

Consideration of Comments

Project Name:	2021-04 Modifications to PRC-002 – Phase II Draft 2
Comment Period Start Date:	3/18/2024
Comment Period End Date:	4/11/2024
Associated Ballot(s):	2021-04 Modifications to PRC-002 – Phase II Implementation Plan AB 2 OT 2021-04 Modifications to PRC-002 – Phase II PRC-002-5 Non-Binding Poll AB 2 NB 2021-04 Modifications to PRC-002 – Phase II PRC-002-5 AB 2 ST 2021-04 Modifications to PRC-002 – Phase II PRC-028-1 Non-Binding Poll AB 2 NB 2021-04 Modifications to PRC-002 – Phase II PRC-028-1 AB 2 ST

There were 73 sets of responses, including comments from approximately 173 different people from approximately 115 companies representing 10 of the Industry Segments as shown in the table on the following pages.

All comments submitted can be reviewed in their original format on the [project page](#).

If you feel that your comment has been overlooked, let us know immediately. Our goal is to give every comment serious consideration in this process. If you feel there has been an error or omission, contact Vice President of Engineering and Standards, [Soo Jin Kim](#) (via email) or at (404) 446-9742.

Questions

1. Do you agree with the modification in “Applicability, Section 4.2. Facilities” in PRC-002-5 and PRC-028-1?
2. Do you agree the modifications made in PRC-002-5 and new Standard PRC-028-1 are cost effective?
3. Do you agree with the Implementation Plan for revised PRC-002-5 and new Standard PRC-028-1?
4. Do you agree with introduction of Requirement R9 in PRC-028-1 requiring Entities of an applicable facility that is in commercial operation before the effective date of this standard that is not able to install disturbance monitoring equipment in accordance with Requirements R1 through R7 in the time provided for compliance to develop, maintain, and implement a Corrective Action Plan?
5. Provide any additional comments for the standard drafting team to consider, if desired.

The Industry Segments are:

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

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
MRO	Anna Martinson	1,2,3,4,5,6	MRO	MRO Group	Shonda McCain	Omaha Public Power District (OPPD)	1,3,5,6	MRO
					Michael Brytowski	Great River Energy	1,3,5,6	MRO
					Jamison Cawley	Nebraska Public Power District	1,3,5	MRO
					Jay Sethi	Manitoba Hydro (MH)	1,3,5,6	MRO
					Husam Al-Hadidi	Manitoba Hydro (System Performance)	1,3,5,6	MRO
					Kimberly Bentley	Western Area Power Administration	1,6	MRO

					Jaimin Patal	Saskatchewan Power Corporation (SPC)	1	MRO
					George Brown	Pattern Operators LP	5	MRO
					Larry Heckert	Alliant Energy (ALTE)	4	MRO
					Terry Harbour	MidAmerican Energy Company (MEC)	1,3	MRO
					Dane Rogers	Oklahoma Gas and Electric (OG&E)	1,3,5,6	MRO
					Seth Shoemaker	Muscatine Power & Water	1,3,5,6	MRO
					Michael Ayotte	ITC Holdings	1	MRO
					Andrew Coffelt	Board of Public Utilities- Kansas (BPU)	1,3,5,6	MRO
					Peter Brown	Invenergy	5,6	MRO
					Angela Wheat	Southwestern Power Administration	1	MRO
					Bobbi Welch	Midcontinent ISO, Inc.	2	MRO
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
Southern Company - Alabama Power Company	Colby Galloway	1,3,5,6	MRO,RF,SERC,Texas RE,WECC	Southern Company	Matt Carden	Southern Company - Southern Company Services, Inc.	1	SERC
					Joel Dembowski	Southern Company - Alabama Power Company	3	SERC
					Ron Carlsen	Southern Company - Southern Company Generation	6	SERC
					Leslie Burke	Southern Company - Southern Company Generation	5	SERC
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
					Kris Carper	Arizona Electric Power Cooperative, Inc.	2	WECC

					Jason Proconiar	Buckeye Power, Inc.	4	RF
					Nick Fogleman	Prairie Power, Inc.	1,3	SERC
					Kevin Lyons	Central Iowa Power Cooperative	1	MRO
					Scott Berry	Wabash Valley Power Association	3	RF
					Amber Skillern	East Kentucky Power Cooperative	1	SERC
					Jasmine Morris	Southern Maryland Electric Cooperative	3	RF
Eversource Energy	Joshua London	1,3		Eversource	Joshua London	Eversource Energy	1	NPCC
					Vicki O'Leary	Eversource Energy	3	NPCC
Electric Reliability Council of Texas, Inc.	Kennedy Meier	2		ISO/RTO Council Standards Review Committee (SRC)	Darcy O'Connell	California ISO	2	WECC
					Kennedy Meier	Electric Reliability Council of Texas, Inc.	2	Texas RE
					Joshua Phillips	Southwest Power Pool, Inc. (RTO)	2	MRO
					Helen Lainis	Independent Electricity System Operator	2	NPCC

					John Pearson	ISO New England, Inc.	2	NPCC
					Bobbi Welch	Midcontinent ISO, Inc.	2	RF
					Gregory Campoli	New York Independent System Operator	2	NPCC
					Thomas Foster	PJM Interconnection, L.L.C.	2	RF
FirstEnergy - FirstEnergy Corporation	Mark Garza	4		FE Voter	Julie Severino	FirstEnergy - FirstEnergy Corporation	1	RF
					Aaron Ghodooshim	FirstEnergy - FirstEnergy Corporation	3	RF
					Robert Loy	FirstEnergy - FirstEnergy Solutions	5	RF
					Mark Garza	FirstEnergy-FirstEnergy	1,3,4,5,6	RF
					Stacey Sheehan	FirstEnergy - FirstEnergy Corporation	6	RF
Michael Johnson	Michael Johnson		WECC	PG&E All Segments	Marco Rios	Pacific Gas and Electric Company	1	WECC

					Sandra Ellis	Pacific Gas and Electric Company	3	WECC
					Tyler Brun	Pacific Gas and Electric Company	5	WECC
Black Hills Corporation	Rachel Schuldt	6		Black Hills Corporation - All Segments	Micah Runner	Black Hills Corporation	1	WECC
					Josh Combs	Black Hills Corporation	3	WECC
					Rachel Schuldt	Black Hills Corporation	6	WECC
					Carly Miller	Black Hills Corporation	5	WECC
					Sheila Suurmeier	Black Hills Corporation	5	WECC
Northeast Power Coordinating Council	Ruida Shu	1,2,3,4,5,6,7,8,9,10	NPCC	NPCC RSC	Gerry Dunbar	Northeast Power Coordinating Council	10	NPCC
					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
Elevate Energy Consulting	Ryan Quint	NA - Not Applicable	NA - Not Applicable	Elevate Energy Consulting	Ryan Quint	Elevate Energy Consulting		NA - Not Applicable
					N/A	N/A		NA - Not Applicable
Ryan Strom	Ryan Strom		RF	Buckeye Power Group	Carl Spaetzel	Buckeye Power, Inc.	3	RF
					Jason Proconiar	Buckeye Power, Inc.	4	RF
					Kevin Zemanek	Buckeye Power, Inc.	5	RF
Dominion - Dominion Resources, Inc.	Sean Bodkin	6		Dominion	Connie Lowe	Dominion - Dominion Resources, Inc.	3	NA - Not Applicable
					Lou Oberski	Dominion - Dominion Resources, Inc.	5	NA - Not Applicable
					Larry Nash	Dominion - Dominion Virginia Power	1	NA - Not Applicable
					Rachel Snead	Dominion - Dominion Resources, Inc.	5	NA - Not Applicable
Stephen Whaite	Stephen Whaite		RF	ReliabilityFirst Ballot Body	Lindsey Mannion	ReliabilityFirst	10	RF

				Member and Proxies	Stephen Whaite	ReliabilityFirst	10	RF
Western Electricity Coordinating Council	Steven Rueckert	10		WECC Entity Monitoring	Steve Rueckert	WECC	10	WECC
					Curtis Crews	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

1. Do you agree with the modification in “Applicability, Section 4.2. Facilities” in PRC-002-5 and PRC-028-1?	
Ryan Quint - Elevate Energy Consulting - NA - Not Applicable - NA - Not Applicable, Group Name Elevate Energy Consulting	
Answer	No
Document Name	
Comment	
<p>The applicability section of PRC-028-1 uses “BES” and then “Non-BES” and it is unclear why the SDT could not simply say Registered IBR, since the section is essentially duplicating the definition of Registered IBR pursuant to the changes in the ROP. Furthermore, the language does not appear to exactly match those changes and uses the phrase “that either have or contribute to an aggregate...” which seems vague. Therefore, we recommend developing a more straightforward and effective approach to defining this applicability rather than slightly modifying and using redundant language as compared to the ROP.</p>	
Likes	0
Dislikes	0
Response	
<p>Thank you for your comment. The phrase “that either have or contribute to an aggregate...” came directly from the latest version of the NERC ROP registration criteria for GO/GOP approved by the NERC Board of Trustees (Board) in February and filed with FERC on March 19, 2024. However, the language used in the Applicability section of the next draft has been revised. It will not include any in progress definitions or the non-BES IBRs affected by the Rules of Procedure revision process.</p>	
Andy Thomas - Duke Energy - 1,3,5,6 - SERC,RF	
Answer	No
Document Name	
Comment	
<p>Duke Energy supports and recommends implementation of EEI provided comments.</p>	

Additionally, Duke Energy recommends changing PRC-028-1 Applicability - 4.2 from "a voltage greater than or equal to 60 kV" to "a voltage greater than or equal to 40 kV" to capture a larger aggregate of resources.

Likes 0

Dislikes 0

Response

Thank you for your comments. The applicability was based on the latest version of the NERC Rules of Procedure (ROP) registration criteria for GO/GOP, and the intent was to include registered IBRs. IBRs connected at 40kV do not meet that registration threshold. However, the language used in the Applicability section of the next draft has been revised. It will not include any in progress definitions or the non-BES IBRs affected by the ROP revision process. See also response to EEI comments.

Robert Follini - Avista - Avista Corporation – 3

Answer No

Document Name

Comment

No objection to the applicability for PRC-002-5. However the language for PRC-028-1 the scope of what is applicable and what isnt for IBRs needs clarification. Also, the PRC-028 defines IBR which isn't in the NERC Glossary of Terms. It would be preferable to have this term defined before use in the PRC-028 standard.

Likes 0

Dislikes 0

Response

Thank you for your comments. The Applicability section has been edited and reformatted for clarity in the next draft, and the language used will not include any in progress definitions or the non-BES IBRs affected by the Rules of Procedure revision process.

Glen Farmer - Avista - Avista Corporation – 5

Answer No

Document Name	
Comment	
No objection to the applicability for PRC-002-5. However the language for PRC-028-1 the scope of what is applicable and what isn't for IBRs needs clarification. Also, the PRC-028 defines IBR which isn't in the NERC Glossary of Terms. It would be preferable to have this term defined before use in the PRC-028 standard.	
Likes 0	
Dislikes 0	
Response	
Thank you for your comments. The Applicability section has been edited and reformatted for clarity in the next draft, and the language used will not include any in progress definitions or the non-BES IBRs affected by the Rules of Procedure revision process.	
Patricia Lynch - NRG - NRG Energy, Inc. - 5,6	
Answer	No
Document Name	
Comment	
NRG agrees with NAGF's comments concerning applicability language. The language proposed for applicability to PRC-002 is acceptable but not with regards to language proposed for PRC-028. NRG supports NAGF's comments that this needs to " <i>align with the pending NERC Glossary of Terms GO/GOP definition revisions</i> ".	
Likes 0	
Dislikes 0	
Response	
Thank you. Please see response to NAGF comments.	
Marcus Bortman - APS - Arizona Public Service Co. – 6	

Answer	No
Document Name	
Comment	
<p>AZPS supports the proposed language contained in the Applicability section for PRC-002-5. However, we do not support the proposed language contained in the Applicability section of PRC-028-1 because the phrase “The Elements associated with” is too broad and subjective. AZPS would support the language if that phrase was removed.</p>	
Likes	0
Dislikes	0
Response	
<p>Thank you for your comment. The SDT has removed “The Elements associated with” from the Applicability section of the next draft of PRC-028.</p>	
Ben Hammer - Western Area Power Administration – 1	
Answer	No
Document Name	
Comment	
<p>For PRC-002, yes. For PRC-028, no. There is no filtering or high impact assessment of the wide-open applicability scope of the facilities in Section 4.2 as there is in PRC-002 for synchronous units. Some engineering assessment is needed to determine which subset of IBR facilities may be the critical sites based on location, vendor susceptibility to trouble, or some other valid criterion rather than requiring every site to install DME.</p>	
Likes	0
Dislikes	0
Response	

Thank you for your comment. This SDT has been tasked not only with making sure data is available to analyze IBR response to BES disturbances similar to what PRC-002 does for synchronous machines, but also with ensuring disturbance data is available to evaluate IBR performance and validate IBR models per FERC Order 901. The requirements of the two standards cannot be directly compared.

Ryan Strom - Ryan Strom On Behalf of: Jason Procuinar, Buckeye Power, Inc., 4, 5, 3; Kevin Zemanek, Buckeye Power, Inc., 4, 5, 3; Tom Schmidt, Buckeye Power, Inc., 4, 5, 3; - Ryan Strom, Group Name Buckeye Power Group

Answer	No
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Document Name	
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Comment

Buckeye Power supports the comments made by ACES:

We at ACES appreciate the efforts of the SDT to deal with the nebulous topic that is IBRs. It is certainly a difficult task to create a new Reliability Standard and carefully craft the language thereof. We see no issue with the update to Section 4.2 of PRC-002-5 draft 2 and in fact appreciate the SDT's conciseness in this area. However, we do have several concerns with Section 4 of PRC-0028-1 draft 2. It is our opinion that taking a blanket approach for TOs with respect to non-BES IBRs creates confusion, is not in line with the latest revisions to the NERC Rules of Procedure, and represents an unreasonable level of compliance scope creep.

It is our opinion that requiring the TO to install monitoring equipment on non-BES Elements is contradictory to the scope of the TO in the NERC Rules of Procedure. We believe that the role of the TO should be limited to Facilities as defined in the NERC Glossary of Terms (i.e., BES only).

As stated in the Technical Rationale, "It is not common for Transmission Owner to own the main power transformer and/or portions of collector system associated with an IBR generating facility." As this is an uncommon occurrence, we do not believe that exceeding the scope of the TO's registration represents any significant reduction in risk to the BES. Therefore, we recommend modifying Section 4 of PRC-028-1 as follows:

4. Applicability:

4.1 Functional Entities:

4.1.1 Transmission Owner that owns equipment as identified in section 4.2.1.

4.1.2 Generator Owner that owns equipment identified in section 4.2.

4.2 Facilities:

4.2.1 Elements associated with a BES Inverter-Based Resource(s)

4.2.2 Elements associated with a non-BES Inverter-Based Resource(s) that is:

4.2.2.1 Connected to the Bulk Power System, and
 4.2.2.2 Meets the criteria for a Category 2 GO facility.

Likes 0

Dislikes 0

Response

Thank you. Please see the response to ACES comments.

Kimberly Turco - Constellation – 6

Answer No

Document Name

Comment

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

Kimberly Turco on behalf of Constellation Segments 5 and 6

Likes 0

Dislikes 0

Response

Thank you for your comment. The language used in the Applicability section of the next draft has been revised. It will not include any in progress definitions or the non-BES IBRs affected by the Rules of Procedure revision process.

Rachel Schuldt - Black Hills Corporation - 6, Group Name Black Hills Corporation - All Segments

Answer No

Document Name	
Comment	
<p>Black Hills Corporation agrees with NAGF comments. NAGF supports the “Applicability, Section 4.2. Facilities” language proposed for PRC-002-5. The NAGF does not support the “Applicability, Section 4.2. Facilities” language proposed for PRC-028-1. The NAGF notes that the language for PRC-028-1 needs to align with the pending NERC Glossary of Terms GO/GOP definition revisions and therefore, recommend that the PRC-028-1 “Applicability, Section 4.2. Facilities” language be revised as follows:</p> <p>“4.1.1. Transmission Owner that owns equipment as identified in Facilities section</p> <p>4.1.2. Generator Owner that owns equipment as identified in Facilities section</p> <p>Facilities: The Elements associated with (1) BES Inverter-Based Resources; (2) – to be defined and align with the pending NERC Glossary of Terms GO/GOP definition revisions.”</p> <p>Additionally, Black Hills Corporation agrees with the following comment from EEI:</p> <p>IBR & Unit IBR Definitions:</p> <p>The IBR and IBR Unit definitions should be removed from PRC-002 and PRC-028 because the associated SAR does not provide this SDT with the authority to develop or adopt a definition that is currently unapproved. Moreover, once these definitions are approved and added to the Glossary of Terms there will be no need for inclusion of the definitions within these Reliability Standards.</p>	
Likes	0
Dislikes	0
Response	
Thank you. Please see responses to NAGF & EEI comments.	
Donna Wood - Tri-State G and T Association, Inc. – 1	
Answer	No
Document Name	

Comment

Tri-State agrees with MRO Comments.

Likes 0

Dislikes 0

Response

Thank you. Please see responses to MRO Comments.

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

Answer No

Document Name

Comment

AEPC has signed on to ACES comments:

We at ACES appreciate the efforts of the SDT to deal with the nebulous topic that is IBRs. It is certainly a difficult task to create a new Reliability Standard and carefully craft the language thereof. We see no issue with the update to Section 4.2 of PRC-002-5 draft 2 and in fact appreciate the SDT’s conciseness in this area. However, we do have several concerns with Section 4 of PRC-0028-1 draft 2. It is our opinion that taking a blanket approach for TOs with respect to non-BES IBRs creates confusion, is not in line with the latest revisions to the NERC Rules of Procedure, and represents an unreasonable level of compliance scope creep.

It is our opinion that requiring the TO to install monitoring equipment on non-BES Elements is contradictory to the scope of the TO in the NERC Rules of Procedure. We believe that the role of the TO should be limited to Facilities as defined in the NERC Glossary of Terms (i.e., BES only).

As stated in the Technical Rationale, “It is not common for Transmission Owner to own the main power transformer and/or portions of collector system associated with an IBR generating facility.” As this is an uncommon occurrence, we do not believe that exceeding the scope of the TO’s registration represents any significant reduction in risk to the BES. Therefore, we recommend modifying Section 4 of PRC-028-1 as follows:

4. Applicability:

4.1 Functional Entities:

4.1.1 Transmission Owner that owns equipment as identified in section 4.2.1.

4.1.2 Generator Owner that owns equipment identified in section 4.2.

4.2 Facilities:

4.2.1 Elements associated with a BES Inverter-Based Resource(s)

4.2.2 Elements associated with an non-BES Inverter-Based Resource(s) that is:

4.2.2.1 Connected to the Bulk Power System, and

4.2.1.14.2.2.2 Meets the criteria for a Category 2 GO facility.

Likes 0

Dislikes 0

Response

Thank you. Please see responses to ACES comments.

Anna Martinson - MRO - 1,2,3,4,5,6 - MRO, Group Name MRO Group

Answer

No

Document Name

Comment

For PRC-002, yes. For PRC-028, no. There is no filtering or high impact assessment of the wide-open applicability scope of the facilities in Section 4.2 as there is in PRC-002 for synchronous units. Some engineering assessment is needed to determine which subset of IBR facilities may be the critical sites based on location, vendor susceptibility to trouble, or some other valid criterion rather than requiring every site to install DME.

Likes 1	Lincoln Electric System, 1, Johnson Josh
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Dislikes 0	
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Response

Thank you for your comment. This SDT has been tasked not only with making sure data is available to analyze IBR response to BES disturbances similar to what PRC-002 does for synchronous machines, but also with ensuring disturbance data is available to evaluate IBR performance and validate IBR models per FERC Order 901. The requirements of the two standards cannot be directly compared.

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

Answer	No
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Document Name	
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Comment

WEC Energy Group supports the comments of both the MRO NSRF and the NAGF.

Likes 0	
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Dislikes 0	
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Response

Thank you. Please see responses to MRO NSRF and NAGF comments.

Alison MacKellar - Constellation – 5

Answer	No
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Document Name	
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Comment

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

Alison Mackellar on behalf of Constellation Segments 5 and 6

Likes 0

Dislikes 0

Response

Thank you for your comment. The language used in the Applicability section of the next draft has been revised. It will not include any in progress definitions or the non-BES IBRs affected by the Rules of Procedure revision process.

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

Answer

No

Document Name

Comment

Evergy supports and incorporates by reference the comments of the Edison Electric Institute (EEI), the MRO NSRF, and the NAGF for question #1.

Likes 0

Dislikes 0

Response

Thank you. Please see responses to EEI, MRO NSRF, and NAGF comments.

Brad Harris - CenterPoint Energy Houston Electric, LLC - 1 - Texas RE

Answer	No
Document Name	
Comment	
No, CenterPoint Energy Houston Electric, LLC (CEHE) supports Edison Electric Institute (EEI) comments submitted for question 1.	
Likes 0	
Dislikes 0	
Response	
Thank you. Please see response to EEI comments.	
Daniel Gacek - Exelon – 1	
Answer	No
Document Name	
Comment	
Exelon supports the comments submitted by the EEI for this question.	
Additionally, PRC-028, Section 4.2 the wording should be modified to define equal to or greater than 20MVA (and/or?) connected to a common point equal to or greater than 60kV. The proposed wording is ambiguous.	
Likes 0	
Dislikes 0	
Response	
Thank you for your comment. The language used in the Applicability section of the next draft has been revised and will not include the non-BES IBRs affected by the Rules of Procedure revision process. Also, see response to EEI comments.	
Colby Galloway - Southern Company - Alabama Power Company - 1,3,5,6 - SERC, Group Name Southern Company	

Answer	No
Document Name	
Comment	
<p>Southern Company is in agreement with EEI and does not support the language contained in the Applicability section of PRC-028-1 because the phrase “The Elements associated with” is too broad and subjective. To address this concern, we suggest deleting that phrase (see below).</p> <p>Facilities: [<i>The Elements associated with</i>] REMOVE... (1) BES Inverter-Based Resources; and (2) Non-BES Inverter Based Resources (IBRs) that either have or contribute to an aggregate nameplate capacity of greater than or equal to 20 MVA, connected through a system designed primarily for delivering such capacity to a common point of connection at a voltage greater than or equal to 60 kV.</p> <p>In addition, Southern Company recommends the applicability section in PRC-028, should include a clause for filtering or high impact assessment of the wide-open applicability scope of the facilities in Section 4.2 as there is in PRC-002 for synchronous units. Engineering assessment is needed to determine which subset of IBR facilities may be the critical sites based on location, vendor susceptibility to trouble, or some other valid criterion (risk-based approach) rather than requiring every site to install DME.</p> <p>Southern agrees with the Applicability changes proposed in PRC-002-5.</p>	
Likes	0
Dislikes	0
Response	
<p>Thank you for your comments. The SDT has removed “The Elements associated with” from the Applicability section of the next draft of PRC-028. The purpose and requirements of PRC-002 and PRC-028 cannot be directly compared. This SDT has been tasked not only with making sure data is available to analyze IBR response to BES disturbances similar to what PRC-002 does for synchronous machines, but also ensuring disturbance data is available to evaluate IBR performance and validate IBR models per FERC Order 901. Also, see response to EEI comments.</p>	
Leslie Hamby - Southern Indiana Gas and Electric Co. - 3,5,6 - RF	
Answer	No
Document Name	
Comment	

Southern Indiana Gas & Electric, Company (SIGE) supports Edison Electric Institute (EEl) comments submitted for question 1.	
Likes	0
Dislikes	0
Response	
Thank you. See the response to EEl comments.	
Stephanie Kenny - Edison International - Southern California Edison Company - 6	
Answer	No
Document Name	
Comment	
<p>EEl does not object to the proposed language contained in the Applicability section for PRC-002-5, however, we do not support the language contained in the Applicability section of PRC-028-1 because the phrase “The Elements associated with” is too broad and subjective. To address this concern, we suggest deleting that phrase (see below).</p> <p>Facilities: The Elements associated with (1) BES Inverter-Based Resources; and (2) Non-BES Inverter Based Resources (IBRs) that either have or contribute to an aggregate nameplate capacity of greater than or equal to 20 MVA, connected through a system designed primarily for delivering such capacity to a common point of connection at a voltage greater than or equal to 60 kV.</p>	
Likes	0
Dislikes	0
Response	
Thank you for your comments. The SDT has removed “The Elements associated with” from the Applicability section of the next draft of PRC-028.	

