

Implementation Plan

Project 2007-17.4 PRC-005 FERC Order No. 803 Directive PRC-005-6

Standards Involved

Approval:

- PRC-005-6 – Protection System, Automatic Reclosing, and Sudden Pressure Relaying Maintenance

Retirement:

- PRC-005-5 – Protection System, Automatic Reclosing, and Sudden Pressure Relaying Maintenance
- PRC-005-4 Protection System, Automatic Reclosing, and Sudden Pressure Relaying Maintenance
- PRC-005-3 (ii) Protection System and Automatic Reclosing Maintenance
- PRC-005-3 (i) Protection System and Automatic Reclosing Maintenance
- PRC-005-3 Protection System and Automatic Reclosing Maintenance
- PRC-005-2 (ii) Protection System Maintenance
- PRC-005-2 (i) Protection System Maintenance
- PRC-005-1.1b – 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:

In Order No. 803, FERC approved Standard PRC-005-3 and, in Paragraph 31, directed NERC to:

"...develop modifications to PRC-005-3 to include supervisory devices associated with auto-reclosing relay schemes to which the Reliability Standard applies. Further, we clarify that NERC's proposal regarding the scope of supervisory devices is an acceptable approach to satisfy the Commission directive. Specifically, NERC proposed in its NOPR comments, and we find acceptable, that the scope of the supervisory devices to be encompassed in the Reliability Standard are those providing voltage supervision, supervisory inputs associated with selective autoreclosing, and sync-check relays that are part of a reclosing scheme covered by PRC-005-3."

This Implementation Plan addresses:

- The implementation of changes relating to maintenance and testing of supervisory relays and associated voltage sensing devices related to Automatic Reclosing.
- The phased implementation approach included in the approved PRC-005-2(i) (PRC-005-2 has been retired by PRC-005-2(i)) will remain as-is and is carried forward and incorporated by reference.
- Because PRC-005-6 incorporates all revisions to date, this implementation plan will supersede the implementation plans for PRC-005-2(ii), PRC-005-3, PRC-005-3(i), PRC-005-3(ii), PRC-005-4 and PRC-005-5 when PRC-005-6 becomes effective. PRC-005-2(i) will remain in effect and not be retired until entities are required to be compliant with R1, R2, and R5 of the PRC-005-6 standard under this implementation plan.

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, PRC-005-2(i), PRC-005-2(ii), PRC-005-3, PRC-005-3(i), PRC-005-3(ii), PRC-005-4 and PRC-005-5, establish minimum maintenance activities for Protection System, Automatic Reclosing, and Sudden Pressure Relaying Component Types as well as the maximum allowable maintenance intervals for these maintenance activities.
2. The maintenance activities established in the various PRC-005 versions may not be presently performed by some registered entities and the established maximum allowable intervals may be shorter than those currently in use by some entities. Therefore, registered entities may not be presently performing a maintenance activity or may be using longer intervals than the maximum allowable intervals established in the PRC-005 standards. For these registered entities, it is unrealistic to become immediately compliant with the new activities or intervals. Further, registered entities should be allowed to become compliant in such a way as to facilitate a continuing PRC-005 maintenance program. The registered 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.

3. The implementation schedule set forth below carries forward and incorporates by reference the implementation schedules contained in the currently-effective PRC-005-2(i) implementation plan (which in turn incorporates by reference the PRC-005-2 implementation plan)), and combines the implementation schedules for PRC-005-2(ii), PRC-005-3, PRC-005-3(i), PRC-005-3(ii), PRC-005-4 and PRC-005-5. In addition, the implementation schedule includes changes needed to address the addition of Automatic Reclosing supervisory relays and associated voltage sensing devices in PRC-005-6.

General Considerations:

Each Transmission Owner, Generator Owner, and Distribution Provider shall maintain documentation to demonstrate compliance with PRC-005-1.1b, PRC-008-0, PRC-011-0, and PRC-017-0 until that entity meets all of the requirements of the currently effective PRC-005-2(i), or its combined successor standards, in accordance with this implementation plan.

