation by a year. Also consider MW size of Facilities since this is a reliability assurance issue.

Likes 0

Dislikes 0

Response

Hillary Creurer - Allete - Minnesota Power, Inc. - 1

Answer

No

Document Name

Comment

Minnesota Power agrees with the PRC-002-5 implementation plan.

For the PRC-028-1, Minnesota Power's comments are aligned with the MRO NSRF and suggest a time frame of 6 calendar years to meet the 100% requirement.

Likes 0

Dislikes 0

Response	
Steven Taddeucci - NiSource - Northern Indiana Public Service Co. - 3	
Answer	No
Document Name	
Comment	
Concerns about PRC-028 applicability and data requirements will need to be addressed before the implementation plan can be supported.	
Likes	0
Dislikes	0
Response	
Jodirah Green - ACES Power Marketing - 1,3,4,5,6 - MRO,WECC,Texas RE,SERC,RF, Group Name ACES Collaborators	
Answer	No
Document Name	
Comment	
It is ACES' opinion that the proposed changes to PRC-002 are minimal; therefore, the timeline identified in the Implementation Plan is appropriate.	
As for the proposed timeline for PRC-028-1 R1-R7 identified in the Implementation Plan, it is ACES' opinion that the timelines identified for 50% and 100% compliance should be equal. We recommend the following change:	
"...fully compliant at 100% of their generating plant/Facilities within six (6) calendar years of the effective date of Reliability Standard PRC-028-1."	
Lastly, while an individual entity's compliance with a given requirement is auditable, their strategy for how they will manage their compliance is not auditable. Therefore, the requirement that an entity share their implementation strategy for PRC-028-1 R1-R7 with the ERO Compliance Monitoring and Enforcement Program staff should be struck from the Implementation Plan.	
Likes	0
Dislikes	0
Response	
Andy Fuhrman - Minnkota Power Cooperative Inc. - 1,5 - MRO	
Answer	No
Document Name	
Comment	

MPC supports comments submitted by the MRO NERC Standards Review Forum (NSRF).

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

No

Document Name

Comment

PG&E does not support the time frame in the current implementation plan without an exception (see the input to Question 5, item #1 below) for existing applicability to facilities at the Transmission Owner (TO) Point of Interconnection (POI).

An exemption clause is given to preexisting IBR facilities (GO). At present, no TO exemption exists at the Point of interconnection. This requires installation of equipment, or replacement of existing equipment, at the POI for all identified IBR facilities. We recommend providing a TO exemption similar to that granted for GO, particularly if the bus had been identified under PRC-002 and has equipment installed to comply with PRC-002. An alternative is to make PRC-028 FR/SER/DR performance requirements identical to PRC-002.

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 supports the comments of the NAGF.

Likes 0

Dislikes 0

Response

Jou Yang - MRO - 1,2,3,4,5,6 - MRO, Group Name MRO NSRF

Answer	No
Document Name	
Comment	
<p>The PRC-002-5 implementation plan is fine as proposed (immediate) since the previous requirements did not change for the synchronous units.</p> <p>The two partitions of completion proposed, 50% & 100%, should be given equal time periods since the %'s are split in half - that is, the 100% time period should be "within six (6) calendar years of the effective date of PRC-028-1" (rather than in 5 calendar years).</p> <p>Entities should not have to share their strategy for implementation with the ERO Compliance Monitoring and Enforcement Program staff. This requirement should not be in the implementation plan.</p>	
Likes 1	JEA, 1, McClung Joseph
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	
<p>The PRC-002-5 implementation plan is fine as proposed (immediate) since the previous requirements did not change for the synchronous units.</p> <p>The two partitions of completion proposed, 50% & 100%, should be given equal time periods since the %'s are split in half - that is, the 100% time period should be "within six (6) calendar years of the effective date of PRC-028-1" (rather than in 5 calendar years).</p> <p>Entities should not have to share their strategy for implementation with the ERO Compliance Monitoring and Enforcement Program staff. This requirement should not be in the implementation plan.</p> <p>The 100% compliant date given for R8 doesn't make sense because there may not be any DME installed at the time specified. Consider using this, "R8 is be applicable to each DME installation upon completion of the installation and commissioning of the DME equipment."</p>	
Likes 0	
Dislikes 0	
Response	
Michael Whitney - Northern California Power Agency - 3	
Answer	No
Document Name	
Comment	

NCPA supports other opposing comments that have been submitted.

Likes 0

Dislikes 0

Response

Dennis Sismaet - Northern California Power Agency - 6

Answer

No

Document Name

Comment

1. NCPA supports other opposing comments that have been submitted.

Likes 0

Dislikes 0

Response

Marty Hostler - Northern California Power Agency - 4

Answer

No

Document Name

Comment

NO, NCPA supports various other opposing comments that have been submitted.

Likes 0

Dislikes 0

Response

Jennie Wike - Jennie Wike On Behalf of: Hien Ho, Tacoma Public Utilities (Tacoma, WA), 1, 4, 5, 6, 3; John Merrell, Tacoma Public Utilities (Tacoma, WA), 1, 4, 5, 6, 3; Ozan Ferrin, Tacoma Public Utilities (Tacoma, WA), 1, 4, 5, 6, 3; Terry Gifford, Tacoma Public Utilities (Tacoma, WA), 1, 4, 5, 6, 3; - Jennie Wike, Group Name Tacoma Power

Answer

No

Document Name

Comment

Tacoma Power supports the MRO NSRF comments.

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:

It is ACES' opinion that the proposed changes to PRC-002 are minimal; therefore, the timeline identified in the Implementation Plan is appropriate.

As for the proposed timeline for PRC-028-1 R1-R7 identified in the Implementation Plan, it is ACES' opinion that the timelines identified for 50% and 100% compliance should be equal. We recommend the following change:

"...fully compliant at 100% of their generating plant/Facilities within six (6) calendar years of the effective date of Reliability Standard PRC-028-1."

Lastly, while an individual entity's compliance with a given requirement is auditable, their strategy for how they will manage their compliance is not auditable. Therefore, the requirement that an entity share their implementation strategy for PRC-028-1 R1-R7 with the ERO Compliance Monitoring and Enforcement Program staff should be struck from the Implementation Plan.

Likes 0

Dislikes 0

Response

Claudine Bates - Black Hills Corporation - 6

Answer

No

Document Name

Comment

Black Hills Corporation agrees with NAGF comments.

