

## Implementation Plan

### Protection System ~~and~~, Automatic Reclosing, ~~and Sudden Pressure Relaying~~ Maintenance PRC-005-~~3~~X

#### Standards Involved

##### Approval:

- PRC-005-~~X~~ – Protection System, Automatic Reclosing, and Sudden Pressure Relaying Maintenance

##### Retirement:

- PRC-005-3 – Protection System and Automatic Reclosing Maintenance

##### Retirements:

- ~~PRC-005-2 – Protection System Maintenance~~
- ~~PRC-005-1b – Transmission and Generation Protection System Maintenance and Testing~~
- ~~PRC-008-0 – Implementation and Documentation of Underfrequency Load Shedding Equipment Maintenance Program~~
- ~~PRC-011-0 – Undervoltage Load Shedding System Maintenance and Testing~~
- ~~PRC-017-0 – Special Protection System Maintenance and Testing~~

#### Prerequisite Approvals:

N/A

#### Background:

Reliability Standard PRC-005-2 with its associated Implementation Plan was approved by FERC, effective on April 1, 2015. PRC-005-3 was approved by the NERC Board of Trustees in November ~~2012~~, 2013 and has been filed with the applicable regulatory authorities for approval. The Implementation Plan for PRC-005-~~3~~X addresses ~~both~~ Protection Systems as outlined in PRC-005-~~2~~and, Automatic Reclosing ~~components~~. Components as outlined in PRC-005-3, and Sudden Pressure Relaying. PRC-005-X establishes minimum maintenance activities for Automatic ReclosingSudden Pressure Relaying Component Types and the maximum allowable maintenance intervals for these maintenance activities. PRC-005-~~3~~X requires entities to revise the Protection System Maintenance Program by now including Automatic ReclosingSudden Pressure Relaying Components.

This Implementation Plan adds:

- The implementation plan established under PRC-005-2 remains unchanged except of changes relating to Sudden Pressure Relaying maintenance and testing.
- The implementation of new Requirement R6 for Balancing Authorities, and
- The removal of the addition of "Implementation Plan for Newly identified Automatic Reclosing Components required under PRC-005-3. Due to Generation Changes in the Balancing Authority Area" section, as the elements are now incorporated within the requirements of the standard itself.

Otherwise, the Implementation Plan has not been changed.

The Implementation Plan reflects consideration of the following:

1. The requirements set forth in the proposed standard, which carry forward requirements from PRC-005-2 and PRC-005-3, establish minimum maintenance activities for Protection System ~~and~~, Automatic Reclosing, and Sudden Pressure Relaying Component Types as well as the maximum allowable maintenance intervals for these maintenance activities. The maintenance activities established may not be presently performed by some entities and the established maximum allowable intervals may be shorter than those currently in use by some entities.
2. For entities not presently performing a maintenance activity or using longer intervals than the maximum allowable intervals established in the proposed standard, it is unrealistic for those entities to be immediately compliant with the new activities or intervals. Further, entities should be allowed to become compliant in such a way as to facilitate a continuing maintenance program.
3. Entities that have previously been performing maintenance within the newly specified intervals may not have all the documentation needed to demonstrate compliance with all of the maintenance activities specified.
4. The Implementation Schedule set forth below in this document carries forward the implementation schedules contained in PRC-005-2 and PRC-005-3 and includes changes needed to address the addition of ~~Automatic Reclosing~~ Sudden Pressure Relaying Components in PRC-005-~~3~~X.
5. The Implementation Schedule set forth in this document facilitates implementation of the more lengthy maintenance intervals within the revised Protection System Maintenance Program in approximately equally-distributed steps over those intervals prescribed for each respective maintenance activity in order that entities may implement this standard in a systematic method that facilitates an effective ongoing Protection System Maintenance Program.

**General Considerations:**

Each Transmission Owner, Generator Owner, and Distribution Provider shall maintain documentation to demonstrate compliance with PRC-005-1b, PRC-008-0, PRC-011-0, and PRC-017-0 until that entity meets

the requirements of PRC-005-2, or the combined successor ~~standard~~standards PRC-005-3 and PRC-005-X, in accordance with this implementation plan.

