

NERC

NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

PRC-024-3 Training

Project 2018-04 Modifications to PRC-024-2

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RELIABILITY | RESILIENCE | SECURITY



- 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](#)

- Cease Injecting Current
 - Requirements R1 and R2 modified to specify a generating resource may neither trip NOR cease injecting current 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) in the Quebec Interconnection own GSU or collector transformers, yet are not currently in scope PRC-024
- TOs (in the Quebec Interconnection only) that own a BES generator step-up (GSU) transformer or main power transformer (MPT) and apply protection listed in the facilities section are now in scope of PRC-024

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 (in the Quebec Interconnection only) that own a BES generator step-up (GSU) transformer or main power transformer (MPT)¹ and apply protection listed in Section 4.2.1.
- 4.1.3 Planning Coordinators (in the Quebec Interconnection only)

4.2. Facilities²:

4.2.1 Frequency, voltage, and volts per hertz protection (whether provided by relaying or functions within associated control systems) that respond to electrical signals and: (i) directly trip the generating resource(s); or (ii) provide signals to the generating resource(s) to either trip or cease injecting current; and are applied to the following:

4.2.1.1 BES generating resource(s).

4.2.1.2 BES GSU transformer(s).

4.2.1.3 High side of the generator-connected unit auxiliary transformer³ (UAT) installed on BES generating resource(s).

4.2.1.4 Individual dispersed power producing resource(s) identified in the BES Definition, Inclusion I4.

4.2.1.5 Elements that are designed primarily for the delivery of capacity from the individual dispersed power producing resources identified in the BES Definition, Inclusion I4, to the point where those resources aggregate to greater than 75 MVA.

- “Point of Interconnection” terminology replaced with, “at the high side of the GSU or MPT”
- 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
 - Added footnote 9 to clarify that instantaneous trip settings based on instantaneously calculated frequency measurement is not permitted
 - Modifications to the Voltage Boundary Clarifications
- Separated frequency tables and figures by Interconnection

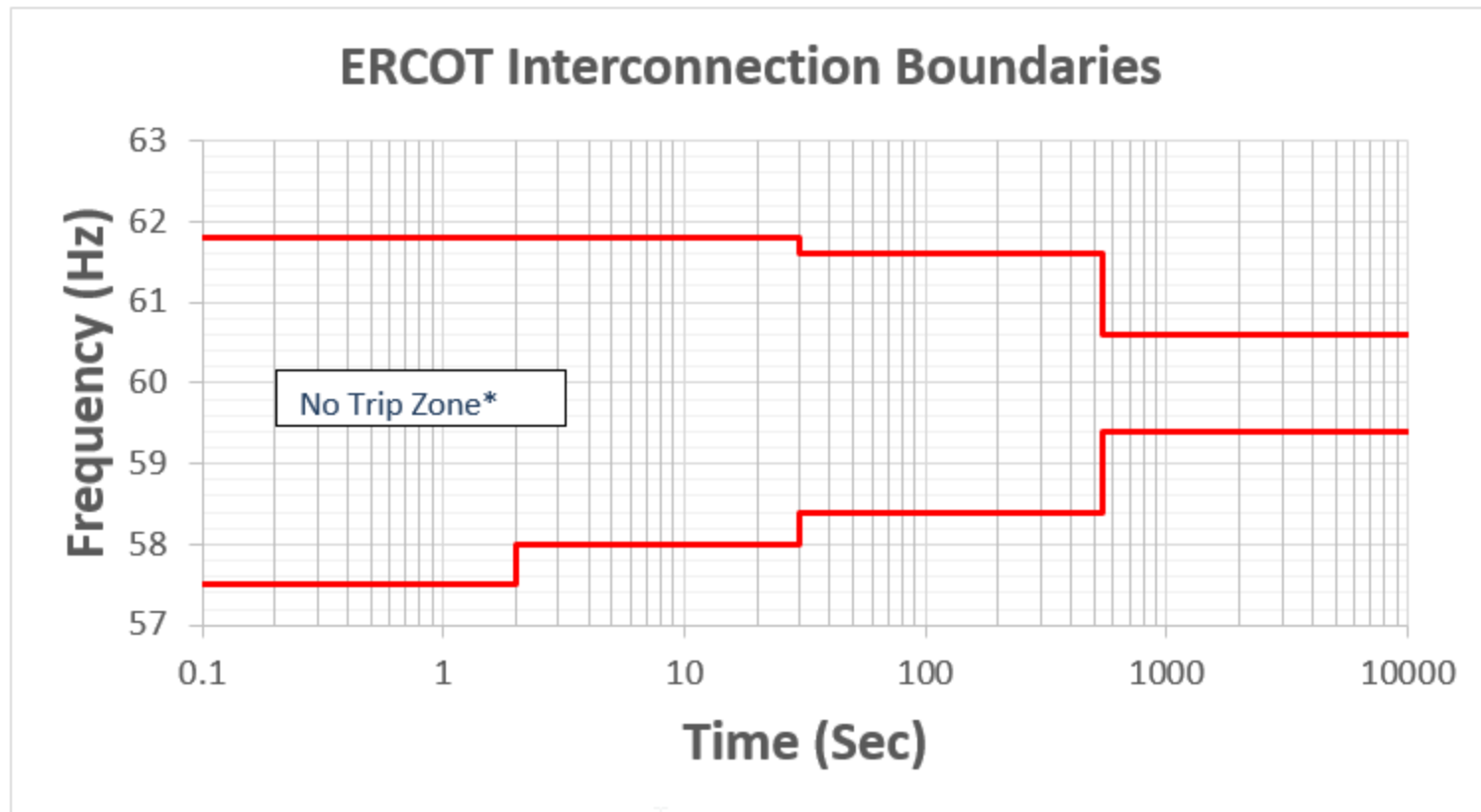


Figure 4

** The area outside the "No Trip Zone" is not a "Must Trip Zone."*

Frequency Boundary Data Points – ERCOT Interconnection

High Frequency Duration		Low Frequency Duration	
Frequency (Hz)	Minimum Time (Sec)	Frequency (Hz)	Minimum Time (sec)
≥61.8	Instantaneous ⁹	≤57.5	Instantaneous ⁹
≥61.6	30	≤58.0	2
≥60.6	540	≤58.4	30
<60.6	Continuous operation	≤59.4	540
		>59.4	Continuous operation

Table 4

- See Project 2018-04 [Project Page](#) on the NERC Standards webpage

A stylized map of North America is centered on the page. The map is divided into three horizontal color bands: a light purple band at the top, a medium blue band in the middle, and a dark blue band at the bottom. The text "Thank You" is written in a large, bold, black sans-serif font, centered horizontally and overlapping the middle and bottom bands of the map.

Thank You