

Comment Report

Project Name: 2018-04 Modifications to PRC-024-2 | PRC-024-3 (Draft 2)
Comment Period Start Date: 9/20/2019
Comment Period End Date: 11/4/2019
Associated Ballots: 2018-04 Modifications to PRC-024-2 PRC-024-3 AB 2 ST

There were 49 sets of responses, including comments from approximately 140 different people from approximately 106 companies representing 10 of the Industry Segments as shown in the table on the following pages.

Questions

- 1. Based on industry feedback, the SDT removed the Transmission Owner (TO) from the Applicability (Functional Entities) of PRC-024-3. Do you agree with this change? If not, please provide the basis for your disagreement and a specific instance where not including the TO would present a risk to reliability.**
- 2. Based on industry feedback, the SDT modified the Applicability (Facilities) to clarify both the types of 'protection' applicable, if activated, and the specific equipment the 'protection' is applied on. Do you agree with these changes? If not, please provide the basis for your disagreement and an alternate solution.**
- 3. To address Scope Item 'f' from the approved SAR, the SDT added an exemption to the Applicability (Facilities) to clarify that all auxiliary equipment and associated protection(s) within the generating Facility are not applicable to the standard. Do you agree with the 'Exemption'? If not, please provide the basis for your disagreement and an alternate solution.**
- 4. Based on industry feedback, the SDT replaced the 0.1 second 'Minimum Time (Sec)' value in the frequency tables with "Instantaneous" and provided additional clarity via Footnote #6 regarding frequency calculation/measurement. Do you agree with this change? If not, please provide the basis for your disagreement and an alternate solution.**
- 5. Based on industry feedback, the SDT revised the Implementation Plan to provide twenty-four months for applicable entities to evaluate settings, make changes for applicable equipment, and purchase necessary equipment, if necessary. Do you agree with the revised Implementation Plan? If not, please provide the basis for your disagreement and an alternate proposal.**
- 6. Do you agree that the proposed modifications provide a cost-effective means of addressing issues identified in the SAR? If not, please provide an alternative, more cost-effective manner in which to achieve at least an equivalent level of reliability.**

Organization Name	Name	Segment(s)	Region	Group Name	Group Member Name	Group Member Organization	Group Member Segment(s)	Group Member Region
Florida Municipal Power Agency	Chris Gowder	5	FRCC	FMPA	Carol Chinn	Florida Municipal Power Agency	4	SERC
					Richard Montgomery	Florida Municipal Power Agency	6	SERC
					Michelle Johnson	Florida Municipal Power Agency	3	SERC
					Don Cuevas	Beaches Energy Services	1	SERC
					David Owens	Gainesville Regional Utilities	1	SERC
					Steven Lancaster	Beaches Energy Services	3	SERC
					Darko Kovac	Gainesville Regional Utilities	3	SERC
					Neville Bowen	Ocala Utility Services	3	SERC
					Nick Batty	Keys Energy Services	4	SERC
					Tom Reedy	Florida Municipal Power Pool	6	SERC
Santee Cooper	Chris Wagner	1		Santee Cooper	Rene' Free	Santee Cooper	1,3,5,6	SERC
					Debbie Schneider	Santee Cooper	1,3,5,6	SERC
					Bridget Coffman	Santee Cooper	1,3,5,6	SERC
MRO	Dana Klem	1,2,3,4,5,6	MRO	MRO NSRF	Joseph DePoorter	Madison Gas & Electric	3,4,5,6	MRO
					Larry Heckert	Alliant Energy	4	MRO
					Michael Brytowski	Great River Energy	1,3,5,6	MRO

					Jodi Jensen	Western Area Power Administration	1,6	MRO
					Andy Crooks	SaskPower Corporation	1	MRO
					Bryan Sherrow	Kansas City Board of Public Utilities	1	MRO
					David Heins	Omaha Public Power District	1,3,5,6	MRO
					Jeremy Voll	Basin Electric Power Cooperative	1	MRO
					David Zwergel	Midcontinent ISO	2	MRO
					Douglas Webb	Kansas City Power & Light	1,3,5,6	MRO
					Fred Meyer	Algonquin Power Co.	1	MRO
					James Nail	Independence Power & Light (Independence Missouri)	1,3,5	MRO
					James Williams	Southwest Power Pool, Inc.	2	MRO
					Jamie Monette	Minnesota Power / ALLETE	1	MRO
					Jamison Cawley	Nebraska Public Power	1,3,5	MRO
					Sing Tay	Oklahoma Gas & Electric	1,3,5,6	MRO
					Terry Harbour	MidAmerican Energy	1,3	MRO
					Troy Brumfield	American Transmission Company	1	MRO
Public Utility District No. 1 of Chelan County	Davis Jelusich	6		Public Utility District No. 1 of Chelan County	Joyce Gundry	Public Utility District No. 1 of Chelan County	3	WECC
					Jeff Kimbell	Public Utility District No. 1 of Chelan County	1	WECC

					Meaghan Connell	Public Utility District No. 1 of Chelan County	5	WECC
					Davis Jelusich	Public Utility District No. 1 of Chelan County	6	WECC
Douglas Webb	Douglas Webb		MRO,SPP RE	Westar-KCPL	Doug Webb	Westar	1,3,5,6	MRO
					Doug Webb	KCP&L	1,3,5,6	MRO
ACES Power Marketing	Jodirah Green	1,3,4,5,6	MRO,NA - Not Applicable,RF,SERC,Texas RE,WECC	ACES Standard Collaborations	Bob Solomon	Hoosier Energy Rural Electric Cooperative, Inc.	1	SERC
					Kevin Lyons	Central Iowa Power Cooperative	1	MRO
					Bill Hutchison	Southern Illinois Power Cooperative	1	SERC
					Tara Lightner	Sunflower Electric Power Corporation	1	MRO
					Jenny Knernshield	Old Dominion Electric Cooperative	3,4	SERC
DTE Energy - Detroit Edison Company	Karie Barczak	3		DTE Energy - DTE Electric	Jeffrey Depriest	DTE Energy - DTE Electric	5	RF
					Daniel Herring	DTE Energy - DTE Electric	4	RF
					Karie Barczak	DTE Energy - DTE Electric	3	RF
Duke Energy	Kim Thomas	1,3,5,6	FRCC,RF,SERC	Duke Energy	Laura Lee	Duke Energy	1	SERC
					Dale Goodwine	Duke Energy	5	SERC
					Greg Cecil	Duke Energy	6	RF
FirstEnergy - FirstEnergy Corporation	Mark Garza	4		FE Voter	Julie Severino	FirstEnergy - FirstEnergy Corporation	1	RF
					Aaron Ghodooshim	FirstEnergy - FirstEnergy Corporation	3	RF

					Robert Loy	FirstEnergy - FirstEnergy Solutions	5	RF
					Ann Carey	FirstEnergy - FirstEnergy Solutions	6	RF
					Mark Garza	FirstEnergy-FirstEnergy	4	RF
Southern Company - Southern Company Services, Inc.	Pamela Hunter	1,3,5,6	SERC	Southern Company	Adrienne Collins	Southern Company - Southern Company Services, Inc.	1	SERC
					Joel Dembowski	Southern Company - Alabama Power Company	3	SERC
					William D. Shultz	Southern Company Generation	5	SERC
					Ron Carlsen	Southern Company - Southern Company Generation	6	SERC
Northeast Power Coordinating Council	Ruida Shu	1,2,3,4,5,6,7,8,9,10	NPCC	RSC	Guy V. Zito	Northeast Power Coordinating Council	10	NPCC
					Randy MacDonald	New Brunswick Power	2	NPCC
					Glen Smith	Entergy Services	4	NPCC
					Brian Robinson	Utility Services	5	NPCC
					Alan Adamson	New York State Reliability Council	7	NPCC
					David Burke	Orange & Rockland Utilities	3	NPCC
					Michele Tondalo	UI	1	NPCC

Helen Lainis	IESO	2	NPCC
Sean Cavote	PSEG	4	NPCC
Kathleen Goodman	ISO-NE	2	NPCC
David Kiguel	Independent	NA - Not Applicable	NPCC
Silvia Mitchell	NextEra Energy - Florida Power and Light Co.	6	NPCC
Paul Malozewski	Hydro One Networks, Inc.	3	NPCC
Nick Kowalczyk	Orange and Rockland	1	NPCC
Joel Charlebois	AESI - Acumen Engineered Solutions International Inc.	5	NPCC
Mike Cooke	Ontario Power Generation, Inc.	4	NPCC
Salvatore Spagnolo	New York Power Authority	1	NPCC
Shivaz Chopra	New York Power Authority	5	NPCC
Mike Forte	Con Ed - Consolidated Edison	4	NPCC
Dermot Smyth	Con Ed - Consolidated Edison Co. of New York	1	NPCC
Peter Yost	Con Ed - Consolidated Edison Co. of New York	3	NPCC
Ashmeet Kaur	Con Ed - Consolidated Edison	5	NPCC
Caroline Dupuis	Hydro Quebec	1	NPCC

					Chantal Mazza	Hydro Quebec	2	NPCC
					Sean Bodkin	Dominion - Dominion Resources, Inc.	6	NPCC
					Laura McLeod	NB Power Corporation	5	NPCC
					Randy MacDonald	NB Power Corporation	2	NPCC
					Gregory Campoli	New York Independent System Operator	2	NPCC
					John Hastings	National Grid	1	NPCC
					Quintin Lee	Eversource Energy	1	NPCC
					Michael Jones	National Grid USA	1	NPCC
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

1. Based on industry feedback, the SDT removed the Transmission Owner (TO) from the Applicability (Functional Entities) of PRC-024-3. Do you agree with this change? If not, please provide the basis for your disagreement and a specific instance where not including the TO would present a risk to reliability.

