

Meeting Notes

Project 2018-04 Modifications to PRC-024-2

Standard Drafting Team

September 4-6, 2019

[WebEx](#) | Dial-in: 415.655.0002 | Access Code: 737 552 334

Administrative

Mat Bunch reviewed the NERC Antitrust Compliance Guidelines and noted that the meeting was public. Quorum was achieved, as at least 2/3 of members of the standard drafting team (SDT) were in attendance. The SDT chair, Bryan Burch, welcomed the members, thanked them for supporting the project, and reviewed the meeting objectives.

Agenda Items

Review SDT Progress & Outreach

Mat Bunch reviewed outreach with the team regarding the proposed changes. Most of the feedback indicated (from the comment period) that the TO-only entity owning and applying protection on transformers. The SDT received positive feedback on responses to the following comments:

- Elimination of the term momentary cessation
 - Replaced with “or cease injecting current”
- Clarification of the word *protection*
 - Facilities section better specified the type of protection; footnote added to Requirements
- *GSU protection should not be included within the scope of PRC-024*
 - Generator step-up (GSU) protection is included in PRC-024-2 for dispersed power resources (footnotes 2 and 4)
 - Also meets the reliability purpose of the standard
 - The SDT submitted a supplemental SAR to address – the majority of industry provided positive feedback
 - No change made in Draft 2
- *Transmission Owners should not be included in the applicability of PRC-024*
 - Draft 2 change: Based on the feedback received from the supplemental SAR comments, TOs have been removed from the applicability of PRC-024-3
 - Exception – Variance for Quebec Interconnection (only those TOs that own GSUs)
- *Auxiliary equipment protection should be explicitly excluded*

- Draft 2 change: The SDT has added an explicit exemption for auxiliary equipment protection to the Facilities section
- *“Collector transformer” is a confusing term*
 - Draft 2 change: The SDT has replaced the term with “main power transformer” (MPT)
- *Why did the SDT stop using the term “Point of Interconnection”?*
 - The term was replaced with “at the high side of the GSU/MPT” in Draft 1 and 2 to be consistent with the intent of PRC-024-2 (see footnote #3)
 - No change made in Draft 2
- *Adding “May Trip Zone” to the area outside of the “No Trip Zone” in the charts implies that it is okay to trip even if there are no equipment limitations. We should encourage generators to remain connected during frequency and voltage excursions as long as they can without damaging equipment*
 - Draft 2 change: The SDT has replaced “May Trip Zone” with “The area outside the ‘No Trip Zone’ is not a ‘Must Trip Zone’.”
- *Why did the SDT remove the generator “may trip” exception bullet points in Requirements R1 and R2?*
 - The SDT notes that PRC-024 is a protection *settings* standard – not a ride-through standard – and should not define every circumstance in which a generating resource may trip
 - No change made in Draft 2
- *The implementation plan is too short considering some of the clarifications will require GOs to reevaluate their protection settings*
 - Draft 2 change: The SDT has extended the implementation plan to 24 months
- Variance – Quebec Interconnection
 - More stringent Voltage No Trip Boundaries
 - Boundaries vary based on plant type
 - Transmission Owners that own GSUs/MPTs applicable in the Quebec Interconnection
 - Only one affected entity – Hydro-Québec TransÉnergie

The SDT discussed momentary cessation and whether or not “protective function” should be replaced with “protective and control” due to the fact that a GO may consider “ceasing injecting current” may be NOT be considered a “protective” function. Ryan Mauldin commented that there whether or not control is in the standard, the auditor is going to look at the requirements; therefore, it would be interpreted as a protective function. The requirements clearly specify that the settings have to be set appropriately, no matter whether considered a control or protective function. The SDT removed “protective” before functions in the Facilities section.

Mechanical Overspeed Protection

The SDT once again reviewed mechanical overspeed/underspeed protection and whether it should be in scope of PRC-024 since speed is proportionate to frequency. FERC staff asked for the technical justification as to why mechanical overspeed/underspeed protection should not be in scope of PRC-024, given that speed is proportional to frequency. The SDT noted that generating resources have not had issues tripping in the No Trip Zone due to lack of mechanical protection. SDT members gave examples of how speed protection is already covered in the turbine and disagreed that it should be in scope of PRC-024. On the topic of overspeed protection, one of the SDT members suggested that NERC collect data and ask NERC's SPCS to develop a technical paper on this issue. Rich Bauer indicated that he would contact the subcommittee.

Further technical justification: The turbine controls system is the primary protection for turbine overspeed protection. The turbine protection system uses electronic speed pickups (multiple proximity probes looking at 60+ tooth wheel, configured usually in a 2 out of 3 vote for trip) and/or mechanical overspeed trip mechanism (AKA speed bolt) located in the front standard. These systems are tested on a weekly or frequent basis based on the value of the asset for third party asset insurance purposes and validation that the protection systems are working. This is not a matter of insignificance to the turbine controls engineer nor those that provide asset insurance coverage for the equipment. The generator protection relay can only see the electrical frequency waveform signal as derived from the potential transformer on the generator bus. The generator protection relay is, and has always been, secondary protection to the turbine controls protection systems for turbine overspeed protection and sub synchronous resonant frequency timer accumulators. With this understanding I do not consider there is a reliability gap. (see attachments and references) Turbines are designed, at a minimum on average, to operate momentarily up to 120% of rated speed with a trip setpoint typically at 110%, so $110\% \times 60\text{hz} = 66\text{hz}$.

