

NERC

NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

Project 2010-05.1

Protection System (Misoperations)

Protection System Misoperation Standard Drafting Team

Industry Webinar

June 5, 2014

RELIABILITY | ACCOUNTABILITY



- Industry
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 - John Miller, Manager – System Protection
 - Steve Paglow, Senior Engineer
- NERC
 - Scott Barfield-McGinnis, Standards Developer
 - Phil Tatro, Principal Performance and Analysis Engineer

Member	Entity
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Mark Gutzmann, P.E.	Xcel Energy, Inc.
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Rick Purdy, P.E.	Dominion Virginia Power
Patrick Sorrells	Sacramento Municipal Utility District

- Administrative Items
 - Antitrust and Disclaimer
 - Project Background
- Standard – PRC-004-3
 - NERC Glossary Definitions
 - Applicability and Requirements
 - Application Guidelines
- Response to Industry Concerns
- Other Documents
- Section 1600 Data Request
- Closing Remarks



Administrative Items

- 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.

- 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.

- Webinar is intended to provide a general industry update
 - Most significant revisions
 - Clarifications based on comments
- Informal Question and Answer (Q&A) at the end
 - Q&A session is intended to improve overall understanding
 - Submit questions and comments via the chat feature
 - Please reference slide number, standard section, etc.
 - Presenters will attempt to address each question
 - Webinar and chat comments are not a part of the official project record
- Presentation Material
 - Wording in this presentation is used for presentation purposes and may not reflect the official posted draft of the standard

- FERC Order No. 693 (dated March 16, 2007)
 - PRC-003-1
 - Identified as a “fill-in-the-blank” standard
 - Commission did not approve or remand
 - As unenforceable, would not support PRC-004-2
 - Procedures are not standardized among the regions
 - Lack of consistent metrics for measuring Protection System performance
- Project 2010-05.1 Protection System (Misoperations)
 - Addresses only Protection Systems
 - Does not apply to:
 - SPS – Special Protection Systems (See Project 2010-05.2)
 - RAS – Remedial Action Schemes (See Project 2010-05.2)
 - UVLS – Undervoltage load shedding (See Project 2008-02)

- BES – Bulk Electric System
- DP – Distribution Provider
- GO – Generator Owner
- RAS – Remedial Action Scheme
- TO – Transmission Owner
- SDT – Standard Drafting Team
- SPCS – NERC System Protection and Control Subcommittee
- SPS – Special Protection System
- VRF – Violation Risk Factor
- VSL – Violation Severity Level
- WECC – Western Electricity Coordinating Council

- Today's important takeaways
 - Improvements to the definitions
 - Applicability
 - What's in and what's out
 - Improvements to the standard
 - Address a gap
 - Measures
 - Application Guidelines
 - Clarifications
 - Examples
 - Implementation
 - Removal of the 24-month provision for WECC



Standard – PRC-004-3

- Misoperation (Revised)

Definition: The failure of a Composite Protection System to operate as intended [for protection purposes](#). Any of the following is a Misoperation:

- 1) Failure to Trip – During Fault ...
- 2) Failure to Trip – Other Than Fault ...
- 3) Slow Trip – During Fault ...
- 4) Slow Trip – Other Than Fault ...
- 5) Unnecessary Trip – During Fault ...
- 6) Unnecessary Trip – Other Than Fault ...

- If intended performance is achieved – not a Misoperation

- Clarifications

- Categories 3 and 4 (Slow Trip)
- Category 6 (On-site activities)

- Composite Protection System (New-Proposed)

Definition: The total complement of Protection System(s) that function collectively to protect an Element. Backup protection provided to a remote Protection System is included.

