

## Implementation Plan ~~for PRC-004-03~~

### Standards Involved:

- ~~• Approval:~~

### Project 2010-05.1 Protection Systems: Phase 1 (Misoperations)

### Requested Approvals

- PRC-004-3 – Protection System Misoperation Identification and Correction

### Requested Retirements:

- PRC-003-1 ~~—~~ — Regional Procedure for Analysis of Misoperations of Transmission and Generation Protection ~~Systems~~ System
- PRC-004-~~1a~~ ~~—~~ 2a – Analysis and Mitigation of Transmission and Generation Protection System Misoperations
  - ~~○ PRC 004 2 — Analysis and Mitigation of Transmission and Generation Protection System Misoperations~~

- ~~• Related~~

~~PRC 003-STD 1, PRC 004 WECC 1: These are two regional standards~~ Prerequisite Approvals

- ~~• None~~

### Revisions to Defined Terms in the NERC Glossary

The standards drafting team proposes modifying the following approved definition:

Misoperation: Any of the following:

1. Failure to Trip - During Fault - A failure of a Protection System to operate for a Fault within the zone it is designed to protect. (The failure of a Protection System component is not a Misoperation as long as the overall performance of the Protection System for an Element is correct.)
2. Failure to Trip - Other Than Fault - A failure of a Protection System to operate for a non-Fault condition for which the Protection System was intended to operate, such as a power swing, under-voltage, over excitation, or loss of excitation. (The failure of a Protection System component is not a Misoperation as long as the overall performance of the Protection System for an Element is correct.)
3. Slow Trip - During Fault - A Protection System operation that is slower than intended for a Fault within the zone it is designed to protect. (Delayed Fault Clearing associated with an installed high-speed protection scheme is a Misoperation if the high-speed performance is required to meet the performance requirements of the TPL standards or by coordination requirements with other Protection Systems.)

4. **Slow Trip - Other Than Fault** - A Protection System operation that is slower than intended for a non-Fault condition such as a power swing, under-voltage, over excitation, or loss of excitation for which the Protection System was intended to operate.
5. **Unnecessary Trip - During Fault** - A Protection System operation for a Fault for which the Protection System is not intended to operate, excluding any remote Protection System operation that resulted from a failure to trip or slow trip of a local Protection System in a faulted adjacent zone.
6. **Unnecessary Trip - Other Than Fault** - A Protection System operation for a non-Fault condition for which the Protection System is not intended to operate, and is unrelated to on-site maintenance, testing, construction or commissioning activities.

### **Background**

PRC-004-3 Protection System Misoperations is a revision of PRC-004-2a Analysis and Mitigation of Transmission and Generation Protection System Misoperations with the stated purpose: Ensure all transmission and generation Protection System Misoperations affecting the reliability of the Bulk Electric System (BES) are analyzed and mitigated. PRC-003-1 Regional Procedure for Analysis of Misoperations of Transmission and Generation Protection Systems required the Regions to establish procedures for analysis of Misoperations. In the NOPR, the Commission identified PRC-003-0 as a fill-in-the-blank standard. The NOPR stated that because the regional procedures had not been submitted, the Commission proposed not to approve or remand PRC-003-0. Because PRC-003-0 (now PRC-003-1) is not enforceable, there is not a mandatory requirement for Regional procedures to support the requirements of PRC-004-2a. This is a potential reliability gap; consequently, PRC-004-3 combines the reliability intent of the two legacy standards PRC-003-1 and PRC-004-2a.

