

**Reliability Standard Audit Worksheet[[1]](#footnote-1)**

# PRC-019-2 – Coordination of Generating Unit or Plant Capabilities, Voltage Regulating Controls, and Protection

***This section to be completed by the Compliance Enforcement Authority.***

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| --- | --- |
| **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]](#footnote-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 Requirements**

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

Findings

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

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| **Req.** | **Finding** | **Summary and Documentation** | **Functions Monitored** |
| **R1** |  |  |  |
| **R2** |  |  |  |

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| **Req.** | **Areas of Concern** |
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| **Req.** | **Recommendations** |
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| **Req.** | **Positive Observations** |
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Effective Dates

Regulatory Approval Required (United States)

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| --- | --- | --- | --- |
| Standard | Requirement | Effective Date | Applicable % of Facilities |
| PRC-019-2 | R1 and R2 | 7/1/2016 | 40% |
| PRC-019-2 | R1 and R2 | 7/1/2017 | 60% |
| PRC-019-2 | R1 and R2 | 7/1/2018 | 80% |
| PRC-019-2 | R1 and R2 | 7/1/2019 | 100% |

Regulatory Approval Not Required

|  |  |  |  |
| --- | --- | --- | --- |
| Standard | Requirement | Effective Date | Applicable % of Facilities |
| PRC-019-2 | R1 and R2 | 4/1/2015 | 40% |
| PRC-019-2 | R1 and R2 | 4/1/2016 | 60% |
| PRC-019-2 | R1 and R2 | 4/1/2017 | 80% |
| PRC-019-2 | R1 and R2 | 4/1/2018 | 100% |

Applicability

**4.1. Functional Entities**

**4.1.1** Generator Owner

**4.1.2** Transmission Owner that owns synchronous condenser(s)

**4.2. Facilities**

For the purpose of this standard, the term, “applicable Facility” shall mean any one of the following:

**4.2.1** Individual generating unit greater than 20 MVA (gross nameplate rating) directly connected to the Bulk Electric System.

**4.2.2** Individual synchronous condenser greater than 20 MVA (gross nameplate rating) directly connected to the Bulk Electric System.

**4.2.3** Generating plant/ Facility consisting of one or more units that are connected to the Bulk Electric System at a common bus with total generation greater than 75 MVA (gross aggregate nameplate rating).

**4.2.3.1** This includes individual generating units of the dispersed power producing resources identified through Inclusion I4 of the Bulk Electric System definition where voltage regulating control for the facility is performed solely at the individual generating unit of the dispersed power producing resources.

**4.2.4** Any generator, regardless of size, that is a blackstart unit material to and designated as part of a Transmission Operator’s restoration plan.

Subject Matter Experts

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

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

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

**R1.** At a maximum of every five calendar years, each Generator Owner and Transmission Owner with applicable Facilities shall coordinate the voltage regulating system controls, (including in-service[[3]](#footnote-3) limiters and protection functions) with the applicable equipment capabilities and settings of the applicable Protection System devices and functions.

* 1. Assuming the normal automatic voltage regulator control loop and steady-state system operating conditions, verify the following coordination items for each applicable Facility:
     1. The in-service limiters are set to operate before the Protection System of the applicable Facility in order to avoid disconnecting the generator unnecessarily.
     2. The applicable in-service Protection System devices are set to operate to isolate or de-energize equipment in order to limit the extent of damage when operating conditions exceed equipment capabilities or stability limits.

**M1.** Each Generator Owner and Transmission Owner with applicable Facilities will have evidence (such as examples provided in PRC-019 Section G) that it coordinated the voltage regulating system controls, including in-service[[4]](#footnote-4) limiters and protection functions, with the applicable equipment capabilities and settings of the applicable Protection System devices and functions as specified in Requirement R1. This evidence should include dated documentation that demonstrates the coordination was performed.

**Registered Entity Response (Required):**

**Question: Does your entity have any applicable Facilities in accordance with Requirement R1**?  Yes  No

[If yes, provide a summary of those Facilities in the box below, and proceed to the Compliance Narrative below. If no, proceed to the Compliance Narrative 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[[5]](#endnote-1):

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| Provide the following evidence, or other evidence to demonstrate compliance. |
| A list of all applicable voltage regulating system controls. |
| For all, or for samples selected by the auditor, dated documentation that demonstrates that the entity coordinated voltage regulating system controls, including in-service limiters and protection functions, in accordance with the Implementation Plan, or every 5 calendar years after the initial Implementation Plan has been completed. This evidence may take the form of P-Q Diagrams, R-X Diagrams, Inverse Time Diagrams, or some equivalent table as long as it outlines equipment capabilities and the operating region for the limiters and protection functions as noted in Section G of PRC-019-2. |

Registered Entity Evidence (Required):

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| **The following information is requested for all evidence submitted, as appropriate. 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-019-2, R1

***This section to be completed by the Compliance Enforcement Authority***

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| Select all, or a sample thereof, voltage regulating system controls, and ensure they have been coordinated with the applicable equipment capabilities and settings of the applicable Protection System devices and functions as follows: | |
|  | Assuming the normal automatic voltage regulator control loop and steady-state system operating conditions, verify the following coordination items for each applicable Facility (part 1.1): |
|  | The in-service limiters are set to operate before the Protection System of the applicable Facility in order to avoid disconnecting the generator unnecessarily (part 1.1.1). |
|  | The applicable in-service Protection System devices are set to operate to isolate or de-energize equipment in order to limit the extent of damage when operating conditions exceed equipment capabilities or stability limits (part 1.1.2). |
| **Notes to Auditor:** The entity is required to coordinate the voltage regulating system controls every 5 calendar years after the initial coordination was completed in accordance with the Implementation Plan.  Reference section G of the Standard for examples of coordination. | |

Auditor Notes:

R2 Supporting Evidence and Documentation

**R2.** Within 90 calendar days following the identification or implementation of systems, equipment or setting changes that will affect the coordination described in Requirement R1, each Generator Owner and Transmission Owner with applicable Facilities shall perform the coordination as described in Requirement R1. These possible systems, equipment or settings changes include, but are not limited to the following:

* Voltage regulating settings or equipment changes;
* Protection System settings or component changes;
* Generating or synchronous condenser equipment capability changes; or
* Generator or synchronous condenser step-up transformer changes.

**M2.** Each Generator Owner and Transmission Owner with applicable Facilities will have evidence of the coordination required by the events listed in Requirement R2. This evidence should include dated documentation that demonstrates the specified intervals in Requirement R2 have been met.

**Registered Entity Response (Required):**

**Question: During the audit period, has your entity identified or implemented systems, equipment or setting changes (as described in Requirement R2) that affected the coordination described in Requirement R1?**

Yes  No

[If yes, provide a summary of those newly identified or implemented systems, equipment or setting changes (in accordance with Requirement R2) that will affect the coordination described in Requirement R1 in the box below, and proceed to the Compliance Narrative below. If no, proceed to the Compliance Narrative 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 Requestedi:

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| Provide the following evidence, or other evidence to demonstrate compliance. Please contact your CEA with any questions regarding requested evidence. |
| A list of all systems, equipment or setting changes that have been added or changed during the audit period as described in Requirement R2. |
| Dated documentation that coordination of the applicable Facilities was performed as described in Requirement R1 within the 90 calendar day interval in Requirement R2. |

Registered Entity Evidence (Required):

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| **The following information is requested for all evidence submitted, as appropriate. 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-019-2, R2

***This section to be completed by the Compliance Enforcement Authority***

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|  | Select all, or a sample thereof, and verify that within 90 calendar days following the identification or implementation of systems, equipment or setting changes (as per Requirement R2) that affected the coordination described in Requirement R1, the entity with applicable Facilities performed the coordination as described in Requirement R1. |
| **Note to Auditor:** | |

Auditor Notes:

Additional Information:

Reliability Standard

The full text of PRC-019-2 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

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

FERC approved PRC-019-1 on March 20, 2014. *Coordination of Generating Unit or Plant Capabilities, Voltage Regulating Controls, and Protect*, [Order No. 796, 146 FERC ¶ 61,213 (2014).](http://www.nerc.com/FilingsOrders/us/FERCOrdersRules/Order%20No.%20808%20Approving%20Reliability%20Standards%20COM-001-2%20and%20COM-002-4.pdf)

In Order No. 796, FERC noted that the Reliability Standard contains two requirements intended to ensure that both generator owners and transmission owners verify coordination of generating unit facility or synchronous condenser voltage regulating controls, limit functions, equipment capabilities and protection system settings.

P 15: Reliability Standard PRC-019-1 requires requires generator owners and transmission owners to coordinate the voltage regulating system controls with the equipment capabilities and settings of the applicable protection system devices and functions. Requirement R2 requires generator owners and transmission owners to perform the coordination described in Requirement R1 to address equipment or setting changes. The coordination required in Reliability Standard PRC-019-1 must be performed at least every five years.

Revision History for RSAW

|  |  |  |  |
| --- | --- | --- | --- |
| **Version** | **Date** | **Reviewers** | **Revision Description** |
| 1 | 03/31/2016 | RSAW Working Group | New Document |
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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 NERC RSAW language contained within this document provides 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 reserves the right to request additional evidence from the registered entity that is not included in this RSAW. Additionally, this RSAW includes excerpts from FERC Orders and other regulatory references. The FERC Order cites 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. [↑](#footnote-ref-1)
2. Compliance Assessment Date(s): The date(s) the actual compliance assessment (on-site audit, off-site spot check, etc.) occurs. [↑](#footnote-ref-2)
3. Limiters or protection functions that are installed and activated on the generator or synchronous condenser. [↑](#footnote-ref-3)
4. Limiters or protection functions that are installed and activated on the generator or synchronous condenser. [↑](#footnote-ref-4)
5. 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. [↑](#endnote-ref-1)