Likes 0

Dislikes 0

Response

Sheila Suurmeier - Black Hills Corporation - 5

Answer	No
Document Name	
Comment	
Black Hills Corporation agrees with NAGF comments.	
Likes 0	
Dislikes 0	
Response	
Micah Runner - Black Hills Corporation - 1	
Answer	No
Document Name	
Comment	
Black Hills Corporation agrees with NAGF comments.	
Likes 0	
Dislikes 0	
Response	
Rachel Schuldts - Rachel Schuldts On Behalf of: Josh Combs, Black Hills Corporation, 5, 6, 1, 3; - Rachel Schuldts	
Answer	No
Document Name	
Comment	
Black Hills Corporation agrees with NAGF comments.	
Likes 0	
Dislikes 0	
Response	
Wendy Kalidass - U.S. Bureau of Reclamation - 5	
Answer	No
Document Name	

Comment

Reclamation supports a 18-month implementation time frame.

Likes 0

Dislikes 0

Response

Adrian Andreoiu - BC Hydro and Power Authority - 1, Group Name BC Hydro

Answer No

Document Name

Comment

Given BC Hydro's comments to Question #3 above, and pending additional clarifications, BC Hydro is unable to support the proposed Implementation Plan at this stage.

Likes 0

Dislikes 0

Response

Kevin Conway - Public Utility District No. 1 of Pend Oreille County - 1,3,5,6

Answer No

Document Name

Comment

Entities should have to submit a plan that is approved by the Region as being reasonable. It is difficult to determine the number of facilities and how much equipment may have to be addressed by companies that will be impacted. Timelines are clean, but do not always represent the real-life situations that must be addressed.

Likes 0

Dislikes 0

Response

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

Answer No

Document Name

Comment

Until the definition of inverter-based resources is clearly defined, then FE would be supportive of the implementation plan.

Likes 0

Dislikes 0

Response**Donald Lock - Talen Generation, LLC - 5**

Answer

No

Document Name

Comment

Talen supports the comments of the NAGF.

Likes 0

Dislikes 0

Response**Dwanique Spiller - Berkshire Hathaway - NV Energy - 5**

Answer

No

Document Name

Comment

The PRC-002-5 implementation plan is fine as proposed (immediate) since the previous requirements did not change for the synchronous units.

The two partitions of completion proposed, 50% & 100%, should be given equal time periods since the %'s are split in half - that is, the 100% time period should be "within six (6) calendar years of the effective date of PRC-028-1" (rather than in 5 calendar years).

Entities should not have to share their strategy for implementation with the ERO Compliance Monitoring and Enforcement Program staff. This requirement should not be in the implementation plan.

The 100% compliant date given for R8 doesn't make sense because there may not be any DME installed at the time specified. Consider using this, "R8 is applicable to each DME installation upon completion of the installation and commissioning of the DME equipment."

Likes 0

Dislikes 0

Response

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

Until further clarifications are provided regarding our expressed concerns, AEP would be unable to support a proposed Implementation Period.

Likes 0

Dislikes 0

Response**David Vickers - David Vickers On Behalf of: Daniel Roethemeyer, Vistra Energy, 5; - David Vickers****Answer** No**Document Name****Comment**

With the timeline provided it may be difficult to procure proper equipment in time to meet requirements.

Likes 0

Dislikes 0

Response**Wendy Devries - CMS Energy - Consumers Energy Company - 1,2 - RF****Answer** No**Document Name****Comment**

The implementation plan for PRC-028-1 is to short of a time frame. 50% within in 3years won't happen due to industry wide material and equipment shortages and delays. Implementation should be extended to at least a minimum of 7 years at 50%.

Likes 0

Dislikes 0

Response**Denise Sanchez - Denise Sanchez On Behalf of: Diana Torres, Imperial Irrigation District, 1, 6, 5, 3; Jesus Sammy Alcaraz, Imperial Irrigation District, 1, 6, 5, 3; Tino Zaragoza, Imperial Irrigation District, 1, 6, 5, 3; - Denise Sanchez**

Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Jeremy Lawson - Northern California Power Agency - 5	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Constantin Chitescu - Ontario Power Generation Inc. - 5	
Answer	Yes
Document Name	
Comment	
OPG supports the NPCC RSC's comments.	
Likes 0	
Dislikes 0	
Response	
Mark Gray - Edison Electric Institute - NA - Not Applicable - NA - Not Applicable	
Answer	Yes
Document Name	
Comment	

EEl supports the proposed phased Implementation Plan.

Likes 0

Dislikes 0

Response

Dennis Chastain - Tennessee Valley Authority - 1,3,5,6 - SERC

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 Fowler - Mark Fowler On Behalf of: David Jendras Sr, Ameren - Ameren Services, 3, 6, 1; - Mark Fowler

Answer

Yes

Document Name

Comment

Ameren supports EEl's comments on this question.

Likes 0

Dislikes 0

Response

Mike Magruder - Avista - Avista Corporation - 1

Answer

Yes

Document Name

Comment

Phased implementation plan is acceptable.

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

Glen Farmer - Avista - Avista Corporation - 5

Answer

Yes

Document Name

Comment

Phased implementation plan is acceptable.

Likes 0

Dislikes 0

Response	
Robert Follini - Avista - Avista Corporation - 3	
Answer	Yes
Document Name	
Comment	
Phased implementation plan is acceptable.	
Likes	0
Dislikes	0
Response	
Kacie Fischer - Kacie Fischer On Behalf of: Byron Booker, Oncor Electric Delivery, 1; - Kacie Fischer	
Answer	Yes
Document Name	
Comment	
Likes	0
Dislikes	0
Response	
Stephen Whaite - Stephen Whaite On Behalf of: Lindsey Mannion, ReliabilityFirst , 10; - Stephen Whaite, Group Name ReliabilityFirst Ballot Body Member and Proxies	
Answer	Yes
Document Name	
Comment	
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	Yes

Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Ruchi Shah - AES - AES Corporation - 5	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Alan Kloster - Alan Kloster On Behalf of: Jennifer Flandermeyer, Evergy, 3, 6, 5, 1; Jeremy Harris, Evergy, 3, 6, 5, 1; Kevin Frick, Evergy, 3, 6, 5, 1; Marcus Moor, Evergy, 3, 6, 5, 1; - Alan Kloster	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Kinte Whitehead - Exelon - 3	
Answer	Yes
Document Name	
Comment	
Likes 0	

Dislikes 0

Response

Daniel Gacek - Exelon - 1

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

Sean Bodkin - Dominion - Dominion Resources, Inc. - 6

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Teresa Krabe - Lower Colorado River Authority - 5

Answer

Yes

Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Matt Lewis - Lower Colorado River Authority - 1	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Allie Gavin - Allie Gavin On Behalf of: Michael Moltane, International Transmission Company Holdings Corporation, 1; - Allie Gavin	
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

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

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Leslie Hamby - Southern Indiana Gas and Electric Co. - 3,5,6 - RF

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Israel Perez - Israel Perez On Behalf of: Mathew Weber, Salt River Project, 3, 1, 6, 5; Sarah Blankenship, Salt River Project, 3, 1, 6, 5; Thomas Johnson, Salt River Project, 3, 1, 6, 5; Timothy Singh, Salt River Project, 3, 1, 6, 5; - Israel Perez