While entities are transitioning to the requirements of PRC-005-2, or the combined successor ~~standard~~standards PRC-005-3 and PRC-005-X, each entity must be prepared to identify:

- All of its applicable Protection System ~~and~~, Automatic Reclosing, and Sudden Pressure Relaying Components, and
- Whether each component has last been maintained according to PRC-005-2 (or the combined successor ~~standard~~standards PRC-005-3 and PRC-005-X), PRC-005-1b, PRC-008-0, PRC-011-0, PRC-017-0, or a combination thereof.

~~For activities being added to an entity's program as part of PRC-005-3 implementation, evidence may be available to show only a single performance of the activity until two maintenance intervals have transpired following initial implementation of PRC-005-3.~~

**Effective Date**

PRC-005-X shall become effective on the first day of the first calendar quarter after the date that the standard is approved by an applicable governmental authority or as otherwise provided for in a jurisdiction where approval by an applicable governmental authority is required for a standard to go into effect. 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.

**Retirement of Existing Standards:**

Standards PRC-005-1b, PRC-008-0, PRC-011-0, and PRC-017-0 shall remain active throughout the phased implementation period of PRC-005-~~32~~ and shall be applicable to an entity's Protection System Component maintenance activities not yet transitioned to PRC-005-~~32~~. Standards PRC-005-1b, PRC-008-0, PRC-011-0, and PRC-017-0 shall be retired at midnight of the day immediately prior to the first day of the first calendar quarter one hundred fifty-six (156) months following applicable regulatory approval of PRC-005-2 or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities; or, in those jurisdictions where no regulatory approval is required, at midnight of the day immediately prior to the first day of the first calendar quarter one hundred sixty-eight (168) months following the November 2012 NERC Board of Trustees' adoption of PRC-005-2.

~~The existing standard~~ PRC-005-2 shall be retired at midnight of the day immediately prior to the first day of the first calendar quarter, twelve (12) calendar months following applicable regulatory approval of PRC-005-3, or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities; or, in those jurisdictions where no regulatory approval is required, the first day of the first calendar quarter twelve (12) calendar months from the date of Board of Trustees' adoption.

PRC-005-3 shall be retired at midnight of the day immediately prior to the first day of the first calendar quarter following applicable regulatory approval of PRC-005-X, or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities; or, in those jurisdictions where no regulatory approval is required, the first day of the first calendar quarter from the date of Board of Trustees' adoption.

**Implementation Plan for Definitions:**

This section includes all newly defined or revised terms used in the proposed standard. Terms already defined in the Reliability Standards Glossary of Terms (Glossary) are not repeated here. New or revised definitions listed below become approved when the proposed standard is approved. When the standard becomes effective, the Glossary definition will be removed from the individual standard and added to the Glossary. The definitions of terms used only in the standard will remain in the standard.

**Glossary Definition:**

**Protection System Maintenance Program — Entities (PSMP)** — An ongoing program by which Protection System, Automatic Reclosing, and Sudden Pressure Relaying Components are kept in working order and proper operation of malfunctioning Components is restored. A maintenance program for a specific Component includes one or more of the following activities:

- Verify — Determine that the Component is functioning correctly.
- Monitor — Observe the routine in-service operation of the Component.
- Test — Apply signals to a Component to observe functional performance or output behavior, or to diagnose problems.
- Inspect — Examine for signs of Component failure, reduced performance or degradation.
- Calibrate — Adjust the operating threshold or measurement accuracy of a measuring element to meet the intended performance requirement.

#### **Definitions of Terms Used in the Standard:**

**Sudden Pressure Relaying** — A system that trips an interrupting device(s) to isolate the equipment it is monitoring and includes the following Components:

- Fault pressure relay – a mechanical relay or device that detects rapid changes in gas pressure, oil pressure, or oil flow that are indicative of Faults within liquid-filled, wire-wound equipment
- Control circuitry associated with a fault pressure relay

#### **Component Type –**

- Any one of the five specific elements of a Protection System.
- Any one of the two specific elements of Automatic Reclosing.
- Any one of the two specific elements of Sudden Pressure Relaying.

**Component** — Any individual discrete piece of equipment included in a Protection System, Automatic Reclosing, or Sudden Pressure Relaying.

