Unofficial Comment Form

Project 2010-13.3 – Relay Loadability: Stable Power Swings

Please **DO NOT** use this form for submitting comments. Please use the electronic form to submit comments on the Standard. The electronic comment form must be completed by **8 p.m. Eastern, Monday, November 24, 2014**.

If you have questions please contact Scott Barfield-McGinnis, Standards Developer at scott.barfield@nerc.net or by telephone at 404-446-9689.

<http://www.nerc.com/pa/Stand/Pages/Project2010133Phase3of-RelayLoadabilityStablePowerSwings.aspx>

## Background Information

This posting is soliciting formal comment.

This is Phase 3 of a three-phased standard development that is focused on developing a new Reliability Standard, PRC-026-1 – Relay Performance During Stable Power Swings, to address protective relay operations due to stable power swings. The March 18, 2010, the Federal Energy Regulatory Commission (FERC) Order No. 733, approved Reliability Standard PRC-023-1 – Transmission Relay Loadability. In this Order, FERC directed NERC to address three areas of relay loadability that include modifications to the approved PRC-023-1, development of a new Reliability Standard to address generator protective relay loadability, and a new Reliability Standard to address the operation of protective relays due to stable power swings. This project’s SAR addresses these directives with a three-phased approach to standard development.

Phase 1 focused on making the specific modifications to PRC-023-1 and was completed in the approved Reliability Standard PRC-023-2, which became mandatory on July 1, 2012. Phase 2 focused on developing a new Reliability Standard, PRC-025-1 – Generator Relay Loadability, to address generator protective relay loadability. PRC-025-1 became mandatory on October 1, 2014 along with PRC-023-2, which was modified to harmonize PRC-023-2 with PRC-025-1. This Phase 3 of the project focuses on developing a new Reliability Standard, PRC-026-1 – Relay Performance During Stable Power Swings, to address protective relay operations due to stable power swings. This Reliability Standard will establish requirements aimed at preventing protective relays from tripping unnecessarily due to stable power swings by requiring the Transmission Owners and Generator Owners to assess the security of protective relay systems that are susceptible to operation during stable and unstable power swings, and take actions to improve security for only stable power swings where such actions would not compromise dependable operation for faults and unstable power swings.

**Summary of Changes from Draft 2 to Draft 3**

The following is a summary of the change made to the proposed PRC-026-1 NERC Reliability Standard.

**Applicability**

Section 4.2, Facilities was revised from “The following Bulk Electric System Elements” to “The following Elements that are part of the Bulk Electric System (BES)” to clarify that the listed items are the items being addressed in the Requirements as the “Elements.”

**Requirement R1**

The Elements from the Applicability 4.2 (i.e., generator, transformer, and transmission line BES Elements) was added for clarity. Also, the Requirement was modified to specifically require “notification” rather than “identify and provide notification.” Identification of Elements based on the criteria is implied and necessary as a part of the Requirement.

**Requirement R1, Criterion 1**

The term “operating limit” was clarified to be “System Operating Limit (SOL)” to remove ambiguity between the operating and planning time frame. Also, “transmission switching station” was revised to be “Transmission station.” The word “switching” did not add any additional clarity and the capitalized term “Transmission” references the *Glossary of Terms Used in NERC Reliability Standards*.

**Requirement R1, Criterion 2**

The phrase “constraints identified in system planning or operating studies” was modified to be “…a SOL identified by the Planning Coordinator’s methodology.” This allows the Standard to draw a connection between the FAC-010 standard applicable to the Planning Coordinator in the planning horizon.

**Requirement R1, Criterion 3**

This criterion originally identified Elements that formed the boundary of an island which in many cases would include Elements that were selected as arbitrary separation points and are not intended to be included within the scope of the Standard. Therefore, Criterion 3 was rewritten to reflect it is the Element which tripped on angular stability thus forming the island. Also, the criterion was updated to reflect the most recent “design assessment” by the Planning Coordinator (i.e., PRC-006) and when the Planning Coordinator uses angular stability as a design criteria for identifying islands.

**Requirement R1, Criterion 4**

The term “annual” was added to provide clarity.

**Requirement R1, Criterion 5**

Criterion 5 was removed from Requirement R1 because Requirements R2 and R3 in Draft 2 were eliminated. Those Requirements directed the Transmission Owner and Generator Owner to notify the Planning Coordinator of Elements that actually tripped due to a stable or unstable power swing. Criterion 5 created a loopback to the Generator Owner and Transmission Owner to ensure that load-responsive protective relays on identified Elements were evaluated on a periodic basis. Actual tripping events are now included in Requirement R2 (previously Requirement R4) and do not require periodic review, unless the Element trips due to a stable or unstable power swing.