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

Answer No

Document Name

Comment

How does it make sense that GSUs owned by GOs are in scope, but GSUs owned by TOs are not? Are GSUs owned by TOs less of a risk to the BES?

Likes 0

Dislikes 0

Response

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

Answer No

Document Name

Comment

Some Transmission Owners (TO) apply voltage and frequency trip settings at the Point of Interconnection that trip generation based on PRC-024 voltage and frequency requirements, particularly for inverter-based resources tapped onto network transmission lines. These TO's typically have the same functionality applied by the Generator Owner (GO). This arrangement would suggest that both the GO and TO should comply with PRC-024. If the TO is not required to comply with PRC-024, it could trip a generating plant quicker than required by PRC-024.

Likes 0

Dislikes 0

Response

Rachel Coyne - Texas Reliability Entity, Inc. - 10

Answer No

Document Name

Comment

Although it is uncommon for the TO to own the generator step-up (GSU) or main power transformer (MPT), in cases where TO does own the GSU or MPT the TO should be required to take steps to ensure the generator rides through voltage and frequency excursions as prescribed within the Standard.

Likes 0

Dislikes 0

Response

Marty Hostler - Northern California Power Agency - 5

Answer

No

Document Name

Comment

Why are TO's GSU protection not included but GO's GSUs are? Also see DUKE, and TRE.

Likes 0

Dislikes 0

Response

Michelle Amarantos - APS - Arizona Public Service Co. - 1

Answer

Yes

Document Name

Comment

AZPS appreciates that this was changed.

Likes 0

Dislikes 0

Response

Dana Klem - MRO - 1,2,3,4,5,6 - MRO, Group Name MRO NSRF

Answer

Yes

Document Name

Comment

The NSRF has concerns with the term “main power transformer (MPT)”. This term is not included in the NERC Glossary of Terms, nor is it well defined in this proposed revision to PRC-024-3. It is introduced as a part of the inclusion of the TO Functional Entity requirement limited to the Quebec Interconnection, yet it is included in the text of Requirement 2 as well as Attachment 2, applicable to the Eastern, Western, and ERCOT Interconnections in the United States. The NSRF requests that the inclusion of this new term in this Standard be reversed, or a formal definition of the term be provided in the Standard or NERC Glossary of Terms.

Likes 1	Alliant Energy Corporation Services, Inc., 4, Heckert Larry
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Dislikes 0	
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Response

Maryanne Darling-Reich - Black Hills Corporation - 1,3,5,6 - MRO,WECC

Answer	Yes
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Document Name	
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Comment

BHC agrees with EEI’s comments as submitted

Likes 0	
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Dislikes 0	
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Response

Aaron Cavanaugh - Bonneville Power Administration - 1,3,5,6 - WECC

Answer	Yes
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Document Name	
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Comment

BPA is supportive of the proposed change. BPA would like to point out for consideration that this change could possibly be creating a loophole under the following scenario.

If a Generator Owner installs a GSU on a new project that does not meet the requirements outlined in the standard, they could potentially decide with a Transmission Owner, to make the ownership change on the low side, essentially giving the GSU to a non-Quebec Transmission Owner.

If this scenario played out, would the non-Quebec Transmission Owner not need to consider the protection of that GSU for this standard?

Perhaps this is a far-fetched scenario but it was a thought that came to mind regarding this change. The BPA subject matter experts that reviewed this standard do not see this hypothetical loophole as a measurable risk to reliability that would justify a disagreement with the change. BPA only wants to share the thought for others to consider.

Likes 0	
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Dislikes 0	
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Response

Glen Farmer - Avista - Avista Corporation - 5

Answer Yes

Document Name

Comment

agree with EEI Comments.

Likes 0

Dislikes 0

Response

Glenn Barry - Los Angeles Department of Water and Power - 5

Answer Yes

Document Name

Comment

There is concern for addressing frequency protection settings for inerties on transmission lines. Because PRC-024 applies to generating resources, should this concern be addressed in PRC-024 or in a separate Standard?

Likes 0

Dislikes 0

Response

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

Answer Yes

Document Name

Comment

EEI supports the removal of Transmission Owners (TOs) from the Applicability Section of this Reliability Standard believing that this change is consistent with the purpose of the standard and how TOs operate throughout the US.

Likes 0

Dislikes 0

Response

Douglas Webb - Douglas Webb On Behalf of: Allen Klassen, Westar Energy, 6, 3, 1, 5; Bryan Taggart, Westar Energy, 6, 3, 1, 5; Derek Brown, Westar Energy, 6, 3, 1, 5; Grant Wilkerson, Westar Energy, 6, 3, 1, 5; James McBee, Great Plains Energy - Kansas City Power and Light Co., 1, 3, 6, 5; Jennifer Flandermeyer, Great Plains Energy - Kansas City Power and Light Co., 1, 3, 6, 5; John Carlson, Great Plains Energy - Kansas City Power and Light Co., 1, 3, 6, 5; Marcus Moor, Great Plains Energy - Kansas City Power and Light Co., 1, 3, 6, 5; - Douglas Webb, Group Name Westar-KCPL

Answer Yes

Document Name

Comment

Westar Energy and Kansas City Power & Light support the Edison Electric Institutes (EEI) Comments.

Likes 0

Dislikes 0

Response

Larry Heckert - Alliant Energy Corporation Services, Inc. - 4

Answer Yes

Document Name

Comment

Support the MRO NSRF Comments, as follows:

The NSRF has concerns with the term "main power transformer (MPT)". This term is not included in the NERC Glossary of Terms, nor is it well defined in this proposed revision to PRC-024-3. It is introduced as a part of the inclusion of the TO Functional Entity requirement limited to the Quebec Interconnection, yet it is included in the text of Requirement 2 as well as Attachment 2, applicable to the Eastern, Western, and ERCOT Interconnections in the United States. The NSRF requests that the inclusion of this new term in this Standard be reversed, or a formal definition of the term be provided in the Standard or NERC Glossary of Terms.

Likes 0

Dislikes 0

Response

Chantal Mazza - Hydro-Quebec TransEnergie - 2 - NPCC

Answer Yes

Document Name [PRC-024-3 HQ comments.docx](#)

Comment

Hydro-Quebec supports the comments submitted by the RSC.

In addition, Hydro-Quebec has the following comments :

- Review and clarify footnote #4 associated with Requirement #3. The last part that was added regarding the protection imbedded in control systems for IBRs brings some confusion as it relates to the protection system itself while the first part of the sentence relates to the equipment that is protected: "Excludes limitations caused by the setting capability of the frequency and voltage protective relays for the generating resource(s) but does not exclude limitations originating in the equipment protected by the relays or frequency and voltage protection embedded in control systems."
- In Attachment 1, we recommend adding the distinct over frequency requirement (curve) that currently applies to thermal generation and IBRs in the Quebec Interconnection . Please see attached file.

Likes 0

Dislikes 0

Response

Daniel Gacek - Exelon - 1

Answer

Yes

Document Name

Comment

Exelon supports the SDTs decision to limit applicability to functional entities that apply the protection systems that are the subject of the standard.

On behalf of Exelon, Segments 1, 3, 5, 6

Likes 0

Dislikes 0

Response

Wayne Guttormson - SaskPower - 1

Answer

Yes

Document Name

Comment

Support the MRO NSRF comments.

Likes 0

Dislikes 0

Response

Matthew Nutsch - Seattle City Light - 1,3,4,5,6 - WECC

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Chris Wagner - Santee Cooper - 1, Group Name Santee Cooper

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Bette White - AES - Indianapolis Power and Light Co. - 3

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Jeanne Kurzynowski - CMS Energy - Consumers Energy Company - 1,3,4,5 - RF

Answer

Yes

Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Leonard Kula - Independent Electricity System Operator - 2	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Anthony Jablonski - ReliabilityFirst - 10	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thomas Foltz - AEP - 5	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	

Response

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

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Bridget Silvia - Sempra - San Diego Gas and Electric - 3

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

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

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Karl Blaszkowski - CMS Energy - Consumers Energy Company - 3

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response**Amy Casuscelli - Amy Casuscelli On Behalf of: Carrie Dixon, Xcel Energy, Inc. , 6; Gerry Huitt, Xcel Energy, Inc., 1, 5, 3; - Amy Casuscelli****Answer**

Yes

Document Name**Comment**

Likes 0

Dislikes 0

Response**Donald Lynd - CMS Energy - Consumers Energy Company - 1****Answer**

Yes

Document Name**Comment**

Likes 0

Dislikes 0

Response**Davis Jelusich - Public Utility District No. 1 of Chelan County - 6, Group Name Public Utility District No. 1 of Chelan County****Answer**

Yes

Document Name**Comment**

Likes 0

Dislikes 0

Response

Neil Swearingen - Salt River Project - 1,3,5,6 - WECC

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Richard Jackson - U.S. Bureau of Reclamation - 1

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Siddharth Pant - GE - General Electric Power Systems - NA - Not Applicable - NA - Not Applicable

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Jamie Monette - Allete - Minnesota Power, Inc. - 1

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Nick Batty - Keys Energy Services - 9 - SERC

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

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

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Bruce Reimer - Manitoba Hydro - 1

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Armin Klusman - CenterPoint Energy Houston Electric, LLC - 1 - WECC

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

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

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Karie Barczak - DTE Energy - Detroit Edison Company - 3, Group Name DTE Energy - DTE Electric

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

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

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Constantin Chitescu - Ontario Power Generation Inc. - 5

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Chris Gowder - Florida Municipal Power Agency - 5, Group Name FMPA

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Trevor Tidwell - PNM Resources - Public Service Company of New Mexico - 3

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Pamela Hunter - Southern Company - Southern Company Services, Inc. - 1,3,5,6 - SERC, Group Name Southern Company

Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Teresa Cantwell - Lower Colorado River Authority - 5	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Line Dufour - Hydro-Quebec Production - 6 - NPCC	
Answer	
Document Name	
Comment	
N/A, For Quebec interconnection, TO is still part of the standards	
Likes 0	
Dislikes 0	
Response	

2. Based on industry feedback, the SDT modified the Applicability (Facilities) to clarify both the types of 'protection' applicable, if activated, and the specific equipment the 'protection' is applied on. Do you agree with these changes? If not, please provide the basis for your disagreement and an alternate solution.

Pamela Hunter - Southern Company - Southern Company Services, Inc. - 1,3,5,6 - SERC, Group Name Southern Company

Answer No

Document Name

Comment

Paragraph 4.2.1.5 includes items not included in the BES definition document and should not be included in the scope of PRC-024. Paragraph 4.2.1.4 should be the limit of the scope of equipment covered by PRC-024 for inverter-based resources.

Likes 0

Dislikes 0

Response

Chris Gowder - Florida Municipal Power Agency - 5, Group Name FMMPA

Answer No

Document Name

Comment

1. Main Power Transformer (MPT)- not defined anywhere. The intent was to replace "collector transformer", but MPT is no better without context. Also, the term is defined in the Quebec-only language, then used in NERC-wide language.
2. Footnote seems to be adding unnecessary complexity.
3. Use of term capacity in the facility definition will lead to confusion, should just refer to BES definition Inclusion I4.

Likes 0

Dislikes 0

Response

Constantin Chitescu - Ontario Power Generation Inc. - 5

Answer No

Document Name

Comment

The terms "cease injecting current", "cease current injection" and "momentary cessation" are not defined, nor commonly understood.

Significant reduction of the amount of current being injected has a similar effect to momentary current cessation; they both deprive the grid of much needed support during the disturbance which negatively impacts grid reliability, and therefore, should not be an option, nor allowed without approval.

Understanding the compounded effect on the grid of a multitude of inverters having similar design is important and accurate modelling may not be possible without adequate information regarding the amount of current being reduced.

OPG recommends the terms “cease injecting current”, “cease current injection” and “momentary cessation”, used throughout the standard (applicable Facilities 4.2.1, R1, R2, applicable protection definition per footnote 3, D.A.2, Attachment 2a, etc.), to be replaced with “ceasing injecting current or significant reduction in current injection”.

If this comment is adopted and implemented as such then there is a need to define the term “significant”.

Likes 0

Dislikes 0

Response

Marty Hostler - Northern California Power Agency - 5

Answer

No

Document Name

Comment

See AEP, Duke, and TRE comments.

Likes 0

Dislikes 0

Response

Armin Klusman - CenterPoint Energy Houston Electric, LLC - 1 - WECC

Answer

No

Document Name

Comment

CenterPoint Energy Houston Electric, LLC (CenterPoint Energy) disagrees with changing “collector transformer” to a newly developed term of “main power transformer (MPT)”. The use of “power” in the term tends to suggest a distribution substation power transformer instead of a transformer at a generation resource substation. A more applicable term would be ‘main step-up (MSU) transformer’. Other possible terms that could be considered are ‘main transformer (MT)’ or ‘station step-up (SSU) transformer’ which is used in the current draft of the Compliance Implementation Guidance PRC-019-2 that is being developed by a NERC Planning Committee task force. The term ‘main transformer’ is used in several places in the recently approved NERC Reliability Guideline – Improvements to Interconnection Requirements for BPS-Connected Inverter-Based Resources (September 2019). Regardless of what the collector transformer is renamed, CenterPoint Energy recommends adding a second figure in Attachment 2 (voltage ride-through) with a station sketch to provide clarity on Footnote 8: “Voltage at the high-side of the GSU or MPT.”

Likes 0

Dislikes 0

Response

Rachel Coyne - Texas Reliability Entity, Inc. - 10

Answer No

Document Name

Comment

Applicable Facilities only address protection up to the GSU or MPT. However, Texas RE has noted voltage protection applied on lines interconnecting a generating Facility to a Transmission station where the line protection is set to trip within the “no-trip zone” of PRC-024-2 Attachment 2. Texas RE recommends the SDT not limit the Facilities that are applicable to the Standard and should include any voltage or frequency protection that would result in an inability of the generating resource to ride through a frequency or voltage excursion as prescribed in Attachment 1 and Attachment 2.

Likes 0

Dislikes 0

Response

Neil Swearingen - Salt River Project - 1,3,5,6 - WECC

Answer No

Document Name

Comment

SRP supports most of the changes to the Applicability section. However SRP requests the SDT clarify 4.2.1, specifically "functions within the associated control systems". The phrase may be interpreted to include exciter settings even though they are covered by PRC-019-2.

Likes 0

Dislikes 0

Response

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

Answer No

Document Name

Comment

Given Duke Energy’s response to Question #1, PRC-024 should apply to equipment out to the Point of Interconnection.

Likes 0

Dislikes 0

Response

Thomas Foltz - AEP - 5

Answer

No

Document Name

Comment

The changes proposed to 4.2.1.5, specifically in regards to the text “to the point where those resources aggregate to greater than 75 MVA” may not be reflective of all real-world conditions given that the currently proposed scope has been pared back to the Generator Owner.

Referencing a subset of the BES in the Facilities section seems to be a somewhat unorthodox approach in establishing the Facilities within scope.

Likes 0

Dislikes 0

Response

Daniel Gacek - Exelon - 1

Answer

Yes

Document Name

Comment

Microprocessor technology allows for protection elements to be embedded in a broad variety of control systems. Exelon agrees with the changes made to clarify applicability of the standard to all elements providing protection that is the subject of this standard.

Note that volts per hertz relays are identified within the Applicability Section, however Footnote 4 does not specifically reference volts per hertz relay. For consistency Exelon requests that Volts Per Hertz relays are included in Footnote 4.

On behalf of Exelon, Segments 1, 3, 5, 6

Likes 0

Dislikes 0

Response

Douglas Webb - Douglas Webb On Behalf of: Allen Klassen, Westar Energy, 6, 3, 1, 5; Bryan Taggart, Westar Energy, 6, 3, 1, 5; Derek Brown, Westar Energy, 6, 3, 1, 5; Grant Wilkerson, Westar Energy, 6, 3, 1, 5; James McBee, Great Plains Energy - Kansas City Power and Light Co., 1, 3, 6, 5; Jennifer Flandermeyer, Great Plains Energy - Kansas City Power and Light Co., 1, 3, 6, 5; John Carlson, Great Plains Energy - Kansas

City Power and Light Co., 1, 3, 6, 5; Marcus Moor, Great Plains Energy - Kansas City Power and Light Co., 1, 3, 6, 5; - Douglas Webb, Group Name Westar-KCPL

Answer Yes

Document Name

Comment

Westar Energy and Kansas City Power & Light support the Edison Electric Institutes (EEI) Comments.

Likes 0

Dislikes 0

Response

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

Answer Yes

Document Name

Comment

EEI supports the changes made to the Applicability (Facilities) section of PRC-024-3 (Draft 2) believing it accurately reflects those facilities within the US that should be covered under this Reliability Standard. However, one area that the SDT should investigate further is the proposed change from “collector transformer” to “main power transformer (MPT)”. This type of transformers is referenced using at least three different names in three different documents. (i.e., collector transformer – BES Definition; MPT – PRC-024-3 Draft 3 and SSU (Station Step-up) within Implementation Guidance (*Under development by the SPCS*) for PRC-019, pages 71 -73). EEI suggest that NERC and the various SDTs and committees agree on a single name, that is defined, in order to ensure consistency and avoid confusion.

EEI also notes that volts per hertz relays are specifically identified within the Applicability Section (4.2.1), however, in Footnote 4 these relays are not specifically identified. For consistency, EEI suggests making the following change to Footnote 4: (*indicated in bold below*)

Footnote 4: Excludes limitations caused by the setting capability of the frequency, **and** voltage **and volts per hertz** protective relays for the generating resource(s) but does not exclude limitations originating in the equipment that the relays protect or frequency and voltage protection imbedded in control systems.