While registered entities are implementing the requirements of PRC-005-2(i) or its combined successor standards, each registered entity must be prepared to identify whether its applicable Protection System, Automatic Reclosing, and Sudden Pressure Relaying Components were last maintained according to PRC-005-2(i) (or its combined successor standards), PRC-005-1.1b, PRC-008-0, PRC-011-0, PRC-017-0, or a combination thereof.

Effective Date

PRC-005-6 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-005-1.1b, PRC-008-0, PRC-011-0, and PRC-017-0 shall remain enforceable throughout the phased implementation period set forth in the PRC-005-2(i) implementation plan, incorporated herein by reference, and shall be applicable to a registered entity's Protection System Component maintenance activities not yet transitioned to PRC-005-2(i) or its combined successor standards. Standards PRC-005-1.1b, PRC-008-0, PRC-011-0, and PRC-017-0 shall be retired at midnight of March 31, 2027 or as otherwise made effective pursuant to the laws applicable to such Electric Reliability Organization (ERO) governmental authorities; or, in those jurisdictions where no regulatory approval is required, at midnight of March 31, 2027.

PRC-005-2(i) shall be retired at midnight of the day immediately prior to the first day of the first calendar quarter that is twelve (12) calendar months following applicable regulatory approval of PRC-005-6, 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 following the date of Board of Trustees' adoption.

If approved by the applicable ERO governmental authority prior to the approval of PRC-005-6, PRC-005-2(ii), PRC-005-3, PRC-005-3(i), PRC-005-3(ii), PRC-005-4 and PRC-005-5 shall be retired on the date immediately prior to the first day of the first calendar quarter following regulatory approval of PRC-005-6.

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 by 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. 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 (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:

Automatic Reclosing – Includes the following Components:

- Reclosing relay

- Supervisory relay(s) or function(s) – relay(s) or function(s) that perform voltage and/or sync check functions that enable or disable operation of the reclosing relay
- Voltage sensing devices associated with the supervisory relay(s)
- Control circuitry associated with the reclosing relay or supervisory relay(s)

Component Type –

- Any one of the five specific elements of a Protection System.
- Any one of the four 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 4-3, 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.

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

Implementation Plan for New or Revised Definitions:

The revised definitions (Protection System Maintenance Program, Automatic Reclosing, Component Type, Component, Countable Event and Sudden Pressure Relaying) become effective upon the effective date of PRC-005-6.

Implementation Plan for PRC-005-2(i) and PRC-005-6

All Components with existing requirements under currently effective PRC-005-2(i) will continue to follow the PRC-005-2(i) implementation plan, which is incorporated herein by reference. Those

Components and/or Facilities newly introduced by PRC-005-2(ii),* PRC-005-3, PRC-005-3(i), PRC-005-3(ii),* PRC-005-4, PRC-005-5 and PRC-005-6 (including Sudden Pressure Relaying, Automatic Reclosing Components, and dispersed generation resources) will be covered by the following Implementation Plan:

Requirements R1, R2, and R5:

PRC-005-6: For Automatic Reclosing Components, Sudden Pressure Relaying Components, and dispersed generation resources, entities shall be 100% compliant on the first day of the first calendar quarter twelve (12) months following applicable regulatory approvals of PRC-005-6 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-005-6 or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities.

Implementation Plan for Requirements R3 and R4:

PRC-005-6:

1. For Automatic Reclosing Components, Sudden Pressure Relaying Components, and dispersed generation resources maintenance activities with maximum allowable intervals of six (6) calendar years, as established in Tables 4-1, 4-2(a), 4-2(b), 4-3, and 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-005-6 (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-005-6 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-005-6 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-005-6, 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-005-6 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-005-6 or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities.

*The proposed Implementation Plan for the Revised Definition of "Remedial Action Scheme" developed as part of Project 2010-05.2 – Special Protection Systems shall continue to govern implementation of the revised Remedial Action Scheme definition, including implementation for entities with newly classified "Remedial Action Scheme."

2. For Automatic Reclosing Components, Sudden Pressure Relaying Components, and dispersed generation resources maintenance activities, with maximum allowable intervals of twelve (12) calendar years, as established in Table 4-1, 4.2(a), 4.2(b), 4-3, and 5:
- 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-005-6 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-005-6 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-005-6 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-005-6 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-005-6 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-005-6 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