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 agrees with the changes to PRC-002 which explicitly exclude IBRs from the standard. PG&E does not agree with the changes to PRC-028-1 Applicability, Section 4.2 Facilities. PG&E concurs with the EEI comments which indicated they do not agree with the proposed language contained in the Applicability section of PRC-028-1 for the following reasons:

- 1 - Given the voltage identified with Non-BES IBRs, DPs should be added to the Functional Entities section.
- 2 - Applying the phrase all Elements to non-BES IBR units is too broad and subjective for use with these resources.
- 3 - Clarity is needed as to what is and is not in scope for IBR resources.

Likes 0

Dislikes 0

Response

Thank you for your comments. See the response to EEI comments.

- 1 – The language used in the Applicability section of the next draft has been revised and will not include the non-BES IBRs affected by the Rules of Procedure revision process.
- 2 – PRC-028 does not use the phrase “all Elements”, but the phrase “The Elements associated with” has been removed from the Applicability section of the next draft of the standard.
- 3 – The Applicability section has been edited and reformatted for clarity in the next draft, and the language used will not include any in progress definitions or the non-BES IBRs affected by the Rules of Procedure revision process.

Kinte Whitehead - Exelon - 3

Answer	No
Document Name	
Comment	
<p>Exelon supports the comments submitted by the EEI for this question.</p> <p>Additionally, PRC-028, Section 4.2 the wording should be modified to define equal to or greater than 20MVA (and/or?) connected to a common point equal to or greater than 60kV. The proposed wording is ambiguous.</p>	
Likes 0	
Dislikes 0	
Response	
<p>Thank you for your comments. The language used in the Applicability section of the next draft has been revised and will not include the non-BES IBRs affected by the Rules of Procedure revision process. Also, see response to EEI comments.</p>	
Scott Langston - Tallahassee Electric (City of Tallahassee, FL) - 1	
Answer	No
Document Name	
Comment	
<p>The threshold of 20MW seems low and would create additional burden on the utilities to have to install all the equipment to monitor what is being required.</p>	
Likes 0	
Dislikes 0	
Response	
<p>Thank you for your comment. The language used in the Applicability section of the next draft has been revised. It will not include the non-BES IBRs affected by the Rules of Procedure revision process.</p>	

Lori Frisk - Lori Frisk On Behalf of: Hillary Creurer, Allete - Minnesota Power, Inc., 1; - Lori Frisk	
Answer	No
Document Name	
Comment	
Minnesota Power supports MRO NERC Standards Review Forum’s (NSRF) comments.	
Likes 0	
Dislikes 0	
Response	
Thank you. See the response to the MRO NSRF comments.	
Megan Melham - Decatur Energy Center LLC - 5	
Answer	No
Document Name	
Comment	
Capital Power supports the comments submitted by NAGF.	
Capital Power does not agree with the modification in “Applicability, Section 4.2. Facilities” for PRC-028-1. The language for PRC-028-1 needs to align with the pending NERC Glossary of Terms GO/GOP definition revisions. Capital Power recommends that the PRC-028-1 “Applicability, Section 4.2. Facilities” language be revised as follows:	
4.1.1. Transmission Owner that owns equipment as identified in Facilities section	
4.1.2. Generator Owner that owns equipment as identified in Facilities section	
Facilities: The Elements associated with (1) BES Inverter-Based Resources; (2) to be defined and align with the pending NERC Glossary of Terms GO/GOP definition revisions.	
Capital Power agrees with the modification in “Applicability, Section 4.2. Facilities” for PRC-002-5.	

Likes 0	
Dislikes 0	
Response	
Thank you for your comments. The language used in the Applicability section of the next draft has been revised. It will not include any in progress definitions or the non-BES IBRs affected by the Rules of Procedure revision process. Also see response to NAGF comments.	
Dwanique Spiller - Berkshire Hathaway - NV Energy - 5	
Answer	No
Document Name	
Comment	
For PRC-002, yes. For PRC-028, no. There is no filtering or high impact assessment of the wide-open applicability scope of the facilities in Section 4.2 as there is in PRC-002 for synchronous units. Some engineering assessment is needed to determine which subset of IBR facilities may be the critical sites based on location, vendor susceptibility to trouble, or some other valid criterion rather than requiring every site to install DME.	
Likes 0	
Dislikes 0	
Response	
Thank you for your comment. This SDT has been tasked not only with making sure data is available to analyze IBR response to BES disturbances similar to what PRC-002 does for synchronous machines, but also with ensuring disturbance data is available to evaluate IBR performance and validate IBR models per FERC Order 901. The requirements of the two standards cannot be directly compared.	
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

We at ACES appreciate the efforts of the SDT to deal with the nebulous topic that is IBRs. It is certainly a difficult task to create a new Reliability Standard and carefully craft the language thereof. We see no issue with the update to Section 4.2 of PRC-002-5 draft 2 and in fact appreciate the SDT's conciseness in this area. However, we do have several concerns with Section 4 of PRC-0028-1 draft 2. It is our opinion that taking a blanket approach for TOs with respect to non-BES IBRs creates confusion, is not in line with the latest revisions to the NERC Rules of Procedure, and represents an unreasonable level of compliance scope creep.

It is our opinion that requiring the TO to install monitoring equipment on non-BES Elements is contradictory to the scope of the TO in the NERC Rules of Procedure. We believe that the role of the TO should be limited to Facilities as defined in the NERC Glossary of Terms (i.e., BES only).

As stated in the Technical Rationale, "It is not common for Transmission Owner to own the main power transformer and/or portions of collector system associated with an IBR generating facility." As this is an uncommon occurrence, we do not believe that exceeding the scope of the TO's registration represents any significant reduction in risk to the BES. Therefore, we recommend modifying Section 4 of PRC-028-1 as follows:

- 4. Applicability:
 - 4.1 Functional Entities:
 - 4.1.1 Transmission Owner that owns equipment as identified in section 4.2.1.
 - 4.1.2 Either of the following Generator Owner types that owns equipment identified in section 4.2.:
 - 4.1.1.1 Category 1 Generator Owner
 - 4.1.1.1 Category 2 Generator Owner
 - 4.2 Facilities: Elements associated with either of the following facility types:
 - 4.2.1 Elements associated with a BES Inverter-Based Resource(s) connected to the Bulk Electric System

4.2.2 Elements associated with an non-BES Inverter-Based Resource(s) that is:

4.2.2.1 cConnected to the Bulk Power System, that and

4.2.2.2 mMeets the criteria for a Category 2 GO facility.

Likes 0

Dislikes 0

Response

Thank you for your comments. The language used in the Applicability section of the next draft has been revised and will not include the non-BES IBRs affected by the Rules of Procedure revision process.

Lindsay Wickizer - Berkshire Hathaway - PacifiCorp - 6

Answer No

Document Name

Comment

For PRC-002, yes. For PRC-028, no. There is no filtering or high impact assessment of the wide-open applicability scope of the facilities in Section 4.2 as there is in PRC-002 for synchronous units. Some engineering assessment is needed to determine which subset of IBR facilities may be the critical sites based on location, vendor susceptibility to trouble, or some other valid criterion rather than requiring every site to install DME.

Likes 0

Dislikes 0

Response

Thank you for your comment. This SDT has been tasked not only with making sure data is available to analyze IBR response to BES disturbances similar to what PRC-002 does for synchronous machines, but also with ensuring disturbance data is available to evaluate IBR performance and validate IBR models per FERC Order 901. The requirements of the two standards cannot be directly compared.

Kennedy Meier - Electric Reliability Council of Texas, Inc. - 2, Group Name ISO/RTO Council Standards Review Committee (SRC)

Answer	No
Document Name	
Comment	
<p>The ISO/RTO Council (IRC) Standards Review Committee (SRC) asks the SDT to clarify Figure 1 in the PRC-002-5 Technical Rationale (page 2) to ensure adequate data is available to facilitate analysis of Bulk Electric System (BES) Disturbances. Currently, the title for Figure 1: “Example to Clarify Applicability of PRC-002 Versus PRC-028” uses the word “versus” which seems to denote only one or the other standard is applicable. Therefore, the SRC asks the SDT to clarify Figure 1 and the supporting text to clearly indicate that data relative to breaker #3 is subject to both PRC-002-5 and PRC-028-1. This will serve to illustrate that Facilities that are part of protection schemes that overlap with Facilities covered by PRC-028-1 are not automatically excluded from PRC-002 applicability.</p>	
Likes	0
Dislikes	0
Response	
<p>Thank you for your comment. The intent of Figure 1 in the PRC-002-5 Technical Rationale is to illustrate that breaker 3 <i>is only</i> applicable to PRC-028 as an element associated with a registered IBR. This SDT has been careful to avoid setting up a situation of double jeopardy for registered entities with PRC-002 and PRC-028.</p>	
Patricia Ireland - DTE Energy - 4	
Answer	No
Document Name	
Comment	
<p>For PRC-028 section 4.2: 20 MVA is too low of a diminimus. With this facility definition, implementation of this standard will be unduly burdensome</p>	
Likes	0
Dislikes	0

Response

Thank you for your comment. The language used in the Applicability section of the next draft has been revised and will not include the non-BES IBRs affected by the Rules of Procedure revision process.

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

Answer No

Document Name

Comment

EI does not object to the proposed language contained in the Applicability section for PRC-002-5, however, we do not support the language contained in the Applicability section of PRC-028-1 because the phrase “The Elements associated with” is too broad and subjective. To address this concern, we suggest deleting that phrase (see below).

Facilities: (1) BES Inverter-Based Resources; and (2) Non-BES Inverter Based Resources (IBRs) that either have or contribute to an aggregate nameplate capacity of greater than or equal to 20 MVA, connected through a system designed primarily for delivering such capacity to a common point of connection at a voltage greater than or equal to 60 kV.

Likes 0

Dislikes 0

Response

Thank you for your comment. The phrase “The Elements associated with” has been deleted from the next draft of PRC-028.

Colin Chilcoat - Invenergy LLC - 5,6

Answer No

Document Name

Comment

The Applicability section would benefit from simplification and alignment with the other IBR-focused standards in development. As currently drafted, PRC-028-1, PRC-029-1, and PRC-030-1 all use different language to describe the same applicable Facilities.

Likes 0

Dislikes 0

Response

Thank you for your comments. The language used in the Applicability section of the next draft has been revised. It will not include any in progress definitions or the non-BES IBRs affected by the Rules of Procedure revision process. The other standards referenced in your comment will likely follow similar format in upcoming revisions.

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

Answer No

Document Name

Comment

The NAGF supports the “Applicability, Section 4.2. Facilities” language proposed for PRC-002-5. The NAGF does not support the “Applicability, Section 4.2. Facilities” language proposed for PRC-028-1. The NAGF notes that the language for PRC-028-1 needs to align with the pending NERC Glossary of Terms GO/GOP definition revisions and therefore, recommend that the PRC-028-1 “Applicability, Section 4.2. Facilities” language be revised as follows:

“4.1.1. Transmission Owner that owns equipment as identified in Facilities section

4.1.2. Generator Owner that owns equipment as identified in Facilities section

Facilities: *The Elements associated with (1) BES Inverter-Based Resources; (2) – to be defined and align with the pending NERC Glossary of Terms GO/GOP definition revisions.”*

Likes 0

Dislikes 0

Response

Thank you for your comment. The language used in the Applicability section of the next draft has been revised. It will not include any in progress definitions or the non-BES IBRs affected by the Rules of Procedure revision process.

Mike Magruder - Avista - Avista Corporation - 1

Answer

No

Document Name

Comment

No objection to the applicability for PRC-002-5. However, in the language for PRC-028-1 the scope of what is applicable and what isn't for IBRs needs clarification. Also, the PRC-028 defines IBR which isn't in the NERC Glossary of Terms. It would be preferable to have this term defined before use in the PRC-028 standard.

Likes 0

Dislikes 0

Response

Thank you for your comments. The Applicability section has been edited and reformatted for clarity in the next draft, and the language used will not include any in progress definitions or the non-BES IBRs affected by the Rules of Procedure revision process.

Rhonda Jones - Invenergy LLC - 5,6

Answer

No

Document Name

Comment

The Applicability section would benefit from simplification and alignment with the other IBR-focused standards in development. As currently drafted, PRC-028-1, PRC-029-1, and PRC-030-1 all use different language to describe the same applicable Facilities.

Likes 0

Dislikes	0
Response	
Thank you for your comments. The language used in the Applicability section of the next draft has been revised. It will not include any in progress definitions or the non-BES IBRs affected by the Rules of Procedure revision process. The other standards referenced in your comment will likely follow similar format in upcoming revisions.	
Mark Garza - FirstEnergy - FirstEnergy Corporation - 4, Group Name FE Voter	
Answer	Yes
Document Name	
Comment	
No additional comments.	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
Sean Steffensen - IDACORP - Idaho Power Company - 1	
Answer	Yes
Document Name	
Comment	
If there is a small IBR resource (<20MVA) that is connected on a collector system that connects into a >=60kV system, it wouldn't fall under PRC-028. If a few years later a separate entity connects another IBR-based resource on that same system that brings the aggregate MVA above the threshold of 20MVA, how would the original GO know that they now fall under the PRC-028 standard?	

Similarly, if there are multiple separate entities sharing a common point of interconnect on a $\geq 60\text{kV}$ system and they each contribute to a $\geq 20\text{MVA}$ aggregate, is it the expectation that each of these GOs be familiar enough with the surrounding system and generation resources to know that they fall under the requirements of this new standard?

Specific to PRC-028-1 R2.1., if fault recording data is measured on the high-side of the main power transformer, current injected by the inverters may be swamped out by ground current from the main power transformer for ground faults on the transmission system if the main power transformer is configured to be a ground source for transmission faults. This has been observed at IBR plants connected to Idaho Power’s system. If the goal is to record plant-level current injected by the inverters, we recommend changing R2.1 to obtain FR data at the low-side of the main power transformer.

These are all challenges that could develop, if not addressed.

Likes 0

Dislikes 0

Response

Thank you for your support and your comments. Your first two questions are outside the scope of this SDT and would be better addressed through the NERC IBR Registration Initiative as they deal with the latest version of the NERC ROP registration criteria for GO/GOP approved by the NERC Board in February and filed with FERC on March 19, 2024. Your concern with PRC-028-1 R2.1 is addressed in the “Rationale for Requirement 2” section of the PRC-028 Technical Rationale beginning on page 7.

Thomas Foltz - AEP - 5

Answer Yes

Document Name

Comment

While AEP agrees with the modification of the Applicability sections, we believe it would provide consistency across standards if the BPS registration criteria was referenced for the applicable IBR entities. For example, in the most recent draft of PRC-029, they simply point to the

BPS registration criteria. Might that be considered here also? If all standards are to meet the FERC 901 order, this might be an idea to consider.

Likes 0

Dislikes 0

Response

Thank you for your support and comments. The language used in the Applicability section of the next draft has been revised. It will not include the non-BES IBRs affected by the Rules of Procedure revision process. The other standards referenced in your comment will likely follow similar format in upcoming revisions.

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

Answer Yes

Document Name

Comment

Reclamation agrees with the PRC-002-5 but PRC-028 does not apply to Reclamation.

Likes 0

Dislikes 0

Response

Thank you for your support.

Selene Willis - Edison International - Southern California Edison Company - 5

Answer Yes

Document Name

Comment

“See comments submitted by the Edison Electric Institute”

Likes 0

Dislikes 0

Response

Thank you for your support. See response to EEI comments.

David Jendras Sr - Ameren - Ameren Services - 3

Answer

Yes

Document Name

Comment

None.

Likes 0

Dislikes 0

Response

Thank you for your support.

Marty Hostler - Northern California Power Agency - 4

Answer

Yes

Document Name

Comment

YES

Likes 0

Dislikes	0
Response	
Thank you for your support.	
Duane Franke - Manitoba Hydro - 1,3,5,6 - MRO	
Answer	Yes
Document Name	
Comment	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
Andrea Jessup - Bonneville Power Administration - 1,3,5,6 - WECC	
Answer	Yes
Document Name	
Comment	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
Adrian Andreoiu - BC Hydro and Power Authority - 1, Group Name BC Hydro	
Answer	Yes

Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thank you for your support.	
Teresa Krabe - Lower Colorado River Authority - 5	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thank you for your support.	
Jennifer Weber - Tennessee Valley Authority - 1,3,5,6 - SERC	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	

Response	
Thank you for your support.	
Scott Thompson - PNM Resources - 1,3 - WECC,Texas RE	
Answer	Yes
Document Name	
Comment	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
David Vickers - David Vickers On Behalf of: Daniel Roethemeyer, Vistra Energy, 5; - David Vickers	
Answer	Yes
Document Name	
Comment	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
Ijad Dewan - Ijad Dewan On Behalf of: Emma Halilovic, Hydro One Networks, Inc., 1; - Ijad Dewan	
Answer	Yes
Document Name	

Comment	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
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	
Thank you for your support.	
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	
Thank you for your support.	
John Pearson - ISO New England, Inc. - 2	
Answer	Yes
Document Name	
Comment	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
Carver Powers - Utility Services, Inc. - 4	
Answer	Yes
Document Name	
Comment	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
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	
Thank you for your support.	
Adam Burlock - Adam Burlock On Behalf of: Ashley Scheelar, TransAlta Corporation, 5; - Adam Burlock	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thank you for your support.	
Kenisha Webber - Entergy - NA - Not Applicable - SERC	
Answer	Yes
Document Name	
Comment	
Likes 0	

Dislikes	0
Response	
Thank you for your support.	
Sean Bodkin - Dominion - Dominion Resources, Inc. - 6, Group Name Dominion	
Answer	Yes
Document Name	
Comment	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
Eric Sutlief - CMS Energy - Consumers Energy Company - 3,4,5 - RF	
Answer	Yes
Document Name	
Comment	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
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	
Thank you for your support.	
Steven Taddeucci - NiSource - Northern Indiana Public Service Co. - 3	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thank you for your support.	
Dave Krueger - SERC Reliability Corporation - 10	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	

Response	
Thank you for your support.	
Constantin Chitescu - Ontario Power Generation Inc. - 5	
Answer	Yes
Document Name	
Comment	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
Lauren Giordano - Lauren Giordano On Behalf of: Dennis Sismaet, Northern California Power Agency, 4, 6, 3, 5; Marty Hostler, Northern California Power Agency, 4, 6, 3, 5; Michael Whitney, Northern California Power Agency, 4, 6, 3, 5; - Lauren Giordano	
Answer	Yes
Document Name	
Comment	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
Joshua Phillips - Southwest Power Pool, Inc. (RTO) - 2	
Answer	Yes

Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thank you for your support.	
Rachel Coyne - Texas Reliability Entity, Inc. - 10	
Answer	
Document Name	
Comment	
Texas RE recommends revising Section 4.2 Facilities in proposed PRC-028-1 to clarify that both Elements at either BES Inverter-Based Resources or non-BES Inverter-Based resources as described are not required, but the scenario of either or both could exist. Texas RE proposes the following verbiage:	
4.2. Facilities	
4.2.1 The Elements associated with BES Inverter-Based Resources	
4.2.2 The Elements associated with Non-BES Inverter-Based Resources that either have or contribute to an aggregate nameplate capacity of greater than or equal to 20 MVA, connected through a system designed primarily for delivering such capacity to a common point of connection at a voltage greater than or equal to 60 kV.	
Likes 0	
Dislikes 0	
Response	

Thank you for your comments. The Applicability section has been edited and reformatted for clarity in the next draft. The phrase “The Elements associated with” has been deleted from the Facilities section, because the elements are clarified in the body of the standard. The language used will not include the non-BES IBRs affected by the Rules of Procedure revision process.

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

Answer

Document Name

Comment

WECC has no comments on PRC-002-5. For PRC-028-1, the use of the term “Element” to describe Facilities included per “Applicability, Section 4.2 Facilities” may confuse industry as the definition of Facility references “single” BES Element. Consider dropping the phrase “The Elements associated with” as the Requirements dictate which equipment is in scope (and the “Functional Entities” section mention equipment. Would consider saying for 4.1.1 and 4.1.2 “..that owns Facilities as identified in section 4.2.” to provide more clarification.

Likes 0

Dislikes 0

Response

Thank you for your comments. The Applicability section has been edited and reformatted for clarity in the next draft. The phrase “The Elements associated with” has been deleted.

2. Do you agree the modifications made in PRC-002-5 and new Standard PRC-028-1 are cost effective?	
Rhonda Jones - Invenergy LLC - 5,6	
Answer	No
Document Name	
Comment	
NERC has not provided any cost benefit analysis to suggest PRC-028 will provide a reliability benefit commensurate with the significant costs expected to be paid by applicable Generator Owners.	
Likes	0
Dislikes	0
Response	
This is a FERC Order 901 related project to address reliability gaps created by inverter based resources. With current version after the modifications made by the drafting team (from the previous version), hopefully the cost is not that significant.	
Mike Magruder - Avista - Avista Corporation - 1	
Answer	No
Document Name	
Comment	
Cannot determine cost effectiveness.	
Likes	0
Dislikes	0
Response	

This is a FERC Order 901 related project to address reliability gaps created by inverter based resources. With current version after the modifications made by the drafting team (from the previous version), hopefully the cost is not that significant.

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

Answer No

Document Name

Comment

The NAGF notes that requiring data monitoring equipment at all IBR facilities is unnecessary and an excessive cost burden for existing IBR facility owners to bear which may lead to unintended adverse impacts to reliability.

The NAGF requests additional clarification regarding the language “if capable of recording” used in Requirement 1.3 to better understand the cost impacts of the proposed PRC-028-1.