Likes 0

Dislikes 0

Response

Aaron Cavanaugh - Bonneville Power Administration - 1,3,5,6 - WECC

Answer Yes

Document Name

Comment

None

Likes 0

Dislikes 0

Response

Maryanne Darling-Reich - Black Hills Corporation - 1,3,5,6 - MRO,WECC

Answer

Yes

Document Name

Comment

BHC agrees with EEI's comments as submitted

Likes 0

Dislikes 0

Response

Wayne Guttormson - SaskPower - 1

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Teresa Cantwell - Lower Colorado River Authority - 5

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Trevor Tidwell - PNM Resources - Public Service Company of New Mexico - 3

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Chantal Mazza - Hydro-Quebec TransEnergie - 2 - NPCC

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Line Dufour - Hydro-Quebec Production - 6 - NPCC

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Larry Heckert - Alliant Energy Corporation Services, Inc. - 4

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

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

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Karie Barczak - DTE Energy - Detroit Edison Company - 3, Group Name DTE Energy - DTE Electric

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

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

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Glenn Barry - Los Angeles Department of Water and Power - 5

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Bruce Reimer - Manitoba Hydro - 1

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

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

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Nick Batty - Keys Energy Services - 9 - SERC

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Jamie Monette - Allele - Minnesota Power, Inc. - 1

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Michael Goggin - Grid Strategies - 5 - NA - Not Applicable

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Siddharth Pant - GE - General Electric Power Systems - NA - Not Applicable - NA - Not Applicable

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Richard Jackson - U.S. Bureau of Reclamation - 1

Answer	Yes
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Document Name	
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Comment

Likes 0

Dislikes 0

Response

Glen Farmer - Avista - Avista Corporation - 5

Answer	Yes
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Document Name	
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Comment

Likes 0

Dislikes 0

Response

Davis Jelusich - Public Utility District No. 1 of Chelan County - 6, Group Name Public Utility District No. 1 of Chelan County

Answer	Yes
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Document Name	
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Comment

Likes 0

Dislikes 0

Response

Donald Lynd - CMS Energy - Consumers Energy Company - 1

Answer	Yes
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Document Name	
----------------------	--

Comment

Likes 0

Dislikes 0

Response

Amy Casuscelli - Amy Casuscelli On Behalf of: Carrie Dixon, Xcel Energy, Inc. , 6; Gerry Huitt, Xcel Energy, Inc., 1, 5, 3; - Amy Casuscelli

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Karl Blaszkowski - CMS Energy - Consumers Energy Company - 3

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

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

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Dana Klem - MRO - 1,2,3,4,5,6 - MRO, Group Name MRO NSRF

Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Dennis Chastain - Tennessee Valley Authority - 1,3,5,6 - SERC	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Bridget Silvia - Sempra - San Diego Gas and Electric - 3	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Kevin Conway - Public Utility District No. 1 of Pend Oreille County - 1,3,5,6	
Answer	Yes
Document Name	
Comment	
Likes 0	

Dislikes 0

Response

Anthony Jablonski - ReliabilityFirst - 10

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Leonard Kula - Independent Electricity System Operator - 2

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Jeanne Kurzynowski - CMS Energy - Consumers Energy Company - 1,3,4,5 - RF

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Bette White - AES - Indianapolis Power and Light Co. - 3

Answer

Yes

Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Michelle Amarantos - APS - Arizona Public Service Co. - 1	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Chris Wagner - Santee Cooper - 1, Group Name Santee Cooper	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Matthew Nutsch - Seattle City Light - 1,3,4,5,6 - WECC	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	

Response

3. To address Scope Item 'f' from the approved SAR, the SDT added an exemption to the Applicability (Facilities) to clarify that all auxiliary equipment and associated protection(s) within the generating Facility are not applicable to the standard. Do you agree with the 'Exemption'? If not, please provide the basis for your disagreement and an alternate solution.

Rachel Coyne - Texas Reliability Entity, Inc. - 10

Answer No

Document Name

Comment

The language in section 4.2.1.3 appears to conflict with the language in section 4.2.2. Section 4.2.3.1 includes the high side of the generator-connected auxiliary transformer, while section 4.2.2 exempts protection on all auxiliary equipment within the generating Facility. Please clarify why Facilities meeting applicability Section 4.2.1.3 would not fall under this exemption.

Texas RE has the following additional comments:

- The Severe VSL for R4 needs an additional row space between settings and "OR".
- Page 9 of 23 states: "In Requirements R1, R3, and R4, all references to "Generator Owner" are replaced with "Generator Owner *and* Transmission Owner." Texas RE noticed on Page 12 of 23: VSL for D.A.2. says Generator owner "**or**" Transmission Owner. Should it be changed to "**and**" to be consistent with the statement above?

Likes 0

Dislikes 0

Response

Marty Hostler - Northern California Power Agency - 5

Answer No

Document Name

Comment

See TRE comments.

Likes 0

Dislikes 0

Response

Dana Klem - MRO - 1,2,3,4,5,6 - MRO, Group Name MRO NSRF

Answer Yes

Document Name

Comment

Volts/Hertz relaying is specifically included in the applicability section 4.2.1., but is not included in the exemptions listed in Footnote 4. Please include the relay function Volts/Hertz as part of Footnote 4.

Likes 0

Dislikes 0

Response

Maryanne Darling-Reich - Black Hills Corporation - 1,3,5,6 - MRO,WECC

Answer

Yes

Document Name

Comment

BHC agrees with EEI's comments as submitted

Likes 0

Dislikes 0

Response

Aaron Cavanaugh - Bonneville Power Administration - 1,3,5,6 - WECC

Answer

Yes

Document Name

Comment

None

Likes 0

Dislikes 0

Response

Larry Heckert - Alliant Energy Corporation Services, Inc. - 4

Answer

Yes

Document Name

Comment

Support NSRF Comments:

Volts/Hertz relaying is specifically included in the applicability section 4.2.1., but is not included in the exemptions listed in Footnote 4. Please include the relay function Volts/Hertz as part of Footnote 4.

Likes 0

Dislikes 0

Response

Daniel Gacek - Exelon - 1

Answer

Yes

Document Name

Comment

Exelon appreciates and supports the clearly stated exemption for auxiliary equipment.

On behalf of Exelon, Segments 1, 3, 5, 6

Likes 0

Dislikes 0

Response

Wayne Guttormson - SaskPower - 1

Answer

Yes

Document Name

Comment

Support the MRO NSRF comments.

Likes 0

Dislikes 0

Response

Matthew Nutsch - Seattle City Light - 1,3,4,5,6 - WECC

Answer

Yes

Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Chris Wagner - Santee Cooper - 1, Group Name Santee Cooper	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Michelle Amarantos - APS - Arizona Public Service Co. - 1	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Bette White - AES - Indianapolis Power and Light Co. - 3	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	

Response

Jeanne Kurzynowski - CMS Energy - Consumers Energy Company - 1,3,4,5 - RF

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Leonard Kula - Independent Electricity System Operator - 2

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Anthony Jablonski - ReliabilityFirst - 10

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Thomas Foltz - AEP - 5

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

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

Yes

Document Name**Comment**

Likes 0

Dislikes 0

Response**Bridget Silvia - Sempra - San Diego Gas and Electric - 3****Answer**

Yes

Document Name**Comment**

Likes 0

Dislikes 0

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

Yes

Document Name**Comment**

Likes 0

Dislikes 0

Response

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

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Karl Blaszkowski - CMS Energy - Consumers Energy Company - 3

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

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

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Amy Casuscelli - Amy Casuscelli On Behalf of: Carrie Dixon, Xcel Energy, Inc. , 6; Gerry Huitt, Xcel Energy, Inc., 1, 5, 3; - Amy Casuscelli

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Donald Lynd - CMS Energy - Consumers Energy Company - 1

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Davis Jelusich - Public Utility District No. 1 of Chelan County - 6, Group Name Public Utility District No. 1 of Chelan County

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Glen Farmer - Avista - Avista Corporation - 5

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Neil Swearingen - Salt River Project - 1,3,5,6 - WECC

Answer	Yes
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Document Name	
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Comment	
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Likes	0
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Dislikes	0
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Response	
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Richard Jackson - U.S. Bureau of Reclamation - 1

Answer	Yes
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Document Name	
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Comment	
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Likes	0
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Dislikes	0
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Response	
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Siddharth Pant - GE - General Electric Power Systems - NA - Not Applicable - NA - Not Applicable

Answer	Yes
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Document Name	
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Comment	
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Likes	0
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Dislikes	0
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Response	
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Jamie Monette - Allete - Minnesota Power, Inc. - 1

Answer	Yes
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Document Name	
----------------------	--

Comment	
----------------	--

Likes 0

Dislikes 0

Response

Nick Batty - Keys Energy Services - 9 - SERC

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

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

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Bruce Reimer - Manitoba Hydro - 1

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Glenn Barry - Los Angeles Department of Water and Power - 5

Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Ruida Shu - Northeast Power Coordinating Council - 1,2,3,4,5,6,7,8,9,10 - NPCC, Group Name RSC	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Karie Barczak - DTE Energy - Detroit Edison Company - 3, Group Name DTE Energy - DTE Electric	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Mark Gray - Edison Electric Institute - NA - Not Applicable - NA - Not Applicable	
Answer	Yes
Document Name	
Comment	
Likes 0	

