

# Implementation Plan

## Project 2016-04 – Modifications to PRC-025-1 Reliability Standard PRC-025-2

### Applicable Standard

- PRC-025-2 – Generator Relay Loadability

### Requested Retirement

- PRC-025-1 – Generator Relay Loadability

### Prerequisite Standard

- None

### Applicable Entities\*

- Generator Owner
- Transmission Owner
- Distribution Provider

\*See the proposed standard for detailed applicability for functional entities and Facilities.

### Terms in the NERC Glossary of Terms

No definitions are proposed as a part of this standard.

### Background

The Reliability Standard PRC-025-1 went into effect in the United States on October 1, 2014 under a phased implementation plan based on two time frames. The first timeframe was provided to the Generator Owner, Transmission Owner, or Distribution Provider to apply settings to its existing load-responsive protective relays that are capable of meeting the standard while maintaining reliable fault protection. The second and extended timeframe was provided to the Generator Owner, Transmission Owner, or Distribution Provider that determined its existing load-responsive protective relays require replacement or removal. The PRC-025-1 standard drafting team recognized that it may be necessary to replace a legacy load-responsive protective relay with a modern advanced-technology relay that can be set using functions such as load encroachment or that removal of the load-responsive protective relay is the best alternative to satisfy the entity's protection criteria and meet the requirements of PRC-025-1.

## General Considerations

This Implementation Plan supersedes and retires the *Implementation Plan PRC-025-1 – Generator Relay Loadability*<sup>1</sup> such that entities are not required to implement the requirements in the PRC-025 Reliability Standard until the dates provided herein. In drafting this Implementation Plan, the PRC-025-2 standard drafting team considered the scope of the proposed revisions and the timing for regulatory approvals with respect to the phased-in implementation dates for PRC-025-1. The first U.S. phased-in implementation date for PRC-025-1 of October 1, 2019 applies to load-responsive protective relays where the applicable entity will be making a setting change to meet the setting criteria of the standard while maintaining reliable fault protection. The second U.S. phased-in implementation date for PRC-025-1 of October 1, 2021 applies to load-responsive protective relays where the applicable entity will be removing or replacing the relay to meet the setting criteria of the standard while maintaining reliable fault protection.

The PRC-025-2 Implementation Plan reflects consideration of the following:

- The phased-in implementation dates for PRC-025-1,
- The proposed Option 5b reduces the implementation burden to the applicable entities,
- The proposed revisions to Options 14b, 15b, and 16b may give reason for entities to re-evaluate their settings for load-responsive protective relays,
- A few proposed Option(s) that now include the 50 element, and
- Generator outage cycles.

## Effective Date

### PRC-025-2

Where approval by an applicable governmental authority is required, the standard shall become effective on the first day of the first calendar quarter after the effective date of the applicable governmental authority's order approving the standard, or as otherwise provided for by the applicable governmental authority.

Where approval by an applicable governmental authority is not required, the standard shall become effective on the first day of the first calendar quarter after the date the standard is adopted by the NERC Board of Trustees, or as otherwise provided for in that jurisdiction.

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<sup>1</sup> [http://www.nerc.com/pa/Stand/PRC0251RD/PRC\\_025\\_1\\_Implementation\\_Plan\\_2013\\_06\\_20\\_Draft\\_4\\_\(Clean\).pdf](http://www.nerc.com/pa/Stand/PRC0251RD/PRC_025_1_Implementation_Plan_2013_06_20_Draft_4_(Clean).pdf)

## Effective Date and Phased-In Compliance Dates

### Load-responsive protective relays subject to the standard

Each Generator Owner, Transmission Owner, or Distribution Provider shall not be required to comply with Requirement R1 until the following dates after the effective date of Reliability Standard PRC-025-2:

Requirement	Applicability	Implementation Date
<b>R1</b>	Each Generator Owner, Transmission Owner, and Distribution Provider shall apply settings that are in accordance with PRC-025-2 – Attachment 1: Relay Settings, on each load-responsive protective relay while maintaining reliable fault protection.	Where determined by the Generator Owner, Transmission Owner, or Distribution Provider that replacement or removal is not necessary, the later of October 1, 2019 or 12 months after the effective date of Reliability Standard PRC-025-2, except as noted for the PRC-025-2 – Attachment 1, Table 1 Relay Loadability Evaluation Criteria, Options listed below
		Where determined by the Generator Owner, Transmission Owner, or Distribution Provider that replacement or removal is necessary, the later of October 1, 2021 or 36 months after the effective date of Reliability Standard PRC-025-2, except as noted for the Table 1 Relay Loadability Evaluation Criteria Options listed below

Phased-in implementation of specific Table 1 Relay Loadability Evaluation Criteria Options		
Option	Application and Relay Type	Implementation Date
<b>Option 5b</b>	Asynchronous generating unit(s) (including inverter-based installations), including Elements utilized in the aggregation of dispersed power producing resources applying any phase overcurrent relay (e.g., 51, or 51V-R – voltage-restrained) <sup>2</sup>	Where determined by the Generator Owner, Transmission Owner, or Distribution Provider that replacement or removal is not necessary, 24 months after the effective date of Reliability Standard PRC-025-2
		Where determined by the Generator Owner, Transmission Owner, or Distribution Provider that replacement or removal is necessary, 48 months after the effective date of Reliability Standard PRC-025-2

<sup>2</sup> Phased-in implementation of the phase overcurrent relay 50 element is provided under Options 5a and 5b.

<p><b>Options 2a, 2b, and 2c</b> (50 element only)</p>	<p>Synchronous generating unit(s), including Elements utilized in the aggregation of dispersed power producing resources applying, specifically the phase overcurrent relay 50 element</p>	<p>Where determined by the Generator Owner, Transmission Owner, or Distribution Provider that replacement or removal is not necessary, 60 months after the effective date of Reliability Standard PRC-025-2</p>
		<p>Where determined by the Generator Owner, Transmission Owner, or Distribution Provider that replacement or removal is necessary, 84 months after the effective date of Reliability Standard PRC-025-2</p>
<p><b>Options 5a and 5b</b> (50 element only)</p>	<p>Asynchronous generating unit(s) (including inverter-based installations), including Elements utilized in the aggregation of dispersed power producing resources applying, specifically the phase overcurrent relay 50 element</p>	<p>Where determined by the Generator Owner, Transmission Owner, or Distribution Provider that replacement or removal is not necessary, 60 months after the effective date of Reliability Standard PRC-025-2</p>
		<p>Where determined by the Generator Owner, Transmission Owner, or Distribution Provider that replacement or removal is necessary, 84 months after the effective date of Reliability Standard PRC-025-2</p>
<p><b>Options 8a, 8b, and 8c</b> (50 element only)</p>	<p>Generator step-up transformer(s) connected to synchronous generators applying, specifically the phase overcurrent relay 50 element installed on generator-side of the GSU transformer</p>	<p>Where determined by the Generator Owner, Transmission Owner, or Distribution Provider that replacement or removal is not necessary, 60 months after the effective date of Reliability Standard PRC-025-2</p>
		<p>Where determined by the Generator Owner, Transmission Owner, or Distribution Provider that replacement or removal is necessary, 84 months after the effective date of Reliability Standard PRC-025-2</p>
<p><b>Option 11</b> (50 element only)</p>	<p>Generator step-up transformer(s) connected to asynchronous generators only (including inverter-based installations) applying, specifically the phase</p>	<p>Where determined by the Generator Owner, Transmission Owner, or Distribution Provider that replacement or removal is not necessary, 60 months after the effective date of Reliability Standard PRC-025-2</p>

	overcurrent 50 element – installed on generator-side of the GSU transformer	Where determined by the Generator Owner, Transmission Owner, or Distribution Provider that replacement or removal is necessary, 84 months after the effective date of Reliability Standard PRC-025-2
<b>Options 13a and 13b</b> (50 element only)	Unit auxiliary transformer(s) (UAT) applying, specifically the phase overcurrent 50 element applied at the high-side terminals of the UAT, for which operation of the relay will cause the associated generator to trip	Where determined by the Generator Owner, Transmission Owner, or Distribution Provider that replacement or removal is not necessary, 60 months after the effective date of Reliability Standard PRC-025-2
		Where determined by the Generator Owner, Transmission Owner, or Distribution Provider that replacement or removal is necessary, 84 months after the effective date of Reliability Standard PRC-025-2
<b>Option 14b</b>	Relays installed on the high-side of the GSU transformer, including relays installed on the remote end of line, for Elements that connect the GSU transformer(s) to the Transmission system that are used exclusively to export energy directly from a BES generating unit or generating plant (except that Elements may also supply generating plant loads) – connected to synchronous generators applying a phase distance relay (e.g., 21) – directional toward the Transmission system	Where determined by the Generator Owner, Transmission Owner, or Distribution Provider that replacement or removal is not necessary, 24 months after the effective date of Reliability Standard PRC-025-2
		Where determined by the Generator Owner, Transmission Owner, or Distribution Provider that replacement or removal is necessary, 48 months after the effective date of Reliability Standard PRC-025-2
<b>Option 15b</b>	Relays installed on the high-side of the GSU transformer, including relays installed at the remote end of the line, for Elements that connect the GSU transformer(s) to	Where determined by the Generator Owner, Transmission Owner, or Distribution Provider that replacement or removal is not necessary, 24 months after the effective date of Reliability Standard PRC-025-2

	<p>the Transmission system that are used exclusively to export energy directly from a BES generating unit or generating plant (except that Elements may also supply generating plant loads) – connected to synchronous generators applying a phase instantaneous overcurrent supervisory element (e.g., 50) – associated with current-based, communication-assisted schemes where the scheme is capable of tripping for loss of communications and/or phase time overcurrent relay (e.g., 51)</p>	<p>Where determined by the Generator Owner, Transmission Owner, or Distribution Provider that replacement or removal is necessary, 48 months after the effective date of Reliability Standard PRC-025-2</p>
<p><b>Option 16b</b></p>	<p>Relays installed on the high-side of the GSU transformer, including relays installed at the remote end of the line, for Elements that connect the GSU transformer(s) to the Transmission system that are used exclusively to export energy directly from a BES generating unit or generating plant (except that Elements may also supply generating plant load.) – connected to synchronous generators applying Phase directional instantaneous overcurrent supervisory element (e.g., 67) – associated with current-based, communication-assisted schemes where the scheme is capable of tripping for loss of communications directional toward the Transmission system and/or phase directional time overcurrent relay (e.g., 67) – directional toward the Transmission system</p>	<p>Where determined by the Generator Owner, Transmission Owner, or Distribution Provider that replacement or removal is not necessary, 24 months after the effective date of Reliability Standard PRC-025-2</p>
		<p>Where determined by the Generator Owner, Transmission Owner, or Distribution Provider that replacement or removal is necessary, 48 months after the effective date of Reliability Standard PRC-025-2</p>

**Load-responsive protective relays which become applicable to the standard**

Each Generator Owner, Transmission Owner, or Distribution Provider that owns load-responsive protective relays that become applicable to this standard, not because of the actions of itself including but not limited to changes in NERC Registration Criteria or Bulk Electric System (BES) definition, shall not be required to comply with Requirement R1 until the following dates:

Requirement	Applicability	Implementation Date
R1	Each Generator Owner, Transmission Owner, and Distribution Provider shall apply settings that are in accordance with PRC-025-2 – Attachment 1: Relay Settings, on each load-responsive protective relay while maintaining reliable fault protection.	Where determined by the Generator Owner, Transmission Owner, or Distribution Provider that replacement or removal is not necessary, 60 months beyond the date the load-responsive protective relays become applicable to the standard
		Where determined by the Generator Owner, Transmission Owner, or Distribution Provider that replacement or removal is necessary, 84 months beyond the date the load-responsive protective relays become applicable to the standard

**Retirement Date**

PRC-025-1

Reliability Standard PRC-025-1 shall be retired immediately prior to the effective date of PRC-025-2 in the particular jurisdiction in which the revised standard is becoming effective.

**Phased-In Retirement**

None

**Implementation Plan for Definitions**

No definitions are proposed as a part of this standard.