**Measure M1**

Measure M1 was updated to reflect changes to Requirement R1 and to clarify that the focus is on notification and not identification of Elements.

**Requirements R2 and R3**

These Requirements were removed due to structural changes in Requirement R4 (now Requirement R2). The evaluation Requirement (now R2) was restructured to have two conditions for performance; 1) upon notification of an Element pursuant to Requirement R1, and 2) an actual event due to a stable or unstable power swing.

**Requirement R4**

This Requirement became Requirement R2 due to the removal of Requirements R2 and R3. Most significantly, the Requirement was restructured to incorporate the removal of Requirements R2 and R3. It was determined that Elements that tripped due to a stable or unstable power swing (R2/R3) would be infrequent and more than likely a significantly large event which the Planning Coordinator would be aware of through an event analysis. The new structure of the Requirement causes an evaluation; however, it would not be necessary for the Planning Coordinator to be notified and then to continue notifying the Generator Owner and Transmission Owner. Elements that actually tripped due to stable or unstable power swings are not typical and requiring the Generator Owner and Transmission Owner to do a one-time analysis is sufficient to address the risk.

**Requirements R5 and R6**

These Requirements became Requirements R3 and R4 due to the removal of Requirements R2 and R3. Requirement R3 to develop the Corrective Action Plan (CAP) was inflexible as it only allowed the modification of a Protection System that did not meet the PRC-026-1 – Attachment B criteria. To correct this issue, Requirement R3 was modified to meet the purpose of the standard which is to ensure that load-responsive protective relays are expected to not trip in response to stable power swings during non-Fault conditions. First, the Requirement was revised to include two conditions. The first condition requires a CAP to be developed such that the Protection System will meet the PRC-026-1 – Attachment B criteria. For example, this may include a Protection System modification or a system configuration change which causes the Protection System to meet the criteria. Second, the CAP allows power swing block to be applied such that the Protection System may be excluded from the Standard.

Also, the development period of the CAP was extended from 90 calendar days to six calendar months due to the complexities that might be involved with determining appropriate remediation of a Protection System that did not meet PRC-026-1 – Attachment B criteria.

**Compliance Section**

Section C1.1.2 was modified to conform evidence retention to the Reliability Assurance Initiative (RAI). Retention periods were set to 12 calendar months.

**Violation Severity Levels**

The Violation Severity Levels (VSL) were modified to align them with the revisions made to the Requirements.

**PRC-026-1 – Attachments A and B**

Attachment A received editorial changes and Attachment B, Criteria A was rewritten to clarify that a relay characteristic that is completely contained within the unstable power swing region meets the criteria. The unstable power swing region is formed by the union of three shapes in the impedance (R-X) plane.

**Guidelines and Technical Basis**

This section was revised substantively in response to comments and due to the removal of Requirements R2 and R3. Revisions are too numerous to list here effectively. Please see the Guidelines and Technical Basis redline document for changes.

**Implementation Plan**

The period for implementing the standard did not change substantively. Based on comments, the implementation time frame for Requirements R5 and R6 (now Requirements R3 and R4) were increased from 12 calendar months to 36 calendar months to align them with Requirement R4 (now Requirement R2).

*\*Please use the* [*electronic comment form*](https://www.nerc.net/nercsurvey/Survey.aspx?s=7e71a568d2be45b697a13b688b6bd981) *to submit your final comments to NERC.*

**You do not have to answer all questions. Enter All Comments in Simple Text Format.**

Please note that the official comment form ***does not*** retain formatting (even if it appears to transfer formatting when you copy from the unofficial Word version of the form into the official electronic comment form). If you enter extra carriage returns, bullets, automated numbering, symbols, bolding, italics, or any other formatting, that formatting will not be retained when you submit your comments.

* Separate discrete comments by idea, e.g., preface with (1), (2), etc.
* Use brackets [] to call attention to suggested inserted or deleted text.
* Insert a “check” mark in the appropriate boxes by double-clicking the gray areas.
* **Do not use** formatting such as extra carriage returns, bullets, automated numbering, bolding, or italics.
* **Please do not repeat other entity’s comments**. Select the appropriate item to support another entity’s comments. An opportunity to enter additional or exception comments will be available.
* If supporting other’s comments, be sure the other party submits comments.

## Question

1. The Protection System Response to Power Swings Standard Drafting Team believes it has addressed industry comments in such a manner that industry consensus can be achieved. If there are remaining unresolved issues in the proposed PRC-026-1 Reliability Standard, please provide your comments here:

Comments: