

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

# PRC-026-1 – Relay Performance During Stable Power Swings

***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** | **PC** | **RC** | **RP** | **RSG** | **TO** | **TOP** | **TP** | **TSP** |
| **R1** |  |  |  |  | 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 |

Findings

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

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

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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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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

1. Each Planning Coordinator shall, at least once each calendar year, provide notification of each generator, transformer, and transmission line BES Element in its area that meets one or more of the following criteria, if any, to the respective Generator Owner and Transmission Owner:

Criteria:

1. Generator(s) where an angular stability constraint exists that is addressed by a System Operating Limit (SOL) or a Remedial Action Scheme (RAS) and those Elements terminating at the Transmission station associated with the generator(s).
2. An Element that is monitored as part of a SOL identified by the Planning Coordinator’s methodology[[3]](#footnote-3) based on an angular stability constraint.
3. An Element that forms the boundary of an island in the most recent underfrequency load shedding (UFLS) design assessment based on application of the Planning Coordinator’s criteria for identifying islands, where the island is formed by tripping the Element due to angular instability.
4. An Element identified in the most recent annual Planning Assessment where relay tripping occurs due to a stable or unstable power swing during a simulated disturbance.
5. Each Planning Coordinator shall have dated evidence that demonstrates notification of the generator, transformer, and transmission line BES Element(s) that meet one or more of the criteria in Requirement R1, if any, to the respective Generator Owner and Transmission Owner. Evidence may include, but is not limited to, the following documentation: emails, facsimiles, records, reports, transmittals, lists, or spreadsheets.

**Registered Entity Response (Required):**

**Question:** Did the entity identify any BES Element(s) (i.e., generator, transformer, or transmission line) that met one or more of the criteria of Requirement R1, within its area?

Yes  No

If yes, provide a list of such Elements. If no, please explain how the entity made this determination.

**Note to Auditor:**

[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[[4]](#endnote-1):

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| **Provide the following evidence, or other evidence to demonstrate compliance.** |
| Dated documentation demonstrating that the Planning Coordinator notified the respective Generator Owner or Transmission Owner each calendar year of the BES Element(s) that met one or more of the criteria in Requirement R1. |

Registered Entity Evidence (Required):

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| **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-026-1, R1

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

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|  | For all, or a sample, of BES Elements that met one or more of the criteria of Requirement R1, verify the entity notified the respective Generator Owner and Transmission Owner. |
| **Note to Auditor:** Auditors may use their professional judgment in selecting BES Elements for audit testing. In cases where an auditor expected an Element to meet one or more of the criteria of Requirement R1, but was not identified; the auditor should obtain an explanation why an Element was not identified. | |

Auditor Notes:

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R2 Supporting Evidence and Documentation

1. Each Generator Owner and Transmission Owner shall:
   1. Within 12 full calendar months of notification of a BES Element pursuant to Requirement R1, determine whether its load-responsive protective relay(s) applied to that BES Element meets the criteria in PRC-026-1 - Attachment B where an evaluation of that Element's load-responsive protective relay(s) based on PRC-026-1 - Attachment B criteria has not been performed in the last five calendar years.
   2. Within 12 full calendar months of becoming aware of a generator, transformer, or transmission line BES Element that tripped in response to a stable or unstable power swing due to the operation of its protective relay(s), determine whether its load-responsive protective relay(s) applied to that BES Element meets the criteria in PRC-026-1 - Attachment B.
2. Each Generator Owner and Transmission Owner shall have dated evidence that demonstrates the evaluation was performed according to Requirement R2. Evidence may include, but is not limited to, the following documentation: apparent impedance characteristic plots, email, design drawings, facsimiles, R-X plots, software output, records, reports, transmittals, lists, settings sheets, or spreadsheets.

**Registered Entity Response (Required):**

**Question:** Did the entity receive notification of any Element(s) according to Requirements R2, Part 2.1 (i.e., pursuant to Requirement R1) or identify any Element(s) according to Requirement R2, Part 2.2 (i.e., actual Element trips due to a stable or unstable power swing due to the operation of its protective relay(s))?

Yes  No

If yes, then provide a list of such Elements, including the date the entity received notification of the Element or identified the Element. If no, please explain how the entity made this determination.