Likes 0

Dislikes 0

Response

This is a FERC Order 901 related project to address reliability gaps created by inverter based resources. With current version after the modifications made by the drafting team (from the previous version), hopefully the cost is not that significant.

Joshua Phillips - Southwest Power Pool, Inc. (RTO) - 2

Answer No

Document Name

Comment

SPP has a concern about the applicability of this question.

In reference to PRC-002, the drafting team has not provided any analytical data to show industry the potential of any cost to implement this standard. We understand that there were some non-substantive changes in the standard that would suggest no major cost. From our perspective, the question can't be answered about cost effectiveness when there is no data to review.

Additionally, the implementation plan for PRC-028 states that the standard will need various phase-in dates for the standard; however, there is no data to show what the cost will be to implement changes in reference to addressing industry's compliance need. Some type of cost analysis report should be produced to help industry measure concerns like man hours as well as installation of equipment from a compliance perspective.

SPP recommends that the drafting team provide information on cost-effectiveness (if equipment installation is required and/or man hours required to implement) to help them get a better understanding of the implementation cost and the opportunity to provide quality feedback to NERC in reference to cost effectiveness.

Likes	0
Dislikes	0

Response

This is a FERC Order 901 related project to address reliability gaps created by inverter based resources. With current version after the modifications made by the drafting team (from the previous version), hopefully the cost is not that significant.

Colin Chilcoat - Invenergy LLC - 5,6

Answer	No
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Document Name	
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Comment

NERC has not provided any cost benefit analysis to suggest PRC-028 will provide a reliability benefit commensurate with the significant costs expected to be paid by applicable Generator Owners.

Likes	0
Dislikes	0

Response

This is a FERC Order 901 related project to address reliability gaps created by inverter based resources. With current version after the modifications made by the drafting team (from the previous version), hopefully the cost is not that significant.

Lauren Giordano - Lauren Giordano On Behalf of: Dennis Sismaet, Northern California Power Agency, 4, 6, 3, 5; Marty Hostler, Northern California Power Agency, 4, 6, 3, 5; Michael Whitney, Northern California Power Agency, 4, 6, 3, 5; - Lauren Giordano

Answer No

Document Name

Comment

The SDT has not provided a cost estimate nor tangible reliability indices improvements said modifications are projected to provide. No standard should be allowed if a cost/benefit analysis is not provided by the SDT. SDT frequently asks this question but never provides a cost/benefit justification. SDTs and others, usually simply says there is a reliability gap, or a risk, but does not provide estimated, tangible, reliability indices improvement numbers or a cost estimate to fill the alleged gap or risk.

Likes 0

Dislikes 0

Response

This is a FERC Order 901 related project to address reliability gaps created by inverter based resources. With current version after the modifications made by the drafting team (from the previous version), hopefully the cost is not that significant.

Patricia Ireland - DTE Energy - 4

Answer No

Document Name

Comment

Meeting the PRC-028 monitoring requirements will involve the installation of expensive monitoring equipment at locations with minimal impact on the BES

Likes	0
Dislikes	0
Response	
This is a FERC Order 901 related project to address reliability gaps created by inverter based resources. With current version after the modifications made by the drafting team (from the previous version), hopefully the cost is not that significant.	
Lindsay Wickizer - Berkshire Hathaway - PacifiCorp - 6	
Answer	No
Document Name	
Comment	
Requiring DME equipment at all IBR facilities will be excessively costly compared to the value having the equipment. It is hard to believe that every single IBR site needs to have this equipment installed.	
Likes	0
Dislikes	0
Response	
This is a FERC Order 901 related project to address reliability gaps created by inverter based resources. With current version after the modifications made by the drafting team (from the previous version), hopefully the cost is not that significant.	
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 applicable IBR facilities **regardless of risk to the BES.**

In the opinion of ACES, a blanket approach requiring every applicable IBR facility to install SER, FR, and/or DDR capabilities is overly gratuitous. We believe that the industry’s finite resources would best be spent by first ascertaining which IBR facilities would provide the most benefit to the BES, before selectively adding such capabilities.

In summary, it is our recommendation that PRC-028-1 take a similar risk-based approach as is done in PRC-002-5.

Likes 0

Dislikes 0

Response

This is a FERC Order 901 related project to address reliability gaps created by inverter based resources. With current version after the modifications made by the drafting team (from the previous version), hopefully the cost is not that significant.

Marty Hostler - Northern California Power Agency - 4

Answer No

Document Name

Comment

NO. The SDT has not provided a cost estimate nor tangible reliability indices improvements said modifications are projected to provide. No standard should be allowed if a cost/benefit analysis is not provided by the SDT. SDT frequently asks this question but never provides a cost/benefit justification. SDTs and others, usually simply says there is a reliability gap, or a risk, but does not provide estimated, tangible, reliability indices improvement numbers or a cost estimate to fill the alleged gap or risk.

Likes 0

Dislikes 0

Response

This is a FERC Order 901 related project to address reliability gaps created by inverter based resources. With current version after the modifications made by the drafting team (from the previous version), hopefully the cost is not that significant.

Dwanique Spiller - Berkshire Hathaway - NV Energy - 5

Answer No

Document Name

Comment

Requiring DME equipment at all IBR facilities will be excessively costly compared to the value having the equipment. It is hard to believe that every single IBR site needs to have this equipment installed.

Likes 0

Dislikes 0

Response

This is a FERC Order 901 related project to address reliability gaps created by inverter based resources. With current version after the modifications made by the drafting team (from the previous version), hopefully the cost is not that significant.

Megan Melham - Decatur Energy Center LLC - 5

Answer No

Document Name

Comment

Capital Power supports the comments submitted by NAGF.

Capital Power notes that requiring data monitoring equipment at all IBR facilities is unnecessary and an excessive cost burden for existing IBR facility owners to bear which may lead to unintended adverse impacts to reliability. PRC-028-1 creates a more restrictive requirement on IBR facilities for data monitoring than for synchronous generation facilities. The requirement for data monitoring equipment should align between the two types of generating resources by requiring the TOP or applicable RE to indicate that monitoring equipment is necessary for the IBR facility.

Additional clarification regarding the language “if capable of recording” used in Requirement 1.3 is requested to better understand the cost impacts of the proposed PRC-028-1.

Likes 0

Dislikes 0

Response

This is a FERC Order 901 related project to address reliability gaps created by inverter based resources. With current version after the modifications made by the drafting team (from the previous version), hopefully the cost is not that significant.

Lori Frisk - Lori Frisk On Behalf of: Hillary Creurer, Allete - Minnesota Power, Inc., 1; - Lori Frisk

Answer No

Document Name

Comment

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

Likes 0

Dislikes 0

Response

This is a FERC Order 901 related project to address reliability gaps created by inverter based resources. With current version after the modifications made by the drafting team (from the previous version), hopefully the cost is not that significant.

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

Answer No

Document Name

Comment

The threshold of 20MW seems low and would create additional burden on the utilities to have to install all the equipment to monitor what is being required.

Likes 0

Dislikes 0

Response

This is a FERC Order 901 related project to address reliability gaps created by inverter based resources. With current version after the modifications made by the drafting team (from the previous version), hopefully the cost is not that significant.

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

Answer No

Document Name

Comment

PRC-028 should follow PRC-002 with criteria to filter the BES Elements required to provide SER and FR data, as well as DDR data. The cost of all IBR facilities providing this data seems excessive without some analysis first of which sites will provide the most benefit.

Capturing all fault codes and all fault alarms under requirements R1.2 and R1.3 will also not provide much benefit vs. the cost.

Likes 0

Dislikes 0

Response

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Eric Sutlief - CMS Energy - Consumers Energy Company - 3,4,5 - RF

Answer No

Document Name

Comment

The modifications include existing IBRs now and require monitoring specific elements that may be costly to implement especially for the units that are at a distance greater than or equal to 90% of the longest collector feeder. The proposed requirements for IBRs that will be installed are reasonable as new sites can be built to include that monitoring.

Likes 0

Dislikes 0

Response

This is a FERC Order 901 related project to address reliability gaps created by inverter based resources. With current version after the modifications made by the drafting team (from the previous version), hopefully the cost is not that significant.

Colby Galloway - Southern Company - Alabama Power Company - 1,3,5,6 - SERC, Group Name Southern Company

Answer No

Document Name

Comment

Southern Company does not agree that the modifications are cost effective. For PRC-028-1, requiring DME equipment at all IBR facilities does not comport with the NERC risk-based approach. To incorporate an informed, risk-based approach to reliability, Southern would propose limiting the applicability through an engineering assessment to evaluate critical sites based on location, vendor susceptibility to trouble, or some other valid criterion.

Southern agrees that the modifications made in PRC-002-5 are cost effective.

Likes 0

Dislikes 0

Response

This is a FERC Order 901 related project to address reliability gaps created by inverter based resources. With current version after the modifications made by the drafting team (from the previous version), hopefully the cost is not that significant.

Kenisha Webber - Entergy - NA - Not Applicable - SERC	
Answer	No
Document Name	
Comment	
The granularity of the distribution feeder level is questioned as to the need for such information and how it will be used. In order to store the data, new applications are needed which are not economical.	
Likes	0
Dislikes	0
Response	
This is a FERC Order 901 related project to address reliability gaps created by inverter based resources. With current version after the modifications made by the drafting team (from the previous version), hopefully the cost is not that significant.	
Adam Burlock - Adam Burlock On Behalf of: Ashley Scheelar, TransAlta Corporation, 5; - Adam Burlock	
Answer	No
Document Name	
Comment	
TransAlta supports the comments provided by AEP.	
Likes	0
Dislikes	0
Response	
This is a FERC Order 901 related project to address reliability gaps created by inverter based resources. With current version after the modifications made by the drafting team (from the previous version), hopefully the cost is not that significant.	

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
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Document Name	
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Comment

The modifications proposed in new Standard PRC-028-1 are not cost effective in preventing undesirable IBR responses during Bulk Electric System faults.

Likes 0	
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Dislikes 0	
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Response

This is a FERC Order 901 related project to address reliability gaps created by inverter based resources. With current version after the modifications made by the drafting team (from the previous version), hopefully the cost is not that significant.

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

Answer	No
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Document Name	
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Comment

Evergy supports and incorporates by reference the comments of the MRO NSRF and the NAGF for question #2.

Likes 0	
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Dislikes 0	
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Response

This is a FERC Order 901 related project to address reliability gaps created by inverter based resources. With current version after the modifications made by the drafting team (from the previous version), hopefully the cost is not that significant.

Alison MacKellar - Constellation - 5

Answer No

Document Name

Comment

The modifications made in this PRC-028-1 draft are an improvement in cost expenditures from the initial version. However, the implementation costs for PRC-028-1 are still appreciably higher than PRC-002. With the additional data requirements and higher sampling rates, the costs are higher per facility for PRC-028 than PRC-002. With DME required to be implemented at all BES IBR facilities and many non-BES IBR facilities, the overall costs of PRC-028 exceeds PRC-002.

Alison MacKellar on behalf of Constellation Segments 5 and 6

Likes 0

Dislikes 0

Response

This is a FERC Order 901 related project to address reliability gaps created by inverter based resources. With current version after the modifications made by the drafting team (from the previous version), hopefully the cost is not that significant.

Carver Powers - Utility Services, Inc. - 4

Answer No

Document Name

Comment

The level of data recording required and the amount of data that is to be collected is significantly greater than PRC-002. Also, requiring all applicable Facilities to have a DDR seems excessive. For PRC-002, the threshold for DDR is governed by a notification by the RC of applicable BES Elements however there is no comparable Requirement in PRC-028 resulting in all IBR generation being obligated to provide DDR data.

There is a significant cost associated with the installation and maintenance of a DDR and expecting an IBR to have this level of recording when they do not meet the BES definition may be overreaching.

Could this be better addressed by TOs having DDRs that could capture more information from multiple generation facilities during an event?

Likes 0

Dislikes 0

Response

This is a FERC Order 901 related project to address reliability gaps created by inverter based resources. With current version after the modifications made by the drafting team (from the previous version), hopefully the cost is not that significant.

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

Answer No

Document Name

Comment

WEC Energy Group supports the comments of both the MRO NSRF and the NAGF.

Likes 0

Dislikes 0

Response

This is a FERC Order 901 related project to address reliability gaps created by inverter based resources. With current version after the modifications made by the drafting team (from the previous version), hopefully the cost is not that significant.

Anna Martinson - MRO - 1,2,3,4,5,6 - MRO, Group Name MRO Group

Answer No

Document Name

Comment

Requiring DME equipment at all IBR facilities will be excessively costly compared to the value having the equipment. It is hard to believe that every single IBR site needs to have this equipment installed.

Likes 1	Lincoln Electric System, 1, Johnson Josh
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Dislikes 0	
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Response

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

Answer	No
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Document Name	
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Comment

AEPC 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 applicable IBR facilities **regardless of risk to the BES**.

In the opinion of ACES, a blanket approach requiring every applicable IBR facility to install SER, FR, and/or DDR capabilities is overly gratuitous. We believe that the industry's finite resources would best be spent by first ascertaining which IBR facilities would provide the most benefit to the BES, before selectively adding such capabilities.

In summary, it is our recommendation that PRC-028-1 take a similar risk-based approach as is done in PRC-002-5.

Likes 0	
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Dislikes 0	
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Response

This is a FERC Order 901 related project to address reliability gaps created by inverter based resources. With current version after the modifications made by the drafting team (from the previous version), hopefully the cost is not that significant.

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

Answer

No

Document Name

Comment

Tri-State can not comment on cost effectiveness at this time.

Likes 0

Dislikes 0

Response

This is a FERC Order 901 related project to address reliability gaps created by inverter based resources. With current version after the modifications made by the drafting team (from the previous version), hopefully the cost is not that significant.

Kimberly Turco - Constellation - 6

Answer

No

Document Name

Comment

The modifications made in this PRC-028-1 draft are an improvement in cost expenditures from the initial version. However, the implementation costs for PRC-028-1 are still appreciably higher than PRC-002. With the additional data requirements and higher sampling rates, the costs are higher per facility for PRC-028 than PRC-002. With DME required to be implemented at all BES IBR facilities and many non-BES IBR facilities, the overall costs of PRC-028 exceeds PRC-002.

Kimberly Turco on behalf of Constellation Segments 5 and 6

Likes 0

Dislikes 0

Response

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Ryan Strom - Ryan Strom On Behalf of: Jason Procnuiar, Buckeye Power, Inc., 4, 5, 3; Kevin Zemanek, Buckeye Power, Inc., 4, 5, 3; Tom Schmidt, Buckeye Power, Inc., 4, 5, 3; - Ryan Strom, Group Name Buckeye Power Group

Answer No

Document Name

Comment

Buckeye Power supports the comments made by ACES:

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 applicable IBR facilities regardless of risk to the BES. In the opinion of ACES, a blanket approach requiring every applicable IBR facility to install SER, FR, and/or DDR capabilities is overly gratuitous. We believe that the industry's finite resources would best be spent by first ascertaining which IBR facilities would provide the most benefit to the BES, before selectively adding such capabilities. In summary, it is our recommendation that PRC-028-1 take a similar risk-based approach as is done in PRC-002-5.

Likes 0

Dislikes 0

Response

This is a FERC Order 901 related project to address reliability gaps created by inverter based resources. With current version after the modifications made by the drafting team (from the previous version), hopefully the cost is not that significant.

Ben Hammer - Western Area Power Administration - 1

Answer No

Document Name

Comment

Requiring DME equipment at all IBR facilities will be excessively costly compared to the value having the equipment. It is hard to believe that every single IBR site needs to have this equipment installed.

Likes 0

Dislikes 0

Response

This is a FERC Order 901 related project to address reliability gaps created by inverter based resources. With current version after the modifications made by the drafting team (from the previous version), hopefully the cost is not that significant.

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

Answer No

Document Name

Comment

Yes for new IBR facilities. For existing IBR facilities, the location requirements are reasonable; however, the required sample rates and data retention requirements may require additional investment in the collector substation.

Likes 0

Dislikes 0

Response

This is a FERC Order 901 related project to address reliability gaps created by inverter based resources. With current version after the modifications made by the drafting team (from the previous version), hopefully the cost is not that significant.

Thomas Foltz - AEP - 5	
Answer	No
Document Name	
Comment	
<p>For the reasons expressed below, AEP is concerned by the cost versus perceived reliability benefit of the new Standard PRC-028-1.</p> <p>AEP does not consider the inclusion of “at least one IBR Unit, per collector bus, on any of the collector feeders that is connected at a distance greater than or equal to 90% of the longest collector feeder” in PRC-028 1.2 and 1.3 as cost effective. AEP questions the reliability benefit of the data these BES Elements will provide when considering the proposed requirements of PRC-029 to a performance-based ride-through standard that ensures generators remain connected to the BPS during system disturbances and the proposed requirements of PRC-030, Unexpected Inverter-Based Resource Event Mitigation. Requirements proposed in PRC-030 clearly make the GO responsible for the performance of the Inverter-Based Resources and IBR units it owns. The proposed obligation to collect and provide FR and SER data beyond the MPT bus(es) in PRC-028 is unwarranted.</p> <p>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.</p> <p>AEP does not believe capturing all fault codes and fault alarms listed in R1.2 and R1.3 under this standard would be beneficial to the Transmission Planner, Planning Coordinator, Transmission Operator, Balancing Authority, Reliability Coordinator, Regional Entity, or NERC as there are several OEMs with thousands of differing fault codes and fault alarms. AEP is concerned with the ability of these entities to understand or utilize the data in a timely manner. For some entities, this data would be more akin to SCADA quality data and not delivered with the timing nor accuracy of typical SER data. In addition, under PRC-030, we are asking the GO to resolve those issues. AEP recommends the SDT for PRC-028, PRC-029 and PRC-030 review each proposed standard obligation to ensure there is an integrated plan across these standards to achieve the goal of correcting the past performance of Inverter-Based Resources and IBR units. Having a coherent strategy document that explains how these three standards complement each other (and not be duplicative) would be beneficial.</p>	
Likes	0
Dislikes	0

Response

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

Answer No

Document Name

Comment

NRG supports NAGFs comments concerning excessive cost burden for IBR facility owners.

Likes 0

Dislikes 0

Response

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Glen Farmer - Avista - Avista Corporation - 5

Answer No

Document Name

Comment

Cannot determine cost effectiveness

Likes 0

Dislikes 0

Response

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Ryan Quint - Elevate Energy Consulting - NA - Not Applicable - NA - Not Applicable, Group Name Elevate Energy Consulting

Answer No

Document Name

Comment

No, simply from a value-add perspective. The standard requires IBR owners to have a robust compliance program implemented as well as event data collection process in place. However, for example, Requirement R1.2 only requires fault codes, fault alarms, mode status change, etc., from a single IBR Unit far down the feeder. This is common practice for this information to be stored on the IBR Unit inverter or logging device.

This will not help any event analysis process as it will not paint an adequate picture of the IBR facility's abnormal performance, if analyzed. At a minimum, fault codes should be available from every single IBR Unit within the facility. Lack of comprehensive data has significantly affected the ERO Enterprise's ability to conduct event analysis at many facilities over the past 7 years, as reported in numerous disturbance reports. The proposed standard would lead to inadequate data available at the inverter-level to do any useful event analysis and model validation, possibly leading to ongoing inconclusive root cause analyses. This would not be cost effective for industry.

Likes 0

Dislikes 0

Response

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Rob Robertson - Leeward Renewable Energy - 5

Answer No

Document Name [LRE PRC-028 April 2024 comments April 11 2024.docx](#)

Comment

Likes 0	
Dislikes 0	
Response	
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Selene Willis - Edison International - Southern California Edison Company - 5	
Answer	Yes
Document Name	
Comment	
"See comments submitted by the Edison Electric Institute"	
Likes 0	
Dislikes 0	
Response	
Thank you for your support.	
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	
SRP believes that while implementation of these changes may be costly, they provide high value from operation, integration, and monitoring perspective.	

Likes	0
Dislikes	0
Response	
Thank you for your support.	
Wendy Kalidass - U.S. Bureau of Reclamation - 5	
Answer	Yes
Document Name	
Comment	
Reclamation agrees with the PRC-002-5 cost but inverter base does not apply to Reclamation.	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
Marcus Bortman - APS - Arizona Public Service Co. - 6	
Answer	Yes
Document Name	
Comment	
None	
Likes	0
Dislikes	0
Response	

Thank you for your support.	
Mark Garza - FirstEnergy - FirstEnergy Corporation - 4, Group Name FE Voter	
Answer	Yes
Document Name	
Comment	
No additional comments.	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
Dave Krueger - SERC Reliability Corporation - 10	
Answer	Yes
Document Name	
Comment	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
Sean Bodkin - Dominion - Dominion Resources, Inc. - 6, Group Name Dominion	
Answer	Yes
Document Name	

Comment

Likes 0

Dislikes 0

Response

Thank you for your support.

John Pearson - ISO New England, Inc. - 2

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Thank you for your support.

Scott Thompson - PNM Resources - 1,3 - WECC,Texas RE

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Thank you for your support.	
Jennifer Weber - Tennessee Valley Authority - 1,3,5,6 - SERC	
Answer	Yes
Document Name	
Comment	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
Sean Steffensen - IDACORP - Idaho Power Company - 1	
Answer	Yes
Document Name	
Comment	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
Teresa Krabe - Lower Colorado River Authority - 5	
Answer	Yes
Document Name	
Comment	

Likes 0	
Dislikes 0	
Response	
Thank you for your support.	
Andrea Jessup - Bonneville Power Administration - 1,3,5,6 - WECC	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thank you for your support.	
Duane Franke - Manitoba Hydro - 1,3,5,6 - MRO	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thank you for your support.	

David Jendras Sr - Ameren - Ameren Services - 3	
Answer	
Document Name	
Comment	
No comment.	
Likes 0	
Dislikes 0	
Response	
Thank you for your support.	
Michael Johnson - Michael Johnson On Behalf of: Marco Rios, Pacific Gas and Electric Company, 3, 1, 5; Sandra Ellis, Pacific Gas and Electric Company, 3, 1, 5; - Michael Johnson, Group Name PG&E All Segments	
Answer	
Document Name	
Comment	
PG&E does not have any input on this question.	
Likes 0	
Dislikes 0	
Response	
Thank you for your support.	
Steven Rueckert - Western Electricity Coordinating Council - 10, Group Name WECC Entity Monitoring	
Answer	

Document Name	
Comment	
No comment	
Likes 0	
Dislikes 0	
Response	
Thank you for your support.	
Brad Harris - CenterPoint Energy Houston Electric, LLC - 1 - Texas RE	
Answer	
Document Name	
Comment	
CEHE abstains from responding.	
Likes 0	
Dislikes 0	
Response	
Thank you for your support.	
Rachel Schuldt - Black Hills Corporation - 6, Group Name Black Hills Corporation - All Segments	
Answer	
Document Name	
Comment	

Black Hills Corporation will not comment on cost effectiveness.	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
Robert Follini - Avista - Avista Corporation - 3	
Answer	
Document Name	
Comment	
Cannot determine cost effectiveness.	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
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

Thank you for your support.

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

Thomas Foltz - AEP - 5

Answer No

Document Name

Comment

AEP is unable to support the current Implementation Plan driven by our concerns with the scope and requirements of the current draft of PRC-028.

Likes 0

Dislikes 0

Response

Thank you for your comment. The drafting team has modified the Implementation Plan.

Ben Hammer - Western Area Power Administration - 1

Answer No

Document Name

Comment

Implementation Plan Says:

R1-7: Current imp plan is 50% in 3 calendar years after effective date, 100% by 1/1/2030

R8: max 9 months after effective date

R9: no later than 1/1/2029

The phased in implementation plan needs to be given in a time frame after the effective date for the standard. Specifying a fixed date may not provide adequate time for the wide scale installation of DME at all IBR facilities. PRC-028, as written, will require much more DME than did PRC-002, and the implementation plan needs to recognize this difference and provide adequate time to accomplish.

Likes 0

Dislikes 0

Response

Thank you for your comment. FERC Order 901 requires that PRC-028 be effective and enforceable no later than January 1, 2030. This SDT has no option to extend that deadline. The concession provided to industry is inclusion of a process allowing the GO or TO to request an extension through its Regional Entity for IBRs in commercial operation before the effective date of PRC-028-1. This was R9 in the previous draft but has been moved to the Implementation Plan.

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

Answer No

Document Name

Comment

Reclamation supports an 18-month implementation time frame.

Likes 0

Dislikes 0

Response

Thank you for your comment.

Ryan Strom - Ryan Strom On Behalf of: Jason Procniar, Buckeye Power, Inc., 4, 5, 3; Kevin Zemanek, Buckeye Power, Inc., 4, 5, 3; Tom Schmidt, Buckeye Power, Inc., 4, 5, 3; - Ryan Strom, Group Name Buckeye Power Group

Answer No

Document Name

Comment

Buckeye Power supports the comments made by ACES:

As written, PRC-028-1 is applicable to both BES and non-BES IBRs; consequently, we recommend updating the Implementation Plan to use the term “IBR facility(ies)” in lieu of the term defined term “Facility(ies)”.

From the perspective of ACES, the special stipulations surrounding commercial operation are overly complex and unnecessary. For example, assume PRC-028-1 is approved by FERC and becomes effective 10/1/2024. Using the provided example, the end of the first calendar year that is 12 months following the effective date of the standard would be 12/31/2025. Thus any facilities entering commercial operation prior to 10/1/2025 would have until 12/31/2025 to be compliant while any facilities entering commercial operation on or after 10/1/2025 must be compliant immediately. We do not believe that a delay of only 1 day should move the compliance deadline forward by 3 calendar months. We recommend removing these special stipulations and instead address this specific case using a strategy akin to that used for existing facilities. We suggest the following language:

“For facilities entering commercial operation after the effective date: Entities shall comply with Requirements R1 through R7 within three (3) calendar years of the effective date of PRC-028-1.”

Likes	0
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Dislikes	0
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Response

Thank you. See response to ACES comments.

Kimberly Turco - Constellation – 6

Answer	No
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Document Name	
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Comment

Although the PRC-028 Implementation Plan mirrors PRC-002-2 Implementation Plan, PRC-028 requires all BES IBRs and many non-BES IBRs to have DME installed. If the GO has a large IBR fleet, numerous DME installations would be required with a demanding project schedule. With

the large amount of DME required to be installed per PRC-028, OEMs might not be able to provide GOs with a timely supply of DME equipment.

Kimberly Turco on behalf of Constellation Segments 5 and 6

Likes 0

Dislikes 0

Response

Thank you for your comments. The SDT recognizes the possibility of supply chain issues. FERC Order 901 requires that PRC-028 be effective and enforceable no later than January 1, 2030. This SDT has no option to extend that deadline. The concession provided to industry is inclusion of a process allowing the GO or TO to request an extension through its Regional Entity for IBRs in commercial operation before the effective date of PRC-028-1. This was R9 in the previous draft but has been moved to the Implementation Plan. Supply chain issues could be cited under subpart 1.3 of the extension request.

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

Answer No

Document Name

Comment

AEPC has signed on to ACES comments:

As written, PRC-028-1 is applicable to both BES and non-BES IBRs; consequently, we recommend updating the Implementation Plan to use the term “IBR facility(ies)” in lieu of the term defined term “Facility(ies)”.

From the perspective of ACES, the special stipulations surrounding commercial operation are overly complex and unnecessary. For example, assume PRC-028-1 is approved by FERC and becomes effective 10/1/2024. Using the provided example, the end of the first calendar year that is 12 months following the effective date of the standard would be 12/31/2025. Thus any facilities entering commercial operation prior to

10/1/2025 would have until 12/31/2025 to be compliant while any facilities entering commercial operation on or after 10/1/2025 must be compliant immediately. We do not believe that a delay of only 1 day should move the compliance deadline forward by 3 calendar months.

We recommend removing these special stipulations and instead address this specific case using a strategy akin to that used for existing facilities. We suggest the following language:

“For facilities entering commercial operation after the effective date:

Entities shall comply with Requirements R1 through R7 within three (3) calendar years of the effective date of PRC-028-1.”

Likes	0
Dislikes	0

Response

Thank you. Please see response to ACES comments.

Anna Martinson - MRO - 1,2,3,4,5,6 - MRO, Group Name MRO Group

Answer	No
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Document Name	
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Comment

Implementation Plan Says:

R1-7: Current imp plan is 50% in 3 calendar years after effective date, 100% by 1/1/2030

R8: max 9 months after effective date

R9: no later than 1/1/2029

The phased in implementation plan needs to be given in a time frame after the effective date for the standard. Specifying a fixed date may not provide adequate time for the wide scale installation of DME at all IBR facilities. PRC-028, as written, will require much more DME than did PRC-002, and the implementation plan needs to recognize this difference and provide adequate time to accomplish.

Likes 1	Lincoln Electric System, 1, Johnson Josh
Dislikes 0	
Response	
Thank you for your comment. FERC Order 901 requires that PRC-028 be effective and enforceable no later than January 1, 2030. This SDT has no option to extend that deadline. The concession provided to industry is inclusion of a process allowing the GO or TO to request an extension through its Regional Entity for IBRs in commercial operation before the effective date of PRC-028-1. This was R9 in the previous draft but has been moved to the Implementation Plan.	
Christine Kane - WEC Energy Group, Inc. - 3, Group Name WEC Energy Group	
Answer	No
Document Name	
Comment	
WEC Energy Group supports the comments of both the MRO NSRF and the NAGF.	
Likes 0	
Dislikes 0	
Response	
Thank you. Please see responses to MRO NSRF and NAGF comments.	
Alison MacKellar - Constellation – 5	
Answer	No
Document Name	
Comment	
Although the PRC-028 Implementation Plan mirrors PRC-002-2 Implementation Plan, PRC-028 requires all BES IBRs and many non-BES IBRs to have DME installed. If the GO has a large IBR fleet, numerous DME installations would be required with a demanding project schedule. With	

the large amount of DME required to be installed per PRC-028, OEMs might not be able to provide GOs with a timely supply of DME equipment.

Alison Mackellar on behalf of Constellation Segments 5 and 6

Likes 0

Dislikes 0

Response

Thank you for your comments. The SDT recognizes the possibility of supply chain issues. FERC Order 901 requires that PRC-028 be effective and enforceable no later than January 1, 2030. This SDT has no option to extend that deadline. The concession provided to industry is inclusion of a process allowing the GO or TO to request an extension through its Regional Entity for IBRs in commercial operation before the effective date of PRC-028-1. This was R9 in the previous draft but has been moved to the Implementation Plan. Supply chain issues could be cited under subpart 1.3 of the extension request.

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

Answer No

Document Name

Comment

TransAlta recommends removing the stipulations surrounding commercial operation. There are associated project execution risks with making design changes later in a project. TransAlta would prefer to have the flexibility to install and/or configure monitoring equipment after commercial operation. Thus, TransAlta recommends updating the implementation plan to specify compliance with Requirements R1 through R7 at 50% of plants/Facilities within 3 calendar years and 100% within 6 calendar years for all plants/Facilities regardless of commercial operation date.

Likes 0

Dislikes 0

Response

Thank you for your comments. The current Implementation Plan has a fixed end date because FERC Order 901 requires that PRC-028 be effective and enforceable no later than January 1, 2030. This SDT has no option to extend that deadline. The concession provided to industry is inclusion of a process allowing the GO or TO to request an extension through its Regional Entity for IBRs in commercial operation before the effective date of PRC-028-1. This was R9 in the previous draft but has been moved to the Implementation Plan.

Kenisha Webber - Entergy - NA - Not Applicable - SERC

Answer No

Document Name

Comment

Propose three (3) calendar years instead of one (1) year for budgeting and planning purposes.

Likes 0

Dislikes 0

Response

Thank you for your comment. The current Implementation Plan already gives 3 years for 50% and until January 1, 2030 for 100% of IBRs in commercial operation on or before the effective date. The implementation timeline for IBRs entering commercial operation after the effective date has been revised in the latest draft.

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

Answer No

Document Name

Comment

The Plan is too aggressive. Dominion Energy recommends an additional 12-24 months to accommodate all of the non-BES IBRs that need to now be included.

Likes 0

Dislikes 0

Response

Thank you for your comment. FERC Order 901 requires that PRC-028 be effective and enforceable no later than January 1, 2030. This SDT has no option to extend that deadline. The concession provided to industry is inclusion of a process allowing the GO or TO to request an extension through its Regional Entity for IBRs in commercial operation before the effective date of PRC-028-1. This was R9 in the previous draft but has been moved to the Implementation Plan.

Colby Galloway - Southern Company - Alabama Power Company - 1,3,5,6 - SERC, Group Name Southern Company

Answer No

Document Name

Comment

The PRC-028-1 standard as written, requires 50% completion within (3) calendar years and 100% completion of R1-R7 by 1/1/2030, R9 by 1/1/2029 and R8 a maximum of 9 months after the effective date. The phased-in implementation plan needs to be given in a timeframe after the effective date for the standards. Specifying a fixed date may not provide adequate time for the wide scale installation of DME at all applicable IBR facilities. PRC-028, as written, will require much more DME than PRC-002 did, and the implementation plan needs to recognize this difference and provide adequate time to accomplish. Traditional language for implementation plans in other Standards have provided a certain period after implementation instead of a fixed date (e.g. within 6 calendar years of the effective date...).

Likes 0

Dislikes 0

Response

Thank you for your comment. FERC Order 901 requires that PRC-028 be effective and enforceable no later than January 1, 2030. This SDT has no option to extend that deadline. The concession provided to industry is inclusion of a process allowing the GO or TO to request an extension through its Regional Entity for IBRs in commercial operation before the effective date of PRC-028-1. This was R9 in the previous draft but has been moved to the Implementation Plan.

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

Answer No

Document Name

Comment

NIPSCO is not able to support the current implementation plan until concerns with the requirements of PRC-028 are addressed.

Likes 0

Dislikes 0

Response

Thank you for your comment.

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

Answer No

Document Name

Comment

See response to questions 4 and 5

Likes 0

Dislikes 0

Response

Thank you.

Lori Frisk - Lori Frisk On Behalf of: Hillary Creurer, Allete - Minnesota Power, Inc., 1; - Lori Frisk

Answer No

Document Name

Comment

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

Likes	0
Dislikes	0
Response	
Thank you. See response to MRO NSRF comments.	
Dwanique Spiller - Berkshire Hathaway - NV Energy - 5	
Answer	No
Document Name	
Comment	
<p>Implementation Plan Says:</p> <p>R1-7: Current imp plan is 50% in 3 calendar years after effective date, 100% by 1/1/2030</p> <p>R8: max 9 months after effective date</p> <p>R9: no later than 1/1/2029</p> <p>The phased in implementation plan needs to be given in a time frame after the effective date for the standard. Specifying a fixed date may not provide adequate time for the wide scale installation of DME at all IBR facilities. PRC-028, as written, will require much more DME than did PRC-002, and the implementation plan needs to recognize this difference and provide adequate time to accomplish.</p>	
Likes	0
Dislikes	0
Response	
Thank you for your comment. FERC Order 901 requires that PRC-028 be effective and enforceable no later than January 1, 2030. This SDT has no option to extend that deadline. The concession provided to industry is inclusion of a process allowing the GO or TO to request an extension through its Regional Entity for IBRs in commercial operation before the effective date of PRC-028-1. This was R9 in the previous draft but has been moved to the Implementation Plan.	

Marty Hostler - Northern California Power Agency – 4	
Answer	No
Document Name	
Comment	
No. Entities more need time to budget for projects and to coordinate modifications.	
Likes	0
Dislikes	0
Response	
Thank you for your comment. FERC Order 901 requires that PRC-028 be effective and enforceable no later than January 1, 2030. This SDT has no option to extend that deadline. The concession provided to industry is inclusion of a process allowing the GO or TO to request an extension through its Regional Entity for IBRs in commercial operation before the effective date of PRC-028-1. This was R9 in the previous draft but has been moved to the Implementation Plan.	
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	
As written, PRC-028-1 is applicable to both BES and non-BES IBRs; consequently, we recommend updating the Implementation Plan to use the term “IBR facility(ies)” in lieu of the term defined term “Facility(ies)”.	
From the perspective of ACES, the special stipulations surrounding commercial operation are overly complex and unnecessary. For example, assume PRC-028-1 is approved by FERC and becomes effective 10/1/2024. Using the provided example, the end of the first calendar year that is 12 months following the effective date of the standard would be 12/31/2025. Thus any facilities entering commercial operation prior to 10/1/2025 would have until 12/31/2025 to be compliant while any facilities entering commercial operation on or after 10/1/2025 must be compliant immediately. We do not believe that a delay of only 1 day should move the compliance deadline forward by 3 calendar months.	

We recommend removing these special stipulations and instead address this specific case using a strategy akin to that used for existing facilities. We suggest the following language:

“For facilities entering commercial operation after the effective date:
 Entities shall comply with Requirements R1 through R7 within three (3) calendar years of the effective date of PRC-028-1.”

Likes 0

Dislikes 0

Response

Thank you for your comments. The SDT will be making overall revisions to the Technical Rationale and Implementation Plan before the next posting. The current Implementation Plan has a fixed end date because FERC Order 901 requires that PRC-028 be effective and enforceable no later than January 1, 2030. This SDT has no option to extend that deadline. The concession provided to industry is inclusion of a process allowing the GO or TO to request an extension through its Regional Entity for IBRs in commercial operation before the effective date of PRC-028-1. This was R9 in the previous draft but has been moved to the Implementation Plan. The Implementation Plan language referencing IBRs not in operation at the effective date of the standard has also been revised.

Lindsay Wickizer - Berkshire Hathaway - PacifiCorp - 6

Answer No

Document Name

Comment

Implementation Plan Says:

R1-7: Current imp plan is 50% in 3 calendar years after effective date, 100% by 1/1/2030

R8: max 9 months after effective date

R9: no later than 1/1/2029

The phased in implementation plan needs to be given in a time frame after the effective date for the standard. Specifying a fixed date may not provide adequate time for the wide scale installation of DME at all IBR facilities. PRC-028, as written, will require much more DME than did PRC-002, and the implementation plan needs to recognize this difference and provide adequate time to accomplish.

Likes 0

Dislikes 0

Response

Thank you for your comment. FERC Order 901 requires that PRC-028 be effective and enforceable no later than January 1, 2030. This SDT has no option to extend that deadline. The concession provided to industry is inclusion of a process allowing the GO or TO to request an extension through its Regional Entity for IBRs in commercial operation before the effective date of PRC-028-1. This was R9 in the previous draft but has been moved to the Implementation Plan.

Lauren Giordano - Lauren Giordano On Behalf of: Dennis Sismaet, Northern California Power Agency, 4, 6, 3, 5; Marty Hostler, Northern California Power Agency, 4, 6, 3, 5; Michael Whitney, Northern California Power Agency, 4, 6, 3, 5; - Lauren Giordano

Answer

No

Document Name

Comment

Entities need more time to budget for projects and to coordinate modifications.

Likes 0

Dislikes 0

Response

Thank you for your comment. FERC Order 901 requires that PRC-028 be effective and enforceable no later than January 1, 2030. This SDT has no option to extend that deadline. The concession provided to industry is inclusion of a process allowing the GO or TO to request an extension through its Regional Entity for IBRs in commercial operation before the effective date of PRC-028-1. This was R9 in the previous draft but has been moved to the Implementation Plan.

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

Answer	Yes
Document Name	
Comment	
None.	
Likes 0	
Dislikes 0	
Response	
Thank you for your support.	
Robert Follini - Avista - Avista Corporation - 3	
Answer	Yes
Document Name	
Comment	
Implementation plan seems reasonable. Changes to PRC-002 are clarifying in nature, for the removal of IBRs. PRC-028 would be a new PRC with a 3 year implementation.	
Likes 0	
Dislikes 0	
Response	
Thank you for your support.	
Glen Farmer - Avista - Avista Corporation - 5	
Answer	Yes
Document Name	

Comment

Implementation plan seems reasonable. Changes to PRC-002 are clarifying in nature, for the removal of IBRs. PRC-028 would be a new PRC with a 3 year implementation.

Likes 0

Dislikes 0

Response

Thank you for your support.

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

Answer Yes

Document Name

Comment

While FirstEnergy supports the Implementation Plan, we offer our comments. See our response to Q4.

Likes 0

Dislikes 0

Response

Thank you for your support.

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

Answer Yes

Document Name

Comment

None	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
John Pearson - ISO New England, Inc. - 2	
Answer	Yes
Document Name	
Comment	
We recognize that there is a cost but the benefits to reliability are worthwhile.	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
Carver Powers - Utility Services, Inc. - 4	
Answer	Yes
Document Name	
Comment	
Six years would be a sufficient amount of time to plan and budget for the procurement and installation of the DDR equipment barring any supply chain risk complications or any other delays. USV recognizes the FERC directive mandating completion by 1/1/2030, however, due to	

many of the IBR sites having strict language when dealing with manufacturers warranty and having to rely on third parties, it may result in additional complications that could delay the installation and setting up of this highly specialized equipment.

Likes 0

Dislikes 0

Response

Thank you for your support and comment. The SDT recognizes the potential for supply chain or other constraints, thus the inclusion of a process allowing the GO or TO to request an extension through its Regional Entity for IBRs in commercial operation before the effective date of PRC-028-1. This was R9 in the previous draft but has been moved to the Implementation Plan.

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

Answer Yes

Document Name

Comment

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

Likes 0

Dislikes 0

Response

Thank you for your support. See responses to EEI and NAGF comments.

Daniel Gacek - Exelon - 1

Answer Yes

Document Name

Comment

Exelon supports the comments submitted by the EEI for this question.

Likes 0

Dislikes 0

Response

Thank you for your support. See reply to EEI comments.

Selene Willis - Edison International - Southern California Edison Company - 5

Answer Yes

Document Name

Comment

“See comments submitted by the Edison Electric Institute”

Likes 0

Dislikes 0

Response

Thank you for your support. See reply to EEI comments.

Stephanie Kenny - Edison International - Southern California Edison Company - 6

Answer Yes

Document Name

Comment

EEI supports proposed implementation plan as developed for PRC-002 and PRC-028.

Likes 0

Dislikes	0
Response	
Thank you for your support.	
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	
{C}PG&E supports the proposed implementation plan as developed for PRC-002 and PRC-028.	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
Kinte Whitehead - Exelon - 3	
Answer	Yes
Document Name	
Comment	
Exelon supports the comments submitted by the EEI for this question.	
Likes	0
Dislikes	0
Response	

Thank you for your support. See response to EEI comments.

David Jendras Sr - Ameren - Ameren Services - 3

Answer Yes

Document Name

Comment

None.

Likes 0

Dislikes 0

Response

Thank you for your support.

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

Answer Yes

Document Name

Comment

EEI supports proposed implementation plan as developed for PRC-002 and PRC-028.

Likes 0

Dislikes 0

Response

Thank you for your support.

Mike Magruder - Avista - Avista Corporation - 1

Answer Yes

Document Name	
Comment	
Implementation plan seems reasonable. Changes to PRC-002 are clarifying in nature, for the removal of IBRs. PRC-028 would be a new PRC with a 3 year implementation.	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
Duane Franke - Manitoba Hydro - 1,3,5,6 - MRO	
Answer	Yes
Document Name	
Comment	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
Ryan Quint - Elevate Energy Consulting - NA - Not Applicable - NA - Not Applicable, Group Name Elevate Energy Consulting	
Answer	Yes
Document Name	
Comment	

Likes	0
Dislikes	0
Response	
Thank you for your support.	
Andrea Jessup - Bonneville Power Administration - 1,3,5,6 - WECC	
Answer	Yes
Document Name	
Comment	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
Teresa Krabe - Lower Colorado River Authority - 5	
Answer	Yes
Document Name	
Comment	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
Patricia Lynch - NRG - NRG Energy, Inc. - 5,6	

Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thank you for your support.	
Sean Steffensen - IDACORP - Idaho Power Company - 1	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thank you for your support.	
Jennifer Weber - Tennessee Valley Authority - 1,3,5,6 - SERC	
Answer	Yes
Document Name	
Comment	
Likes 0	

Dislikes	0
Response	
Thank you for your support.	
Scott Thompson - PNM Resources - 1,3 - WECC,Texas RE	
Answer	Yes
Document Name	
Comment	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
David Vickers - David Vickers On Behalf of: Daniel Roethemeyer, Vistra Energy, 5; - David Vickers	
Answer	Yes
Document Name	
Comment	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
Rachel Schuldt - Black Hills Corporation - 6, Group Name Black Hills Corporation - All Segments	
Answer	Yes

Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thank you for your support.	
Ijad Dewan - Ijad Dewan On Behalf of: Emma Halilovic, Hydro One Networks, Inc., 1; - Ijad Dewan	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thank you for your support.	
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	
Thank you for your support.	
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	
Thank you for your support.	
Tim Kelley - Tim Kelley On Behalf of: Charles Norton, Sacramento Municipal Utility District, 3, 6, 4, 1, 5; Foug 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	

Thank you for your support.	
Brad Harris - CenterPoint Energy Houston Electric, LLC - 1 - Texas RE	
Answer	Yes
Document Name	
Comment	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
Eric Sutlief - CMS Energy - Consumers Energy Company - 3,4,5 - RF	
Answer	Yes
Document Name	
Comment	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
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	
Thank you for your support.	
Leslie Hamby - Southern Indiana Gas and Electric Co. - 3,5,6 - RF	
Answer	Yes
Document Name	
Comment	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
Scott Langston - Tallahassee Electric (City of Tallahassee, FL) - 1	
Answer	Yes
Document Name	
Comment	
Likes	0
Dislikes	0
Response	
Thank you for your support.	

