

DRAFT Reliability Standard Audit Worksheet¹

PRC-024-3 – Frequency and Voltage Protection Settings for Generating Resources

This section to be completed by the Compliance Enforcement Authority.

Audit ID: Audit ID if available; or REG-NCRnnnnn-YYYYMMDD
Registered Entity: Registered name of entity being audited
NCR Number: NCRnnnnn
Compliance Enforcement Authority: Region or NERC performing audit
Compliance Assessment Date(s)²: Month DD, YYYY, to Month DD, YYYY
Compliance Monitoring Method: [On-site Audit | Off-site Audit | Spot Check]
Names of Auditors: Supplied by CEA

Applicability of Requirements³

| | BA | DP | GO | GOP | IA | LSE | PA | PSE | RC | RP | RSG | TO | TOP | TP | TSP |
|----|----|----|----|-----|----|-----|----|-----|----|----|-----|----|-----|----|-----|
| R1 | | | X | | | | | | | | | X | | | |
| R2 | | | X | | | | | | | | | X | | | |
| R3 | | | X | | | | | | | | | X | | | |
| R4 | | | X | | | | | | | | | X | | | |

Legend:

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| Text with blue background: | Fixed text – do not edit |
| Text entry area with Green background: | Entity-supplied information |
| Text entry area with white background: | Auditor-supplied information |

¹ NERC developed this Reliability Standard Audit Worksheet (RSAW) language in order to facilitate NERC’s and the Regional Entities’ assessment of a registered entity’s compliance with this Reliability Standard. The NERC RSAW language is written to specific versions of each NERC Reliability Standard. Entities using this RSAW should choose the version of the RSAW applicable to the Reliability Standard being assessed. While the information included in this RSAW provides some of the methodology that NERC has elected to use to assess compliance with the requirements of the Reliability Standard, this document should not be treated as a substitute for the Reliability Standard or viewed as additional Reliability Standard requirements. In all cases, the Regional Entity should rely on the language contained in the Reliability Standard itself, and not on the language contained in this RSAW, to determine compliance with the Reliability Standard. NERC’s Reliability Standards can be found on NERC’s website. Additionally, NERC Reliability Standards are updated frequently, and this RSAW may not necessarily be updated with the same frequency. Therefore, it is imperative that entities treat this RSAW as a reference document only, and not as a substitute or replacement for the Reliability Standard. It is the responsibility of the registered entity to verify its compliance with the latest approved version of the Reliability Standards, by the applicable governmental authority, relevant to its registration status.

The RSAW may provide a non-exclusive list, for informational purposes only, of examples of the types of evidence a registered entity may produce or may be asked to produce to demonstrate compliance with the Reliability Standard. A registered entity’s adherence to the examples contained within this RSAW does not necessarily constitute compliance with the applicable Reliability Standard, and NERC and the Regional Entity using this RSAW reserve the right to request additional evidence from the registered entity that is not included in this RSAW. This RSAW may include excerpts from FERC Orders and other regulatory references which are provided for ease of reference only, and this document does not necessarily include all applicable Order provisions. In the event of a discrepancy between FERC Orders, and the language included in this document, FERC Orders shall prevail.

² Compliance Assessment Date(s): The date(s) the actual compliance assessment (on-site audit, off-site spot check, etc.) occurs.

³ Refer to PRC-024-3 Section 4, Applicability, to determine which GOs and TOs are subject to PRC-024-3.

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Findings

(This section to be completed by the Compliance Enforcement Authority)

| Req. | Finding | Summary and Documentation | Functions Monitored |
|------|---------|---------------------------|---------------------|
| R1 | | | |
| R2 | | | |
| R3 | | | |
| R4 | | | |

| Req. | Areas of Concern |
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| Req. | Recommendations |
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| Req. | Positive Observations |
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Subject Matter Experts

Identify the Subject Matter Expert(s) responsible for this Reliability Standard.

Registered Entity Response (Required; Insert additional rows if needed):

| SME Name | Title | Organization | Requirement(s) |
|----------|-------|--------------|----------------|
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R1 Supporting Evidence and Documentation

- R1.** Each Generator Owner shall set its applicable frequency protection⁴ in accordance with PRC-024 Attachment 1 such that the applicable protection does not cause the generating resource to trip or cease injecting current during a frequency excursion within the “no trip zone”, with the following exception:
- Applicable frequency protection may be set to trip or cease injecting current within a portion of the “no trip zone” for documented and communicated regulatory or equipment limitations in accordance with Requirement R3.

M1. Each Generator Owner shall have evidence that the applicable frequency protection has been set in accordance with Requirement R1 such as dated setting sheets, calibration sheets, calculations, or other documentation.

Registered Entity Response (Required):

Question: Does your entity own any applicable frequency protection set to trip or cease injecting current during a frequency excursion in accordance with Requirement R1? Yes No

If yes, provide a summary of the applicable frequency protection in the box below, and proceed to the Registered Entity Response section below.

[Note: A separate spreadsheet or other document may be used. If so, provide the document reference below.]

Registered Entity Response (Required):

Compliance Narrative:

Provide a brief explanation, in your own words, of how you comply with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

Evidence Requested:

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| Provide the following evidence, or other evidence to demonstrate compliance. |
| A list of all applicable frequency protection that is set to trip or cease injecting current during a frequency excursion for applicable generating resource(s). |
| A list of applicable frequency protection that has exceptions, as listed in Requirement R1, including the reason for each exception. |
| For all, or a sample of applicable frequency protection selected by the auditor, dated setting sheets, calibration sheets, calculations, or other documentation that demonstrate that applicable frequency protection settings were set such that the applicable frequency protection does not trip or cease injecting current during a frequency excursion for the applicable generating resource(s) within the “no trip zone” of |

⁴ 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.

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PRC-024 Attachment 1.

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

| File Name | Document Title | Revision or Version | Document Date | Relevant Page(s) or Section(s) | Description of Applicability of Document |
|-----------|----------------|---------------------|---------------|--------------------------------|--|
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Audit Team Evidence Reviewed (This section to be completed by the Compliance Enforcement Authority):

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Compliance Assessment Approach Specific to PRC-024-3, R1

This section to be completed by the Compliance Enforcement Authority

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| | Select all, or a sample thereof, applicable frequency protection and verify the settings are set to prevent the applicable generating resources from tripping or ceasing to inject current during a frequency excursion within the “no trip zone” of PRC-024-3 Attachment 1 (unless the specified exception applies). |
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Notes to Auditor:

Section 4 of the Standard, Applicability, guides the applicable protection to which this requirement pertains. Applicable frequency protection must be set within high and low frequency limits, and frequency duration limits per PRC-024 Attachment 1. Furthermore, the auditor needs to ensure the compliance assessment is performed with the appropriate Interconnection curve.

Auditor Notes:

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R2 Supporting Evidence and Documentation

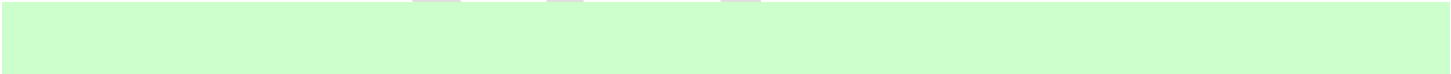
- R2.** Each Generator Owner shall set its applicable voltage protection⁵ in accordance with PRC-024 Attachment 2, such that the applicable protection does not cause the generating resource to trip or cease injecting current within the “no trip zone” during a voltage excursion at the high side of the GSU or MPT, subject to the following exceptions:
- If the Transmission Planner allows less stringent voltage protection settings than those required to meet PRC-024 Attachment 2, then the Generator Owner may set its protection within the voltage recovery characteristics of a location-specific Transmission Planner’s study.
 - Applicable voltage protection may be set to trip or cease injecting current during a voltage excursion within a portion of the “no trip zone” for documented and communicated regulatory or equipment limitations in accordance with Requirement R3.
- M2.** Each Generator Owner shall have evidence that applicable voltage protection has been set in accordance with Requirement R2, such as dated setting sheets, voltage-time curves, calibration sheets, coordination plots, dynamic simulation studies, calculations, or other documentation.