Dislikes 0

Response

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

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Douglas Webb - Douglas Webb On Behalf of: Allen Klassen, Westar Energy, 6, 3, 1, 5; Bryan Taggart, Westar Energy, 6, 3, 1, 5; Derek Brown, Westar Energy, 6, 3, 1, 5; Grant Wilkerson, Westar Energy, 6, 3, 1, 5; James McBee, Great Plains Energy - Kansas City Power and Light Co., 1, 3, 6, 5; Jennifer Flandermeyer, Great Plains Energy - Kansas City Power and Light Co., 1, 3, 6, 5; John Carlson, Great Plains Energy - Kansas City Power and Light Co., 1, 3, 6, 5; Marcus Moor, Great Plains Energy - Kansas City Power and Light Co., 1, 3, 6, 5; - Douglas Webb, Group Name Westar-KCPL

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Line Dufour - Hydro-Quebec Production - 6 - NPCC

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Chantal Mazza - Hydro-Qu?bec TransEnergie - 2 - NPCC**Answer** Yes**Document Name****Comment**

Likes 0

Dislikes 0

Response**Constantin Chitescu - Ontario Power Generation Inc. - 5****Answer** Yes**Document Name****Comment**

Likes 0

Dislikes 0

Response**Chris Gowder - Florida Municipal Power Agency - 5, Group Name FMPA****Answer** Yes**Document Name****Comment**

Likes 0

Dislikes 0

Response**Trevor Tidwell - PNM Resources - Public Service Company of New Mexico - 3****Answer** Yes**Document Name****Comment**

Likes 0

Dislikes 0

Response

Pamela Hunter - Southern Company - Southern Company Services, Inc. - 1,3,5,6 - SERC, Group Name Southern Company

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Teresa Cantwell - Lower Colorado River Authority - 5

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

4. Based on industry feedback, the SDT replaced the 0.1 second 'Minimum Time (Sec)' value in the frequency tables with "Instantaneous" and provided additional clarity via Footnote #6 regarding frequency calculation/measurement. Do you agree with this change? If not, please provide the basis for your disagreement and an alternate solution.

Marty Hostler - Northern California Power Agency - 5

Answer No

Document Name

Comment

It appears it was changed back to what is was originally? We need a Redline showing changes form the last approved standard to the current proposal.

Likes 0

Dislikes 0

Response

Jamie Monette - Allete - Minnesota Power, Inc. - 1

Answer No

Document Name

Comment

Minnesota Power suggests changing the frequency tables and figures to show "Time Delay" rather than "Time." Then the tables could show 0.0 seconds, or they could go back to what was shown in PRC-024-2 "Instantaneous Trip."

Minnesota Power suggests altering Footnote 7 to read:

"Frequency is calculated over a window of time. Time delays shown in Attachment 1 Figures 1-4 and Tables 1-4 refer to the minimum required time delay after the frequency calculation has completed."

The last sentence of the current footnote is confusing ("Instantaneous trip settings based on instantaneously calculated frequency measurement is note permissible."). If this sentence remains, the standard should clarify the minimum window required rather than just describing a typical window.

Likes 0

Dislikes 0

Response

Wayne Guttormson - SaskPower - 1

Answer Yes

Document Name

Comment

Support the MRO NSRF comments.

Likes 0

Dislikes 0

Response

Daniel Gacek - Exelon - 1

Answer

Yes

Document Name

Comment

Exelon agrees with the change back to “Instantaneous”, however Footnote #7 describes a concern associated with microprocessor protection only and should therefore be limited to microprocessor protection.

Exelon suggests the following language:

7 Microprocessor protection calculates frequency over a window of time. While the frequency boundaries include the option to trip instantaneously for frequencies outside the specified range, microprocessor protection should perform this calculation over a time window. Typical window/filtering lengths are three to six cycles (50 – 100 milliseconds). Instantaneous trip settings by microprocessor protection based on instantaneously calculated frequency measurement is not permissible. Electromechanical and solid-state protection does not exhibit the concern described and may use instantaneous trip settings.

On behalf of Exelon, Segments 1, 3, 5, 6

Likes 0

Dislikes 0

Response

Larry Heckert - Alliant Energy Corporation Services, Inc. - 4

Answer

Yes

Document Name

Comment

Support NSRF comments:

Footnote 7 states that instantaneous trip settings based on instantaneously calculated frequency measurement is not permissible. We request an explanation of the technical basis of this footnote and methods to determine whether our trip settings are permissible. It seems that verification will be difficult to achieve without input from relay manufacturers.

Likes 0

Dislikes 0

Response

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

Answer Yes

Document Name

Comment

Please include the NPCC Region’s underfrequency no-trip boundary in the Supplemental Material section of the standard – Attachment 1. The NPCC Region’s under-frequency boundary is more stringent than the Eastern Interconnection Boundary.

The low voltage duration, voltage (pu) < 0.45 minimum (sec) 0.15 appears to be insufficient. Clearing times for High Voltage circuits can often exceed 0.15 seconds. Therefore, the exposure to generators tripping during normally cleared faults is higher than optimal. Please consider increasing the Low Voltage Duration No Trip Zone-boundary for the <0.45 pu voltage threshold.

Please consider adding additional details of restrictions on active and reactive power cessations during underfrequency or overfrequency conditions. As written, the standard could allow momentary cessation of active (real) current inside the frequency envelope of Attachment 1, as long as reactive current is provided. Cessation of active (real) current for frequencies inside the frequency envelope could compromise the effectiveness of the UFLS program.

Likes 0

Dislikes 0

Response

Bruce Reimer - Manitoba Hydro - 1

Answer Yes

Document Name

Comment

Shouldn't the graph also reflect this change with the minimum time changed to 0 second?

Likes 0

Dislikes 0

Response

Rachel Coyne - Texas Reliability Entity, Inc. - 10

Answer Yes

Document Name	
Comment	
Texas RE noticed this shows as Footnote 7, not Footnote 6.	
Likes 0	
Dislikes 0	
Response	
Aaron Cavanaugh - Bonneville Power Administration - 1,3,5,6 - WECC	
Answer	Yes
Document Name	
Comment	
None	
Likes 0	
Dislikes 0	
Response	
Maryanne Darling-Reich - Black Hills Corporation - 1,3,5,6 - MRO,WECC	
Answer	Yes
Document Name	
Comment	
BHC agrees with EEI's comments as submitted	
Likes 0	
Dislikes 0	
Response	
Dana Klem - MRO - 1,2,3,4,5,6 - MRO, Group Name MRO NSRF	
Answer	Yes
Document Name	
Comment	

Footnote 7 states that instantaneous trip settings based on instantaneously calculated frequency measurement is not permissible. We request an explanation of the technical basis of this footnote and methods to determine whether our trip settings are permissible. It seems that verification will be difficult to achieve without input from relay manufacturers.

The note, "The area outside the "No Trip Zone" is not a "Must Trip Zone" is not included after the graph on PRC-024 – Attachment 2, Page 21/27 of the redline draft 09202019.

Likes 0

Dislikes 0

Response

Leonard Kula - Independent Electricity System Operator - 2

Answer

Yes

Document Name

Comment

In order to prevent the facility from being tripped for phase to ground faults cleared in breaker failure time, we suggest that the wording "Unless otherwise specified by the Transmission Planner" be added to the Boundary Details #4 in Attachment 2: Voltage Boundary Clarifications – Eastern, Western, and ERCOT Interconnections, as follows:

" 4. Unless otherwise specified by the Transmission Planner, voltages in boundaries assume RMS fundamental frequency phase-to-phase ground or phase-to-phase unit per unit voltage."

Likes 0

Dislikes 0

Response

Teresa Cantwell - Lower Colorado River Authority - 5

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Trevor Tidwell - PNM Resources - Public Service Company of New Mexico - 3

Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Chris Gowder - Florida Municipal Power Agency - 5, Group Name FMPA	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Constantin Chitescu - Ontario Power Generation Inc. - 5	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Chantal Mazza - Hydro-Qu?bec TransEnergie - 2 - NPCC	
Answer	Yes
Document Name	
Comment	
Likes 0	

Dislikes 0

Response

Line Dufour - Hydro-Quebec Production - 6 - NPCC

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Douglas Webb - Douglas Webb On Behalf of: Allen Klassen, Westar Energy, 6, 3, 1, 5; Bryan Taggart, Westar Energy, 6, 3, 1, 5; Derek Brown, Westar Energy, 6, 3, 1, 5; Grant Wilkerson, Westar Energy, 6, 3, 1, 5; James McBee, Great Plains Energy - Kansas City Power and Light Co., 1, 3, 6, 5; Jennifer Flandermeyer, Great Plains Energy - Kansas City Power and Light Co., 1, 3, 6, 5; John Carlson, Great Plains Energy - Kansas City Power and Light Co., 1, 3, 6, 5; Marcus Moor, Great Plains Energy - Kansas City Power and Light Co., 1, 3, 6, 5; - Douglas Webb, Group Name Westar-KCPL

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

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

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

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

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Karie Barczak - DTE Energy - Detroit Edison Company - 3, Group Name DTE Energy - DTE Electric

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Glenn Barry - Los Angeles Department of Water and Power - 5

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

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

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Nick Batty - Keys Energy Services - 9 - SERC

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Michael Goggin - Grid Strategies - 5 - NA - Not Applicable

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Siddharth Pant - GE - General Electric Power Systems - NA - Not Applicable - NA - Not Applicable

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Richard Jackson - U.S. Bureau of Reclamation - 1

Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Neil Swearingen - Salt River Project - 1,3,5,6 - WECC	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Glen Farmer - Avista - Avista Corporation - 5	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Davis Jelusich - Public Utility District No. 1 of Chelan County - 6, Group Name Public Utility District No. 1 of Chelan County	
Answer	Yes
Document Name	
Comment	
Likes 0	

Dislikes 0

Response

Donald Lynd - CMS Energy - Consumers Energy Company - 1

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Amy Casuscelli - Amy Casuscelli On Behalf of: Carrie Dixon, Xcel Energy, Inc. , 6; Gerry Huitt, Xcel Energy, Inc., 1, 5, 3; - Amy Casuscelli

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

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

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Karl Blaszkowski - CMS Energy - Consumers Energy Company - 3

Answer Yes

Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Mark Garza - FirstEnergy - FirstEnergy Corporation - 4, Group Name FE Voter	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Dennis Chastain - Tennessee Valley Authority - 1,3,5,6 - SERC	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Bridget Silvia - Sempra - San Diego Gas and Electric - 3	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	

Response

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

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Thomas Foltz - AEP - 5

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Anthony Jablonski - ReliabilityFirst - 10

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Jeanne Kurzynowski - CMS Energy - Consumers Energy Company - 1,3,4,5 - RF

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response**Bette White - AES - Indianapolis Power and Light Co. - 3****Answer**

Yes

Document Name**Comment**

Likes 0

Dislikes 0

Response**Michelle Amarantos - APS - Arizona Public Service Co. - 1****Answer**

Yes

Document Name**Comment**

Likes 0

Dislikes 0

Response**Chris Wagner - Santee Cooper - 1, Group Name Santee Cooper****Answer**

Yes

Document Name**Comment**

Likes 0

Dislikes 0

Response

Matthew Nutsch - Seattle City Light - 1,3,4,5,6 - WECC

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

5. Based on industry feedback, the SDT revised the Implementation Plan to provide twenty-four months for applicable entities to evaluate settings, make changes for applicable equipment, and purchase necessary equipment, if necessary. Do you agree with the revised Implementation Plan? If not, please provide the basis for your disagreement and an alternate proposal.

Thomas Foltz - AEP - 5

Answer No

Document Name

Comment

As we similarly stated in the previous comment period, we believe that 24 months is still insufficient, especially in regards to impacts associated with a) changing, albeit unintentionally, the historically recognized "Point of Interconnection" as the reference point of compliance and b) the inclusion of applicable functions on the high side of generator-connected auxiliary transformers. AEP suggests that the proposed implementation plan be increased to 36 months as the proposed changes would redefine the entire scope of the work performed to date.

There are a number of important, non-controversial clarifications being proposed to improve this standard that should not be delayed by the perhaps more controversial and possibly even more time-consuming requirements. For example, the proposed clarifications for Attachments 1 and 2 could and should be implemented as soon as practical, however any revisions affecting the applicability scope or "point of interconnection" should be delayed in their implementation. As a result, we suggest splitting implementation to advance as rapidly as possible these clarifications.

Likes 0

Dislikes 0

Response

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

Answer No

Document Name

Comment

As discussed in some detail in the previous round of comments, the 24-month implementation period (though better than the original 18-month one) is still not enough time for some (nuclear, in particular) units to implement the new requirements if they have equipment that has to be modified. Per the typical nuclear projects process, they have to 1) obtain funding for and perform an analysis to see if they have compliance gaps [this can take a year plus, depending on when this version gets approved and where they are in the annual funding cycle] and, if so, 2) obtain funding for the change(s) [possibly another year plus], 3) instigate and award a contract to a design partner to complete the design for the change(s) [9 months to a year], and 4) implement the changes which will likely require an outage that can be as much as two years in the future [the change(s) likely won't be that hard to do, but the projects process requires that designs be complete at least 13 months prior to the beginning of the outage, which adds another year plus]. All together, these timeframes could easily add up to well over four years. The original dates for version 1 (and 2) were phased in over a 5-year period. This same issue was raised for the implementation of PRC-025-2 and its SDT provided 5-years to implement the requirements for any new scope. Please provide a 5-year implementation period to give time to implement any required modifications within the standard projects process.

Likes 0

Dislikes 0

Response

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

Answer No

Document Name

Comment

Consider a 60-month phased implementation plan as setting changes require time to account for planning, budgeting and outage coordination.

Likes 0

Dislikes 0

Response

Karie Barczak - DTE Energy - Detroit Edison Company - 3, Group Name DTE Energy - DTE Electric

Answer No

Document Name

Comment

24 months is not sufficient for nuclear power plants. Please reconsider a 36 or 48 month implementation plan.

Likes 0

Dislikes 0

Response

Marty Hostler - Northern California Power Agency - 5

Answer No

Document Name

Comment

NERC originally provided a five year progressive implementation plan for PRC-024-1 and -2. PRC-023-3's original SAR was for Inverter based resources, then a supplemental SAR was developed include UAT and GSUs protection. All PRC-024 studies now have to be redone and potentially more modifications/additions made. The implementation plan should be 5-years.

Likes 0

Dislikes 0

Response

Daniel Gacek - Exelon - 1

Answer No

Document Name

Comment

As discussed in some detail in the previous round of comments, the 24-month implementation period (though better than the original 18-month one) is still not enough time for existing, non-inverter based generating units to perform studies, assess compliance with the new revision to the Standard, and implement any necessary modification

Nuclear units typically operate continuously and therefore modifications are scheduled during refueling outages. Refueling outages take place approximately every two years and the work is scheduled years in advance. From budgeting to execution, the modification process at a nuclear unit can add up to well over four years.

This concern was also communicated to the NERC SDT for PRC-025-2 resulting a 5-year implementation period for scope changes.

The original dates for PRC-024 version 1 (and 2) were phased in over a 5-year period. Please consider the same 5-year implementation period for existing, non-inverter based generating units to perform studies and implement any required modifications within their established projects timeframe.

On behalf of Exelon, Segments 1, 3, 5, 6

Likes 0

Dislikes 0

Response

Anthony Jablonski - ReliabilityFirst - 10

Answer Yes

Document Name

Comment

ReliabilityFirst notes that there is currently an ERO-endorsed guidance on PRC-024-2. Can ReliabilityFirst assume this ERO-endorsed guidance will be updated as well whenever PRC-024-3 is approved?

Likes 0

Dislikes 0

Response

Maryanne Darling-Reich - Black Hills Corporation - 1,3,5,6 - MRO,WECC

Answer Yes

Document Name

Comment

BHC agrees with EEI's comments as submitted

Likes 0

Dislikes 0

Response

Aaron Cavanaugh - Bonneville Power Administration - 1,3,5,6 - WECC

Answer Yes

Document Name

Comment

None

Likes 0

Dislikes 0

Response

Matthew Nutsch - Seattle City Light - 1,3,4,5,6 - WECC

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Chris Wagner - Santee Cooper - 1, Group Name Santee Cooper

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response**Michelle Amarantos - APS - Arizona Public Service Co. - 1****Answer**

Yes

Document Name**Comment**

Likes 0

Dislikes 0

Response**Bette White - AES - Indianapolis Power and Light Co. - 3****Answer**

Yes

Document Name**Comment**

Likes 0

Dislikes 0

Response**Jeanne Kurzynowski - CMS Energy - Consumers Energy Company - 1,3,4,5 - RF****Answer**

Yes

Document Name**Comment**

Likes 0

Dislikes 0

Response

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

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Bridget Silvia - Sempra - San Diego Gas and Electric - 3

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Dana Klem - MRO - 1,2,3,4,5,6 - MRO, Group Name MRO NSRF

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Karl Blaszkowski - CMS Energy - Consumers Energy Company - 3

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

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

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Amy Casuscelli - Amy Casuscelli On Behalf of: Carrie Dixon, Xcel Energy, Inc. , 6; Gerry Huitt, Xcel Energy, Inc., 1, 5, 3; - Amy Casuscelli

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Donald Lynd - CMS Energy - Consumers Energy Company - 1

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Davis Jelusich - Public Utility District No. 1 of Chelan County - 6, Group Name Public Utility District No. 1 of Chelan County

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Glen Farmer - Avista - Avista Corporation - 5

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Neil Swearingen - Salt River Project - 1,3,5,6 - WECC

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Richard Jackson - U.S. Bureau of Reclamation - 1

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Siddharth Pant - GE - General Electric Power Systems - NA - Not Applicable - NA - Not Applicable

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Jamie Monette - Allete - Minnesota Power, Inc. - 1

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Rachel Coyne - Texas Reliability Entity, Inc. - 10

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Nick Batty - Keys Energy Services - 9 - SERC

Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Sean Bodkin - Dominion - Dominion Resources, Inc. - 6, Group Name Dominion	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Bruce Reimer - Manitoba Hydro - 1	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Glenn Barry - Los Angeles Department of Water and Power - 5	
Answer	Yes
Document Name	
Comment	
Likes 0	

Dislikes 0

Response

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

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

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

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

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

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Douglas Webb - Douglas Webb On Behalf of: Allen Klassen, Westar Energy, 6, 3, 1, 5; Bryan Taggart, Westar Energy, 6, 3, 1, 5; Derek Brown, Westar Energy, 6, 3, 1, 5; Grant Wilkerson, Westar Energy, 6, 3, 1, 5; James McBee, Great Plains Energy - Kansas City Power and Light Co., 1, 3, 6, 5; Jennifer Flandermeyer, Great Plains Energy - Kansas City Power and Light Co., 1, 3, 6, 5; John Carlson, Great Plains Energy - Kansas

City Power and Light Co., 1, 3, 6, 5; Marcus Moor, Great Plains Energy - Kansas City Power and Light Co., 1, 3, 6, 5; - Douglas Webb, Group Name Westar-KCPL

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Larry Heckert - Alliant Energy Corporation Services, Inc. - 4

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Line Dufour - Hydro-Quebec Production - 6 - NPCC

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Chantal Mazza - Hydro-Quebec TransEnergie - 2 - NPCC

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Constantin Chitescu - Ontario Power Generation Inc. - 5

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Chris Gowder - Florida Municipal Power Agency - 5, Group Name FMPA

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Trevor Tidwell - PNM Resources - Public Service Company of New Mexico - 3

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Pamela Hunter - Southern Company - Southern Company Services, Inc. - 1,3,5,6 - SERC, Group Name Southern Company	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Teresa Cantwell - Lower Colorado River Authority - 5	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Wayne Guttormson - SaskPower - 1	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

6. Do you agree that the proposed modifications provide a cost-effective means of addressing issues identified in the SAR? If not, please provide an alternative, more cost-effective manner in which to achieve at least an equivalent level of reliability.

Marty Hostler - Northern California Power Agency - 5

Answer No

Document Name

Comment

More studies and work have to be done. We really need a Standards process that is standard and thoughtfully implemented. It appears Standard modifications are coming out too quickly and causing inefficiencies in redoing work already done. (Standards efficiency project?)

NERC should provide a redline showing the difference between the new proposed standard and the existing standard first.

NERC should provide a list detailing studies GO's already did, versus what needs to be redone to comply with the proposed standard.

AND provide an honest cost estimate of redoing studies.

Likes 0

Dislikes 0

Response

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

Answer No

Document Name

Comment

Since the comment form does not provide for 'other' or 'additional' comments related to the proposed PRC-024 changes, Dominion Energy is submitting the following comments under this section: 1) Additional clarity around whether the boundary for voltage ride through is part of the no-trip zone or not. This is unclear on the curves and different Regions have interpreted this differently. 2) The revised standard and guidance documents do not address issues, specifically the reflection process, outlined in the NERC Inverter Based Resource Performance Guide that blurs 1.0 per unit inverter voltage (based on inverter rated voltage) and 2) POI voltage in per unit, and appears to equate them. If this is the intent then it should be clearly stated in the revised standard or associated guidance documents. Dominion Energy recommends it be clearly stated that in lieu of reflection voltage, GOs should be allowed to use inverter rated voltage as being equivalent to POI voltage; or allow inverter skid settings to ride the line due to the fact that simulation results illustrate inverter schemes are completely restrained for system POI voltages along the LVRT boundary in PRC-024 Attachment 2.

Likes 1

Northern California Power Agency, 5, Hostler Marty

Dislikes 0

Response

Rachel Coyne - Texas Reliability Entity, Inc. - 10

Answer	No
Document Name	
Comment	
Texas RE does not have comments on this question.	
Likes	0
Dislikes	0

Response

Siddharth Pant - GE - General Electric Power Systems - NA - Not Applicable - NA - Not Applicable

Answer	No
Document Name	
Comment	

All the items below can be addressed by clarifications or corrections. They are a possible cause for confusion as stated in the current draft.

ITEM 1:

PRC-024-2 note 3 in Attachment 2 clarified that the times in the voltage/time curves were cumulative. The SAR had asked for clarifications with respect to start/stop/reset times while leaving cumulative in the verbiage. With the removal of “cumulative” from the voltage/time curves in the draft, there is room for mis-interpretation of the requirements, unless some interpretation guidance is also included. Is it a voltage vs. time profile as given in other grid codes? In other words, does it represent the “worst case” voltage as would be observed on an oscilloscope? Or, should it be interpreted some other way?

As an example, for an rms voltage with the following profile (very extreme, but just to make a point):

- a. $t < 0, V = 1$
- b. $0 \leq t < 0.1 \text{ sec}, V = 0$
- c. $0.1 \text{ sec} \leq t < 1 \text{ sec}, V = 1$
- d. $1 \text{ sec} \leq t < 1.06 \text{ sec}, V = 0$
- e. $1.06 \text{ sec} \leq t \leq 4 \text{ sec}, V = 1$

With “cumulative” in the description, the above curve would be interpreted as falling outside of the “No Trip Zone” of PRC-024-2 as the total time when the voltage is below 0.45 pu is 0.16 sec. What would be the interpretation in the draft PRC-024?

To carry this to an even more extreme, if the voltage was essentially toggling between 1 and 0 every 0.1 sec, that would clearly be outside the “No Trip Zone” of PRC-024-2. How should it be interpreted in the current draft?

ITEM 2:

Attachment 2 - The voltage ride-through figure includes ERCOT in the caption. However, the voltage profile in the ERCOT Nodal Operating Guide Section 2 is different from that in the draft PRC-024 (the HV portion in both curves is the same, the LV portion is different). Is this based on knowledge

that ERCOT will be changing their voltage curves to those shown in PRC-024? If not, ERCOT should be treated as a Regional Variance like that done for the Quebec Interconnection. Again, if the release of PRC-024-3 and ERCOT updates are not coordinated, there will be a lack of clarity and possible errors in setting.

ITEM 3:

B.R2 – Under certain conditions of large power production and large voltage dips, to protect itself from destructive overcurrents, an inverter may have to stop producing current for up to 20 ms at the start of the voltage dip. It will then very rapidly ramp back to the current reference values in up to an additional 50 ms. Note this reduction in current is only for a maximum time of 70 ms and not for the duration of the voltage dip. Is such a self-protective fast recovery period of low current considered “cease injecting current”? Will it require documentation under R3?

Note also that this is different from an inverter ceasing to inject current for the duration of the voltage dip and then ramping current after voltage recovery over a 500 ms to 1 second period.

ITEM 4:

In some cases, the clean copy of the draft is different from the redlined version.

Page 7 of clean draft -

Violation Severity Level Tables

R1 - In the Severe VSL cell, the redline document uses terminology “cease injecting current”, the clean document uses terminology “enter momentary cessation”.

R2 - In the Severe VSL cell, the redline document uses terminology “cease injecting current”, the clean document uses terminology “enter momentary cessation”.

Page 11 of clean draft

D.A.2 - In the Severe VSL cell, the redline document uses terminology “cease injecting current”, then clean document uses terminology “enter momentary cessation”.

Likes 0

Dislikes 0

Response

Donald Lynd - CMS Energy - Consumers Energy Company - 1

Answer

No

Document Name

Comment

I did not notice any comments in the SAR addressing a need to change the section “Evaluating Protective Relay Settings” in Attachment 2. In this section the drafting team has removed the option of using the assumptions that the units are at full nameplate real-power output and the power factor is 0.95 lagging. I assume that anyone who previously completed their evaluations using these assumptions would need to reevaluate using the most

probable real and reactive loading conditions. This could be a significant expense, particularly for those who contracted the original work and would effectively be starting over. Allowing use of the previous assumptions should provide a similar level of reliability without the added cost.

On a related note, item 'a' in this section provides instruction regarding the unit under study, but there is no longer clear instruction for the loading of other units connected to the same transformer.

Also related to cost, our existing documentation for wind turbines provides a ride-through curve, but does not indicate when the unit will cease to inject current. For example, one manufacturer's documentation lists a ride-through time at zero percent voltage with a footnote that the converter may stop pulsing during this period. We have attempted to obtain information from one of our manufacturers in support of another NERC PRC Standard, without success to this point. For existing equipment, there is no guarantee the information necessary to comply with the proposed Standard can be obtained.

Likes 0

Dislikes 0

Response

Karl Blaszkowski - CMS Energy - Consumers Energy Company - 3

Answer No

Document Name

Comment

: I did not notice any comments in the SAR addressing a need to change the section "Evaluating Protective Relay Settings" in Attachment 2. In this section the drafting team has removed the option of using the assumptions that the units are at full nameplate real-power output and the power factor is 0.95 lagging. I assume that anyone who previously completed their evaluations using these assumptions would need to reevaluate using the most probable real and reactive loading conditions. This could be a significant expense, particularly for those who contracted the original work and would effectively be starting over. Allowing use of the previous assumptions should provide a similar level of reliability without the added cost.

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Likes 0

Dislikes 0

Response

Bridget Silvia - Sempra - San Diego Gas and Electric - 3

Answer No

Document Name

Comment

Do not have enough information to determine if this will be cost-effective or not.