Megan Melham - Decatur Energy Center LLC - 5	
Answer	Yes
Document Name	
Comment	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
Dave Krueger - SERC Reliability Corporation - 10	
Answer	Yes
Document Name	
Comment	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
Kennedy Meier - Electric Reliability Council of Texas, Inc. - 2, Group Name ISO/RTO Council Standards Review Committee (SRC)	
Answer	Yes
Document Name	
Comment	

Likes	0
Dislikes	0
Response	
Thank you for your support.	
Patricia Ireland - DTE Energy - 4	
Answer	Yes
Document Name	
Comment	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
Constantin Chitescu - Ontario Power Generation Inc. - 5	
Answer	Yes
Document Name	
Comment	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
Colin Chilcoat - Invenergy LLC - 5,6	

Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thank you for your support.	
Joshua Phillips - Southwest Power Pool, Inc. (RTO) - 2	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thank you for your support.	
Wayne Sipperly - North American Generator Forum - 5 - MRO,WECC,Texas RE,NPCC,SERC,RF	
Answer	Yes
Document Name	
Comment	
Likes 0	

Dislikes	0
Response	
Thank you for your support.	
Rhonda Jones - Invenergy LLC - 5,6	
Answer	Yes
Document Name	
Comment	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
Donna Wood - Tri-State G and T Association, Inc. - 1	
Answer	
Document Name	
Comment	
Tri-State agrees with MRO Comments.	
Likes	0
Dislikes	0
Response	
Thank you. See response to MRO comments.	

4. Do you agree with introduction of Requirement R9 in PRC-028-1 requiring Entities of an applicable facility that is in commercial operation before the effective date of this standard that is not able to install disturbance monitoring equipment in accordance with Requirements R1 through R7 in the time provided for compliance to develop, maintain, and implement a Corrective Action Plan?

Rhonda Jones - Invenergy LLC - 5,6

Answer No

Document Name

Comment

Invenergy **suggests the below language** for R9:

R9. Each Generator Owner and Transmission Owner with a documented equipment limitation that would prevent an applicable IBR that is in commercial operation prior to the effective date of this standard from installing disturbance monitoring equipment in accordance with Requirements R1 through R7 shall communicate each equipment limitation to the Regional Entity.

9.1. Each Generator Owner and Transmission Owner shall include in its documentation:

- 9.1.1. Identifying information of the applicable Element and cause of the limitation
- 9.1.2. Which aspect(s) of disturbance monitoring the Element would be unable to meet

9.2. Each Generator Owner and Transmission with a previously communicated equipment limitation that repairs or replaces the equipment causing the limitation shall document and communicate such equipment change to the Regional Entity within 30 days of the equipment change.

Likes 0

Dislikes 0

Response

Thank you for your comments. The intent of R9 was to allow more time for entities that may have circumstances beyond their control that delay installation of DME beyond the stated implementation deadline. It was not meant to provide technical feasibility exceptions such as in this suggested revision. FERC Order 901 requires disturbance monitoring data from the IBRs identified in the Applicability section of PRC-028.

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

Answer

No

Document Name

Comment

The NAGF does not support the proposed Requirement R9 due to the potential cost issues for existing IBR facilities as well as the potential reliability impacts due to existing IBR facilities ceasing operation due to economics.

Likes 0

Dislikes 0

Response

Thank you for your comment. R9 did not add any financial burden to the responsible entity. The purpose of R9 was to allow more time for entities that may have circumstances beyond their control that delay installation of DME beyond the stated implementation deadline.

Colin Chilcoat - Invenergy LLC - 5,6

Answer

No

Document Name

Comment

Invenergy suggests the below language for R9:

R9. Each Generator Owner and Transmission Owner with a documented equipment limitation that would prevent an applicable IBR that is in commercial operation prior to the effective date of this standard from installing disturbance monitoring equipment in accordance with Requirements R1 through R7 shall communicate each equipment limitation to the Regional Entity.

- 9.1.** Each Generator Owner and Transmission Owner shall include in its documentation:
- 9.1.1.** Identifying information of the applicable Element and cause of the limitation
 - 9.1.2.** Which aspect(s) of disturbance monitoring the Element would be unable to meet
- 9.2.** Each Generator Owner and Transmission with a previously communicated equipment limitation that repairs or replaces the equipment causing the limitation shall document and communicate such equipment change to the Regional Entity within 30 days of the equipment change.

Likes	0
Dislikes	0

Response

Thank you for your comments. The intent of R9 was to allow more time for entities that may have circumstances beyond their control that delay installation of DME beyond the stated implementation deadline. It was not meant to provide technical feasibility exceptions such as in this suggested revision. FERC Order 901 requires disturbance monitoring data from the IBRs identified in the Applicability section of PRC-028.

Lauren Giordano - Lauren Giordano On Behalf of: Dennis Sismaet, Northern California Power Agency, 4, 6, 3, 5; Marty Hostler, Northern California Power Agency, 4, 6, 3, 5; Michael Whitney, Northern California Power Agency, 4, 6, 3, 5; - Lauren Giordano

Answer	No
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Document Name	
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Comment

If the allegation that existing IBR's are causing issues then the requirements should be the same.

Likes	0
Dislikes	0

Response

Thank you for your comment. The requirements for new and existing IBRs are the same, but the SDT recognizes that retrofitting existing equipment can be more difficult than including the DME as part of a capital project. R9 did not allow for ongoing exceptions. The intent of R9 was to allow more time for entities that may have circumstances beyond their control that delay installation of DME beyond the stated implementation deadline.

Patricia Ireland - DTE Energy - 4

Answer No

Document Name

Comment

The idea of allowing a corrective action plan for compliance challenges at existing operations is a good one however the circumstance that would allow for use of the CAP is poorly defined. What exactly is "not able to install" ? Does that mean within reason? cost effectively? Not able to install regardless of time or money is a very high bar and essentially unhelpful.

Likes 0

Dislikes 0

Response

Thank you for your comments. The process for seeking an extension has been heavily revised and moved to the Implementation Plan for the next draft. These extensions will have to be approved by the Regional Entity.

Kennedy Meier - Electric Reliability Council of Texas, Inc. - 2, Group Name ISO/RTO Council Standards Review Committee (SRC)

Answer No

Document Name

Comment

The SRC is concerned that the requirement as written may be overly broad. To address this, examples of legitimate reasons that an entity may be unable to “install disturbance monitoring equipment” should be provided in the Technical Rationale.

Alternatively, this concern could be addressed by revising the standard to require all installations to be completed within the parameters of the Implementation Plan for PRC-028.

Likes 0

Dislikes 0

Response

Thank you for your comments. The process for seeking an extension has been heavily revised and moved to the Implementation Plan for the next draft. These extensions will have to be approved by the Regional Entity. The SDT intends to try to expand on how it should be used in the PRC-028 Technical Rationale.

Lindsay Wickizer - Berkshire Hathaway - PacifiCorp - 6

Answer

No

Document Name

Comment

Requiring comprehensive DME for SER, FR, and DDR at all "old" facilities is unnecessary. The investigations performed into past grid disturbances have documented the trouble that legacy facilities have been experiencing. Focusing on new equipment that has been designed and built to better ride-thru system disturbances will provide more benefit and value to system reliability.

R2.3 and R3.3 and their subparts are unnecessary as these devices have not been identified as causing any problems that suggest they need to be monitored.

Likes 0

Dislikes 0

Response

Thank you for your comments. This SDT has been tasked with not only making sure data is available to analyze IBR response to BES disturbances, but also, with the added directives of FERC Order 901, ensuring disturbance data is available to evaluate IBR performance and validate IBR models. That expanded scope makes monitoring at all IBRs important. Individual unit requirements have been removed from the latest draft.

Marty Hostler - Northern California Power Agency - 4	
Answer	No
Document Name	
Comment	
No. If the allegation that existing IBR's are causing issues then the requirements should be the same.	
Likes	0
Dislikes	0
Response	
Thank you for your comment. The requirements for new and existing IBRs are the same, but the SDT recognizes that retrofitting existing equipment can be more difficult than including the DME as part of a capital project. R9 did not allow for ongoing exceptions. The intent of R9 was to allow more time for entities that may have circumstances beyond their control that delay installation of DME beyond the stated implementation deadline.	
Dwanique Spiller - Berkshire Hathaway - NV Energy - 5	
Answer	No
Document Name	
Comment	
Requiring comprehensive DME for SER, FR, and DDR at all "old" facilities is unnecessary. The investigations performed into past grid disturbances have documented the trouble that legacy facilities have been experiencing. Focusing on new equipment that has been designed and built to better ride-thru system disturbances will provide more benefit and value to system reliability.	
R2.3 and R3.3 and their subparts are unnecessary as these devices have not been identified as causing any problems that suggest they need to be monitored.	
Likes	0

Dislikes	0
Response	
Thank you for your comments. This SDT has been tasked with not only making sure data is available to analyze IBR response to BES disturbances, but also, with the added directives of FERC Order 901, ensuring disturbance data is available to evaluate IBR performance and validate IBR models. That expanded scope makes monitoring at all IBRs important. Individual unit requirements have been removed from the latest draft.	
Megan Melham - Decatur Energy Center LLC - 5	
Answer	No
Document Name	
Comment	
Capital Power supports the comments submitted by NAGF.	
Capital Power does not support the proposed Requirement R9 due to the potential cost issues for existing IBR facilities. This can be a costly endeavor if equipment was recently replaced as per planned life cycle replacement strategies. There is also the potential reliability impacts due to existing IBR facilities ceasing operation due to economics.	
Likes	0
Dislikes	0
Response	
Thank you for your comment. R9 did not add any financial burden to the responsible entity. The purpose of R9 was to allow more time for entities that may have circumstances beyond their control that delay installation of DME beyond the stated implementation deadline.	
Lori Frisk - Lori Frisk On Behalf of: Hillary Creurer, Allete - Minnesota Power, Inc., 1; - Lori Frisk	
Answer	No
Document Name	

Comment

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

Likes 0

Dislikes 0

Response

Thank you. See the response to MRO NSRF comments.

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 agree with the language proposed. PG&E agrees with the following EEI comments:

1 - Given the voltage level identified in the Applicability section of PRC-028, DPs will likely own applicable equipment that will be impacted. For this reason, we suggest that DPs be added to R9.

2 - The use of “applicable facility” in R9 should be removed because this term has no defined meaning. To resolve this issue, we suggest replacing “of an applicable facility” with “that own equipment as identified in “Section 4.2 (Facilities)”.

3 - Disturbance Monitoring Equipment is a NERC defined term and should be capitalized to ensure that responsible entities understand the scope of their responsibilities under this Reliability Standard.

Likes 0

Dislikes 0

Response

Thank you for your comments. See the response to EEI comments.

1 – The language used in the Applicability section of the next draft has been revised and will not include the non-BES IBRs affected by the Rules of Procedure revision process.

2 – The SDT will review the standard for use of “facility”. The NERC standard template uses “Facilities” under the “Applicability” section, and the SDT intended the phrase “applicable facilities” to refer back to that section. However, the SDT recognizes that this can cause confusion when “Facilities” is also a NERC Glossary term.

3 – The SDT intends to review all documents for NERC Glossary terms and associated capitalization. Thank you for noting this one.

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

Answer	No
Document Name	

Comment

Conceptually, no, WECC believes there should not be a compliance loophole built into a Reliability Standard. General considerations mention three (3) calendar years to accommodate normal outage schedules. As written the entity may only have to outage one (1) IBR unit per collector feeder (and in some cases maybe only (1) IBR Unit for the entire Inverter-Based Resource), to install equipment in Parts 1.2/2.2. (as an example as it is not clear where that data is being recorded). Granted, SER/FR on circuit breakers, if not already installed at Part 1.1 locations require a complete outage but is it not already industry standard to have that capability on breakers in that voltage class? Waiting until 2029 to create a CAP per the Implementation Plan does not support reliable operations (and at least two “normal outage schedule” periods will have passed since the official start of this Project to accommodate the SER/FR additions if not present.) Part 9.2 allows too broad of a scope to be considered reliable with no support (what is “beyond the control” and who defines that?). Submitting the CAP to the Regional Entity with a request to extend time provided for compliance does not support reliability. The Regional Entity does not necessarily have the authority to grant extensions for compliance. Timelines for compliance are dictated by Implementation Plans or the Requirement language itself. There are no required timelines for the CAP which could equate to a CAP that is never implemented. WECC appreciates the idea of striking a balance between cost and reliability (with compliance impacts) but as written the reliability aspect will suffer to support being compliant.

Likes	0
Dislikes	0

Response

Thank you for your comments. In the next draft, the process for seeking an extension has been heavily revised and moved to the Implementation Plan. The SDT intends to look at clarifying when and how it should be used in the PRC-028 Technical Rationale.

Eric Sutlief - CMS Energy - Consumers Energy Company - 3,4,5 - RF

Answer No

Document Name

Comment

Section R3.2 seems to specify that a Schweitzer level sampling rate of 64 samples per cycle needs to be implemented which it does not appear to be within the capabilities of the event recording generated by the turbine controllers. The minimum requirements appear to be the AC and Frequency values at that high of a resolution.

The GE documentation suggest the points and sampling rate of the trip files generated vary. Even if the resolution we need is possible, it may not have the correct setting dependent on the event that is recorded in the trip file. The fastest sampling rate in the GE trending software is at a 10 milli-seconds, which is significantly less than what would be required for 64 samples per 1 hz.

Likes 0

Dislikes 0

Response

Thank you for your comment. Unit level monitoring has been removed from the latest draft of the standard.

Colby Galloway - Southern Company - Alabama Power Company - 1,3,5,6 - SERC, Group Name Southern Company

Answer No

Document Name

Comment

R9.5 requires Entities submit the CAP to the Regional Entity. Entities will require guidance on the process with input from each Regional Entity. This is an administrative process that could cause undue delay in the CAP process while managing time constraints. It would be more

efficient for the Entity to create and maintain its own CAP similar to PRC-026 R3 and R4. The CAP can be made available during periodic audits. There is no demonstration of how “reporting” CAPs to Regional Entities adds to system Reliability.

Requiring comprehensive DME for SER, FR, and DDR at all existing facilities is unnecessary. The investigations performed for past grid disturbances have documented the trouble that legacy facilities have been experiencing. Focusing on new equipment that has been designed and built to better ride-thru system disturbances will provide more benefit and value to system reliability. R2.3 and R3.3 and their subparts are not necessary as these devices have not been identified as causing any problems that suggest they need to be monitored.

Southern Company agrees with EEI suggested modifications to the text:

1. The use of “applicable facility” in R9 should be removed because this term has no defined meaning. To resolve this issue, it is suggested replacing “of an applicable facility” with “that own equipment as identified in Section 4.2 (Facilities)”.
2. Disturbance Monitoring Equipment is a NERC defined term and should be capitalized in order to ensure that responsible entities understand the scope of their responsibilities under this Reliability Standard.

Likes 0

Dislikes 0

Response

Thank you for your comments.

Requests for extension must be approved by the Regional Entity, so they would not be valid without being filed.

This SDT has been tasked with not only making sure data is available to analyze IBR response to BES disturbances, but also, with the added directives of FERC Order 901, ensuring disturbance data is available to evaluate IBR performance and validate IBR models. That expanded scope makes monitoring at all IBRs important. Individual unit requirements have been removed from the latest draft.

Please, also see response to EEI comments.

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

Answer	No
Document Name	
Comment	
Energy supports and incorporates by reference the comments of the Edison Electric Institute (EEI), the MRO NSRF, and the NAGF for question #4.	
Likes	0
Dislikes	0
Response	
Thank you. See responses to EEI, MRO NSRF, and NAGF comments.	
Christine Kane - WEC Energy Group, Inc. - 3, Group Name WEC Energy Group	
Answer	No
Document Name	
Comment	
WEC Energy Group supports the comments of both the MRO NSRF and the NAGF.	
Likes	0
Dislikes	0
Response	
Thank you. See responses to MRO NSRF and NAGF comments.	
Anna Martinson - MRO - 1,2,3,4,5,6 - MRO, Group Name MRO Group	
Answer	No
Document Name	

Comment

Requiring comprehensive DME for SER, FR, and DDR at all "old" facilities is unnecessary. The investigations performed into past grid disturbances have documented the trouble that legacy facilities have been experiencing. Focusing on new equipment that has been designed and built to better ride-thru system disturbances will provide more benefit and value to system reliability.

R2.3 and R3.3 and their subparts are unnecessary as these devices have not been identified as causing any problems that suggest they need to be monitored.

Likes	1	Lincoln Electric System, 1, Johnson Josh
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Dislikes	0	
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Response

Thank you for your comments. This SDT has been tasked with not only making sure data is available to analyze IBR response to BES disturbances, but also, with the added directives of FERC Order 901, ensuring disturbance data is available to evaluate IBR performance and validate IBR models. That expanded scope makes monitoring at all IBRs important. Individual unit requirements have been removed from the latest draft.

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

Answer	No
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Document Name	
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Comment

Tri-State agrees with MRO Comments.

Likes	0
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Dislikes	0
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Response

Thank you. Please see response to MRO comments.

Rachel Schuldt - Black Hills Corporation - 6, Group Name Black Hills Corporation - All Segments	
Answer	No
Document Name	
Comment	
<p>Black Hills Corporation agrees with NAGF comments. The NAGF does not support the proposed Requirement R9 due to the potential cost issues for existing IBR facilities as well as the potential reliability impacts due to existing IBR facilities ceasing operation due to economics.</p> <p>Black Hills Corporation also agrees with this comment from EEI: EEI supports the language proposed in Requirement R9 but offers the following non substantive comments for consideration:</p> <ol style="list-style-type: none"> 1. The use of “applicable facility” in R9 should be removed because this term has no defined meaning. To resolve this issue, we suggest replacing “of an applicable facility” with “that own equipment as identified in “Section 4.2 (Facilities)”. 2. Disturbance Monitoring Equipment is a NERC defined term and should be capitalized in order to ensure that responsible entities understand the scope of their responsibilities under this Reliability Standard. 	
Likes	0
Dislikes	0
Response	
Thank you. Please see responses to NAGF and EEI comments.	
Ben Hammer - Western Area Power Administration - 1	
Answer	No
Document Name	
Comment	

Requiring comprehensive DME for SER, FR, and DDR at all "old" facilities is unnecessary. The investigations performed into past grid disturbances have documented the trouble that legacy facilities have been experiencing. Focusing on new equipment that has been designed and built to better ride-thru system disturbances will provide more benefit and value to system reliability.

R2.3 and R3.3 and their subparts are necessary as these devices have not been identified as causing any problems that suggest they need to be monitored

Likes 0

Dislikes 0

Response

Thank you for your comments. This SDT has been tasked with not only making sure data is available to analyze IBR response to BES disturbances, but also, with the added directives of FERC Order 901, ensuring disturbance data is available to evaluate IBR performance and validate IBR models. That expanded scope makes monitoring at all IBRs important. Individual unit requirements have been removed from the latest draft.

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

Answer No

Document Name

Comment

FE asks DT to consider removing R9 and putting it into implementation plan to avoid future administrative burden to retire R9 when all CAPs are complete or consider R9 to mirror PRC-028 R8 or PRC-002 R12 to ease administrative burden.

Likes 0

Dislikes 0

Response

Thank you for your comments. In the next draft, the process for seeking an extension has been heavily revised and moved to the Implementation Plan.

Patricia Lynch - NRG - NRG Energy, Inc. - 5,6	
Answer	No
Document Name	
Comment	
NRG is in alignment with NAGFs comments regarding Requirement 9 due to potential cost issues and reliability impacts for existing IBR facilities to install this equipment.	
Likes	0
Dislikes	0
Response	
Thank you. See response to NAGF comments.	
Andy Thomas - Duke Energy - 1,3,5,6 - SERC,RF	
Answer	No
Document Name	
Comment	
Duke Energy supports and recommends implementation of EEI provided comments.	
Additionally, PRC-028-1 R9 that reads: Each Transmission Owner and Generator Owner of an applicable facility as specified in section A.4.2 that is "in commercial operation before the effective date of this standard" that is not able to install disturbance monitoring equipment in accordance with Requirements R1 through R7 in the time provided for compliance shall develop, maintain, and implement a Corrective Action Plan to provide the required capability. For the sake of fully defining compliance expectations, please amend language to define what action, if any, TO/GO entities must take if it is "not in commercial operation before the effective date of this standard".	
Likes	0
Dislikes	0

Response

Thank you for your comments. See the response to EEI comments.

R9 only applied to entities specified in R9. All others should reference the Implementation Plan. In the next draft, the process for seeking an extension previously defined by R9 has been heavily revised and moved to the Implementation Plan.

Ryan Quint - Elevate Energy Consulting - NA - Not Applicable - NA - Not Applicable, Group Name Elevate Energy Consulting

Answer

No

Document Name

Comment

No. This appears to be redundant with the development of an effective and reasonable implementation plan for this standard. The proposed implementation plan for 5+ years to get compliant with the standard seems sufficient to install/enable disturbance monitoring equipment. Elevate is not aware of any supply chain or other issues that would cause such long delays (as opposed to high power equipment, controllers, hardware, etc.).

Likes 0

Dislikes 0

Response

Thank you for your comment.

Mike Magruder - Avista - Avista Corporation - 1

Answer

Yes

Document Name

Comment

Wording should be clarified where “applicable facility” is used as this is not a defined term.

Likes 0

Dislikes	0
Response	
Thank you for your support and comment. The SDT will review the standard for use of “facility”. The NERC standard template uses “Facilities” under the “Applicability” section, and the SDT intended the phrase “applicable facilities” to refer back to that section. However, the SDT recognizes that this can cause confusion when “Facilities” is also a NERC Glossary term.	
Mark Gray - Edison Electric Institute - NA - Not Applicable - NA - Not Applicable	
Answer	Yes
Document Name	
Comment	
<p>EEI supports the language proposed in Requirement R9 but offers the following non substantive comments for consideration:</p> <ol style="list-style-type: none"> 1. The use of “applicable facility” in R9 should be removed because this term has no defined meaning. To resolve this issue, we suggest replacing “of an applicable facility” with “that own equipment as identified in “Section 4.2 (Facilities)””. 2. Disturbance Monitoring Equipment is a NERC defined term and should be capitalized in order to ensure that responsible entities understand the scope of their responsibilities under this Reliability Standard. 	
Likes	0
Dislikes	0
Response	
<p>Thank you for your support and comments.</p> <ol style="list-style-type: none"> 1. The SDT will review the standard for use of “facility”. The NERC standard template uses “Facilities” under the “Applicability” section, and the SDT intended the phrase “applicable facilities” to refer back to that section. However, the SDT recognizes that this can cause confusion when “Facilities” is also a NERC Glossary term. 2. The SDT intends to review all documents for NERC Glossary terms and associated capitalization. Thank you for noting this one. 	
David Jendras Sr - Ameren - Ameren Services - 3	
Answer	Yes
Document Name	

Comment	
None.	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
Kinte Whitehead - Exelon - 3	
Answer	Yes
Document Name	
Comment	
Exelon supports the comments submitted by the EEI for this question.	
Likes	0
Dislikes	0
Response	
Thank you. See response to EEI comments.	
Stephanie Kenny - Edison International - Southern California Edison Company - 6	
Answer	Yes
Document Name	
Comment	
EEI supports the language proposed in Requirement R9 but offers the following non substantive comments for consideration:	

{C}1. {C}The use of “applicable facility” in R9 should be removed because this term has no defined meaning. To resolve this issue, we suggest replacing “of an applicable facility” with “that own equipment as identified in “Section 4.2 (Facilities)”.