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Andrea Jessup - 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 - WECC****Answer** Yes**Document Name****Comment**

Likes 0

Dislikes 0

Response**Todd Bennett - Associated Electric Cooperative, Inc. - 3, Group Name AECI****Answer** Yes**Document Name****Comment**

Likes 0

Dislikes 0

Response**Donna Wood - Tri-State G and T Association, Inc. - 1****Answer** Yes**Document Name****Comment**

Likes 0

Dislikes 0

Response

Duane Franke - Manitoba Hydro - 1,3,5,6 - MRO

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Ijad Dewan - Ijad Dewan On Behalf of: Alain Mukama, Hydro One Networks, Inc., 1, 3; - Ijad Dewan

Answer

Document Name

Comment

No comments

Likes 0

Dislikes 0

Response

Steven Rueckert - Western Electricity Coordinating Council - 10, Group Name WECC Entity Monitoring

Answer

Document Name

Comment

No comment

Likes 0

Dislikes 0

Response

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

Wendy Devries - CMS Energy - Consumers Energy Company - 1,2 - RF

Answer

Document Name

Comment

PRC-028-1 should state clearly how to determine if IBRs are capable of recording or not. IBRs downstream of a feeder shouldn't be monitored as they aren't BES assets.

Likes 0

Dislikes 0

Response

David Vickers - David Vickers On Behalf of: Daniel Roethemeyer, Vistra Energy, 5; - David Vickers

Answer

Document Name

Comment

Section 1.2. Agree with the exclusion for IBRs that are currently installed. No issues with IBR fault codes, alarms, etc but the operating mode, voltage/frequency ride-through, and control system values are either static configuration parameters or operational values which are not sequence of event points.

Section 4. Agree with section 4 and it is the most important for analyzing localized or wide spread events.

Likes 0

Dislikes 0

Response

Thomas Foltz - AEP - 5

Answer

Document Name

Comment

While AEP supports the efforts of the Standards Drafting Team and their overall direction in Phase II, we are concerned by what we perceive as an excessiveness of data granularity, especially when compared to those of synchronous machines in PRC-002. The follow items are of specific concern.

1) R3.1.2. – We see no justification for, nor reliability benefit in, requiring a minimum recording rate of 128 samples per cycle. The sample rate is eight

times greater than that used for synchronous machines in the equivalent requirements of PRC-002, and far exceeds the maximum sampling rate of many relay models currently used. AEP would like to suggest instead using 16 samples per cycle.

2) Subparts of R1.2 – AEP questions the reliability benefit in requiring the data specified in the subparts, which includes data not captured as “sequence of events.” In addition, why would this data be necessary for IBRs but not for synchronous machines?

AEP also questions the necessity of providing the data as several projects are currently underway to address the impact IBRs have had on the BES. The purpose of Project 2020-02 is to retire PRC-024-3 and replace it with a performance-based ride-through standard that ensures generators remain connected to the BPS during system disturbances. Specifically, this SAR focuses on the generator protection and control systems that can result in the reduction or disconnection of generating resources during these events. The SAR also ensures protection or controls that fail to ride through system events are analyzed, addressed with a corrective action plan (if possible), and reported to necessary entities for situational awareness.

3) 7.1 through 7.5 – As currently written, the requirements set no expectations to encourage a timely request for data, which may put data availability at risk. The Technical Rationale states “if a request for the data is made on Day 31, that is outside the 30 calendar days specified in the requirement, and an entity would not be out of compliance if it did not have the data”, however this is not made explicitly clear within the requirements themselves. In addition, recording devices often save and discard data using a “first in / first out” methodology, so thirty full days of meaningful data may not be available if a request is made several weeks after an event. The obtainer of the data needs ample opportunity to retrieve the data after the request, and if a request is made at the end of the allowable 30 day window, it is very possible that some of the desired data may no longer be available. The data at most risk for omission would be pre-event data as well as data at the time of the event. As a result, data “inclusive of the day the data was recorded” may no longer be available. To address the core of our concerns, clarity is needed regarding the standard’s expectations regarding the minimum time period that a device is expected to retain historical information. As currently written, the standard seems to infer that a device might need to retain as many as 60 days of data in order to properly fulfill a request made 30 days after an event occurs. In addition, there is no specificity given regarding how much of the 30 days of data provided be either pre- or post-event.

Likes 0

Dislikes 0

Response

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

Answer

Document Name

Comment

NA

Likes 0

Dislikes 0

Response

Todd Bennett - Associated Electric Cooperative, Inc. - 3, Group Name AECI

Answer

Document Name

Comment

AECI supports the drafting teams approach to PRC-002 and PRC-028 except for the creation of standard specific defined terms for "inverter based resource (IBR)" and "IBR unit". Currently there are at a minimum of 8 active NERC projects under development to address various IBR reliability issues, multiple projects contain inconsistent standard specific defined terms for IBR and IBR unit. NERC should coordinate with industry to develop BES glossary terms for IBR and IBR unit and apply the terms to all applicable standards.

Likes 0

Dislikes 0

Response

Dwanique Spiller - Berkshire Hathaway - NV Energy - 5

Answer

Document Name

Comment

A) Applicability section 4.2.5 is confusing. Is this facility item attempting to identify the required locations for DME to be added? If so, this is out of place and needs to be addressed in a requirement rather than in the applicability section only as is done in R1, 1.2.

B) In requirement R1 sub-parts 1.2.4 and 1.2.5, it is not clear what is desired to be recorded in the SER data.

C) There are multiple control systems in play at these facilities - Requirement R1, sub-part 1.2.6 needs to be very specific to which control system, which command value, which reference value, and which feedback signals are required to be monitored. Further, these signals are not well suited for SER recording, which typically are dry contact inputs used to determine the order of events rather than the time-variation of control and process variables.

D) Requirement sub-parts 3.1.3, 3.2.3, and 3.3.3 need to specify values to be considered as an (ac/dc) overvoltage condition, (ac/dc) undervoltage condition, (ac/dc) overcurrent condition, dc reverse current condition, over frequency condition, underfrequency condition.

E) The inclusion of NERC as a recipient of information upon a request is not appropriate. NERC has other means of obtaining information that should be used, including Section 1600 data requests or NERC Alerts.

Likes 0

Dislikes 0

Response

Answer

Document Name

Comment

NERC Alert R-2023-03-14-01 Level 2 – Inverter-Based Resource Performance Issues (NERC Alert) and NERC Project 2021-04 PRC-028-1 (PRC-028-1) information appear to not align. For example:

(a) NERC Alert information appears to be missing from SER/FR/DFR data requests. Is any of the following information needed to perform wide area analysis, fault analysis, other? While the following three items may possibly be included as specifications required in interconnect agreement data, are they also needed for PRC-028 requirements?

• Active Power Ramp Rate (after momentary cessation)

• Recovery time delay

• Momentary Cessation- if in use- (may be covered by fault alarm (1.2.2) and operating mode change (1.2.3))

(b) Are the below listed signals intended to be covered by R1.2.6 Control system command values, reference values, and feedback signals of the new 28 standard? Are they values that will impact the analysis performed by the RCs and BAs? The following were of concern in the NERC Alert:

• frequency tripping time delay

• frequency tripping inhibit (if used)

• droop performance-this is affected by FERC Order No. 842

• Indication if ramp rate is being controlled by individual unit versus by plant level controller

• Typically, if plant voltage level falls below its continuous operating range the individual inverters control operation – *does this constitute a change in operating mode as covered in R1.2.3?*

• Maximum Power Point Tracking (MPPT) controls (if MPPT function was frozen to pre-contingency value or reset to default).

(c) The NERC Alert highlights the following items. Should they be included in PRC-028-1 as triggers:

• Inverter Instantaneous AC Voltage tripping

• Inverter Instantaneous AC overcurrent

• Inverter phase lock loop loss of sync

• Inverter DC unbalance tripping

Are any point of measure (POM) or point of interconnect (POI) triggers besides the following needed:

• 3.1.3.1. Neutral (residual) overcurrent and

• 3.1.3.2. AC phase overvoltage and undervoltage

Likes 0

Dislikes 0

Response

Donald Lock - Talen Generation, LLC - 5

Answer

Document Name

Comment

Talen supports the comments of the NAGF.

Likes 0

Dislikes 0

Response

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

Answer

Document Name

Comment

FE supports EEI's comments which state:

EEI Comments on PRC-028-1:

Purpose Statement: EEI does not agree that the purpose statement for this Reliability Standard aligns with the intended scope of this project. To address this concern, we offer the following edits in boldface:

To have adequate data available from **a representative number of** inverter-based resources (IBR)/**Facilities** to facilitate **the analysis of IBR performance during** Bulk Electric System (BES) Disturbances.

Functional Entities: EEI does not agree with the Functional Entities as listed. We believe that PRC-028 should also include Reliability Coordinators (RC) in this list, noting that the SAR was never intended to require monitoring of IBRs at all locations. Instead, the SDT should develop a criteria for identifying where and when monitoring should be installed and the RC should be the entity that 1) utilizes that criteria to determine where monitoring is needed and 2) notifies owners of their obligations.

Applicability Section: EEI does not agree with the Applicability Section of Section 4.2 because it implies that inverter-based resources are to be included in the BES Definition, Inclusion I2. (See EEI comments for Question 1)

All Requirements: EEI does not agree that this project was intended to monitor all IBRs or IBR Facilities. In the SAR it clearly states that the intent is to install DDR at some locations, not all locations. The SAR also stated that the requirements were to be balanced against costs which given the magnitude of the proposed requirements, it is difficult to see where costs were adequately balanced.

Likes 0

Dislikes 0

Response

Wendy Kalidass - U.S. Bureau of Reclamation - 5

Answer

Document Name

Comment

Reclamation does not agree with the modifications to the wording of BES Elements in R6 and R7 in the "Violation Severity Levels" section. 'Element' is sufficiently defined in the NERC Glossary of terms and 'BES Element' encompasses the required equipment (elements) for Disturbance Monitoring. Reclamation recommends keeping the original wording "for all applicable BES Elements".

Reclamation concurs that all IBR resources should have and maintain their own separate standards.

Likes 0

Dislikes 0

Response

Rachel Schuldt - Rachel Schuldt On Behalf of: Josh Combs, Black Hills Corporation, 5, 6, 1, 3; - Rachel Schuldt

Answer

Document Name

Comment

Black Hills Corporation agrees with NAGF comments.

Likes 0

Dislikes 0

Response

Micah Runner - Black Hills Corporation - 1

Answer

Document Name

Comment

Black Hills Corporation agrees with NAGF comments.

Likes 0

Dislikes 0

Response

Sheila Suurmeier - Black Hills Corporation - 5

Answer

Document Name

Comment

Black Hills Corporation agrees with NAGF comments.

Likes 0

Dislikes 0

Response

Claudine Bates - Black Hills Corporation - 6

Answer

Document Name

Comment

Black Hills Corporation agrees with NAGF comments.

Likes 0

Dislikes 0

Response

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

Answer

Document Name

Comment

AEPC has signed on to ACES comments:

Firstly, Section 4.2 of the proposed Reliability Standard PRC-028-1 is somewhat confusing and seems to be a bit redundant; specifically, sections 4.2.1 and 4.2.5. It appears that these specific sections are dictating where specific equipment should be installed in addition to the locations specified in the various requirements of the standard. We recommend using an approach similar to the one used in PRC-002-5 Section 4.2. To accomplish this, we recommend using the following verbiage:

“BES Elements associated with inverter-based portions of generating plants/Facilities meeting the criteria set by Inclusion I2, Part (b) or Inclusion I4 of the BES definition.”

Secondly, Requirements 1.2.4 and 1.2.5 are unclear as to what values are to be recorded. We recommend that additional clarification be made to these sections.

Thirdly, Requirement 1.2.6 seems to be out of place. In a typical Sequence of Event Recording setup digital inputs are used to determine the specific sequence of occurrence for recorded events. The signals identified in Requirement 1.2.6 are typically analog signals that vary over time in response to process conditions. We recommend either removing this requirement altogether or being much more specific as to what information should be collected and how.

Lastly, we disagree with the approach that NERC should be able to request information from an entity directly via a Reliability Standard requirement. Please note that we are not opposed to NERC requesting this information nor do we think it is inappropriate for NERC to receive said data. We do however disagree with the method of collection. It is our opinion that NERC should utilize the existing data collection mechanisms (i.e. Section 1600 data requests, NERC Alerts, etc.).

Thank you for the opportunity to comment.

Likes 0

Dislikes 0

Response

Jennie Wike - Jennie Wike On Behalf of: Hien Ho, Tacoma Public Utilities (Tacoma, WA), 1, 4, 5, 6, 3; John Merrell, Tacoma Public Utilities (Tacoma, WA), 1, 4, 5, 6, 3; Ozan Ferrin, Tacoma Public Utilities (Tacoma, WA), 1, 4, 5, 6, 3; Terry Gifford, Tacoma Public Utilities (Tacoma, WA), 1, 4, 5, 6, 3; - Jennie Wike, Group Name Tacoma Power

Answer

Document Name

Comment

Tacoma Power supports the MRO NSRF comments.

