

NERC

NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

PRC-024-3 Industry Webinar

Project 2018-04 Modifications to PRC-024-2

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- North American Electric Reliability Corporation (NERC) Antitrust Guidelines
 - It is NERC's policy and practice to obey the antitrust laws and to avoid all conduct that unreasonably restrains competition. This policy requires the avoidance of any conduct that violates, or that might appear to violate, the antitrust laws. Among other things, the antitrust laws forbid any agreement between or among competitors regarding prices, availability of service, product design, terms of sale, division of markets, allocation of customers or any other activity that unreasonably restrains competition
- Notice of Open Meeting
 - Participants are reminded that this webinar is public. The access number was widely distributed. Speakers on the call should keep in mind that the listening audience may include members of the press and representatives of various governmental authorities, in addition to the expected participation by industry stakeholders.

- Background
- Project Scope
- Key modifications in PRC-024-3
- Questions

- The NERC Integration of Variable Generation Task Force (IVGTF)
 - Identified potential changes to PRC-024
- Standard Authorization Request (SAR) Prepared by the Inverter-Based Resource Performance Task Force (IRPTF)
 - Based off disturbance analyses and the [PRC-024-2 Gaps Whitepaper](#)
- SAR submitted – December 2018
- Standard Drafting Team (SDT) formed – February 2019
- Initial Comment Ballot and Comment Period – open through May 31, 2019

- a) Update the PRC-024 ride-through curves to clarify that the area outside the “No Trip” zone is not erroneously interpreted as requiring resources to trip.
- b) Clarify inconsistencies between the Curve Data Point tables and the Off Nominal Frequency Capability Curves (pages 8 & 9) to ensure that instantaneously calculated frequency is not permissible to define the trip parameters.
- c) Clarify the language in points #1, #3, and #5 of the Curve Details section of the “Voltage Ride-Through Curve Clarifications” on page 11.
- d) Consider whether the SDT should address manners in which to reinforce that the requirements pertain to the Point of Interconnection.

- e) Clarify if the voltage and frequency protective functions within an inverter control system that trip the inverter are subject to the requirements of PRC-024
- f) Clarify that plant auxiliary equipment protection systems are not subject to the requirements of PRC-024.
- g) Clarify whether the use of momentary cessation within the “No Trip” zone of PRC-024 does not comply with the standard. The SDT should consider the use of momentary cessation for very low voltages within the “No Trip” zone of PRC-024.
- h) The SDT should consider whether Interconnection-specific modification(s) or Regional Variance(s) are necessary for the voltage ride-through time duration curve(s) in Attachment 2.

PRC-024-3

Summary of Key Modifications

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- Momentary Cessation
 - Requirements R1 and R2 modified to specify a generating resource may neither trip NOR enter momentary cessation inside the No Trip Zone

- Applicability Section expanded to include a ‘Facilities’ subsection (4.2) that explicitly states the protection required and lists the relevant equipment
 - Protection Systems for plant auxiliary equipment are not applicable

- Addresses a potential reliability gap identified by the standard drafting team
 - Some Transmission Owners (TOs) own GSU or collector transformers, yet are not currently in scope PRC-024
- Only those specific TOs that own a GSU or collector transformer and apply protection listed in the facilities section are now in scope of PRC-024
- *Not all TOs are applicable*

4. Applicability:

4.1. Functional Entities:

4.1.1. Generator Owners that apply protection listed in Section 4.2.1.

4.1.2. Transmission Owners that own a BES generator step-up (GSU) transformer or collector transformer and apply protection listed in Section 4.2.1.

▲ 4.2. Facilities:

4.2.1 Frequency, voltage or volts per hertz protection, including frequency or voltage protective functions within control systems that provide tripping or momentary cessation signals to all or part of the generating resource, applied to the following:

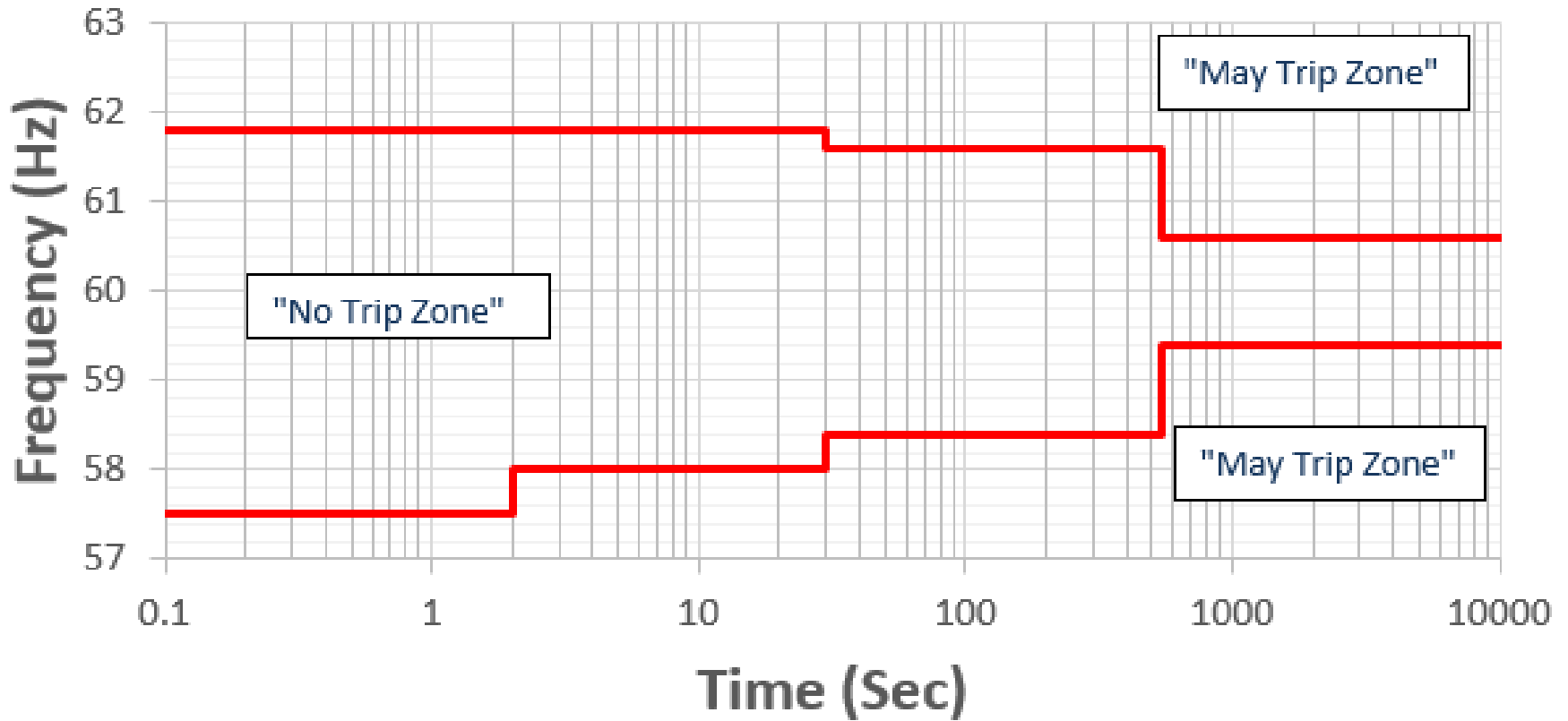
- 4.2.1.1** Bulk Electric System (BES) generating resource(s).
- 4.2.1.2** BES GSU transformer(s).
- 4.2.1.3** High side of the generator-connected unit auxiliary transformer installed on BES generating resource(s).
- 4.2.1.4** Individual dispersed power producing resources identified in the BES Definition, Inclusion I4.
- 4.2.1.5** Elements utilized in aggregation of the dispersed power producing resources.
- 4.2.1.6** Collector transformer of resources identified in the BES Definition, Inclusion I4.

- “Point of Interconnection” terminology replaced with, “at the high side of the GSU or collector transformer”
- Addresses confusion in regards to where the requirements are to be evaluated

- Quebec Variance to Requirement R2 with more stringent under/over voltage boundaries
- Boundaries separated by:
 - Inverter-based resources
 - Strategic Power Plants (identified by the Transmission Planner)
 - All other power plants

- Replaced “Relay” with “Protection” throughout
- Clarified areas of confusion as specified by the SAR
 - Replaced “Curve” with “Boundary”
 - Labeled the area outside the “No Trip Zone” as the “May Trip Zone;”
 - Removed “ride-through” language;
 - Addition of “Minimum Time” to voltage and frequency values
 - Replaced “instantaneous” with “0.10” seconds
 - Modifications to the Voltage Boundary Clarifications
- Separated frequency tables and figures by Interconnection

ERCOT Interconnection Boundaries



Frequency Boundary Data Points – ERCOT Interconnection

High Frequency Duration		Low Frequency Duration	
Frequency (Hz)	Minimum Time (Sec)	Frequency (Hz)	Minimum Time (sec)
≥61.8	0.10	≤57.5	0.10
≥61.6	30	≤58.0	2
≥60.6	540	≤58.4	30
<60.6	Continuous operation	≤59.4	540
		>59.4	Continuous operation

- 45-day initial ballot and comment period open through May 31, 2019
 - Ballot pools formed until May 16, 2019
 - 10-day ballot conducted May 22-31, 2019
- SDT conference call schedule
 - June 5, 7, 11, 12 & 14, 2019 (Noon – 2pm Eastern)
- Next in-person SDT meeting – June 18-20, 2019 (Montreal, QC)
- Subsequent ballot expected to post late June 2019



Questions and Answers