{C}2. {C}Disturbance Monitoring Equipment is a NERC defined term and should be capitalized in order to ensure that responsible entities understand the scope of their responsibilities under this Reliability Standard.

Likes	0
Dislikes	0

Response

Thank you for your support and comments.

1. The SDT will review the standard for use of “facility”. The NERC standard template uses “Facilities” under the “Applicability” section, and the SDT intended the phrase “applicable facilities” to refer back to that section. However, the SDT recognizes that this can cause confusion when “Facilities” is also a NERC Glossary term.
2. The SDT intends to review all documents for NERC Glossary terms and associated capitalization. Thank you for noting this one.

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

Answer	Yes
Document Name	

Comment

SIGE supports the inclusion of Requirement R9; however, SIGE requests a clarification regarding disturbance monitoring equipment referenced in Requirement R9. Was the Standard Drafting team’s use of the phrase “disturbance monitoring equipment” intended to reference the equipment covered by the NERC defined term “Disturbance Monitoring Equipment”? If so, SIGE recommends capitalizing the proposed language to clarify the intent.

Additionally, SIGE recommends two revisions to R9: 1) revise R9 to mirror the language in section 4.2 Functional Entities and 2) align the Applicability section reference with other NERC Standards. Recommended revisions are shown below:

R9. Each Transmission Owner and Generator Owner **that owns equipment as identified in *Applicability* section 4.2** that is in commercial operation before the effective date of this standard that is not able to install disturbance monitoring equipment in accordance with

Requirements R1 through R7 in the time provided for compliance shall develop, maintain, and implement a Corrective Action Plan to provide the required capability. For each Corrective Action Plan, the Transmission Owner and Generator Owner shall:

Likes 0

Dislikes 0

Response

Thank you for your support and comments. The SDT intends to review all documents for NERC Glossary terms and associated capitalization. Disturbance Monitoring Equipment was intended to refer to the NERC Glossary term. In the next draft, the process for seeking an extension has been heavily revised and moved to the Implementation Plan.

Selene Willis - Edison International - Southern California Edison Company - 5

Answer Yes

Document Name

Comment

“See comments submitted by the Edison Electric Institute”

Likes 0

Dislikes 0

Response

Thank you for your support. See the response to EEI comments.

Daniel Gacek - Exelon - 1

Answer Yes

Document Name

Comment

Exelon supports the comments submitted by the EEI for this question.

Likes 0

Dislikes 0

Response

Thank you for your support. See the response to EEI comments.

Brad Harris - CenterPoint Energy Houston Electric, LLC - 1 - Texas RE

Answer Yes

Document Name

Comment

Yes. CEHE supports Southern Indiana Gas & Electric, Company comments submitted for question 4.

Likes 0

Dislikes 0

Response

Thank you for your support. See response to Southern Indiana Gas & Electric, Company comments.

Alison MacKellar - Constellation - 5

Answer Yes

Document Name

Comment

Alison Mackellar on behalf of Constellation Segments 5 and 6

Likes 0

Dislikes	0
Response	
Thank you for your support.	
Carver Powers - Utility Services, Inc. - 4	
Answer	Yes
Document Name	
Comment	
If the standard and implementation plan were to pass in its current form, we do not feel that 2030 would be a sufficient amount of time to implement DDR recording at all sites that meet the applicability section of PRC-028. The procurement and installation process is time-consuming due to the limited amount of vendors and having to do additional efforts for supply chain risk, etc.	
Likes	0
Dislikes	0
Response	
Thank you for your comments. The SDT recognizes the possibility of supply chain issues. FERC Order 901 requires that PRC-028 be effective and enforceable no later than January 1, 2030. This SDT has no option to extend that deadline. The concession provided to industry is inclusion of a process allowing the GO or TO to request an extension through its Regional Entity for IBRs in commercial operation before the effective date of PRC-028-1. This was R9 in the previous draft but has been moved to the Implementation Plan. Supply chain issues could be cited under subpart 1.3 of the extension request.	
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	

SRP agrees with industry that while these changes provide value in evaluating facilities when there are disturbances, however it is also critical to assign responsibility to IBR facilities and their owners to enforce these requirements.

Likes 0

Dislikes 0

Response

Thank you for your support.

Kimberly Turco - Constellation - 6

Answer Yes

Document Name

Comment

Kimberly Turco on behalf of Constellation Segments 5 and 6

Likes 0

Dislikes 0

Response

Thank you for your support.

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

Answer Yes

Document Name

Comment

None

Likes	0
Dislikes	0
Response	
Thank you for your support.	
Glen Farmer - Avista - Avista Corporation - 5	
Answer	Yes
Document Name	
Comment	
Wording should be clarified where “applicable facility” is used as this is not a defined term.	
Likes	0
Dislikes	0
Response	
Thank you for your support and comment. The SDT will review the standard for use of “facility”. The NERC standard template uses “Facilities” under the “Applicability” section, and the SDT intended the phrase “applicable facilities” to refer back to that section. However, the SDT recognizes that this can cause confusion when “Facilities” is also a NERC Glossary term.	
Robert Follini - Avista - Avista Corporation - 3	
Answer	Yes
Document Name	
Comment	
Wording should be clarified where “applicable facility” is used as this is not a defined term.	
Likes	0
Dislikes	0

Response	
Thank you for your support and comment. The SDT will review the standard for use of “facility”. The NERC standard template uses “Facilities” under the “Applicability” section, and the SDT intended the phrase “applicable facilities” to refer back to that section. However, the SDT recognizes that this can cause confusion when “Facilities” is also a NERC Glossary term.	
Constantin Chitescu - Ontario Power Generation Inc. - 5	
Answer	Yes
Document Name	
Comment	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
Dave Krueger - SERC Reliability Corporation - 10	
Answer	Yes
Document Name	
Comment	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
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	
Thank you for your support.	
Scott Langston - Tallahassee Electric (City of Tallahassee, FL) - 1	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thank you for your support.	
Steven Taddeucci - NiSource - Northern Indiana Public Service Co. - 3	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	

Response	
Thank you for your support.	
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	
Thank you for your support.	
Sean Bodkin - Dominion - Dominion Resources, Inc. - 6, Group Name Dominion	
Answer	Yes
Document Name	
Comment	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
Kenisha Webber - Entergy - NA - Not Applicable - SERC	
Answer	Yes
Document Name	

Comment	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
Adam Burlock - Adam Burlock On Behalf of: Ashley Scheelar, TransAlta Corporation, 5; - Adam Burlock	
Answer	Yes
Document Name	
Comment	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
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	
Thank you for your support.	
John Pearson - ISO New England, Inc. - 2	
Answer	Yes
Document Name	
Comment	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
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	
Thank you for your support.	
Jennifer Bray - Arizona Electric Power Cooperative, Inc. - 1	

Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thank you for your support.	
Ryan Strom - Ryan Strom On Behalf of: Jason Procnuiar, Buckeye Power, Inc., 4, 5, 3; Kevin Zemanek, Buckeye Power, Inc., 4, 5, 3; Tom Schmidt, Buckeye Power, Inc., 4, 5, 3; - Ryan Strom, Group Name Buckeye Power Group	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thank you for your support.	
David Vickers - David Vickers On Behalf of: Daniel Roethemeyer, Vistra Energy, 5; - David Vickers	
Answer	Yes
Document Name	
Comment	

Likes	0
Dislikes	0
Response	
Thank you for your support.	
Rachel Coyne - Texas Reliability Entity, Inc. - 10	
Answer	Yes
Document Name	
Comment	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
Thomas Foltz - AEP - 5	
Answer	Yes
Document Name	
Comment	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
Scott Thompson - PNM Resources - 1,3 - WECC,Texas RE	

Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thank you for your support.	
Jennifer Weber - Tennessee Valley Authority - 1,3,5,6 - SERC	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thank you for your support.	
Sean Steffensen - IDACORP - Idaho Power Company - 1	
Answer	Yes
Document Name	
Comment	
Likes 0	

Dislikes	0
Response	
Thank you for your support.	
Teresa Krabe - Lower Colorado River Authority - 5	
Answer	Yes
Document Name	
Comment	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
Adrian Andreoiu - BC Hydro and Power Authority - 1, Group Name BC Hydro	
Answer	Yes
Document Name	
Comment	
Likes	0
Dislikes	0
Response	
Thank you for your support.	
Andrea Jessup - Bonneville Power Administration - 1,3,5,6 - WECC	
Answer	Yes

Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thank you for your support.	
Duane Franke - Manitoba Hydro - 1,3,5,6 - MRO	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thank you for your support.	
Wendy Kalidass - U.S. Bureau of Reclamation - 5	
Answer	
Document Name	
Comment	
Not applicable to Reclamation.	
Likes 0	

Dislikes 0

Response

Thank you for responding.

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

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

Answer

Document Name

Comment

- 1) In 4.3.2 of PRC-002-5, we need to clarify this trigger condition “Phase undervoltage or overcurrent”. Does “phase undervoltage” refer to phase-phase or phase-to-neutral undervoltage”?
- 2) Under “Facilities” of 4.1 in PRC-028-1, how was this 60 kV threshold determined?
- 3) In section 3.1.3.2, section 3.2.3.1 and section 3.3.3.2 of PRC-028-1, we need to clarify this trigger condition “AC phase overvoltage and undervoltage”. Does “phase undervoltage” refer to phase-phase or phase-to-neutral undervoltage”?
- 4) In R8 of PRC-028-1, “Submit a Corrective Action Plan (CAP) to the Regional Entity and implement it.” should probably read “Submit a Corrective Action Plan (CAP) and a CAP implementing schedule to the Regional Entity”?

Likes 0

Dislikes 0

Response

Thank you for your comments.

- 1) The SDT leaves this decision to engineering judgment
- 2) This threshold came directly from the latest NERC ROP GO/GOP registration criteria which were approved by the NERC Board in February and filed with FERC on March 19, 2024. However, the language used in the Applicability section of the next draft has been revised. It will not include the non-BES IBRs affected by the Rules of Procedure revision process.
- 3) The SDT leaves this decision to engineering judgment

4) R8 has been revised in the next draft for clarity.

Ryan Quint - Elevate Energy Consulting - NA - Not Applicable - NA - Not Applicable, Group Name Elevate Energy Consulting

Answer

Document Name

Comment

It is unclear why NERC is so adamant about not adopting IEEE standards within the NERC standards, and has stated this in multiple forums related to the adoption of IEEE 2800-2022. However, then now proposes to adopt IEEE C37.111 COMTRADE standard within the new PRC-028-1 proposed standard. Inconsistency regarding NERC's approach and opinion in this area leaves industry confused, uncertain, and concerned regarding whether NERC has a clear and effective standards improvement strategy.

Likes 0

Dislikes 0

Response

Thanks for your comment. Requiring FR & DDR data in IEEE C37.111 COMTRADE format is consistent with PRC-002 data formatting requirements and ensures that all parties can access necessary files when FR and DDR files are shared.

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

Answer

Document Name

Comment

Duke Energy supports and recommends implementation of EEI provided comments.

Likes 0

Dislikes 0

Response

Thank you. Please see response to EEI comments.	
Robert Follini - Avista - Avista Corporation - 3	
Answer	
Document Name	
Comment	
Overall wording for the sections mentioned above for PRC-028 should be cleaned up. Terms like IBR should have formal definitions, outside of PRC-028 in the NERC Glossary of Terms.	
Likes 0	
Dislikes 0	
Response	
Thank you for your comments. The Applicability section has been edited and reformatted for clarity in the next draft, and the language used will not include any in progress definitions or the non-BES IBRs affected by the Rules of Procedure revision process.	
Glen Farmer - Avista - Avista Corporation - 5	
Answer	
Document Name	
Comment	
Overall wording for the sections mentioned above for PRC-028 should be cleaned up. Terms like IBR should have formal definitions, outside of PRC-028 in the NERC Glossary of Terms.	
Likes 0	
Dislikes 0	
Response	

Thank you for your comment. The Applicability section has been edited and reformatted for clarity in the next draft, and the language used will not include any in progress definitions or the non-BES IBRs affected by the Rules of Procedure revision process.

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

Answer

Document Name

Comment

BC Hydro appreciates the drafting team efforts and the opportunity to comment.

PRC-028-1 R1 requires an entity to record data “when triggered by ride-through operation”. BC Hydro requests that drafting provides additional clarity on or criteria to determine what would constitute “ride-through operation” as it pertains to an applicable entity’s compliance obligation to identify all events in scope of R1 Part 1.2.

Requirement R3 Footnote 3 on “main power transformer” should use IBR instead of the undefined term “dispersed power producing resources”. BC Hydro suggests that instead of this wording, which is indeed referenced in the inclusion I4 of the BES definition, the new IBR Glossary Term is preferable.

Requirement R7 requires that all SER, DDR and FR data be provided upon request by an applicable entity. BC Hydro suggests that all data may not be feasible or even required and recommends instead that the provision of the SER, DDR and FR data be done in accordance with a qualified request and within the bounds set by Part 7.1 through Part 7.5 of Requirement R7.

PRC-028-1 Requirement R8 and PRC-002-5 R12 second bullet as written requires that a CAP will need to be implemented within 90 days. The VSL Table and the Technical Rationale provide clarity that it is only the CAP that requires submission within 90 days for the situations where an entity is unable to restore capability within 90 days. BC Hydro recommends that the drafting team revises the PRC-028-1 R8 and PRC-002-5 R12 wording to clarify that the 90-day timeline is only mandated for the CAP submission. Also important to clarify within the language of the Requirement is whether the 90-day timeline is based on business or calendar days.

BC Hydro recommends that the implementation plan for PRC-028-1 be coordinated with the approval of the approval of the IBR and IBR Unit definitions.

Likes 0

Dislikes	0
Response	
<p>These requirements at the unit level have been removed from the latest draft.</p> <p>This footnote has been revised.</p> <p>Requirement R7 is bounded by subparts 7.1 through 7.6 as the requirement states “in accordance with...”</p> <p>PRC-028-1 Requirement R8 and PRC-002-5 R12 have been revised for clarity.</p> <p>Due to the time constraints of FERC Order 901, development of PRC-028 cannot be put on hold until the IBR related glossary terms are finalized. However, the language used in the Applicability section of the next draft has been revised. It will not include any in progress definitions or the non-BES IBRs affected by the Rules of Procedure revision process.</p>	
Patricia Lynch - NRG - NRG Energy, Inc. - 5,6	
Answer	
Document Name	
Comment	
<p>NRG is supportive of NAGFs comments that the Project needs to be closely coordinated with other active NERC IBR related projects to avoid conflicts and duplication of requirements.</p>	
Likes	0
Dislikes	0
Response	
<p>Thank you for your comment. The PRC-028, PRC-029, & PRC-030 and their NERC facilitators are in close contact. See response to NAGF comments.</p>	
Mark Garza - FirstEnergy - FirstEnergy Corporation - 4, Group Name FE Voter	

Answer	
Document Name	
Comment	
No additional comments.	
Likes 0	
Dislikes 0	
Response	
Thank you.	
Sean Steffensen - IDACORP - Idaho Power Company - 1	
Answer	
Document Name	
Comment	
This comment applies to PRC-028-1 R5.2. Idaho Power presently requires existing and future IBRs connecting to its transmission system to provide plant-level PMU data. This data is streamed to a central data concentrator in real time, where it is then stored in a central data historian. The message rate has been chosen to be 30 samples per second due to limitations of the communications systems. Moving this existing system to 60 samples per cycle to obtain this data may result in significant re-design and additional costs.	
Likes 0	
Dislikes 0	
Response	
Thank you for your comment. The SDT addresses the need for the 60 samples per second output recording rate in the Technical Rationale.	
Marcus Bortman - APS - Arizona Public Service Co. - 6	
Answer	

Document Name	
Comment	
AZPS has no additional comments at this time.	
Likes 0	
Dislikes 0	
Response	
Thank you.	
Thomas Foltz - AEP - 5	
Answer	
Document Name	
Comment	
<p>AEP has concerns with several of the requirement differences between PRC-002 and PRC-028 such as ten day data retention vs. twenty day data retention, output recording rate of electrical quantities of at least 30 times per second versus 60 times per second, synchronized clock accuracy within +/- 2 milliseconds versus +/- 1 millisecond, etc.. The Technical Rational document is silent on the reason for these differences. These changes are not insignificant, and having differing requirements for synchronous vs IBR technologies, introduces a risk for human performance error.</p> <p>PRC-002 Attachment 1 limits the BES buses required to record SER and FR data. During the recent system disturbance events, were any IBR facility buses required to capture SER and FR data under PRC-002? What is the reliability-driven rationale behind requiring *all* IBR facility buses to capture SER and FR data in PRC-028 as opposed to a targeted set based on an engineering analysis as done for PRC-002?</p> <p>PRC-002 and PRC-028 should both be revised to make it clear that the ability to provide data in CSV format is for DDR or PMU data *only.*</p>	
Likes 0	
Dislikes 0	

Response

Thank you for your comments.

It has been unusual for IBR buses (as defined in PRC-002) to meet the top 10% calculation criteria in PRC-002 Attachment 1, particularly since the Attachment 1 criteria only pertain to Transmission Owners, but some were required to be monitored under PRC-002.

This SDT has been tasked not only with making sure data is available to analyze IBR response to BES disturbances similar to what PRC-002 does for synchronous machines, but also ensuring disturbance data is available to evaluate IBR performance and validate IBR models per FERC Order 901. The requirements of the two standards cannot be directly compared. Please refer to the PRC-028 Technical Rationale for more details. The requirements are discussed there.

The SDT has made this revision regarding data formatting in the next draft.

Rachel Coyne - Texas Reliability Entity, Inc. - 10

Answer

Document Name

Comment

Texas RE has the following additional comments:

- Texas RE suggests removing the terms “machine based” from PRC-002-5 Requirement Part 5.1.1 as simply stating “Synchronous generating resource” is sufficient.
- In PRC-028-1 Standard, Requirement Part 2.1.3 should specify Real and reactive power on a three-phase basis:
 - 2.1.3. Real and reactive power on a **three-phase basis**.
- In PRC-028-1 Standard, Requirement Part 2.3.3 should remove ‘Real’ from the requirement and specify the reactive power on a three-phase basis:
 - **2.3.3. Real and Reactive power on three-phase basis.**
- Remove the ending parathesis in Requirement Part 3.2.2.
- Texas RE recommends the SDT consider specifying the trigger settings for ‘overfrequency and underfrequency’ levels to be consistent with the PRC-024 requirements:

- **3.2.3.2 Overfrequency level at minimum 60.6 Hz and underfrequency level at 59.4 Hz**

- Texas RE recommends the SDT consider including an option for existing registered entities that have IBR units that are incapable of recording data to provide technical justification for the IBR unit’s inability to record based on OEM specifications or based on an independent engineering assessment.

Likes 0

Dislikes 0

Response

Thank you for your comments.

- This SDT didn’t touch any of the data requirements in the PRC-002 standard.
- The SDT has made this revision.
- This is now R 2.2.3, and the SDT has made the suggested revision.
- This requirement has been removed
- This requirement has been removed
- FERC Order 901 requires that disturbance data is not only available to analyze IBR response to BES disturbances, but also to evaluate IBR performance and validate IBR models. That directive does not leave room for exceptions. Individual unit requirements have also been removed from the latest draft.

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

Answer

Document Name

Comment

Section 1.2 and 1.3: While IBR settings are important when analyzing events, the various settings and modes may not be recorded by the inverter data recorder. At a minimum 1.3.3 and 1.3.4 should be removed for IBR units that are in commercial operation since they would have not been designed to meet the requirement.

Section 2.1.3: PRC-002 does not require real and reactive power for FR data, the same should apply for PRC-028, Most fault recording equipment does not record power or frequency in FR records, this is a calculated value and is recorded in DDR/Continuous data. Software can be used to calculate power using FR data, power and frequency would not be in the comtrade file.

Section 2.3.3: Same comment as 2.1.3

Section 3.2..2 Existing IBRs may not be able to store 2 second event records at a 64 samples/cycle.

Section 3.2.3.2 Frequency triggers should not be required for FR data. They can be difficult to set and trigger erroneous events which can fill up storage. Frequency triggers should only be required for continuous/DDR recording.

Section 5.2 Not all existing install equipment may be able to meet the 60 samples/second recording rate. Requirement in PRC-002 is 30 samples/second.

Section 7.1 Existing IBRs may not be able to store FR or DDR data for 30 days.

Likes 0

Dislikes 0

Response

Thank you for your comments.

All individual unit requirements have been removed from the latest draft.

This SDT has been tasked not only with making sure data is available to analyze IBR response to BES disturbances similar to what PRC-002 does for synchronous machines, but also with ensuring disturbance data is available to evaluate IBR performance and validate IBR models per FERC Order 901. The requirements of the two standards cannot be directly compared. Also, the requirement is to have data sufficient to determine the quantities, so calculated versus recorded is acceptable.

All individual unit requirements have been removed from the latest draft.

All individual unit requirements have been removed from the latest draft.

Please see PRC-028 Technical Rationale for justification of this recording rate and above response for why PRC-028 requirements cannot be directly compared to PRC-002.

All individual unit requirements have been removed from the latest draft, and the 20 day requirement should be less of an issue with equipment used to monitor at the plant level.

Ben Hammer - Western Area Power Administration - 1

Answer

Document Name

Comment

For R8, it is not clear whether the CAP implementation referenced in the 2nd bullet item must be complete at the end of the 90 days specified in the R8 text. If so, what then is the difference in the first bullet (restoring the capability) and why might the Regional Entity need to know of a repair plan in progress that will be completed before the 90-day limit?

In R9.5 does the request to extend the time provided refer to any changes made to an original CAP timeline? (there are no other deadlines for completing any R9 CAP)

In R1.2 and R1.3 remove the unneeded brackets [] surrounding “the effective date of this standard”.

CAPS documentation specifications and submittals to the RE are purely administrative and should be removed from the requirement list. A simple requirement to fix any faulty equipment will accomplish the intent of R8 & R9. An audit can check to ensure that all broken equipment was handled properly.

What dictates a “ride-thru” event in R1? The IBR mode status?

Why is R2.2.1 needed to be the IBR Unit transformer HV side versus the LV side?

Comments on cost:

Based on research for the last ballot on the costs of having this on each feeder at a wind farm. This doesn't include solar IBRS.

In addition, the contributing entity 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.

Likes 0

Dislikes 0

Response

Thank you for your comments.

R8 has been revised for clarity, and the same revisions have been applied to PRC-002-5, R12.

In the next draft, the process for seeking an extension has been heavily revised and moved from R9 to the Implementation Plan.

These brackets are part of the NERC standard development process. Once the standard is approved by FERC, the phrase “the effective date of this standard” is replaced by the actual effective date of the standard.

R9 did not deal with faulty equipment. The intent of R9 was to allow more time for entities that may have circumstances beyond their control that delay installation of DME beyond the stated implementation deadline. Requests for extension must be approved by the Regional Entity, so they would not be valid without being filed.

All individual unit requirements have been deleted from the latest draft.

