NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Project 2010-05.3

Phase 3 of Protection Systems
PRC-012-2 Remedial Action Schemes

Industry Webinar
December 15, 2015

RELIABILITY | ACCOUNTABILITY




Agenda

- Welcome and Introductions
- Administrative Items
  - NERC Antitrust Guidelines and Disclaimer
  - Webinar Format
- Project Development
- Project Objectives
- Standard Drafting Team Members
- Presenters
- Overview of PRC-012-2 – Draft 2
- Questions and Answers
- Closing Remarks

Administrative Items

Antitrust Guidelines

- It is NERC's policy and practice to obey the antitrust laws and to avoid all conduct that unreasonably restrains competition. This policy requires the avoidance of any conduct that violates, or that might appear to violate, the antitrust laws. Among other things, the antitrust laws forbid any agreement between or among competitors regarding prices, availability of service, product design, terms of sale, division of markets, allocation of customers or any other activity that unreasonably restrains competition. It is the responsibility of every NERC participant and employee who may in any way affect NERC's compliance with the antitrust laws to carry out this commitment.

Disclaimers and Format

- Public
  - Participants are reminded that this meeting is public. Notice of the meeting was widely distributed. Participants should keep in mind that the audience may include members of the press and representatives of various governmental authorities, in addition to the expected participation by industry stakeholders.
- Presentation Material
  - Wording in this presentation is used for illustrative purposes and may not reflect the exact draft of the posted standard.
- Webinar Format
  - Two hours
    - Presentation
    - Question and Answer Session

Project 2010-05 Development

- NERC Project 2010-05 Protection Systems
  - Phase 2: 2010-05.2 Special Protection Systems
    - Initiated in February 2014
    - Revised definition of Remedial Action Scheme
    - Adopted by the NERC Board of Trustees on November 13, 2014
    - Approved by the FERC on November 19, 2015 by Final Order No. 818
  - Phase 3: Project 2010-05.3 Remedial Action Schemes (RAS)
    - Initiated in January 2015
    - Preliminary draft of PRC-012-2 posted for 21-day informal comment period in May 2015
    - Draft 1 of PRC-012-2 failed initial ballot conducted 09/25 – 10/05 2015
    - Draft 2 of PRC-012-2 posted for 45-day comment and additional ballot 11/25/2015 – 01/08/2016
    - Revised SPS definition posted for 45-day comment and initial ballot 11/25/2015 – 01/08/2016
    - Draft RSAW for PRC-012-2 posted 12/09/2015

Project Objectives

- Consolidate the reliability objectives of the six existing RAS/SPS-related standards into one standard – PRC-012-2 Remedial Action Schemes
  - PRC-012-1 Remedial Action Scheme Review Procedure
  - PRC-013-1 Remedial Action Scheme Database
  - PRC-014-1 Remedial Action Scheme Assessment
  - PRC-015-1 Remedial Action Scheme Data and Documentation
  - PRC-016-1 Remedial Action Scheme Misoperations
  - PRC-017-1 Remedial Action Scheme Maintenance and Testing*

* The maintenance of the Protection System components associated with RAS (PRC-017-1 Remedial Action Scheme Maintenance and Testing) are already addressed in PRC-005-2.1. PRC-012-2 addresses the testing of the non-Protection System components associated with RAS/SPS.

Project Objectives

- Revise the definition of Special Protection System to reflect the new definition of Remedial Action Scheme (RAS)
  - Proposed definition of Special Protection System:
    - See "Remedial Action Scheme"
  - Effective on the later of:
    - the effective date of the applicable governmental authority's order approving the revised definition of Special Protection System, or
    - the effective date of the revised definition of Remedial Action Scheme approved by the Commission on November 19, 2015 = April 1, 2017