### **General Considerations**

PRC-004-WECC-1 – This regional standard is related to reporting of Misoperations for a limited set of WECC Paths and Remedial Action Schemes. In those cases where ~~those standards will overlap~~ PRC-004-WECC-1 overlaps with the Continent-wide standard, entities are expected to comply with the more stringent standard. ~~Doing so will ensure compliance with the less stringent standard as well. There are no apparent conflicts between the standards that would lead to mutually exclusive compliance.~~

#### **Prerequisite Approvals:**

~~The proposed standard is not dependent on any prerequisite approvals.~~

#### **Revision to Sections of Approved Standards and Definitions:**

~~There is one revised definition for the proposed standard:~~

***Misoperation:*** Any of the following:

1. ~~Failure to Trip – During Fault~~ Any failure of a Protection System to operate for a Fault within the zone it is designed to protect.
2. ~~Failure to Trip – Other Than Fault~~ Any failure of a Protection System to operate for a non-Fault condition such as power swings, under voltage, over excitation, or loss of excitation for which the Protection System was intended to operate.
3. ~~Slow Trip~~ Any Protection System operation that is slower than planned for a Fault within the zone it is designed to protect.
4. ~~Unnecessary Trip – During Fault~~ Any Protection System operation for a Fault not within the zone it is designed to protect.
5. ~~Unnecessary Trip – Other Than Fault~~ Any Protection System operation for non-Fault conditions such as power swings, under voltage, over excitation, or loss of excitation for which the Protection System is not intended to operate.

***Retirement of Existing Standards:***

The existing Standards PRC-003-1, PRC-004-1a, and PRC-004-2 shall be retired upon regulatory approval of PRC-004-3.

PRC-003-1 is currently not enforceable, but requires the establishment of a procedure by the RRO. The new PRC-004-3 puts this obligation on the Functional Entities instead, and specifies the minimum elements required in the procedure, making PRC-003-1 unnecessary and duplicative.

PRC-004-1a and -2 Requirements R1 and R2 require the Functional Entities implement the procedures specified in PRC-003-1. R1 in the new PRC-004-3 includes this obligation. R3 in PRC-004-1A and -2 requires reporting to the RRO, which has now been included in the Compliance section of the standard. Together, these elements make PRC-004-1A and -2 superfluous as well.

**Applicability:**

This standard applies to the following functional entities:

- Transmission ~~Owners~~Owner
- Generator ~~Owners~~Owner
- Distribution ~~Providers~~Provider

This standard applies to the following Facilities:

- Protection Systems for Facilities that are part of the BES.

Facilities not included

- ~~Special Protection Systems (SPS), or Remedial Action Schemes (RAS), and Under Voltage)~~
- ~~Undervoltage Load Shedding programs (UVLS)~~

Relay functions not included (these are excluded from this standard; non-protective functions that may be imbedded within a Protection System)

- Control (e.g. controlled shut down of generators or capacitor bank switching. Also see Guidelines and Technical Basis section for detailed examples)
- Automation (e.g. data collection)

**Effective Date:**

~~The effective date is the date entities are expected to meet the performance identified in this standard.~~

~~Requirement R1 of New or Revised Standards and its associated parts shall become effective on the Definitions~~

~~First day of the first calendar quarter that is six months beyond the date that PRC-004-3 is approved by applicable regulatory authorities, or in those jurisdictions where regulatory approval is not required, the standard becomes effective on the first day of the first calendar quarter, ~~3~~ that is six months after beyond the date this standard is approved by the NERC Board of Trustees, or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities.~~

~~The proposed definition of Misoperation shall become effective on the same date as PRC-004-3. Entities shall use this definition when implementing any portions of Requirements R1, R2 R3 and R4 that use this defined term.~~

**Implementation Plan for Requirements R1, R2, R3 and R4**

~~Entities shall be 100% compliant on the first day of the first calendar quarter six months following applicable regulatory ~~approval. In~~ approvals, or in those jurisdictions where no regulatory approval is required, ~~all requirements go into effect~~ on the first day of the first calendar quarter, ~~3~~ six months after following Board of Trustees adoption.~~

Retirement of Existing Standards

~~Because the standard does not deviate significantly from what is required today, it is believed that this standard can be implemented on a relatively short schedule.~~

~~The existing standards PRC-003-1 and PRC-004-2a shall be retired at midnight of the day immediately prior to the effective date of PRC-004-3.~~