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

Answer

Document Name	
Comment	
<p>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”.</p> <p>Reclamation concurs that all IBR resources should have and maintain their own separate standards.</p>	
Likes	0
Dislikes	0
Response	
<p>Thank you for your comments. The revision was necessary, because some of the circuit breakers in the monitoring requirements are not BES Elements, specifically the collector circuit breakers.</p> <p>Ryan Strom - Ryan Strom On Behalf of: Jason Procnuiar, Buckeye Power, Inc., 4, 5, 3; Kevin Zemanek, Buckeye Power, Inc., 4, 5, 3; Tom Schmidt, Buckeye Power, Inc., 4, 5, 3; - Ryan Strom, Group Name Buckeye Power Group</p>	
Answer	
Document Name	
Comment	
<p>Buckeye Power supports the comments made by ACES:</p> <p>It is unclear as to what constitutes a “ride-through operation” of an IBR Unit in R1.2 and R1.3. Is this intended to be a reference to “no trip zone” identified in PRC-024? If so, as PRC-024 is not currently applicable to non-BES IBRs, how is this identified for those facilities? We believe additional guidance is needed for these requirements.</p>	
Likes	0

Dislikes	0
Response	
Thank you for your comments. Please see the response to ACES comments. Requirements 1.2 and 1.3 have been deleted from the latest draft of the standard.	
Kimberly Turco - Constellation - 6	
Answer	
Document Name	
Comment	
The cost and burden of the proposed PRC-028 requirements are not believed justified by the reliability benefits it would provide.	
Kimberly Turco on behalf of Constellation Segments 5 and 6	
Likes	0
Dislikes	0
Response	
Thank you for your comment.	
Rachel Schuldt - Black Hills Corporation - 6, Group Name Black Hills Corporation - All Segments	
Answer	
Document Name	
Comment	
Black Hills Corporation agrees with comments from NAGF and EEI, included here:	

The NAGF notes that Project 2021-04 needs to be closely coordinated with other active NERC IBR related projects to ensure there is no conflict and/or duplication of efforts. The NAGF recommends that NERC publish a guideline/roadmap to demonstrate how all the on-going and pending IBR work activities fit together so that industry can understand how these efforts will enhance BPS/BES reliability. For example, why is it necessary for PRC-028 to be effective prior to other new IBR standards (i.e., PRC-029/PRC-030/PRC-031)?

EI offers the following additional comments:

DDR Requirements for PRC-002 & PRC-028

EI suggests that consideration should be given to modifying the requirements for dynamic Disturbance recording (DDR) equipment in both PRC-002 and PRC-028 in order to permit responsible entities to either install DDR equipment or Phasor Measurement Units (PMUs) since PMU equipment capture disturbance data at equal or better rates, and have the added benefit of synchronizing disturbance data from other locations utilizing existing network communications.

Data Retention Requirements for PRC-002 & PRC-028

EI does not agree that the data retention requirements for PRC-002 (see Requirement R11 - 10 days) and PRC-028 (Requirement R7 – 20 days) should be different. Having two different data retention requirements for two Reliability Standards that have the exact same purpose is unjustified. Given the currently enforceable version of PRC-002 has a 10 day retention period, PRC-028 should have the same data retention period.

Reliability Coordinator Responsibilities for PRC-028

EI suggests that the RC should be provided with oversight responsibilities for the placement of DDR equipment, even at IBR facilities. While EI understands that the desire is to have DDR equipment at all IBR Facilities, as more of these facilities are added to the BPS, it is likely that there will be clusters of IBR facilities in some areas diminishing the need for this equipment at all of these facilities. We further note that the cost of this equipment is significant, and consideration should be given to the actual need and the RC would be the best judge to make this determination.

Likes 0

Dislikes 0

Response

Thank you. Please see the responses to NAGF and EEI comments.

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

Answer

Document Name

Comment

NA

Likes 0

Dislikes 0

Response

Thank you.

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

Answer

Document Name

Comment

AEPC thanks you for the opportunity to comment and has signed on to ACES comments.

It is unclear as to what constitutes a “ride-through operation” of an IBR Unit in R1.2 and R1.3. Is this intended to be a reference to “no trip zone” identified in PRC-024? If so, as PRC- 024 is not currently applicable to non-BES IBRs, how is this identified for those facilities? We believe additional guidance is needed for these requirements.

Likes 0

Dislikes	0
Response	
Thank you. Please see the response to ACES comments.	
Anna Martinson - MRO - 1,2,3,4,5,6 - MRO, Group Name MRO Group	
Answer	
Document Name	
Comment	
<p>For R8, it is not clear whether the CAP implementation referenced in the 2nd bullet item must be complete at the end of the 90 days specified in the R8 text. If so, what then is the difference in the first bullet (restoring the capability) and why might the Regional Entity need to know of a repair plan in progress that will be completed before the 90-day limit?</p> <p>In R9.5 does the request to extend the time provided refer to any changes made to an original CAP timeline? (there are no other deadlines for completing any R9 CAP)</p> <p>In R1.2 and R1.3 remove the unneeded brackets [] surrounding “the effective date of this standard”.</p> <p>CAPS documentation specifications and submittals to the RE are purely administrative and should be removed from the requirement list. A simple requirement to fix any faulty equipment will accomplish the intent of R8 & R9. An audit can check to ensure that all broken equipment was handled properly.</p> <p>What dictates a “ride-thru” event in R1? The IBR mode status?</p> <p>Why is R2.2.1 needed to be the IBR Unit transformer HV side versus the LV side?</p> <p>Based on research for the last ballot on the costs of having this on each feeder at a wind farm. This doesn't include solar IBRS. MRO NSRF 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.</p>	

It is not understood what drives the 2 seconds length and the 64 samples/sec recording requirements. Existing FR equipment typically has a maximum recording time of 60 cycles and maximum of 16 or 32 samples/sec. Both of these are not consistent with similar requirements of PRC-002 (30 cycles & 16 samples/sec).

3.2 will be difficult to achieve for older IBRs. FR recording equipment will need to be added to meet this requirement. Meeting these requirements at the inverter/controller level will be challenging.

MRO NSRF recommends that the SDT reach out to various manufacturers to confirm the equipment capability and if any changes/updates that may be necessary for equipment can meet this requirement will become available.

MRO NSRF recommends that the SDT consider equipment limitation be introduced similar to PRC-024 where equipment limitation is allowed but adequately reported.

MRO NSRF recommends the SDT consider alternative methods/requirements be provided as an option for the equipment that are not capable of meeting the recording requirements. Refer to

PRC-025, Options 5a and 5b as an example, where 5b option was introduced to eliminate costly replacements.

Likes 1	Lincoln Electric System, 1, Johnson Josh
Dislikes 0	

Response

Thank you for your comments.

R8 has been revised for clarity, and the same revisions have been applied to PRC-002-5, R12.

In the next draft, the process for seeking an extension has been heavily revised and moved from R9 to the Implementation Plan.

These brackets are part of the NERC standard development process. Once the standard is approved by FERC, the phrase “the effective date of this standard” is replaced by the actual effective date of the standard.

R9 did not deal with faulty equipment. The intent of R9 was to allow more time for entities that may have circumstances beyond their control that delay installation of DME beyond the stated implementation deadline. Requests for extension must be approved by the Regional Entity, so they would not be valid without being filed.

All individual unit requirements have been deleted from the latest draft.

In summary response to your remaining comments:

This SDT has been tasked not only with making sure data is available to analyze IBR response to BES disturbances similar to what PRC-002 does for synchronous machines, but also with ensuring disturbance data is available to evaluate IBR performance and validate IBR models per FERC Order 901. The requirements of the two standards cannot be directly compared. In setting the data recording parameters, the SDT has reviewed the NERC disturbance reports, consulted with manufacturers, and considered the burden to industry. The data requirements are addressed in the PRC-028 Technical Rationale. All individual unit requirements have been removed from the latest draft, and meeting these requirements should be less of an issue with equipment used to monitor at the plant level.

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

Answer

Document Name

Comment

WEC Energy Group supports the comments of both the MRO NSRF and the NAGF.

Likes 0

Dislikes 0

Response	
Thank you. Please see responses to MRO NSRF and NAGF comments.	
Stephen Whaite - Stephen Whaite On Behalf of: Lindsey Mannion, ReliabilityFirst , 10; - Stephen Whaite, Group Name ReliabilityFirst Ballot Body Member and Proxies	
Answer	
Document Name	
Comment	
RF appreciates the continued efforts of the SDT on this project.	
RF recommends adding a justification for the addition of CSV file formats to PRC-002 R11 Part 11.4 to the Technical Rationale. RF also recommends considering whether the addition of CSV should be limited to Dynamic Disturbance Recording (DDR) data, with the use of COMTRADE remaining required for all Fault Recording (FR) data.	
Likes	0
Dislikes	0
Response	
Thank you for your comments. The SDT did revise to limit CSV to DDR data only and has plans to review the Technical Rationale.	
Carver Powers - Utility Services, Inc. - 4	
Answer	
Document Name	
Comment	

We recognize that IBR’s pose a reliability risk and that being able to monitor the events and have in depth data for a trip is very important. However, the granularity of the information being required by PRC-028 does not seem to be in step with what PRC-002 is asking for. Could this data be captured by TOs who have a greater situational awareness?

Likes 0

Dislikes 0

Response

Thank you for your comment. FERC Order 901 directs that data not only be available to analyze IBR response to BES disturbances similar to what PRC-002 does for synchronous machines, but also with ensuring disturbance data is available to evaluate IBR performance and validate IBR models. The requirements of the two standards cannot be directly compared. The responsible party for the required data is the equipment owner registered with NERC, which in most cases is going to be the GO.

Alison MacKellar - Constellation - 5

Answer

Document Name

Comment

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

Alison Mackellar on behalf of Constellation Segments 5 and 6

Likes 0

Dislikes 0

Response

Thank you for your comment. FERC Order 901 mandates that disturbance monitoring data be available to analyze IBR response to BES disturbances, evaluate IBR performance, and validate IBR models.

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

Answer	
Document Name	
Comment	
<p>Evergy supports and incorporates by reference the comments of the Edison Electric Institute (EEI), the MRO NSRF, and the NAGF for question #5.</p>	
Likes 0	
Dislikes 0	
Response	
<p>Thank you. Please see responses to EEI, MRO NSRF, and NAGF comments.</p>	
Chantal Mazza - Chantal Mazza On Behalf of: Nicolas Turcotte, Hydro-Quebec (HQ), 1, 5; - Chantal Mazza	
Answer	
Document Name	
Comment	
<p>The following comments are for the PRC-002-5 standard:</p> <ol style="list-style-type: none"> 1) Replace "Hydro-Québec Interconnection" with "Québec Interconnection". 2) Correct VSL table for R1 Moderate and High since the examples don't cover exactly 70% et 80%. Suggest replacing with "more than 70%, but less than or equal to 80%" for the Moderate VSL and "more than 60%, but less than or equal to 70%" for the high VSL. 3) Severe VSL E11 : should read "...provided the requested data more than 60 days" instead of "...failed to provide the requested data more than 60 calendar days". 4) Attachment 1 step 3: "If the list has 11 or fewer buses, proceed to step 7" should be moved to step 2 with the following text "If the resulting list has 11 or fewer buses, proceed to Step 7". 	

The following comments are for the PRC-028-1 standard:

We are concerned that the standard refers to a defined term for IBR which has yet to be adopted in project 2020-06. No changes are made in Attachment 1, as steps written as-is would result in same outcome with proposed revision.

We suggest that the drafting team ensure consistent language is used in the section 4.2 “Facilities” section with the other projects such as 2020-02 (PRC-029) and 2023-02(PRC-030). Are we to understand that this is the recommended text for the facilities section in regards to the standards where IBRs are applicable and that the other projects will ensure consistent language use in line iwth the recent ROP and GO/GOP definition revisions?

Likes 0

Dislikes 0

Response

Thank you for your comments.

In PRC-002, “Hydro-Quebec Interconnection” is replaced with “Quebec Interconnection”. VSLs for R1 and R11 are also revised as suggested.

Thank you for your comment. The language used in the Applicability section of the next draft has been revised. It will not include any in progress definitions or the non-BES IBRs affected by the Rules of Procedure revision process. The other standards referenced in your comment will likely follow similar format in upcoming revisions.

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

Answer

Document Name

Comment

N/A

Likes 0	
Dislikes 0	
Response	
Thank you.	
Brad Harris - CenterPoint Energy Houston Electric, LLC - 1 - Texas RE	
Answer	
Document Name	
Comment	
CEHE supports EEI comments submitted for question 5 regarding Data Retention Requirements for PRC-002 & PRC-028.	
Likes 0	
Dislikes 0	
Response	
Thank you. Please see response to EEI comments.	
Daniel Gacek - Exelon - 1	
Answer	
Document Name	
Comment	
Exelon supports the comments submitted by the EEI for this question.	
Likes 0	
Dislikes 0	
Response	

Thank you. Please see response to EEI comments.	
Kenisha Webber - Entergy - NA - Not Applicable - SERC	
Answer	
Document Name	
Comment	
Did the standard drafting team consider CIP implications (risks)?	
Likes 0	
Dislikes 0	
Response	
Thank you for your comment. Monitoring equipment alone has no CIP impact. So, the SDT did not consider this an issue. If/how an entity chooses to network monitoring equipment could have a CIP impact, but that is outside the scope of this SDT.	
Colby Galloway - Southern Company - Alabama Power Company - 1,3,5,6 - SERC, Group Name Southern Company	
Answer	
Document Name	
Comment	
For PRC-028, R8, it is not clear whether the CAP implementation in the 2nd bullet item must be complete at the end of the 90-days specified in the R8 text. If so, what then is the difference in the first bullet (restoring the capability) and why might the Regional Entity need to know of a repair plan in progress that will be completed before the 90-day limit?	
In PRC-028, R9.5, does the request to extend the time provided refer to any changes made to an original CAP timeline? There are no other deadlines for completing any R9 CAP.	

CAPs documentation specifications and submittals to the RE are purely administrative and should be removed from the requirements list. A simple requirement to fix any faulty equipment will accomplish the intent of PRC-028, R8 and R9. An audit can check to ensure that all broken equipment was handled properly.

What dictates a “ride-thru” event in PRC-028, R1, the IBR mode status? Clarity is recommended.

In PRC-028, R1.2 and R1.3 remove the unnecessary brackets “[]” surrounding the “effective date of this standard”.

PRC-028, R1.3 has an “*if capable of recording*” clause. If the inverter is incapable of recording certain data, does the SDT contemplate an “exemption process”?

Why does PRC-028, R2.2.1 need to be the IBR Unit transformer HV side versus the LV side?

Southern Company is in agreement with EEI, recommending that the IBR and IBR Unit definitions should be removed from PRC-002 and PRC-028 because the associated SAR does not provide this SDT with the authority to develop or adopt a definition that is currently unapproved. Moreover, once these definitions are approved and added to the Glossary of Terms there will be no need for inclusion of the definitions within these Reliability Standards.

Likes 0

Dislikes 0

Response

Thank you for your comments.

R8 has been revised for clarity, and the same revisions have been applied to PRC-002-5, R12.

In the next draft, the process for seeking an extension has been heavily revised and moved from R9 to the Implementation Plan.

R9 did not deal with faulty equipment. The intent of R9 was to allow more time for entities that may have circumstances beyond their control that delay installation of DME beyond the stated implementation deadline. Requests for extension must be approved by the Regional Entity, so they would not be valid without being filed.

This requirement has been deleted from the latest draft.

These brackets are part of the NERC standard development process. Once the standard is approved by FERC, the phrase “the effective date of this standard” is replaced by the actual effective date of the standard.

This requirement has been deleted from the latest draft.

All individual unit requirements have been deleted from the latest draft.

The Applicability section has been edited and reformatted for clarity in the next draft, and the language used will not include any in progress definitions or the non-BES IBRs affected by the Rules of Procedure revision process.

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

Answer

Document Name

Comment

NPCC RSC supports the project.

Likes 0

Dislikes 0

Response

Thank you for your support.	
Selene Willis - Edison International - Southern California Edison Company - 5	
Answer	
Document Name	
Comment	
“See comments submitted by the Edison Electric Institute”	
Likes 0	
Dislikes 0	
Response	
Thank you. Please see response to EEI comments.	
Joshua London - Eversource Energy - 1,3, Group Name Eversource	
Answer	
Document Name	
Comment	
Eversource supports EEI's comment that the SDT should consider modifying the requirements for dynamic Disturbance recording (DDR) equipment in both PRC-002 and PRC-028 in order to permit responsible entities to either install DDR equipment or Phasor Measurement Units (PMUs) since PMU equipment capture disturbance data at equal or better rates, and have the added benefit of synchronizing disturbance data from other locations utilizing existing network communications.	
Likes 0	
Dislikes 0	
Response	
Thank you. Please see response to EEI comments.	

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

Answer

Document Name

Comment

See comments submitted by the Edison Electric Institute

Likes 0

Dislikes 0

Response

Thank you. Please see response to EEI comments.

Junji Yamaguchi - Hydro-Quebec (HQ) - 5

Answer

Document Name

Comment

The following comments are for the PRC-002-5 standard:

- 1) Replace "Hydro-Québec Interconnection" with "Québec Interconnection".
- 2) Correct VSL table for R1 Moderate and High since the examples don't cover exactly 70% et 80%. Suggest replacing with "more than 70%, but less than or equal to 80%" for the Moderate VSL and "more than 60%, but less than or equal to 70%" for the high VSL.
- 3) Severe VSL E11 : devrait lire "...provided the requested data more than 60 days" instead of "...failed to provide the requested data more than 60 calendar days".
- 4) Attachment 1 step 3: "If the list has 11 or fewer buses, proceed to step 7" should be moved to step 2 with the following text "If the resulting list has 11 or fewer buses, proceed to Step 7".

The following comments are for the PRC-028-1 standard:

We are concerned that the standard refers to a defined term for IBR which has yet to be adopted in project 2020-06.

We suggest that the drafting team ensure consistent language is used in the section 4.2 “Facilities” section with the other projects such as 2020-02 (PRC-029) and 2023-02(PRC-030). Are we to understand that this is the recommended text for the facilities section in regards to the standards where IBRs are applicable and that the other projects will ensure consistent language use?

Likes	0
Dislikes	0

Response

Thank you for your comments.

Thank you for your comment. The language used in the Applicability section of the next draft has been revised. It will not include any in progress definitions or the non-BES IBRs affected by the Rules of Procedure revision process. The other standards referenced in your comment will likely follow similar format in upcoming revisions.

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

Answer	
Document Name	

Comment

The SDT needs to coordinate with other active IBR driven NERC Projects to avoid conflicts and duplications of requirements.

PRC-028 needs to align with PRC-002 in regards to synchronized clock accuracy within +/- 2 milliseconds vs. +/- 1 millisecond.

Also, data retention requirements in PRC-028 need to align with PRC-002 which has 10 days instead of 20 days.

The RC should have oversight of the placement of DDR equipment at IBR facilities as in PRC-002.

Likes 0

Dislikes 0

Response

Thank you for your comments.

The PRC-028, PRC-029, & PRC-030 and their NERC facilitators are in close contact.

In summary response to your other comments, this SDT has been tasked not only with making sure data is available to analyze IBR response to BES disturbances similar to what PRC-002 does for synchronous machines, but also with ensuring disturbance data is available to evaluate IBR performance and validate IBR models per FERC Order 901. The requirements of the two standards cannot be directly compared. Please see the Technical Rationale for discussion of the monitoring requirements.

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

Answer

Document Name

Comment

Including post-approval references (i.e. “the effective date of this standard”) should not be considered as appropriate. Essentially this is grandfathering in the operational and reliability risk of not having appropriate data. The use of “if capable of recording” will be a pivotal point to consider when reviewing equipment for grandfathered IBR Units. Should be noted that “capable” does not equate to non-implementation of recording which could be a choice. With feeder lengths and determination of feeder length varying, the 90% criteria will possibly exclude feeders and significant numbers of IBR Units. If one feeder is 10 miles long and two others at same Inverter-Based Resource are 8.9 miles long only one IBR unit with SER (per Parts 1.2/1.3)/FR (per Part 2.2) data will be required to be compliant on the 10 mile feeder. If that one IBR unit is offline, where is the risk being mitigated? To ensure compliance, CMEP staff will have to ascertain applicability based on the criteria within the Requirement (i.e., entities will have to have documentation explaining their determination.) Non-BES Inverter-Based Resources will be even more difficult to apply the criteria.

The Technical Rationale picture/examples are good and clearly show that only one IBR Unit will need disturbance monitoring data to be compliant. One IBR unit’s data may still not allow for detailed analysis of events. Would reconsider Example 3’s use of BES definition references in light of the definitions proposed for Inverter-Based Resources and IBR Units.

Based on the Technical Rationale, to evaluate compliance for IBR units for SER, FR, and DDR data Regional Entities must access event analysis data.

In PRC-002 there is a need to capture DDR for stability SOLs and Elements included in an IROL. Please confirm that the RC can identify those situations for BES and non-BES IBRs (without considering any commercial operation date limitations) which would require DDR installation. Those situations exist and the risk needs mitigated.

Likes 0

Dislikes 0

Response

Thank you for your comments. All individual unit requirements have been removed from the latest draft.

Stephanie Kenny - Edison International - Southern California Edison Company - 6

Answer

Document Name

Comment

IBR & Unit IBR Definitions:

The IBR and IBR Unit definitions should be removed from PRC-002 and PRC-028 because the associated SAR does not provide this SDT with the authority to develop or adopt a definition that is currently unapproved. Moreover, once these definitions are approved and added to the Glossary of Terms there will be no need for inclusion of the definitions within these Reliability Standards.

DDR Requirements for PRC-002 & PRC-028

EI also suggests that consideration should be given to modifying the requirements for dynamic Disturbance recording (DDR) equipment in both PRC-002 and PRC-028 in order to permit responsible entities to either install DDR equipment or Phasor Measurement Units (PMUs) since

PMU equipment capture disturbance data at equal or better rates, and have the added benefit of synchronizing disturbance data from other locations utilizing existing network communications.

Data Retention Requirements for PRC-002 & PRC-028

EEl does not agree that the data retention requirements for PRC-002 (see Requirement R11 - 10 days) and PRC-028 (Requirement R7 – 20 days) should be different. Having two different data retention requirements for two Reliability Standards that have the exact same purpose is unjustified. Given the currently enforceable version of PRC-002 has a 10 day retention period, PRC-028 should have the same data retention period.

Reliability Coordinator Responsibilities for PRC-028

EEl suggests that the RC should be provided with oversight responsibilities for the placement of DDR equipment, even at IBR facilities. While EEl understands that the desire is to have DDR equipment at all IBR Facilities, as more of these facilities are added to the BPS, it is likely that there will be clusters of IBR facilities in some areas diminishing the need for this equipment at all of these facilities. We further note that the cost of this equipment is significant, and consideration should be given to the actual need and the RC would be the best judge to make this determination.

Likes 0

Dislikes 0

Response

Thank you for your comments.

The Applicability section has been edited and reformatted for clarity in the next draft, and the language used will not include any in progress definitions or the non-BES IBRs affected by the Rules of Procedure revision process.

