NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Implementation Plan

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 System
- PRC-004-2a – Analysis and Mitigation of Transmission and Generation Protection System Misoperations

Prerequisite Approvals

- None

Revisions to Defined Terms in the NERC Glossary

The standards drafting team proposes modifying the following approved definition:

Misoperation:

The failure of an Element's composite Protection System to operate as intended.

Any of the following is considered a Misoperation:

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 the Element it is designed to protect 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 the Element it is designed to protect 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 not a Misoperation if the high-speed performance has not been identified to meet the dynamic stability performance requirements of the TPL standards nor is it required to ensure coordination 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.

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, inspection, construction or commissioning activities.

Background

PRC-004-3 Protection System Misoperation Identification and Correction 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 FERC Order No. 693, the Commission identified PRC-003-0 as a fill-in-the-blank standard. The Order 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 PRC-004-WECC-1 overlaps with the Continent-wide standard, entities are expected to comply with the more stringent standard.

Applicability

This standard applies to the following functional entities:

- Transmission Owner
- Generator Owner
- Distribution Provider

This standard applies to the following Facilities:

- Protection Systems for BES Elements.
- Underfrequency Load Shedding (UFLS) that trips a BES Element
- Special Protection Systems (SPS), Remedial Action Schemes (RAS), and Undervoltage Load Shedding (UVLS) are excluded
- Non-protective functions that may be imbedded within a Protection System are excluded

Effective Date of New or Revised Standards and Definitions

First day of the first calendar quarter that is twelve 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 that is twelve months 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 for any new Protection System Operation on the first day of the first calendar quarter twelve months following applicable regulatory approvals, or in those jurisdictions where no regulatory approval is required, on the first day of the first calendar quarter twelve months following Board of Trustees adoption. Protection System operations that occur before the compliance date shall comply with the previous version of the Standard.

Retirement of Existing Standards

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.