Drafting Team Roster

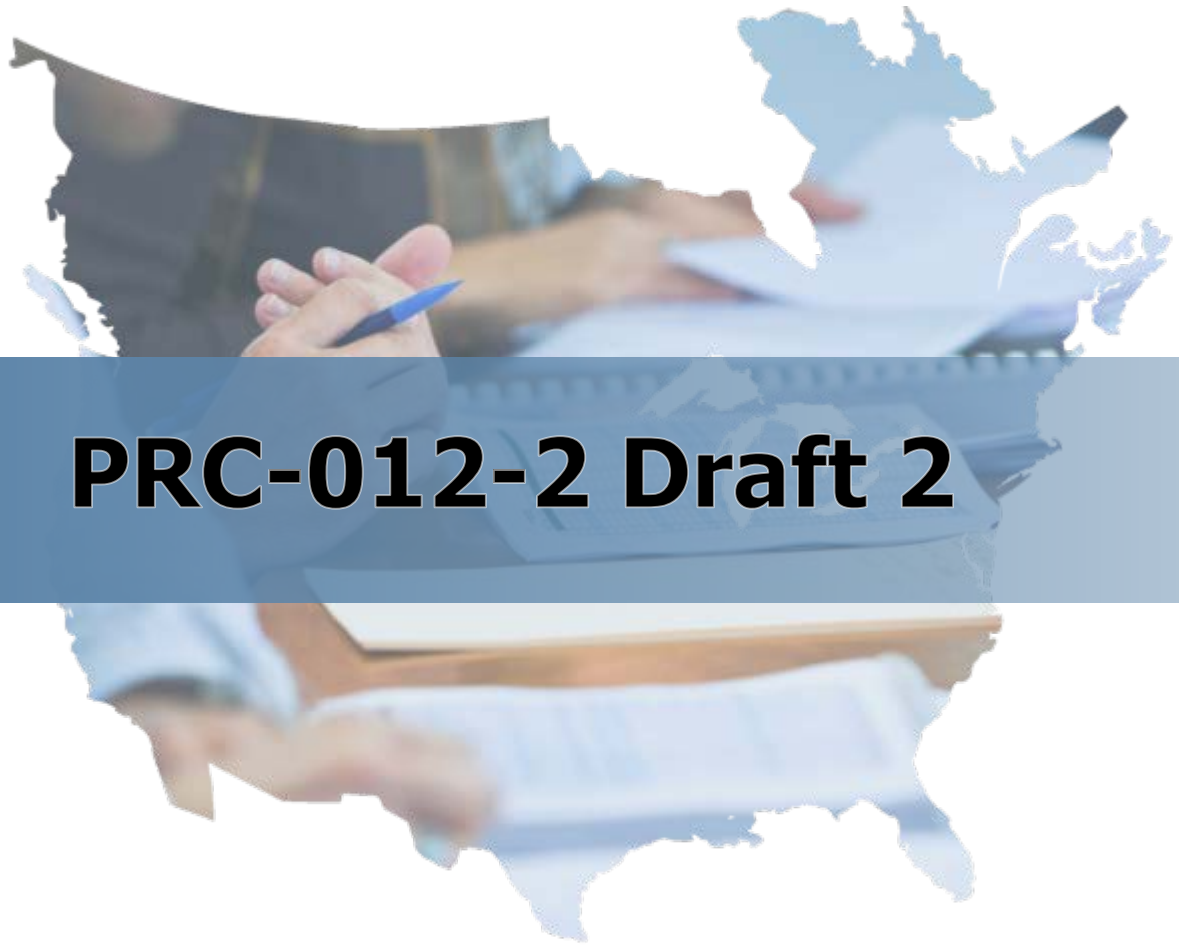
Member	Entity
Gene Henneberg (Chair)	NV Energy / Berkshire Hathaway Energy
Bobby Jones (Vice Chair)	Southern Company
Amos Ang	Southern California Edison
Alan Engelmann	ComEd / Exelon
Davis Erwin	Pacific Gas and Electric
Sharma Kolluri	Entergy
Charles-Eric Langlois	Hydro-Quebec TransEnergie
Robert J. O'Keefe	American Electric Power
Hari Singh	Xcel Energy

Presenters

- Industry Stakeholders
  - Gene Henneberg (Drafting Team Chair)
  - Bobby Jones (Drafting Team Vice Chair)
- NERC Staff
  - Al McMeekin

PRC-012-2 Draft 1 Issues

- Issues from recent comment period:
  - RAS-owner vs RAS-entity
  - RAS review – responsible entity
  - Functional Modifications
  - Functional Testing
  - Single component malfunction and failure requirements
  - RAS periodic evaluation – revisions
  - Corrective Action Plans
  - Implementation Plan – revisions



PRC-012-2 Draft 2

PRC-012-2 General Revisions

- Requirements R1, R2, R6, R7, and R9 – minor clarifying changes.
- Requirements R3 – restructured for consistency.
- Requirement R5:
  - Added “on a mutually agreed upon schedule” to allow longer periods for the RAS operational analysis to be performed.
  - Clarified that results of RAS operational performance analysis need to be reported to the RC only when deficiencies are identified.
- Measures, VSLs, and Attachments – revisions to complement the revised requirements.
- Rationale Boxes and Supplemental Material – revisions to complement the revised requirements and provide additional examples and insight.

PRC-012-2 RAS-owner vs. RAS-entity

- Modified Applicability:
  - Consolidated the terms
  - Redefined RAS-entity: the Transmission Owner, Generator Owner, or Distribution Provider that owns all or part of a RAS

PRC-012-2 RAS Review: Responsible Entity

- The drafting team maintains that the Reliability Coordinator (RC) is the best-suited entity to perform the RAS reviews.
  - RCs have the widest-area reliability perspective of all functional entities and an awareness of reliability issues in neighboring RC Areas.
  - The RC is more likely to be independent of the entities involved in planning and implementing the RAS.
  - The RC has the "flexibility" to request information or assistance from relevant entities (third parties) to participate in the review if they believe it will enhance the quality and efficiency of the review process.
  - The NERC Functional Model is a guideline for the development of standards and their applicability and does not have compliance requirements. The drafting team is not precluded from developing Reliability Standards that address functions not described in the model. Reliability Standard requirements take precedence over the Functional Model.