**Note to Auditor:**

[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.** |
| Dated documentation demonstrating the determination of whether the load-responsive protective relay(s) for each identified Element pursuant to Requirement R2, Parts 2.1 and 2.2 met the PRC-026-1 – Attachment B criteria. |

Registered Entity Evidence (Required):

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| **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-026-1, R2

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

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|  | (2.1.) Verify the entity made a determination whether any load-responsive protective relays applied at the terminals of the Element met PRC-026-1 – Attachment B criteria, within 12 calendar months of receiving notification pursuant to Requirement R1, unless the entity had previously evaluated the load-responsive protective relay(s) according to the PRC-026-1 – Attachment B criteria within the last five calendar years. |
|  | (2.2) Verify the entity made a determination whether any load-responsive protective relays applied at the terminals of the Element met PRC-026-1 – Attachment B criteria, within 12 calendar months of becoming aware of a generator, transformer, or transmission line BES Element that tripped in response to a stable or unstable power swing due to the operation of its protective relay(s). |
| **Note to Auditor:**  The auditor should ensure that all load-responsive protective relays applied at the terminals of a selected BES Element have a determination of whether the load-responsive protective relay meets the PRC-026-1 – Attachment B criteria based on the entity’s evaluation. For example, if an entity owns load-responsive protective relays at both ends of a transmission line BES Element and only one end of the line tripped due to a stable or unstable power swing according to Requirement R2, Part 2.2, the entity must evaluate the load-responsive protective relays at each end of the identified BES Element (e.g., all terminals for which it owns). | |

Auditor Notes:

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R3 Supporting Evidence and Documentation

1. Each Generator Owner and Transmission Owner shall, within six full calendar months of determining a load-responsive protective relay does not meet the PRC-026-1 – Attachment B criteria, develop a Corrective Action Plan (CAP) to meet one or more of the following:

* The Protection System meets the PRC-026-1 – Attachment B criteria, while maintaining dependable fault detection and dependable out-of-step tripping (if out-of-step tripping is applied at the terminal of the BES Element); or
* The Protection System is excluded under the PRC-026-1 – Attachment A criteria (e.g., modifying the Protection System so that relay functions are supervised by power swing blocking or using relay systems that are immune to power swings), while maintaining dependable fault detection and dependable out-of-step tripping (if out-of-step tripping is applied at the terminal of the BES Element).

1. The Generator Owner and Transmission Owner shall have dated evidence that demonstrates the development of a CAP in accordance with Requirement R3. Evidence may include, but is not limited to, the following documentation: corrective action plans, maintenance records, settings sheets, project or work management program records, or work orders.

**Registered Entity Response (Required):**

**Question:** Did the entity determine any load-responsive protective relays that did not meet the PRC-026-1 – Attachment B criteria?

Yes  No

If yes, provide a list of such load-responsive protective relays. If no, please explain how the entity made this determination.

**Note to Auditor:**

[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.** |
| Dated documentation demonstrating the development of the CAP(s), if any, so that the Protection System(s) meets the PRC-026-1 – Attachment B criteria, while maintaining dependable fault detection and dependable out-of-step tripping (if out-of-step tripping is applied at the terminal of the BES Element); or |
| Dated documentation demonstrating that that the Protection System is excluded under the PRC-026-1 – Attachment A criteria (e.g., modifying the Protection System so that relay functions are supervised by power swing blocking or using relay systems that are immune to power swings), while maintaining dependable fault detection and dependable out-of-step tripping (if out-of-step tripping is applied at the terminal of the BES Element). |

Registered Entity Evidence (Required):

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| **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-026-1, R3

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

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|  | Verify the entity developed a Corrective Action Plan to meet the PRC-026-1 – Attachment B criteria, while maintaining dependable fault detection and dependable out-of-step tripping (if out-of-step tripping is applied at the terminal of the BES Element), within six months of determining a load-responsive protective relay did not meet the PRC-026-1 – Attachment B criteria; or |
|  | Verify the entity developed a Corrective Action Plan to meet exclusion under the under the PRC-026-1 – Attachment A criteria (e.g., modifying the Protection System so that relay functions are supervised by power swing blocking or using relay systems that are immune to power swings), while maintaining dependable fault detection and dependable out-of-step tripping (if out-of-step tripping is applied at the terminal of the BES Element), within six months of determining a load-responsive protective relay did not meet the PRC-026-1 – Attachment B criteria. |
| **Note to Auditor:** | |

Auditor Notes:

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R4 Supporting Evidence and Documentation

1. Each Generator Owner and Transmission Owner shall implement each CAP developed pursuant to Requirement R3 and update each CAP if actions or timetables change until all actions are complete.
2. The Generator Owner and Transmission Owner shall have dated evidence that demonstrates implementation of each CAP according to Requirement R4, including updates to the CAP when actions or timetables change. Evidence may include, but is not limited to, the following documentation: corrective action plans, maintenance records, settings sheets, project or work management program records, or work orders.

**Registered Entity Response (Required):**

**Question:** Did the entity develop any CAPs pursuant to Requirement R3?

Yes  No

If yes, provide a list of such CAPs. If no, please explain how the entity made this determination.

**Note to Auditor:**

[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.** |
| Dated documentation demonstrating the implementation of the CAP(s), if any, which were developed pursuant to Requirement R3. |

Registered Entity Evidence (Required):

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| **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-026-1, R4

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

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|  | For all, or a sample, of the CAP(s) developed pursuant to Requirement R3, verify the entity implemented the CAP. |
|  | For all, or a sample, of the CAP(s) developed pursuant to Requirement R3, verify the entity updated each CAP if actions or timetables change until all actions are complete. |
| **Note to Auditor:**  The auditor should be aware that a CAP may be considered complete if the problem for which the CAP anticipated resolving was remedied by some other action. For example, a system configuration change that allowed the Protection System to meet the PRC-026-1 – Attachment B criteria or that the Protection System was excluded under the PRC-026-1 – Attachment A criteria (e.g., modifying the Protection System so that relay functions are supervised by power swing blocking or using relay systems that are immune to power swings), while maintaining dependable fault detection and dependable out-of-step tripping (if out-of-step tripping is applied at the terminal of the BES Element. | |

Auditor Notes:

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Additional Information:



Reliability Standard

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.

Regulatory Language

*Relay Performance During Stable Power Swings Reliability Standard*, Order No. 823, 154 FERC ¶ 61,192 (2016).

“Pursuant to section 215 of the Federal Power Act (FPA),[[5]](#footnote-4) the Commission approves Reliability Standard PRC-026-1 (Relay Performance During Stable Power Swings), submitted by the North American Electric Reliability Corporation (NERC), the Commission-approved Electric Reliability Organization. Reliability Standard PRC-026-1 applies to planning coordinators, as well as generator owners and transmission owners that apply certain load-responsive protective relays in specific, identified circumstances, and is designed to ensure the use of protective relay systems that can differentiate between faults and stable power swings.”

“The Commission determines that Reliability Standard PRC-026-1 satisfies the directive in Order No. 733 concerning undesirable relay operation due to power swings.[[6]](#footnote-5) The Commission concludes that Reliability Standard PRC-026-1 provides an equally effective and efficient alternative to the Order No. 733 directive requiring the use of protective relay systems that can differentiate between faults and stable power swings and, when necessary, retirement of protective relay systems that cannot meet this requirement. [[7]](#footnote-6)

“In addition, the Commission proposes to approve NERC’s proposed implementation plan, and the assigned violation risk factors and violation severity levels.”

Revision History for RSAW

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| **Version** | **Date** | **Reviewers** | **Revision Description** |
| 1 | 05/23/2014 | RSAW Task Force | New RSAW – Draft 1 of the Standard |
| 2 | 9/8/2014 | NERC Compliance, NERC Standards | Updated to reflect changes to Requirements and Measures in Draft 2 of the Standard. |
| 3 | 11/12/2014 | NERC Compliance, NERC Standards | Updated to reflect changes to Requirements and Measures in Draft 3 of the Standard. |
| 4 | 9/13/2017 | NERC Compliance Assurance, RSAWTF | Revised RSAW to align with revised Reliability Standard |

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. NERC Reliability Standard FAC-10 – *System Operating Limits Methodology for the Planning Horizon* [↑](#footnote-ref-3)
4. 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)
5. 16 U.S.C. 824o (2012). [↑](#footnote-ref-4)
6. *Transmission Relay Loadability Reliability Standard*, Order No. 733, 130 FERC ¶ 61,221 (2010), *order on reh’g and clarification*, Order No. 733-A, 134 FERC ¶ 61,127, *order on reh’g and clarification*, Order No. 733-B, 136 FERC ¶ 61,185 (2011). [↑](#footnote-ref-5)
7. Id. P 150. [↑](#footnote-ref-6)