Registered Entity Response (Required):

Question: Does your entity own any applicable voltage protection set to trip or cease injecting current during a voltage excursion in accordance with Requirement R2? Yes No

If yes, provide a summary of the applicable voltage protection in the box below, and proceed to the Registered Entity Response section below.

[Note: A separate spreadsheet or other document may be used. If so, provide the document reference below.]



Evidence Requested¹:

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| Provide the following evidence, or other evidence to demonstrate compliance. |
| A list of all applicable voltage protection that is set to trip or cease injecting current during a voltage excursion for applicable generating resource(s). |
| A list of applicable voltage protection that has exceptions, as listed in Requirement R2, including the reason for each exception. |
| For all, or a sample of applicable voltage protection selected by the auditor, dated setting sheets, voltage-time curves, calibration sheets, coordination plots, dynamic simulation studies, calculations, or other documentation that demonstrates that applicable voltage protection were set such that the applicable voltage protection does not trip or cease injecting current during a voltage excursion for the applicable generating resource(s) within the “no trip zone” of PRC-024 Attachment 2. |
| If the Transmission Planner allows less stringent voltage settings than those required to meet PRC-024 Attachment 2, then provide documentation of the less stringent settings including the Transmission Planner’s |

⁵ 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.

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location-specific study.

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

| File Name | Document Title | Revision or Version | Document Date | Relevant Page(s) or Section(s) | Description of Applicability of Document |
|-----------|----------------|---------------------|---------------|--------------------------------|--|
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Audit Team Evidence Reviewed (This section to be completed by the Compliance Enforcement Authority):

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Compliance Assessment Approach Specific to PRC-024-3, R2

This section to be completed by the Compliance Enforcement Authority

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| | Select all, or a sample thereof, applicable voltage protection, and verify the settings are set to prevent the applicable generating resources from tripping or ceasing to inject current during a voltage excursion within the “no trip zone” of PRC-024-2 Attachment 2 (unless one of two specified exceptions applies). |
| Note to Auditor: Section 4 of the Standard, Applicability, guides the applicable protection to which this requirement pertains. Applicable voltage protection must be set within high and low voltage limits, and durations per PRC-024 Attachment 2. Reference the “Voltage Ride-Through Curve Clarifications” in Attachment 2. | |

Auditor Notes:

R3 Supporting Evidence and Documentation

R3. Each Generator Owner shall document each known regulatory or equipment limitation⁶ that prevents applicable generating resource(s) with frequency or voltage protection from meeting the protection setting criteria in Requirements R1 or R2, including (but not limited to) study results, experience from an actual event, or manufacturer’s advice.

3.1. The Generator Owner shall communicate the documented regulatory or equipment limitation, or the removal of a previously documented regulatory or equipment limitation, to its Planning Coordinator and Transmission Planner within 30 calendar days of any of the following:

- Identification of a regulatory or equipment limitation.
- Repair of the equipment causing the limitation that removes the limitation.
- Replacement of the equipment causing the limitation with equipment that removes the limitation.
- Creation or adjustment of an equipment limitation caused by consumption of the cumulative turbine life-time frequency excursion allowance.

M3. Each Generator Owner shall have evidence that it has documented and communicated any known regulatory or equipment limitations that resulted in an exception to Requirements R1 or R2 in accordance with Requirement R3, such as a dated email or letter that contains such documentation as study results, experience from an actual event, or manufacturer’s advice.