PRC-012-2 Functional Modifications

- Functional modifications consist of any of the following:
  - Changes to System conditions or Contingencies monitored by the RAS
  - Changes to the actions the RAS is designed to initiate
  - Changes to RAS hardware beyond in-kind replacement of existing components
  - Changes to RAS logic beyond error correcting
  - Changes to redundancy levels; i.e., addition or removal

PRC-012-2 Functional Testing

- The drafting team modified Requirement R8 to distinguish between functional testing periods for “limited impact” RAS and all other RAS.
  - At least once every six full calendar years for all RAS not designated as limited impact, or
  - At least once every twelve full calendar years for all RAS designated as limited impact

PRC-012-2 Functional Testing

- More on functional testing:
  - Verifies the overall performance of a RAS and the proper operation of the non-Protection System (control) components such as programmable logic controllers (PLCs), personal computers (PCs), multi-function programmable relays, remote terminal units (RTUs), and logic processors . These control components are not addressed in PRC-005.
    - Functional testing includes the testing of all RAS inputs used for detection, arming, operating, and data collection.
    - Functional testing also includes the processing logic and infrastructure of a RAS as well as the action initiation by RAS outputs to address the System condition(s) for which the RAS is designed.
  - May be accomplished by either testing overlapping segments or end-to-end testing.
  - The interval between tests begins on the date of the most recent successful test for each individual segment or end-to-end test.
  - Correct operation of a RAS or a RAS segment qualifies as a functional test.

PRC-012-2 Single Component Malfunction and Failure Requirements

- In draft 1 of PRC-012-2, the drafting team stipulated that single component failure performance requirements applied to all RAS.
- Draft 1 also required the inadvertent operation of a RAS due to a single component malfunction to meet certain system performance requirements.
- In draft 2 of PRC-012-2, the drafting team modified the standard such that:
  - RAS can be designated as “limited impact.”
  - Single component malfunction and failure performance requirements do not apply to RAS designated by the reviewing RC as “limited impact.”

PRC-012-2 “limited impact”

- A “limited impact” RAS is recognized as one for which it is not possible by inadvertent operation or failure to operate, to cause or contribute to BES Cascading, uncontrolled separation, angular instability, voltage instability, voltage collapse, or unacceptably damped oscillations.
  - For new or functionally modified RAS reviewed by the RCs under PRC-012-2, the reviewing RC will make the final determination as to whether a RAS is “limited impact.”
  - RAS implemented prior to the effective date of PRC-012-2 that have been through the regional review process and designated as Type 3 in NPCC, Type 2 in ERCOT, or LAPS in WECC will be recognized as limited impact for the purposes of Requirement 4, Parts 4.1.3 and 4.1.4.

PRC-012-2 RAS Periodic Evaluation: Revisions

- The drafting team changed the entity responsible for performing the periodic evaluations in Requirement R4 from the Transmission Planner (TP) to the Planning Coordinator (PC).
  - Wider System view of the PC compared to the TP.
- The drafting team now requires the results of the periodic evaluations to be provided to impacted TPs and PCs in addition to each RAS-entity and reviewing RC.

PRC-012-2 Corrective Action Plans

- The drafting team modified Requirement R6 to include a third trigger for developing and submitting a Corrective Action Plan.
- The three triggers are:
  - Being notified of a deficiency in its RAS pursuant to Requirement R4, or
  - Notifying the RC (of a deficiency in its RAS) pursuant to Requirements R5, or
  - Identifying a deficiency in its RAS pursuant to Requirement R8.

PRC-012-2 Implementation Plan: Revisions

- Effective Date – changed from twelve (12) months to thirty-six (36) months to provide entities more time to establish the new working frameworks among RAS-entities, RCs, and PCs.
- Added clarifying language for the initial performance of obligations under:
  - **Requirement R4:** For existing RAS, initial performance of obligations under Requirement R4 must be completed within sixty (60) full calendar months of the effective date of PRC-012-2, as described above. For new or functionally modified RAS, the initial performance of Requirement R4 must be completed within sixty (60) full calendar months of the date that the RAS is approved by the reviewing RC(s) under Requirement R3.
  - **Requirement R8:** For each RAS not designated as limited impact, initial performance of obligations under Requirement R8 must be completed at least once within six (6) full calendar years of the effective date for PRC-012-2, as described above. For each RAS designated as limited impact, initial performance of obligations under Requirement R8 must be completed at least once within twelve (12) full calendar years of the effective date for PRC-012-2, as described above.
  - **Requirement R9:** For each Reliability Coordinator that does not have a RAS database upon the effective date of PRC-012-2, as described above, the initial obligation under Requirement R9 is to establish a database.

Questions and Answers

Conclusion

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  - Email at al.mcmeekin@nerc.net
  - Telephone: 404-446-9675
  - To receive **Project 2010-05.3** announcements and updates
    - Request to be added to email distribution list: **SPSSDT_Plus**
- Project 2010-05.3 website: Project 2010-05.3 Phase 3 of Protection Systems: Remedial Action Schemes