The intent of the frequency protection element in PRC-024 is to ensure the generator does not trip for transient power swings on the system that are deemed stable as determine by the Transmission Planner. The envelope of the frequency "No Trip" zones were provided by Transmission Planner studies that resulted in what were deemed recoverable faults in which the generators needed to stay connected. The PRC-024 frequency "No Trip" zones have nothing to do with over-speed protection of the turbine.

Finalize Quebec Variance | Finalize Implementation Plan | Review Comments & Responses

The team finalized the standard and associated documents for quality review for the September 2019 posting. The SDT completed the summary comment responses by question, and the implementation timeline was extended from 18 to 24 months due to industry comments on needing more time to change settings. The following preamble was added to the Quebec Variance:

This Variance extends the applicability of Requirements R1, R3, and R4 to Transmission Owners in the Quebec Interconnection that own a BES GSU or MPT and apply protection listed in Section 4.2.1, Facilities. This Variance also replaces Requirement R2 of the continent-wide standard in its entirety and adds a new requirement, Requirement D.A.5., applicable to Planning Coordinators in the Quebec Interconnection.

In Requirements R1, R3, and R4, all references to “Generator Owner” are replaced with “Generator Owner and Transmission Owner.”

This Variance replaces continent-wide Requirement R2 in its entirety with the following:

Review Project Plan

Mat Bunch Reviewed the following key dates in the project plan:

- 45-day additional ballot and comment period
 - Scheduled for September 2019
- SDT Meeting to address comments and finalize for subsequent ballot
 - November 2019
- Subsequent ballot
 - Scheduled for November 2019
- NERC Board Adoption
 - Targeted for February 2020
- File with regulatory authorities
 - ~First Quarter 2020

Attendance – September 4, 2019

Role	Name	Entity	Present?
Chair	S. Bryan Burch	Southern Company	Y
Vice Chair	Jeff Billo	ERCOT	Y
Members	Louis Fonte	California ISO	Y
	Noel Aubut	Hydro-Quebec	Y
	Amir Mohammednur	Southern California Edison	Y
	Peter Wybierala	NextEra Energy	
	Tracy MacNicoll	Utility Services, Inc.	Y
	Rajat Majumder	Siemens Gamesa	Y
	Yishan Zhao	Duke Energy	Y
	Mark Kuras	PJM	Y
	Gary Custer	SMA-America	
	John Anderson	Xcel Energy	Y
PMOS Liaison	Linda Lynch	Florida Power & Light	Y
NERC Staff	Mat Bunch, Standards Developer	North American Electric Reliability Corp	Y
	Lauren Perotti, Legal	North American Electric Reliability Corp	Y
	Ryan Mauldin, Compliance	North American Electric Reliability Corp	Y
	Al McMeekin, Risk Issue Management	North American Electric Reliability Corporation	Y
	Rich Bauer, Events Analysis	North American Electric Reliability Corporation	Y

Attendance – September 5, 2019

Role	Name	Entity	Present?
Chair	S. Bryan Burch	Southern Company	
Vice Chair	Jeff Billo	ERCOT	
Members	Louis Fonte	California ISO	
	Noel Aubut	Hydro-Quebec	
	Amir Mohammednur	Southern California Edison	
	Peter Wybierala	NextEra Energy	
	Tracy MacNicoll	Utility Services, Inc.	
	Rajat Majumder	Siemens Gamesa	
	Yishan Zhao	Duke Energy	
	Mark Kuras	PJM	
	Gary Custer	SMA-America	
	John Anderson	Xcel Energy	
PMOS Liaison	Linda Lynch	Florida Power & Light	Y
NERC Staff	Mat Bunch, Standards Developer	North American Electric Reliability Corp	
	Lauren Perotti, Legal	North American Electric Reliability Corp	
	Ryan Mauldin, Compliance	North American Electric Reliability Corp	
	Al McMeekin, Risk Issue Management	North American Electric Reliability Corporation	
	Rich Bauer, Events Analysis	North American Electric Reliability Corporation	

Attendance – September 6, 2019

Role	Name	Entity	Present?
Chair	S. Bryan Burch	Southern Company	
Vice Chair	Jeff Billo	ERCOT	
Members	Louis Fonte	California ISO	
	Noel Aubut	Hydro-Quebec	
	Amir Mohammednur	Southern California Edison	
	Peter Wybierala	NextEra Energy	
	Tracy MacNicoll	Utility Services, Inc.	
	Rajat Majumder	Siemens Gamesa	
	Yishan Zhao	Duke Energy	
	Mark Kuras	PJM	
	Gary Custer	SMA-America	
	John Anderson	Xcel Energy	
PMOS Liaison	Linda Lynch	Florida Power & Light	Y
NERC Staff	Mat Bunch, Standards Developer	North American Electric Reliability Corp	
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	Ryan Mauldin, Compliance	North American Electric Reliability Corp	
	Al McMeekin, Risk Issue Management	North American Electric Reliability Corporation	
	Rich Bauer, Events Analysis	North American Electric Reliability Corporation	