Registered Entity Response (Required):

Question: Did your entity have any known regulatory or equipment limitation that prevents applicable generating resource(s) with frequency or voltage protection from meeting the setting criteria in Requirements R1 or R2 in accordance with Requirement R3 during the audit period? Yes No

If yes, provide a summary of the known regulatory or equipment limitations in the box below, and proceed to the Registered Entity Response section below.

[Note: A separate spreadsheet or other document may be used. If so, provide the document reference below.]

Question: Did your entity have any removal of a previously documented regulatory or equipment limitation in accordance with Requirement R3 during the audit period? Yes No

If yes, provide a summary of the removal of the previously documented regulatory or equipment limitation(s) in the box below, and proceed to the Registered Entity Response section below.

[Note: A separate spreadsheet or other document may be used. If so, provide the document reference below.]

⁶ 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 that the relays protect or frequency and voltage protection imbedded in control systems.

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Registered Entity Response (Required):

Compliance Narrative:

Provide a brief explanation, in your own words, of how you comply with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

Evidence Requested:

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| Provide the following evidence, or other evidence to demonstrate compliance. |
| Provide a list of each known regulatory or equipment limitation that prevents an applicable generating resource with frequency or voltage protection from meeting the setting criteria in Requirements R1 or R2 in accordance with Requirement R3. |
| Provide a list of the removal(s) of a previously documented regulatory or equipment limitation in accordance with Requirement R3. |
| For all, or a sample selected by the auditor, dated email or letter that documents the entity communicated any known regulatory or equipment limitations, and removals of a previously documented regulatory or equipment limitation, to its Planning Coordinator and Transmission Planner within 30 calendar days in accordance with Requirement R3. |

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

| File Name | Document Title | Revision or Version | Document Date | Relevant Page(s) or Section(s) | Description of Applicability of Document |
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Audit Team Evidence Reviewed (This section to be completed by the Compliance Enforcement Authority):

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Compliance Assessment Approach Specific to PRC-024-3, R3

This section to be completed by the Compliance Enforcement Authority

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| Select all, or a sample thereof, and verify the entity documented each known regulatory or equipment limitation that prevents an applicable generating resource with frequency or voltage protection from meeting the setting criteria in Requirements R1 or R2 in accordance with Requirement R3, and the entity is meeting the Implementation Plan. |
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Select all, or a sample thereof, and verify the entity communicated the documented regulatory or equipment limitation, or the removal of a previously documented regulatory or equipment limitation, to its Planning Coordinator and Transmission Planner within 30 calendar days in accordance with Requirement R3 for any of the following:

- Identification of a regulatory or equipment limitation.
- Repair of the equipment causing the limitation that removes the limitation.
- Replacement of the equipment causing the limitation with equipment that removes the limitation.
- Creation or adjustment of an equipment limitation caused by consumption of the cumulative turbine life-time frequency excursion allowance.

Note to Auditor: Reference footnote 4 (of the Standard, footnote 6 in the RSAW) which states: “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 that the relays protect or frequency and voltage protection imbedded in control systems.”

Auditor Notes:

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R4 Supporting Evidence and Documentation

- R4.** Each Generator Owner shall provide its applicable protection settings associated with Requirements R1 and R2 to the Planning Coordinator or Transmission Planner that models the associated generating resource(s) within 60 calendar days of receipt of a written request for the data and within 60 calendar days of any change to those previously requested settings unless directed by the requesting Planning Coordinator or Transmission Planner that the reporting of protection setting changes is not required.

- M4.** Each Generator Owner shall have evidence that it communicated applicable protection settings in accordance with Requirement R4, such as dated e-mails, correspondence or other evidence and copies of any requests it has received for that information.

Registered Entity Response (Required):

Question: Did your entity receive a written request for the data (applicable protection settings associated with Requirements R1 and R2) from the Planning Coordinator or Transmission Planner that models the associated resource during the audit period? Yes No

If yes, provide a summary of the written requests in the box below, including the name of the Planning Coordinator and Transmission Planner, and proceed to the Registered Entity Response section below.

[Note: A separate spreadsheet or other document may be used. If so, provide the document reference below.]

Question (Required): Did your entity have any changes to those previously requested settings? Yes No

If yes, provide a summary of the previously requested settings, and whether your entity was directed by the requesting Planning Coordinator or Transmission Planner that the reporting of protection setting changes is not required, and proceed to the Registered Entity Response section below.

[Note: A separate spreadsheet or other document may be used. If so, provide the document reference below.]

Registered Entity Response (Required):

Compliance Narrative:

Provide a brief explanation, in your own words, of how you comply with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

Evidence Requested:

Provide the following evidence, or other evidence to demonstrate compliance.

Provide a list of all applicable protection settings associated with Requirements R1 and R2 that are associated with any written requests for the data by the Planning Coordinator or Transmission Planner that models the associated unit.

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Provide a list of any change to those previously requested settings (unless directed by the requesting Planning Coordinator or Transmission Planner that the reporting of protection setting changes is not required).

For all, or a sample selected by the auditor, dated e-mails, correspondence or other evidence and copies of any requests, that show the entity communicated applicable protection settings/changes within 60 calendar days of the written request in accordance with R4.

Registered Entity Evidence (Required):

The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.

| File Name | Document Title | Revision or Version | Document Date | Relevant Page(s) or Section(s) | Description of Applicability of Document |
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Audit Team Evidence Reviewed (This section to be completed by the Compliance Enforcement Authority):

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Compliance Assessment Approach Specific to PRC-024-3, R4

This section to be completed by the Compliance Enforcement Authority

Select all, or a sample thereof, and verify the entity communicated applicable protection settings/changes (such as dated e-mails, correspondence or other evidence, and copies of any requests) within 60 calendar days of the written request/change in accordance with R4.

Note to Auditor: Section 4 of the Standard, Applicability, guides the applicable protection to which this requirement, and R1 and R2, pertains.

Auditor Notes:

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Additional Information:

Reliability Standard

The RSAW developer should provide the following information without hyperlinks. Update the information below as appropriate.

The full text of STD-OXX-N may be found on the NERC Web Site (www.nerc.com) under “Program Areas & Departments”, “Reliability Standards.”

In addition to the Reliability Standard, there is an applicable Implementation Plan available on the NERC Web Site.

In addition to the Reliability Standard, there is background information available on the NERC Web Site.

Capitalized terms in the Reliability Standard refer to terms in the NERC Glossary, which may be found on the NERC Web Site.

Sampling Methodology [If developer deems reference applicable]

Sampling is essential for auditing compliance with NERC Reliability Standards since it is not always possible or practical to test 100% of either the equipment, documentation, or both, associated with the full suite of enforceable standards. The Sampling Methodology Guidelines and Criteria (see NERC website), or sample guidelines, provided by the Electric Reliability Organization help to establish a minimum sample set for monitoring and enforcement uses in audits of NERC Reliability Standards.

Regulatory Language [Developer to ensure RSAW has been provided to NERC Legal for links to appropriate Regulatory Language – See example below]

E.g. FERC Order No. 742 paragraph 34: “Based on NERC’s.....”

E.g. FERC Order No. 742 Paragraph 55, Commission Determination: “We affirm NERC’s.....”

Selected Glossary Terms [If developer deems applicable]

The following Glossary terms are provided for convenience only. Please refer to the NERC web site for the current enforceable terms.

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Revision History for RSAW

| Version | Date | Reviewers | Revision Description |
|---------|---------|--|-----------------------------------|
| 1 | 4/29/19 | NERC Compliance Assurance, RSAW Task Force | Draft to accompany first posting |
| 2 | 10/7/19 | NERC Compliance Assurance, RSAW Task Force | Draft to accompany second posting |

ⁱ Items in the Evidence Requested section are suggested evidence that may, but will not necessarily, demonstrate compliance. These items are not mandatory and other forms and types of evidence may be submitted at the entity's discretion.

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