**Countable Event** — A failure of a Component requiring repair or replacement, any condition discovered during the maintenance activities in Tables 1-1 through 1-5, Table 3, Tables 4-1 through 4-2, and Table 5, which requires corrective action or a Protection System Misoperation attributed to hardware failure or calibration failure. Misoperations due to product design errors, software errors, relay settings different from specified settings, Protection System

Component, Automatic Reclosing, or Sudden Pressure Relaying configuration or application errors are not included in Countable Events.

#### **Implementation Plan for New or Revised Definitions:**

New and revised definitions (Sudden Pressure Relaying, Protection System Maintenance Program, Component Type, Component, and Countable Event) shall use this become effective after the date that the definitions are approved by an applicable governmental authority or as otherwise provided for in a jurisdiction where approval by an applicable governmental authority is required for a definition when implementing any portions of R1, R2 R3, R4 and R5 which use this defined term to go into effect. Where approval by an applicable governmental authority is not required, the definitions shall become effective on the first day of the first calendar quarter after the date the definitions are adopted by the NERC Board of Trustees or as otherwise provided for in that jurisdiction.

#### **Implementation Plan for Requirements R1, R2, and R5:**

For Protection System Components, entities shall be 100% compliant on the first day of the first calendar quarter twelve (12) months following applicable regulatory approvals of PRC-005-2, or, in those jurisdictions where no regulatory approval is required, on the first day of the first calendar quarter twenty-four (24) months following the November 2012 NERC Board of Trustees' adoption of PRC-005-2 or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities.

For Automatic Reclosing Components, entities shall be 100% compliant on the first day of the first calendar quarter twelve (12) months following applicable regulatory approvals of PRC-005-3, or, in those jurisdictions where no regulatory approval is required, on the first day of the first calendar quarter twenty-four (24) months following NERC Board of Trustees' adoption of PRC-005-3 or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities.

For Sudden Pressure Relaying Components, entities shall be 100% compliant on the first day of the first calendar quarter twelve (12) months following applicable regulatory approvals of PRC-005-X or, in those jurisdictions where no regulatory approval is required, on the first day of the first calendar quarter twenty-four (24) months following NERC Board of Trustees' adoption of PRC-005-X or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities.

#### **Implementation Plan for Requirements R3 and R4:**

1. For Protection System Component maintenance activities with maximum allowable intervals of less than one (1) calendar year, as established in Tables 1-1 through 1-5:
  - The entity shall be 100% compliant on the first day of the first calendar quarter eighteen (18) months following applicable regulatory approval of PRC-005-2, or in those jurisdictions where no regulatory approval is required, on the first day of the first calendar quarter thirty (30) months following the November 2012 NERC Board of Trustees' adoption of PRC-005-2 or as

otherwise made effective pursuant to the laws applicable to such ERO governmental authorities.

2. For Protection System Component maintenance activities with maximum allowable intervals one (1) calendar year or more, but two (2) calendar years or less, as established in Tables 1-1 through 1-5:
  - The entity shall be 100% compliant on the first day of the first calendar quarter thirty-six (36) months following applicable regulatory approval of PRC-005-2~~7~~ or ~~2~~ in those jurisdictions where no regulatory approval is required, on the first day of the first calendar quarter forty-eight (48) months following the November 2012 NERC Board of Trustees' adoption of PRC-005-2 or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities.
3. For Protection System Component maintenance activities with maximum allowable intervals of three (3) calendar years, as established in Tables 1-1 through 1-5:
  - The entity shall be at least 30% compliant on the first day of the first calendar quarter twenty-four (24) months following applicable regulatory approval of PRC-005-2 (or, for generating plants with scheduled outage intervals exceeding two years, at the conclusion of the first succeeding maintenance outage~~7~~) or ~~2~~ in those jurisdictions where no regulatory approval is required, on the first day of the first calendar quarter thirty-six (36) months following the November 2012 NERC Board of Trustees' adoption of PRC-005-2 or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities.
  - The entity shall be at least 60% compliant on the first day of the first calendar quarter thirty-six (36) months following applicable regulatory approval of PRC-005-2 or ~~2~~ in those jurisdictions where no regulatory approval is required, on the first day of the first calendar quarter forty-eight (48) months following NERC Board of Trustees' adoption of PRC-005-2 or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities.
  - The entity shall be 100% compliant on the first day of the first calendar quarter forty-eight (48) months following applicable regulatory approval of PRC-005-2~~7~~ or ~~2~~ in those jurisdictions where no regulatory approval is required, on the first day of the first calendar quarter sixty (60) months following the November 2012 NERC Board of Trustees' adoption of PRC-005-2 or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities.
4. For Protection System Component maintenance activities with maximum allowable intervals of six (6) calendar years, as established in Tables 1-1 through 1-5 and Table 3:
  - The entity shall be at least 30% compliant on the first day of the first calendar quarter thirty-six (36) months following applicable regulatory approval of PRC-005-2 (or, for generating plants with scheduled outage intervals exceeding three years, at the conclusion of the first succeeding maintenance outage~~7~~) or ~~2~~ in those jurisdictions where no regulatory approval is required, on