Likes 0

Dislikes 0

Response

Marty Hostler - Northern California Power Agency - 4

Answer

Document Name

Comment

N/A

Likes 0

Dislikes 0

Response

Michael Whitney - Northern California Power Agency - 3

Answer

Document Name

Comment

N/A

Likes 0

Dislikes 0

Response

Israel Perez - Israel Perez On Behalf of: Mathew Weber, Salt River Project, 3, 1, 6, 5; Sarah Blankenship, Salt River Project, 3, 1, 6, 5; Thomas Johnson, Salt River Project, 3, 1, 6, 5; Timothy Singh, Salt River Project, 3, 1, 6, 5; - Israel Perez

Answer

Document Name

Comment

PRC-028 - If the point of 4.2.5 is to monitor the individual inverter performance prior to being summed into a collector system, I would consider mandating the last IBR on each feeder is monitored, rather than one of the IBR units in the last 10% of each feeder.

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

A) Applicability section 4.2.5 is confusing. Is this facility item attempting to identify the required locations for DME to be added? If so, this is out of place and needs to be addressed in a requirement rather than in the applicability section only as is done in R1, 1.2.

B) In requirement R1 sub-parts 1.2.4 and 1.2.5, it is not clear what is desired to be recorded in the SER data.

C) There are multiple control systems in play at these facilities - Requirement R1, sub-part 1.2.6 needs to be very specific to which control system, which command value, which reference value, and which feedback signals are required to be monitored. Further, these signals are not well suited for SER recording, which typically are dry contact inputs used to determine the order of events rather than the time-variation of control and process variables.

D) Requirement sub-parts 3.1.3, 3.2.3, and 3.3.3 need to specify values to be considered as an (ac/dc) overvoltage condition, (ac/dc) undervoltage condition, (ac/dc)overcurrent condition, dc reverse current condition, overfrequency condition, underfrequency condition.

Likes 0

Dislikes 0

Response

Jou Yang - MRO - 1,2,3,4,5,6 - MRO, Group Name MRO NSRF

Answer

Document Name

[2021-04.PNG](#)

Comment

1. PRC-028 applicability section 4.2.5 is confusing. Is this facility item attempting to identify the required locations for DME to be added? If so, this is out of place and needs to be addressed in a requirement rather than in the applicability section only as is done in R1, 1.2.
2. PRC-028 in requirement R1 sub-parts 1.2.4 and 1.2.5, it is not clear what is desired to be recorded in the SER data.
3. There are multiple control systems in play at these facilities – PRC-028 Requirement R1, sub-part 1.2.6 needs to be very specific to which control system, which command value, which reference value, and which feedback signals are required to be monitored. Further, these signals are not well suited for SER recording, which typically are dry contact inputs used to determine the order of events rather than the time-variation of control and process variables.
4. PRC-028 Requirement sub-parts 3.1.3, 3.2.3, and 3.3.3 need to specify values to be considered as an (ac/dc) overvoltage condition, (ac/dc) undervoltage condition, (ac/dc)overcurrent condition, dc reverse current condition, overfrequency condition, underfrequency condition.
5. The inclusion of NERC as a recipient of information upon a request is not appropriate. NERC has other means of obtaining information that should be used, including Section 1600 data requests or NERC Alerts.
6. For SER data in R1.2 (PRC-028), what is acceptable proof of exclusion for IBR units installed prior to the effective date of this standard and not capable of recording this data?

7. In PRC-028 it is recommended there be an exclusion similar to R1.2 for FR data in R2.2 and R3.2 for IBR units installed prior to the effective date of this standard that are not capable of recording this data with the required triggering, length, or sample rate. If permitted, what is acceptable proof of exclusion?

8. In PRC-028 it is recommended there be an exclusion similar to R1.2 for FR data in R2.3 and R3.3 for dynamic reactive units installed prior to the effective date of this standard that are not capable of recording this data with the required triggering, length, or sample rate? If permitted, what is acceptable proof of exclusion?

9. In PRC-028 for SER and FR data in sections R1.2, R2.2, R2.3, R3.2 and R3.3, please clarify the exclusion applies if only some data recording capability is available but not all data that the data that is available. It seems cleaner to exclude these units completely rather than use a more complex piecemeal method which may be difficult to audit.

10. Would the following situation be considered a possible violation in PRC-028? There is a discovery of recorder failure as noted may occur in R8 during a time when data was requested per R7? (recorded data is not available due to the failure)

11. The PRC-028-1 technical rationale on page 2 states: *“The standard is only applicable to Transmission Owner in case where Transmission Owner owns equipment within the IBR Plant.”* Should *“equipment”* be clarified that it is applicable to monitored elements such as breakers, transformers, reactive units or IBRs?

12. Review the two figures called scenario 1 and scenario 2 and clarify PRC-028 applicability. Consider that Trans owner bus may or may not be applicable for PRC-002.

Consider if there may be a registration or information gap where (GO) IBR/wind/solar owners that are less than 75MVA may need to comply with PRC-028 due to the >75MVA aggregation threshold.

Likes 1	JEA, 1, McClung Joseph
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Dislikes 0	
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Response

Mark Fowler - Mark Fowler On Behalf of: David Jendras Sr, Ameren - Ameren Services, 3, 6, 1; - Mark Fowler

Answer

Document Name

Comment

Ameren would like more clarification around R2.2, specifically the phrase "IBR unit connected to 10% of each collector feeder length."

2.2.3: Are they referring to a DC collection system as opposed to a DC to AC conversion at each wind turbine or solar panel? Ameren is confused as to how we would collect this data.

Ameren also supports EEI's comments on this question.

Likes 0

Dislikes 0

Response

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

Answer

Document Name

Comment

As stated in our response to question 3 above, AZPS does not agree that the SAR intended that all IBR facilities should be monitored. Instead, there should be a criteria for identifying where and when monitoring should be installed similar to PRC-002 and the RC should be the entity that determines where monitoring is needed and notifies owners of their obligations.

Likes 0

Dislikes 0

Response

Steven Rueckert - Western Electricity Coordinating Council - 10, Group Name WECC Entity Monitoring

Answer

Document Name

Comment

No additional comments.

Likes 0

Dislikes 0

Response

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

Answer

Document Name	
Comment	
WEC Energy Group supports the additional comments provided by the NAGF.	
Likes 0	
Dislikes 0	
Response	
Allie Gavin - Allie Gavin On Behalf of: Michael Moltane, International Transmission Company Holdings Corporation, 1; - Allie Gavin	
Answer	
Document Name	
Comment	
<p>In PRC-002-5 Attachment 1, Bulk Electric System (BES) is spelled out in step 1 despite the acronym being used earlier in the Attachment and SER and FR acronym description are removed. All 3 terms are spelled out and acronyms identified in PRC-002-4 standard. Acronyms only are sufficient for all 3 in Attachment 1.</p> <p>In Figure 2 of the PRC-028-1 Technical Rationale, it is clear the TO breaker on the generator tie line is not applicable. Please clearly identify this in the applicability section of the standard to avoid confusion between GOs and TOs for 4.2.1</p> <p>Add a figure of an IBR interconnection without local high-side transformer breaker to the transmission system via transmission line to a Transmission Owner Ring Bus Substation. Clarify that the Transmission owner ring breakers do not have PRC-028-1 SER/FR responsibilities.</p>	
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	
<p>PG&E has the following additional input:</p> <p>1 – PG&E believes the current wording of Requirement R1, Part 1.2 provides an exception for the Generator Owner (GO) for units installed prior to the effective date of the standard but is not clear the exception would be provided to the Transmission Owner (TO). This is based on the text of "... IBR unit</p>	

connected to the last 10% of each collector feeder length.” This implies that it applies to the GO since they would be part of the last 10% of the feeder length.

To indicate that exemption applies to both the GO and TO, PG&E suggests the following:

Take the text “IBR units installed prior to the effective date of this standard and are not capable of recording this data are excluded”, remove it from Part 1.2, and make it a footnote to the main R1 text. This would clearly indicate the exemption is for both the GO and TO.

2 – PG&E supports the NAGF input for Question 5 regarding having a methodology like PRC-002 to determine if SER/FR equipment are required verses the current draft approach of requiring all BES facilities to have the equipment.

3 – PG&E believes the PRC-028 recorder specification (sampling rate, etc..) are more stringent then PRC-002. PG&E recommends that PRC-028 should be brought into alignment with what is indicted in PRC-002.

Likes 0

Dislikes 0

Response

Andy Fuhrman - Minnkota Power Cooperative Inc. - 1,5 - MRO

Answer

Document Name

Comment

MPC supports comments submitted by the MRO NERC Standards Review Forum (NSRF).

Likes 0

Dislikes 0

Response

Ijad Dewan - Ijad Dewan On Behalf of: Alain Mukama, Hydro One Networks, Inc., 1, 3; - Ijad Dewan

Answer

Document Name

Comment

Not applicable

Likes 0

Dislikes 0

Response

Sean Bodkin - Dominion - Dominion Resources, Inc. - 6

Answer

Document Name

Comment

Dominion Energy supports EEI comments

Likes 0

Dislikes 0

Response

Daniel Gacek - Exelon - 1

Answer

Document Name

Comment

Exelon supports the comments submitted by the EEI.

Likes 0

Dislikes 0

Response

Kinte Whitehead - Exelon - 3

Answer

Document Name

Comment

Exelon supports the comments submitted by the EEI.

Likes 0

Dislikes 0

Response

Alan Kloster - Alan Kloster On Behalf of: Jennifer Flandermeyer, Evergy, 3, 6, 5, 1; Jeremy Harris, Evergy, 3, 6, 5, 1; Kevin Frick, Evergy, 3, 6, 5, 1; Marcus Moor, Evergy, 3, 6, 5, 1; - Alan Kloster

Answer

Document Name

Comment

Evergy supports and incorporates by reference the comments of the Edison Electric Institute for question #5.

Likes 0

Dislikes 0

Response

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

Answer

Document Name

Comment

Firstly, Section 4.2 of the proposed Reliability Standard PRC-028-1 is somewhat confusing and seems to be a bit redundant; specifically, sections 4.2.1 and 4.2.5. It appears that these specific sections are dictating where specific equipment should be installed in addition to the locations specified in the various requirements of the standard. We recommend using an approach similar to the one used in PRC-002-5 Section 4.2. To accomplish this, we recommend using the following verbiage:

“BES Elements associated with inverter-based portions of generating plants/Facilities meeting the criteria set by Inclusion I2, Part (b) or Inclusion I4 of the BES definition.”

Secondly, Requirements 1.2.4 and 1.2.5 are unclear as to what values are to be recorded. We recommend that additional clarification be made to these sections.

Thirdly, Requirement 1.2.6 seems to be out of place. In a typical Sequence of Event Recording setup digital inputs are used to determine the specific sequence of occurrence for recorded events. The signals identified in Requirement 1.2.6 are typically analog signals that vary over time in response to process conditions. We recommend either removing this requirement altogether or being much more specific as to what information should be collected and how.

Lastly, we disagree with the approach that NERC should be able to request information from an entity directly via a Reliability Standard requirement. Please note that we are not opposed to NERC requesting this information nor do we think it is inappropriate for NERC to receive said data. We do however disagree with the method of collection. It is our opinion that NERC should utilize the existing data collection mechanisms (i.e. Section 1600 data requests, NERC Alerts, etc.).

Thank you for the opportunity to comment.

Likes 0

Dislikes 0

Response

Dennis Chastain - Tennessee Valley Authority - 1,3,5,6 - SERC

Answer

Document Name

Comment

None

Likes 0

Dislikes 0

Response

Ruchi Shah - AES - AES Corporation - 5

Answer

Document Name

Comment

AES Clean Energy questions the reliability need for the proposed requirements at all IBRs because this goes beyond what is required at traditional synchronous plant facilities under current PRC-002. As stated in the Purpose statement, the intent of this Reliability Standard is to “have **adequate** data available from inverter-based resources (IBR) to facilitate analysis of Bulk Electric System (BES) Disturbances.” This implies that the needs are not everywhere for data to assist in analyzing disturbance events. AES Clean Energy recommends the Standard Drafting Team consider adding requirement(s) for the Transmission Owner and/or Reliability Coordinator to develop a list of IBRs in their areas that require data based on a set of criteria similar to what is currently in PRC-002 and notify the affected GOs. Along with that, AES Clean Energy also recommends that Standard Drafting Team develop a set of criteria that can be used by the TO/RC to assess where disturbance monitoring equipment should be installed in their region. This set of criteria may include:

- Minimum MW/MVA threshold for IBRs requiring SER/FR/DDR
- Amount of IBRs connected in a particular area of the TO/RC region
- Level of grid strength of areas within the TO/RC region

There may be a need for a requirement for the TO/RC to assess periodically to determine a new list of IBRs, similar to PRC-002.

AES Clean Energy also urges the ERO to be considerate of the cost of installing these equipment while drafting the expectations of the standard and identify different options to ensure reliability of the interconnection. The above recommendations are to ensure that reliability is achieved through a reasonable cost approach.

Likes 0

Dislikes 0

Response

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

Answer

Document Name

Comment

PRC-028-1 R1 sub-part 1.2.6 is not clear as to what control system values, reference values, and feedback signals need to be monitored.

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 drafting team proposal.

Likes 0

Dislikes 0

Response

Rachel Coyne - Texas Reliability Entity, Inc. - 10

Answer

Document Name

Comment

Texas RE has the following comments for PRC-028-1:

- Texas RE recommends the drafting team define Inverter-based Resources (IBR) as it is being used increasingly in standard requirement language and a NERC Glossary definition would drive consistency. Footnote 2 may not be clear and it is inconsistent with the footnote description of IBR in proposed EOP-004-4.
- Texas RE recommends revising the PRC-028-1 Title to include all the applicable inverter-based systems such as STATCOM, SVC, HVDC, etc., other than the traditional inverter-based resources. Texas RE recommends the following verbiage: “Disturbance Monitoring and Reporting Requirements for Inverter-Based Resources and Dynamic Devices”.
- Texas RE noticed that Section A 4.2.4 includes shunt static devices, but that device type does not appear anywhere in the requirement language. Texas RE inquires as to why this is included in section A 4.2.4
- The technical rationale for PRC-028-1 states that SER data is required from all IBR units connected to last 10% of each collector feeder. Requirement 1.2, however, can be interpreted to needing the SER data from only one IBR unit from each feeder. Texas RE recommends making the requirement language consistent with the language in the technical rationale. In addition, SDT should consider providing clarification on the ‘installed date’ for the IBRs that are excluded from this requirement, whether this date is the date at which the IBR is installed in the field or the date at which the IBR is synchronized to grid or the date of commercial operation. Additionally, the requirement should state that the Generator Owner shall document the IBR recording limitations including OEM data sheet or other equipment specifications.
 - Texas RE recommends the following verbiage for Requirement Part 1.2: “All IBR units connected to last 10% of each collector feeder length. The Generator Owner shall document the IBR recording limitations and provide the information to its Reliability Coordinator, Regional Entity, or NERC, upon request. Evidence may include OEM data sheet or other equipment specifications.”
 - Texas RE recommends the technical rationale include the following: “IBR units with commercial operation date prior to the effective date of this standard and are not capable of recording this data are excluded.”
- Texas RE seeks clarity on the sub parts of Requirement Part 1.2 regarding what specifically needs to be recorded.
- Texas RE recommends the SDT clarify whether the data included in R2.1.3 and R2.3.3 can be calculated values or not. Texas RE recommends the following verbiage for Requirement Part 2.1.3: “Three phase Real and Reactive Power (measured or calculated)”
- Requirement Part R2.2 states that IBR unit FR data is needed; however, the sub-requirements state the data can be from the unit terminals or on high-side of the IBR unit transformer. If more than one IBR units are connected to a transformer, then IBR unit level data will not be available based on the current language.
 - Texas RE recommends the language for R2 be changed to "...as applicable, at IBR unit terminals or on high-side of the IBR unit transformer if no more than one IBR is connected to a unit transformer."
- Texas RE requests the sub requirements not include the Regional Entity and NERC. Regional Entities and NERC may request data from registered entities in accordance with section 1600 of the Rules of Procedure.
- Since PRC-028 is intended to have a similar purpose as PRC-002, but specific to IBRs, Texas RE recommends PRC-028 Requirement R7 should mirror PRC-002 Requirement R11. Texas RE inquires as to why IBRs can retrieve data for 30 days while conventional units only have 10 days to retrieve data.
- Texas RE also inquires as to why the synchronized clock accuracy in PRC-028 Requirement R6 is plus/minus 100 milliseconds of UTC, but in PRC-002 Requirement R10, it is plus/minus 2 milliseconds.
- Additionally, Texas RE noticed the PRC-002 Requirement R9 output 30 times per second versus PRC-028 Requirement R5 output is 60 times per second.
- Texas RE requests the SDT update Section C Compliance to the most updated version. For example, Compliance Violation Investigations listed in section C 1.3 do not exist.

Likes 0

Dislikes 0

Response

Hillary Creurer - Allele - Minnesota Power, Inc. - 1

Answer

Document Name	
Comment	
Minnesota Power's comments are aligned with the MRO NSRF & EEI comments.	
Likes 0	
Dislikes 0	
Response	
Bret Galbraith - Seminole Electric Cooperative, Inc. - 6	
Answer	
Document Name	
Comment	
<ol style="list-style-type: none"> 1. In the draft Standard PRC-028, Requirement R1.2, a value of 10% is employed. Reviewing significant digits, it's unclear whether this is 10% or 10.0%, etc. Can the NERC STD provide additional guidance? 2. Some IBR units may be procured prior to the enforcement date of the Standard. Due to supply chain issues, PRC-028 R1.2 should be modified to allow an exemption for sites "procured" prior to the FERC approval of this Standard. 3. PRC-028 R1.2 states "and are not capable of recording this data are excluded". Can the SDT provide examples of situations where an IBR is "not capable" of recording this data. This will help provide a basis for discussion with auditors who may assert that "capable" is a vague term, which may lead to unintended disagreements between a utility and audit staff. 4. It's unclear whether NERC intends to modify PRC-028 if traditional non-BES IBR are added to NERC Standards pursuant to parallel analysis ongoing at NERC. Can the NERC SDT comment on how it will deal with IBR that connects at less than 100 kV or is less than 75 MVA, etc., i.e., non-traditional BES sources? 	
Likes 0	
Dislikes 0	
Response	
Wayne Sipperly - North American Generator Forum - 5 - MRO,WECC,Texas RE,NPCC,SERC,RF	
Answer	
Document Name	
Comment	
<p><i>The NAGF notes that PRC-002 uses a methodology/threshold for selecting BES buses that require Sequence of Events Recording (SER) and Fault Recording (FR) Data. The NAGF recommends that the Standard Drafting Team consider a similar approach for PRC-028, requiring the TO and RC to</i></p>	

Identify areas within their regions that are susceptible to disturbances (or high concentration of IBRs) that would benefit from monitoring and recording capabilities. This would mitigate the financial impact to the industry as a whole, and target the investment on the areas that need it most.

Likes 0

Dislikes 0

Response

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

Answer

Document Name

Comment

See comments submitted by the Edison Electrical Institute

Likes 0

Dislikes 0

Response

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

Answer

Document Name

Comment

EEl Comments on PRC-028-1:

Purpose Statement: EEI does not agree that the purpose statement for this Reliability Standard aligns with the intended scope of this project. To address this concern, we offer the following edits in boldface:

To have adequate data available from **a representative number of** inverter-based resources (IBR)/**Facilities** to facilitate **the analysis of IBR performance during** Bulk Electric System (BES) Disturbances.

Functional Entities: EEI does not agree with the Functional Entities as listed. We believe that PRC-028 should also include Reliability Coordinators (RC) in this list, noting that the SAR was never intended to require monitoring of IBRs at all locations. Instead, the SDT should develop a criteria for identifying where and when monitoring should be installed and the RC should be the entity that 1) utilizes that criteria to determine where monitoring is needed and 2) notifies owners of their obligations.

Applicability Section: EEI does not agree with the Applicability Section of Section 4.2 because it implies that inverter-based resources are to be included in the BES Definition, Inclusion I2. (See EEI comments for Question 1)

All Requirements: EEI does not agree that this project was intended to monitor all IBRs or IBR Facilities. The SAR states that the intent is to install DDR at some locations, not all locations. The SAR also stated that the requirements were to be balanced against costs which given the magnitude of the proposed requirements, it is difficult to see where costs were adequately balanced.

EEI recommends the SDT develop a criteria that can be used by RCs in assessing where disturbance monitoring should be installed to ensure BES performance is effectively analyzed during disturbances, particularly in areas of high IBR penetration.

Likes 0

Dislikes 0

Response

Michael Jones - National Grid USA - 1

Answer

Document Name

Comment

RE: Section C. Compliance: PRC-002-5 and PRC-028-1: Please consider updating section "1.3 Compliance Monitoring and Enforcement Program" with the most recent NERC wording for this section. Please consider removing section "1.4 Additional Compliance Information - None."

Likes 0

Dislikes 0

Response

Alison MacKellar - Constellation - 5

Answer

Document Name

Comment

Constellation does not have any additional comments.

Alison Mackellar on behalf of Constellation Segments 5 and 6

Likes 0

Dislikes 0

Response

Constantin Chitescu - Ontario Power Generation Inc. - 5

Answer

Document Name

Comment

OPG supports the NPCC RSC's comments.

Likes 0

Dislikes 0

Response

Charles Yeung - Southwest Power Pool, Inc. (RTO) - 2 - MRO,WECC, Group Name SRC 2023

Answer**Document Name****Comment**

The requirement to install recording devices to capture IBR performance data through PRC-028-1 should align as closely as possible with the implementation timeframe for the changes made to EOP-004 in Project No. 2023-01 (EOP-004 IBR Event Reporting). This will help ensure that the Events Analysis process has all pertinent data available to make more thorough assessments of IBR-related events.

The SRC believes that referencing just Part (b) of Inclusion I2 in Section 4.2 of the Applicability section of PRC-028-1 is unnecessary, as the language already limits applicability to IBRs and it would be inappropriate to exclude any individual IBRs with a gross individual nameplate rating greater than 20 MVA from the applicability of the standard. The SRC therefore recommends that Section 4.2 of the Applicability section of PRC-028-1 be modified as follows: "The following Elements associated with the inverter-based portion of generating plants/Facilities meeting the criteria set by Inclusion I2 or Inclusion I4 of the BES definition." The SRC has proposed a corresponding modification to the Applicability section of PRC-002-5 in its response to question 1, above. The SRC also recommends that the Applicability section of both standards be aligned with the IBR registration criteria that NERC is in the process of developing under FERC proceeding RD22-4-001.

Based on its review of the draft standards, the SRC is concerned that it is unlikely that transmission system buses in areas of high IBR penetration will be required to have disturbance monitoring and the SRC notes that this monitoring is critical to determining IBR performance on the power system. The Applicability of PRC-028-1 is limited to IBR Facilities, and the methodology in PRC-002-5 Attachment 1 appears to focus on identifying buses with higher fault current levels, which are unlikely to be located in areas with high IBR penetration. The SRC requests that the SDT confirm whether this is the intent of the standards and revise the standards appropriately if this is not the intent.

The SRC notes that PRC-028-1, Requirement 3, Parts 3.1.3, 3.2.3, and 3.3.3 require various forms of trigger settings but do not define associated trigger thresholds. The SRC is concerned that the absence of trigger thresholds will result in inadequate data collection and recommends that the standard be revised to establish default trigger thresholds that apply unless otherwise agreed by the Reliability Coordinator. One possible default threshold would be a requirement that data be captured whenever an IBR changes modes.

Regarding Requirement R7, Part 7.2, the SRC is concerned that allowing 30 calendar days for data to be provided will result in an unacceptably risky delay in the event analysis process. To address this issue, the SRC recommends that Part 7.2 be revised to require that data be provided as soon as possible, but no later than 7 calendar days after a request. PMUs can provide the same data and data storage capabilities this standard requires from

DDRs while also providing real-time reporting capability. We ask the project team to affirm PMUs as a means to provide the required data. If so, the performance requirements should not limit any viable option.

The SRC is concerned that Requirement R8 is inadequate to ensure availability of critical data. To address this issue, the SRC recommends that R8 be revised to require regular testing and maintenance of recording equipment and associated infrastructure or to provide that a failure to provide requested data is a violation of PRC-028-1 regardless of the cause of the failure to provide data.

Finally, the SRC recommends that the following revisions be made to PRC-028-1 to more closely align it with table 19 of IEEE 2800:

- Revise Requirement R2, Part 2.1 to require the following additional data points:

- o Bus frequency,
- o Calculated active and reactive power output, and
- o Applicable binary status (e.g., relay out codes).

- Revise Requirement R2, Part 2.2 to require the following additional data points at the plant level:

- o Bus frequency,
- o Calculated active and reactive power output, and
- o Applicable binary status (e.g., relay out codes).

- Revise Requirement R2, Part 2.3 to require bus frequency as an additional data point.

- Revise the total record length in Requirement R3, Parts 3.1.1, 3.2.1, and 3.3.1 from 2 seconds to 5 seconds.

- Revise Requirement R4, Part 4.2 to require the phase current AND the positive sequence current instead of only requiring one or the other.

- Revise Requirement R6, Part 6.2 to require data synchronization accuracy to 1 microsecond at the plant level and 100 microseconds at the unit level.

- Revise the data retention periods in Requirement R7, Part 7.1 to 90 days for SER and FR data and 1 year for DDR data.

- Align the SER data format in Attachment 1 with the format used in IEEE 2800 table 19 and with PRC-002 Attachment 2 by revising it to read as follows:

- o Date, Time, Local Time Code, Plant Substation, Device, State, Event type (status changes, synchronization status, configuration change, etc.), Sequence number (for potential overwriting).

- o The SRC notes that some breakers may be owned by the generator owner at the station beyond the first station.

- Revise Requirement R7, Part 7.4 to include a reference to IEEE revision C37.111-2013 or later.

Dislikes 0

Response

Casey Perry - PNM Resources - 1,3 - WECC,Texas RE

Answer

Document Name

Comment

PNMR is in support of EEI's comments for question 5.

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 for this question and adopts them as its own.

Likes 0

Dislikes 0

Response

Kimberly Turco - Constellation - 6

Answer

Document Name

Comment

Constellation does not have any additional comments.

Kimberly Turco on behalf of Constellation Segments 5 and 6

Likes 0

Dislikes 0

Response

Israel Perez (Proxy for Thomas Johnson) – Salt River Project

Questions:

1. Yes
2. Yes
3. No

PRC-028 -The data sampling rates seem excessive and are a significant increase from the requirements in PRC-002. These sampling rates will prevent the use of protective relaying to satisfy the standard, which will increase cost burden

4. Yes
5. Additional Comments

PRC-028 - If the point of 4.2.5 is to monitor the individual inverter performance prior to being summed into a collector system, I would consider mandating the last IBR on each feeder is monitored, rather than one of the IBR units in the last 10% of each feeder.