DDR refers to the type of data. As long as the equipment meets the specified requirements in R4 and R5, it does not matter if it is a DFR, DDR, PMU, or something else. The SDT will review the PRC-028 Technical Rationale for opportunities to clarify.

PRC-002 and PRC-028 do not have the exact same purpose. FERC Order 901 mandates that disturbance monitoring data be available not only to analyze IBR response to BES disturbances, similar to what PRC-002 does for synchronous machines, but also to evaluate IBR performance and validate IBR models. The requirements of the two standards cannot be directly compared. Also see the PRC-028 Technical Rationale.

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

Answer

Document Name

Comment

PG&E provides the following:

As currently drafted, PRC-028 does not contain the methodology like PRC-002 to determine if SER/FR is required. However, the DT has added, "elements associated with IBRs with an aggregate nameplate rating of 20 MVA and connecting to a voltage greater than or equal to 60 kV." Therefore, PG&E agrees with EEI input that "Elements to non-BES IBR units and BES IBR units" is too broad and the manner with which EEI has clarified the facilities to which the standard is applicable.

Likes 0

Dislikes 0

Response

Thank you for your comment. Please see the response to EEI.

Kinte Whitehead - Exelon - 3

Answer

Document Name

Comment

Exelon supports the comments submitted by the EEI for this question.

Likes 0

Dislikes 0

Response

Thank you. Please see the response to EEI comments.

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

Answer

Document Name

Comment

TAL believes the threshold of 20MW for a facility to be required to install DDR equipment is going to put a lot of burden on the utilities with very little gain for the BES.

Likes 0

Dislikes 0

Response

Thank you for your comment. The language used in the Applicability section of the next draft has been revised and will not include the non-BES IBRs affected by the Rules of Procedure revision process.

Lori Frisk - Lori Frisk On Behalf of: Hillary Creurer, Allete - Minnesota Power, Inc., 1; - Lori Frisk

Answer

Document Name

Comment

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

Likes	0
Dislikes	0
Response	
Thank you. Please see the response to MRO NSRF comments.	
Megan Melham - Decatur Energy Center LLC - 5	
Answer	
Document Name	
Comment	
<p>Capital Power supports the comments submitted by NAGF.</p> <p>The NAGF notes that Project 2021-04 needs to be closely coordinated with other active NERC IBR related projects to ensure there is no conflict and/or duplication of efforts. The NAGF recommends that NERC publish a guideline/roadmap to demonstrate how all the on-going and pending IBR work activities fit together so that industry can understand how these efforts will enhance BPS/BES reliability. For example, why is it necessary for PRC-028 to be effective prior to other new IBR standards (i.e., PRC-029/PRC-030)?</p> <p>In addition, for the proposed Requirement R8, it is not clear whether or not the CAP referenced in the 2nd bullet item must be complete at the end of the 90 days. If so, what then is the difference between that and the first bullet (restoring the capability). Also, why might the Regional Entity need to know of a repair plan in progress that will be completed before the 90-day limit? Further, the CAPs documentation specifications and submittals to the RE are purely administrative and should be removed from the requirement list. A simple requirement to fix any faulty equipment should accomplish the intent of R8 & R9.</p> <p>The NAGF has the following comments\questions regarding Requirement R3:</p> <ul style="list-style-type: none"> • What is the driver for the 2 seconds length and the 64 samples/sec recording requirements? Existing FR equipment typically has a maximum recording time of 60 cycles and maximum of 16 or 32 samples/sec. The proposed recording requirements are not consistent with similar requirements of PRC-002 (30 cycles & 16 samples/sec). 	

• Requirement 3.2 will be difficult to achieve for older IBRs. FR recording equipment will need to be added to meet this requirement. Meeting these requirements at the inverter/controller level will be challenging.

• Did the SDT reach out to various manufacturers to confirm the equipment capability and more importantly, are the changes/updates available that can meet this requirement?

• Should equipment limitation be introduced as one of the requirements, similar to PRC-024 where equipment limitation is allowed but adequately reported?

• Should an alternative method/requirement be provided as an option for equipment that is not capable of meeting the recording requirements? Refer to PRC-025, Options 5a and 5b as an example, where 5b option was introduced to eliminate costly replacements.

Likes 0

Dislikes 0

Response

Thank you. Please see response to NAGF comments.

David Jendras Sr - Ameren - Ameren Services - 3

Answer

Document Name

Comment

None.

Likes 0

Dislikes 0

Response

Thank you.

Marty Hostler - Northern California Power Agency - 4

Answer	
Document Name	
Comment	
None.	
Likes 0	
Dislikes 0	
Response	
Thank you.	
Jodirah Green - ACES Power Marketing - 1,3,4,5,6 - MRO,WECC,Texas RE,SERC,RF, Group Name ACES Collaborators	
Answer	
Document Name	
Comment	
It is unclear as to what constitutes a “ride-through operation” of an IBR Unit in R1.2 and R1.3. Is this intended to be a reference to “no trip zone” identified in PRC-024? If so, as PRC-024 is not currently applicable to non-BES IBRs, how is this identified for those facilities? We believe additional guidance is needed for these requirements.	
Thank you for the opportunity to comment.	
Likes 0	
Dislikes 0	
Response	
Thank you. Individual unit requirements have been deleted from the latest draft.	
Lindsay Wickizer - Berkshire Hathaway - PacifiCorp - 6	

Answer	
Document Name	
Comment	
<p>For R8, it is not clear whether the CAP implementation referenced in the 2nd bullet item must be complete at the end of the 90 days specified in the R8 text. If so, what then is the difference in the first bullet (restoring the capability) and why might the Regional Entity need to know of a repair plan in progress that will be completed before the 90-day limit?</p> <p>In R9.5 does the request to extend the time provided refer to any changes made to an original CAP timeline? (there are no other deadlines for completing any R9 CAP)</p> <p>In R1.2 and R1.3 remove the unneeded brackets [] surrounding “the effective date of this standard”.</p> <p>CAPS documentation specifications and submittals to the RE are purely administrative and should be removed from the requirement list. A simple requirement to fix any faulty equipment will accomplish the intent of R8 & R9. An audit can check to ensure that all broken equipment was handled properly.</p> <p>What dictates a “ride-thru” event in R1? The IBR mode status?</p> <p>Why is R2.2.1 needed to be the IBR Unit transformer HV side versus the LV side?</p> <p>Based on research for the last ballot on the costs of having this on each feeder at a wind farm. This doesn't include solar IBRS. MRO NSRF 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.</p> <p>It is not understood what drives the 2 seconds length and the 64 samples/sec recording requirements. Existing FR equipment typically has a maximum recording time of 60 cycles and maximum of 16 or 32 samples/sec. Both of these are not consistent with similar requirements of PRC-002 (30 cycles & 16 samples/sec).</p>	

3.2 will be difficult to achieve for older IBRs. FR recording equipment will need to be added to meet this requirement. Meeting these requirements at the inverter/controller level will be challenging.

PacifiCorp recommends that the SDT reach out to various manufacturers to confirm the equipment capability and if any changes/updates that may be necessary for equipment can meet this requirement will become available.

PacifiCorp recommends that the SDT consider equipment limitation be introduced similar to PRC-024 where equipment limitation is allowed but adequately reported.

PacifiCorp recommends the SDT consider alternative methods/requirements be provided as an option for the equipment that are not capable of meeting the recording requirements. Refer to PRC-025, Options 5a and 5b as an example, where 5b option was introduced to eliminate costly replacements.

Likes 0

Dislikes 0

Response

Thank you for your comments.

R8 has been revised for clarity, and the same revisions have been applied to PRC-002-5, R12.

In the next draft, the process for seeking an extension has been heavily revised and moved from R9 to the Implementation Plan.

These brackets are part of the NERC standard development process. Once the standard is approved by FERC, the phrase “the effective date of this standard” is replaced by the actual effective date of the standard.

R9 did not deal with faulty equipment. The intent of R9 was to allow more time for entities that may have circumstances beyond their control that delay installation of DME beyond the stated implementation deadline. Requests for extension must be approved by the Regional Entity, so they would not be valid without being filed.

All individual unit requirements have been deleted from the latest draft.

In summary response to your remaining comments:

This SDT has been tasked not only with making sure data is available to analyze IBR response to BES disturbances similar to what PRC-002 does for synchronous machines, but also with ensuring disturbance data is available to evaluate IBR performance and validate IBR models per FERC Order 901. The requirements of the two standards cannot be directly compared. In setting the data recording parameters, the SDT has reviewed the NERC disturbance reports, consulted with manufacturers, and considered the burden to industry. The requirements are addressed in the PRC-028 Technical Rationale. All individual unit requirements have been removed from the latest draft, and meeting these requirements should be less of an issue with equipment used to monitor at the plant level.

Dave Krueger - SERC Reliability Corporation - 10

Answer

Document Name

Comment

On behalf of the SERC Generator Working Group:

- General comment: Should there be an assessment to determine which facilities this monitoring equipment should be installed on rather than just requiring for every IBR Unit
- R1: The data required in 1.2.1-4 and 1.3.1-4 are not currently available in all manufacturers
- R8: The two bullets say the same thing. Should it be that the CAP is submitted within 90 days and then implemented after? Otherwise implementing it within 90 days is the same as restoring the recording capability.

Likes 0

Dislikes 0

Response

Thank you for your comments.

- This SDT has been tasked with not only making sure data is available to analyze IBR response to BES disturbances, but also, with the added directives of FERC Order 901, ensuring disturbance data is available to evaluate IBR performance and validate IBR models. That expanded scope makes monitoring at all IBRs important.
- All individual unit requirements have been deleted from the latest draft.
- R8 has been revised for clarity, and the same revisions have been applied to PRC-002-5, R12.

Kennedy Meier - Electric Reliability Council of Texas, Inc. - 2, Group Name ISO/RTO Council Standards Review Committee (SRC)

Answer

Document Name

Comment

PRC-028-1 Requirement R4 requires a DDR for the MPT of every 20+ MVA IBR with a connection point at a voltage of 60kV or greater . It is unclear whether these DDR (at least for BES IBR) should be included in the DDR coverage calculation in PRC-002-5 Requirement R5 Part 5.2. The SRC recommends that PRC-002-5 Requirement R5 be revised to clarify if any or all or none of the DDRs required by PRC-028-1 Requirement R4 are required (or allowed) to be included in the minimum DDR coverage under PRC-002-5 Requirement R5 Part 5.2.

PRC-028-1 Requirement R3 does not place minimum triggering thresholds on neutral overcurrent (Part 3.1.3.1), AC phase overvoltage and undervoltage (Parts 3.1.3.2 and 3.2.3.1), or overfrequency or underfrequency (Part 3.2.3.2). Improper threshold settings have led to event data being unavailable in instances where it would have been valuable for analysis. The SRC recommends that minimum triggering thresholds be added to the requirements to ensure this data is captured reliably.

PRC-028-1 Requirement R7, Part 7.2 requires that data subject to Part 7.1 be provided to the requesting entity within 30 calendar days of a request, yet Part 7.1 only requires the data to be retrievable for a period of 20 calendar days. The SRC recommends that the period to provide data under Part 7.2 be half of the data retention period under Part 7.1. In response to data requests, SRC members have often received data that does not fully cover the requested timeframes or that is incomplete and missing information. Ensuring that the response period under Part 7.2 is half of the data retention period under Part 7.1 would allow time for these types of errors to be detected and corrected before the data retention period expires and the data is lost.

PRC-028-1 Requirement R1, Part 1.3 requires currently in operation IBR units to record certain data unless they are not “capable of recording.” The SRC requests that the SDT clarify what it means for an IBR Unit to not be capable of recording the required data, as the

proposed language could be read to include IBR Units that have the technical capability to record the required data, but failed to record the data due to a malfunction or due to being temporarily out of service.

Requirement R5 of PRC-002-5 Includes some unnecessary administrative compliance burdens. A GO with a 500+ MVA unit or 300+ MVA unit within a 1000 MVA plant should already know that they are required to install DDR without a specific RC requirement to provide notification of their DDR obligation.

Likes 0

Dislikes 0

Response

Thank you for your comments.

PRC-002-5 does not apply to IBRs, so the DDR requirements in PRC-028 do not count toward PRC-002. No elements should be covered under both standards as this would set up a double jeopardy situation.

The SDT is leaving trigger settings up to engineering judgement.

Revision to part 7.2 has been made to shorten the response time.

This requirement has been deleted from the latest draft.

This is outside the scope of this SDT. We did not change any of the monitoring requirements in PRC-002.

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

Answer

Document Name

Comment

EEI offer the following additional comments:

IBR & Unit IBR Definitions:

The IBR and IBR Unit definitions should be removed from PRC-002 and PRC-028 because the associated SAR does not provide this SDT with the authority to develop or adopt a definition that is currently unapproved. Moreover, once these definitions are approved and added to the Glossary of Terms there will be no need for inclusion of the definitions within these Reliability Standards.

DDR Requirements for PRC-002 & PRC-028

EI also suggests that consideration should be given to modifying the requirements for dynamic Disturbance recording (DDR) equipment in both PRC-002 and PRC-028 in order to permit responsible entities to either install DDR equipment or Phasor Measurement Units (PMUs) since PMU equipment capture disturbance data at equal or better rates, and have the added benefit of synchronizing disturbance data from other locations utilizing existing network communications.

Data Retention Requirements for PRC-002 & PRC-028

EI does not agree that the data retention requirements for PRC-002 (see Requirement R11 - 10 days) and PRC-028 (Requirement R7 – 20 days) should be different. Having two different data retention requirements for two Reliability Standards that have the exact same purpose is unjustified. Given the currently enforceable version of PRC-002 has a 10 day retention period, PRC-028 should have the same data retention period.

Reliability Coordinator Responsibilities for PRC-028

EI suggests that the RC should be provided with oversight responsibilities for the placement of DDR equipment, even at IBR facilities. While EI understands that the desire is to have DDR equipment at all IBR Facilities, as more of these facilities are added to the BPS, it is likely that there will be clusters of IBR facilities in some areas diminishing the need for this equipment at all of these facilities. We further note that the cost of this equipment is significant, and consideration should be given to the actual need and the RC would be the best judge to make this determination.

Likes	0
Dislikes	0

Response

Thank you for your comments.

The IBR-related definitions have been removed from the upcoming draft.

DDR is intended to refer to the type of data. As long as the data is sufficient to meet the specified requirements, the type of installed equipment does not matter; it can be a DFR, DDR, PMU, or something else. The SDT will review the PRC-028 Technical Rationale for opportunities to clarify.

Combined response to the last two comments: PRC-002 and PRC-028 do not have the exact same purpose. FERC Order 901 mandates that disturbance monitoring data be available not only to analyze IBR response to BES disturbances, similar to what PRC-002 does for synchronous machines, but also to evaluate IBR performance and validate IBR models. The requirements of the two standards cannot be directly compared. Also, see the PRC-028 Technical Rationale for discussion of the differing requirements.

Constantin Chitescu - Ontario Power Generation Inc. - 5

Answer

Document Name

Comment

OPG supports NPCC Regional Standards Committee’s comments.

Likes 0

Dislikes 0

Response

Thank you. Please see response to NPCC Regional Standards Committee’s comments.

Colin Chilcoat - Invenergy LLC - 5,6

Answer

Document Name

Comment

Invenergy thanks the drafting team for their work and the opportunity to provide comments.

In previous response to comments, the drafting team suggested that “FERC Order 901 reinforces the approach taken by this SDT to require monitoring for all IBRs.” In fact, FERC Order 901 states that the more limited approach taken in PRC-002 “[has] been adequate to provide the data necessary to analyze major system events in the past.” Invenergy recommends the SDT develop a methodology similar to PRC-002 Attachment 1 that Transmission Owners and Reliability Coordinators can utilize to identify key nodes where disturbance monitoring equipment should be deployed.

The SER data required in R1.2.1. and R1.2.2. is generic and should be refined to target specific categories of fault codes and alarms so as not to overburden local storage of the data. On that point, 20 days of retrievable data is simply beyond the capabilities of some inverters. Invenergy recommends the data storage requirement in R7.1. be reduced to 10 days to align with PRC-002 R11.1. Furthermore, the various requested IBR Unit level data, sampling rates, time sync, and data format present many technical challenges for existing IBRs, some of which will have no solution other than replacement of the IBR Unit. As such, we suggested changes to R9 to account for these equipment limitations in response to Question 4.

Likes 0

Dislikes 0

Response

Thank you for your comments. The section of FERC Order 901 quoted above is only the first half of a sentence that ends with “... NERC has found that the existing disturbance monitoring equipment is not sufficient (e.g., lack of high speed data captured at the IBR or plant level controller and low resolution time stamping of inverter sequence of event recorder information) to analyze the widespread system events that have become more common since 2016.” This justifies the development of a modified approach as the SDT has stated.

This SDT has been tasked not only with making sure data is available to analyze IBR response to BES disturbances similar to what PRC-002 does for synchronous machines, but also ensuring disturbance data is available to evaluate IBR performance and validate IBR models per FERC Order 901. The requirements of the two standards cannot be directly compared. See the PRC-028-1 Technical Rationale for discussion of the requirements.

The IBR Unit level monitoring requirements have been removed from the next draft of the standard, and meeting these requirements should be less of an issue with equipment used to monitor at the plant level.

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

Answer

Document Name

Comment

The NAGF notes that Project 2021-04 needs to be closely coordinated with other active NERC IBR related projects to ensure there is no conflict and/or duplication of efforts. The NAGF recommends that NERC publish a guideline/roadmap to demonstrate how all the on-going and pending IBR work activities fit together so that industry can understand how these efforts will enhance BPS/BES reliability. For example, why is it necessary for PRC-028 to be effective prior to other new IBR standards (i.e., PRC-029/PRC-030)?

In addition, for the proposed Requirement R8, it is not clear whether or not the CAP referenced in the 2nd bullet item must be complete at the end of the 90 days. If so, what then is the difference between that and the first bullet (restoring the capability). Also, why might the Regional Entity need to know of a repair plan in progress that will be completed before the 90-day limit? Further, the CAPs documentation specifications and submittals to the RE are purely administrative and should be removed from the requirement list. A simple requirement to fix any faulty equipment should accomplish the intent of R8 & R9.

The NAGF has the following comments/questions regarding Requirement R3:

- *What is the driver for the 2 seconds length and the 64 samples/sec recording requirements? Existing FR equipment typically has a maximum recording time of 60 cycles and maximum of 16 or 32 samples/sec. The proposed recording requirements are not consistent with similar requirements of PRC-002 (30 cycles & 16 samples/sec).*
- *Requirement 3.2 will be difficult to achieve for older IBRs. FR recording equipment will need to be added to meet this requirement. Meeting these requirements at the inverter/controller level will be challenging.*
- *Did the SDT reach out to various manufacturers to confirm the equipment capability and more importantly, are the changes/updates available that can meet this requirement?*
- *Should equipment limitation be introduced as one of the requirements, similar to PRC-024 where equipment limitation is allowed but adequately reported?*
- *Should an alternative method/requirement be provided as an option for equipment that is not capable of meeting the recording requirements? Refer to PRC-025, Options 5a and 5b as an example, where 5b option was introduced to eliminate costly replacements.*

Likes 0

Dislikes 0

Response

Thank you for your comments.

- PRC-028, PRC-029, & PRC-030 all have to be delivered to FERC by 11/1/2024 and fully effective and enforceable no later than January 1, 2030 per FERC Order 901 and NERC’s Response to it. NERC has published multiple resources on its website regarding the standards roadmap and workplan. These drafting teams and their NERC facilitators communicate regularly.
- The intent of R8 is to prioritize the repair of equipment. The SDT has revised PRC-028, R8 for clarity, and the same revisions have been applied to PRC-002-5, R12. Please, also refer to the PRC-028 Technical Rationale.
- PRC-028, R9 did not deal with faulty equipment. The intent of R9 was to allow more time for entities that may have circumstances beyond their control that delay installation of DME beyond the stated implementation deadline. Requests for extension must be approved by the Regional Entity, so they would not be valid without being filed. In the next draft, the process for seeking an extension has been heavily revised and moved from R9 to the Implementation Plan.
- Regarding PRC-028, R3:
 This SDT has been tasked not only with making sure data is available to analyze IBR response to BES disturbances similar to what PRC-002 does for synchronous machines, but also with ensuring disturbance data is available to evaluate IBR performance and validate IBR models per FERC Order 901. The requirements of the two standards cannot be directly compared. In setting the data recording parameters, the SDT has reviewed the NERC disturbance reports, consulted with manufacturers, and considered the burden to industry. The data requirements are addressed in the PRC-028 Technical Rationale. All individual unit requirements have been removed from the latest draft, and meeting these requirements should be less of an issue with equipment used to monitor at the plant level.

Mike Magruder - Avista - Avista Corporation – 1

Answer

Document Name

Comment

Overall wording for the sections mentioned above for PRC-028 should be cleaned up. Terms like IBR should have formal definitions, outside of PRC-028 in the NERC Glossary of Terms.

Likes	0
Dislikes	0
Response	
Thank you for your comments. The IBR-related definitions have been removed from the upcoming draft.	
Rhonda Jones - Invenergy LLC - 5,6	
Answer	
Document Name	
Comment	
<p>In previous response to comments, the drafting team suggested that “FERC Order 901 reinforces the approach taken by this SDT to require monitoring for all IBRs.” In fact, FERC Order 901 states that the more limited approach taken in PRC-002 “[has] been adequate to provide the data necessary to analyze major system events in the past.” Invenergy recommends the SDT develop a methodology similar to PRC-002 Attachment 1 that Transmission Owners and Reliability Coordinators can utilize to identify key nodes where disturbance monitoring equipment should be deployed.</p> <p>The SER data required in R1.2.1. and R1.2.2. is generic and should be refined to target specific categories of fault codes and alarms so as not to overburden local storage of the data. On that point, 20 days of retrievable data is simply beyond the capabilities of some inverters. Invenergy recommends the data storage requirement in R7.1. be reduced to 10 days to align with PRC-002 R11.1. Furthermore, the various requested IBR Unit level data, sampling rates, time sync, and data format present many technical challenges for existing IBRs, some of which will have no solution other than replacement of the IBR Unit. As such, we suggested changes to R9 to account for these equipment limitations in response to Question 4.</p>	
Likes	0
Dislikes	0
Response	
Thank you for your comments. The section of FERC Order 901 quoted above is only the first half of a sentence that ends with “...	

NERC has found that the existing disturbance monitoring equipment is not sufficient (e.g., lack of high speed data captured at the IBR or plant level controller and low resolution time stamping of inverter sequence of event recorder information) to analyze the widespread system events that have become more common since 2016.” This justifies the development of a modified approach as the SDT has stated.

This SDT has been tasked not only with making sure data is available to analyze IBR response to BES disturbances similar to what PRC-002 does for synchronous machines, but also ensuring disturbance data is available to evaluate IBR performance and validate IBR models per FERC Order 901. The requirements of the two standards cannot be directly compared. See the PRC-028-1 Technical Rationale for discussion of the requirements.

The IBR Unit level monitoring requirements have been removed from the next draft of the standard, and meeting these requirements should be less of an issue with equipment used to monitor at the plant level.