the first day of the first calendar quarter forty-eight (48) months following the November 2012 NERC Board of Trustees' adoption of PRC-005-2 or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities.

- The entity shall be at least 60% compliant on the first day of the first calendar quarter sixty (60) months following applicable regulatory approval of PRC-005-2~~7~~ or ~~2~~ in those jurisdictions where no regulatory approval is required, on the first day of the first calendar quarter seventy-two (72) months following the November 2012 NERC Board of Trustees' adoption of PRC-005-2 or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities.
- The entity shall be 100% compliant on the first day of the first calendar quarter eighty-four (84) months following applicable regulatory approval of PRC-005-2~~7~~ or ~~2~~ in those jurisdictions where no regulatory approval is required, on the first day of the first calendar quarter ninety-six (96) months following the November 2012 NERC Board of Trustees' adoption of PRC-005-2 or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities.

5. For Automatic Reclosing Component maintenance activities with maximum allowable intervals of six (6) calendar years, as established in Table 4-~~1~~, 4-2(a) and 4-2(b):

- The entity shall be at least 30% compliant on the first day of the first calendar quarter thirty-six (36) months following applicable regulatory approval of PRC-005-3 (or, for generating plants with scheduled outage intervals exceeding three years, at the conclusion of the first succeeding maintenance outage)~~7~~ or ~~2~~ in those jurisdictions where no regulatory approval is required, on the first day of the first calendar quarter forty-eight (48) months following NERC Board of Trustees' adoption of PRC-005-3 or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities.
- The entity shall be at least 60% compliant on the first day of the first calendar quarter sixty (60) months following applicable regulatory approval of PRC-005-3~~7~~ or ~~2~~ in those jurisdictions where no regulatory approval is required, on the first day of the first calendar quarter seventy-two (72) months following NERC Board of Trustees' adoption of PRC-005-3, or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities.
- The entity shall be 100% compliant on the first day of the first calendar quarter eighty-four (84) months following applicable regulatory approval of PRC-005-3~~7~~ or ~~2~~ in those jurisdictions where no regulatory approval is required, on the first day of the first calendar quarter ninety-six (96) months following NERC Board of Trustees' adoption of PRC-005-3 or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities.

6. For Sudden Pressure Relaying Component maintenance activities with maximum allowable intervals of six (6) calendar years, as established in Table 5:



- The entity shall be at least 30% compliant on the first day of the first calendar quarter thirty-six (36) months following applicable regulatory approval of PRC-005-X (or, for generating plants with scheduled outage intervals exceeding three years, at the conclusion of the first succeeding maintenance outage) or, in those jurisdictions where no regulatory approval is required, on the first day of the first calendar quarter forty-eight (48) months following NERC Board of Trustees' adoption of PRC-005-X or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities.
- The entity shall be at least 60% compliant on the first day of the first calendar quarter sixty (60) months following applicable regulatory approval of PRC-005-X or, in those jurisdictions where no regulatory approval is required, on the first day of the first calendar quarter seventy-two (72) months following NERC Board of Trustees' adoption of PRC-005-X, or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities.
- The entity shall be 100% compliant on the first day of the first calendar quarter eighty-four (84) months following applicable regulatory approval of PRC-005-X or, in those jurisdictions where no regulatory approval is required, on the first day of the first calendar quarter ninety-six (96) months following NERC Board of Trustees' adoption of PRC-005-X or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities.