Likes 0

Dislikes 0

Response

Thomas Foltz - AEP - 5

Answer

No

Document Name

Comment

Because the current comment form provides no area for providing general feedback, or feedback regarding areas beyond those stated within the questions themselves, we have elected to provide such feedback in the response to this question.

AEP does not agree that the proposed modifications provide a cost-effective means of addressing issues in the SAR. AEP continues to recommend removing the reference to “high-side of generator step-up or collector transformer” and allow Generator Owners to utilize the point of interconnection as defined within the FERC filed Interconnection Service Agreement. AEP believes the SDT should take the opportunity to remain consistent with the currently enforceable versions of PRC-024 and FAC-008 and retain the reference to “point of interconnection” but remove the “clarifying text” which we believe instead describes a point of measurement. The definition as presented creates undue compliance burden on the Generator Owner and may negatively impact ride-through capability for renewable resources with generator interconnection facilities of considerable distance. Driven by these concerns, AEP has chosen to vote negative on the proposed draft.

While the currently posted “redline to last posted” document is indeed helpful for seeing the most recently proposed changes, we believe that it should be accompanied by an additional redlined document showing all currently proposed edits-to-date, both additions and deletions, using only the current version subject to enforcement as a baseline (i.e. “redline to last approved”). If only the most recently proposed revisions are shown, incorrect conclusions may be drawn by industry during their review. For example, in the “redline to last posted” document, text in black could be currently included in the version under enforcement or it could instead be text that was proposed in the previous draft but left unchanged in the latest draft. Similarly, text shown as deleted could be text recently proposed for deletion in the most recent draft, or instead could be text that was proposed for inclusion in the previous draft but then later struck in the latest draft.

Likes 1

Northern California Power Agency, 5, Hostler Marty

Dislikes 0

Response

Jeanne Kurzynowski - CMS Energy - Consumers Energy Company - 1,3,4,5 - RF

Answer

No

Document Name

Comment

I did not notice any comments in the SAR addressing a need to change the section “Evaluating Protective Relay Settings” in Attachment 2. In this section the drafting team has removed the option of using the assumptions that the units are at full nameplate real-power output and the power factor is 0.95 lagging. I assume that anyone who previously completed their evaluations using these assumptions would need to reevaluate using the most probable real and reactive loading conditions. This could be a significant expense, particularly for those who contracted the original work and would effectively be starting over. Allowing use of the previous assumptions should provide a similar level of reliability without the added cost.

On a related note, item ‘a’ in this section provides instruction regarding the unit under study, but there is no longer clear instruction for the loading of other units connected to the same transformer.

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Likes 0

Dislikes 0

Response

Pamela Hunter - Southern Company - Southern Company Services, Inc. - 1,3,5,6 - SERC, Group Name Southern Company

Answer

Yes

Document Name

Comment

If the existing protection equipment (other than discrete protective relays) are incapable of being set to comply with R1 and/or R2, they should not be required to be changed out and should be permitted to be included in the R3 exclusion option, which has been retained in the current draft.

Two other comments regarding the draft and the negative vote explanation:

First item: Changing the title of the standard implies that the scope of included F and V protection settings has been expanded to non-Generator protection items, e.g. mechanical (turbine), et. al. which used electrical signals in the detection/operation. Disagree with this expansion – no documented need for this change w.r.t. system reliability.

Second item: A.) Many generator owners, including this one, have already made inverter controls setting adjustments for inverter-based systems to permit ride-through capability with immediate or minimal delay to restart as a result of the recent NERC Alert recommendations on the subject.

B.) Industry standard P2800 is being written to ensure that future inverter-based electric generating equipment is built with these operational characteristics maximized for grid performance.

C.) A recent CAISO tariff amendment which targets mitigating reliability issues caused by inverter-based generators response to grid disturbances related to high voltage transmission system faults or transient voltage excursions. These changes to the tariff will provide the necessary changes to future inverter-based resources. These tariff revisions result from the CAISO’s most recent Interconnection Process Enhancements “IPE” stakeholder initiative. The Inverter-based resource task force, too, has issued recommended interconnect agreement suggestions for all transmission service providers to consider when agreeing to connect these types of resources to the grid.

The combination of each of these three factors (A, B, and C above) coupled with the absence of system control instability in the current state makes a sufficient case that these changes to PRC-024 are not needed at this time.

Likes 0

Dislikes 0

Response

Line Dufour - Hydro-Quebec Production - 6 - NPCC

Answer

Yes

Document Name

Comment

We have an additional comment about the draft RSAW that is shown on the project page. It doesn't include the two requirements D.A.2 and D.A.5 from the variance for the Quebec Interconnection.

Likes 0

Dislikes 0

Response

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

Answer

Yes

Document Name

Comment

The new and revised language proposed for PRC-024-3 provide a cost-effective means of addressing the most pressing industry concerns expressed in comments to the SAR. ACES appreciates the efforts of NERC and the drafting team, and the opportunity to comment.

Likes 0

Dislikes 0

Response

Aaron Cavanaugh - Bonneville Power Administration - 1,3,5,6 - WECC

Answer

Yes

Document Name

Comment

None

Likes 0

Dislikes 0

Response

Amy Casuscelli - Amy Casuscelli On Behalf of: Carrie Dixon, Xcel Energy, Inc. , 6; Gerry Huitt, Xcel Energy, Inc., 1, 5, 3; - Amy Casuscelli

Answer

Yes

Document Name

Comment

Xcel Energy is supportive of the modifications proposed. We also submit the following reword of Footnote 4 to assist in readability: "Excludes limitations caused by the setting capability of the frequency and voltage protective relays for the generating resource(s). *This* does not exclude limitations originating in the equipment protected by the relays or frequency and voltage protection that is embedded in control systems."

Likes 0

Dislikes 0

Response

Wayne Guttormson - SaskPower - 1

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Teresa Cantwell - Lower Colorado River Authority - 5

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Trevor Tidwell - PNM Resources - Public Service Company of New Mexico - 3

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Daniel Gacek - Exelon - 1

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Constantin Chitescu - Ontario Power Generation Inc. - 5

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Chantal Mazza - Hydro-Quebec TransEnergie - 2 - NPCC

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Larry Heckert - Alliant Energy Corporation Services, Inc. - 4

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Karie Barczak - DTE Energy - Detroit Edison Company - 3, Group Name DTE Energy - DTE Electric

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

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

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Glenn Barry - Los Angeles Department of Water and Power - 5

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Bruce Reimer - Manitoba Hydro - 1

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Nick Batty - Keys Energy Services - 9 - SERC

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Jamie Monette - Allete - Minnesota Power, Inc. - 1

Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Michael Goggin - Grid Strategies - 5 - NA - Not Applicable	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Richard Jackson - U.S. Bureau of Reclamation - 1	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Neil Swearingen - Salt River Project - 1,3,5,6 - WECC	
Answer	Yes
Document Name	
Comment	
Likes 0	

Dislikes 0

Response

Glen Farmer - Avista - Avista Corporation - 5

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Davis Jelusich - Public Utility District No. 1 of Chelan County - 6, Group Name Public Utility District No. 1 of Chelan County

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Maryanne Darling-Reich - Black Hills Corporation - 1,3,5,6 - MRO,WECC

Answer

Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

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

Answer

Yes

Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Mark Garza - FirstEnergy - FirstEnergy Corporation - 4, Group Name FE Voter	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Dana Klem - MRO - 1,2,3,4,5,6 - MRO, Group Name MRO NSRF	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Kevin Conway - Public Utility District No. 1 of Pend Oreille County - 1,3,5,6	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	

Response

Anthony Jablonski - ReliabilityFirst - 10

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Bette White - AES - Indianapolis Power and Light Co. - 3

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Michelle Amarantos - APS - Arizona Public Service Co. - 1

Answer Yes

Document Name

Comment

Likes 0

Dislikes 0

Response

Chris Wagner - Santee Cooper - 1, Group Name Santee Cooper

Answer Yes

Document Name

Comment	
Likes 0	
Dislikes 0	
Response	
Matthew Nutsch - Seattle City Light - 1,3,4,5,6 - WECC	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Jonathan Robbins - Seminole Electric Cooperative, Inc. - 1,3,4,5,6	
Answer	
Document Name	PRC-024-2 - PRC-024-3 (Draft 2) Comments and Questions.docx
Comment	
See additional questions/comments attached.	
Likes 0	
Dislikes 0	
Response	
Douglas Webb - Douglas Webb On Behalf of: Allen Klassen, Westar Energy, 6, 3, 1, 5; Bryan Taggart, Westar Energy, 6, 3, 1, 5; Derek Brown, Westar Energy, 6, 3, 1, 5; Grant Wilkerson, Westar Energy, 6, 3, 1, 5; James McBee, Great Plains Energy - Kansas City Power and Light Co., 1, 3, 6, 5; Jennifer Flandermeyer, Great Plains Energy - Kansas City Power and Light Co., 1, 3, 6, 5; John Carlson, Great Plains Energy - Kansas City Power and Light Co., 1, 3, 6, 5; Marcus Moor, Great Plains Energy - Kansas City Power and Light Co., 1, 3, 6, 5; - Douglas Webb, Group Name Westar-KCPL	
Answer	
Document Name	
Comment	

Westar Energy and Kansas City Power & Light support the Edison Electric Institutes (EEI) Comments

Likes 0

Dislikes 0

Response