6-7. For Protection System Component maintenance activities with maximum allowable intervals of twelve (12) calendar years, as established in Tables 1-1 through 1-5, Table 2, and Table 3:

- The entity shall be at least 30% compliant on the first day of the first calendar quarter sixty (60) months following applicable regulatory approval of PRC-005-2 or, in those jurisdictions where no regulatory approval is required, on the first day of the first calendar quarter seventy-two (72) months following the November 2012 NERC Board of Trustees' adoption of PRC-005-2 or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities.
- The entity shall be at least 60% compliant on the first day of the first calendar quarter following one hundred eight (108) months following applicable regulatory approval of PRC-005-2 or, in those jurisdictions where no regulatory approval is required, on the first day of the first calendar quarter one hundred twenty (120) months following the November 2012 NERC Board of Trustees' adoption of PRC-005-2 or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities.
- The entity shall be 100% compliant on the first day of the first calendar quarter one hundred fifty-six (156) months following applicable regulatory approval of PRC-005-2 or, in those jurisdictions where no regulatory approval is required, on the first day of the first calendar quarter one hundred sixty-eight (168) months following the November 2012 NERC Board of Trustees' adoption of PRC-005-2 or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities.

7.8. For Automatic Reclosing Component maintenance activities with maximum allowable intervals of twelve (12) calendar years, as established in Table 4:

- The entity shall be at least 30% compliant on the first day of the first calendar quarter sixty (60) months following applicable regulatory approval of PRC-005-3 or    in those jurisdictions where no regulatory approval is required, on the first day of the first calendar quarter seventy-two (72) months following NERC Board of Trustees' adoption of PRC-005-3 or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities.
- The entity shall be at least 60% compliant on the first day of the first calendar quarter following one hundred eight (108) months following applicable regulatory approval of PRC-005-3 or    in those jurisdictions where no regulatory approval is required, on the first day of the first calendar quarter one hundred twenty (120) months following NERC Board of Trustees' adoption of PRC-005-3 or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities.
- The entity shall be 100% compliant on the first day of the first calendar quarter one hundred fifty-six (156) months following applicable regulatory approval of PRC-005-3 or    in those jurisdictions where no regulatory approval is required, on the first day of the first calendar quarter one hundred sixty-eight (168) months following NERC Board of Trustees' adoption of PRC-005-3 or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities.

**~~Implementation Plan for Newly identified Automatic Reclosing Components due to generation changes in the Balancing Authority Area: For Sudden Pressure Relaying Component~~**

~~This applies to PRC-005-3 and successor standards.~~

~~Additional applicable Automatic Reclosing Components may be identified because of the addition or retirement of generating units; or increases of gross generation capacity of individual generating units or plants within the Balancing Authority Area.~~

~~9. In such cases, the responsible entities must complete the maintenance activities, described with maximum allowable intervals of twelve (12) calendar years, as established in Table 4, for 5:~~

- ~~• The entity shall be at least 30% compliant on the newly identified Automatic Reclosing Components prior to the end first day of the third first calendar year quarter sixty (60) months following the identification of applicable regulatory approval of PRC-005-X or, in those Components unless documented prior maintenance fulfilling the requirements jurisdictions where no regulatory approval is required, on the first day of the first calendar quarter seventy-two (72) months following NERC Board of Trustees' adoption of PRC-005-X or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities.~~
- ~~• The entity shall be at least 60% compliant on the first day of Table 4 is available the first calendar quarter following one hundred eight (108) months following applicable regulatory approval of PRC-005-X or, in those jurisdictions where no regulatory approval is required, on the first day of the first calendar quarter one hundred twenty (120) months following NERC Board of Trustees' adoption of PRC-005-X or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities.~~
- ~~• The entity shall be 100% compliant on the first day of the first calendar quarter one hundred fifty-six (156) months following applicable regulatory approval of PRC-005-X or, in those jurisdictions where no regulatory approval is required, on the first day of the first calendar quarter one hundred sixty-eight (168) months following NERC Board of Trustees' adoption of PRC-005-X or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities.~~

## Applicability:

This standard applies to the following functional entities:

- Transmission Owner
- Generator Owner
- Distribution Provider
- Balancing Authority