- Removed previous “examples” to eliminate confusion

- Addresses overall performance of the Protection System

- Concept formally defined based on stakeholder comments
- Supported by NERC SPCS Assessment of Standards: (PRC-003, 004, and 016)¹

- If backup protection is provided it's included

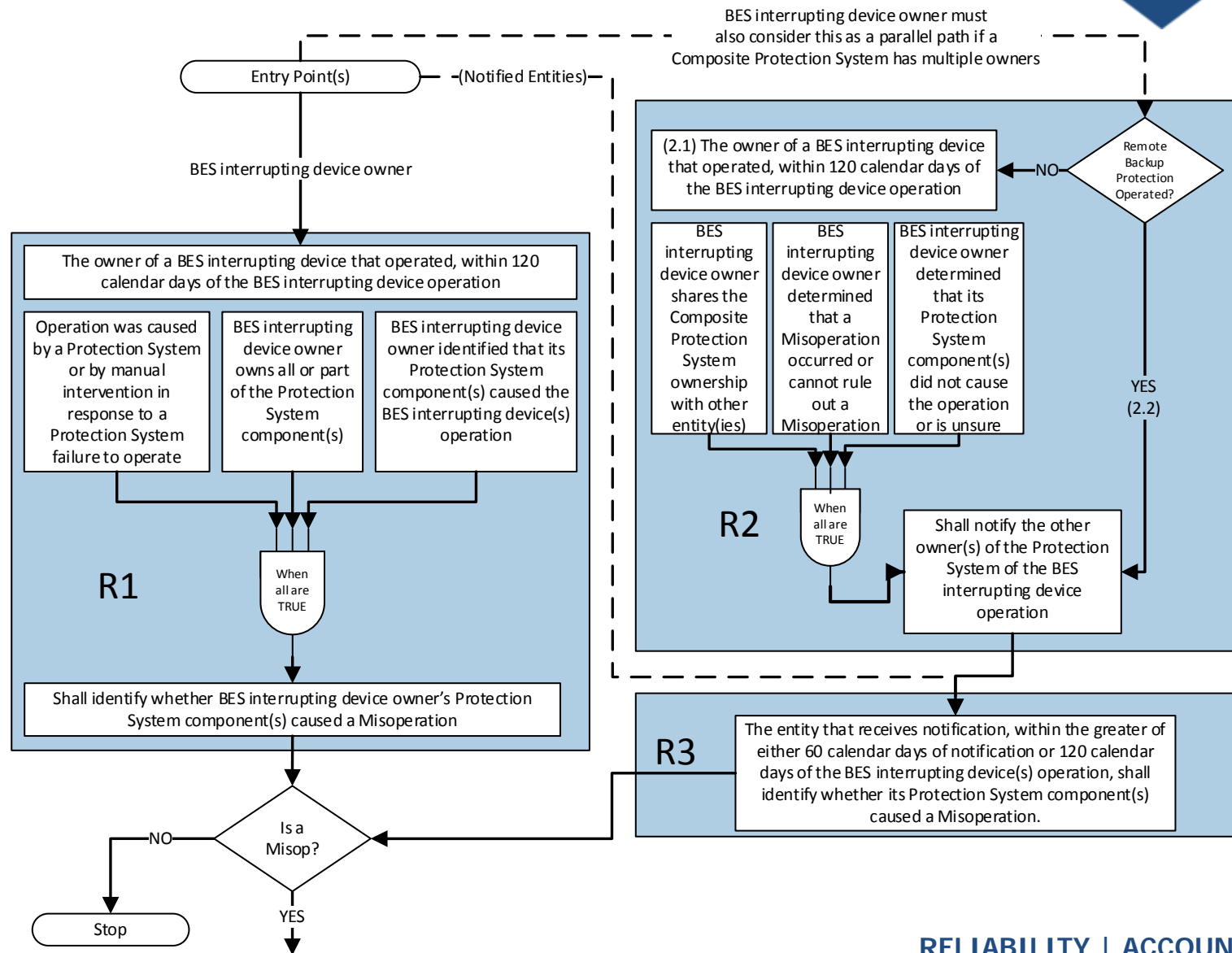
- Comports with the revision to Requirement R2 to close a gap

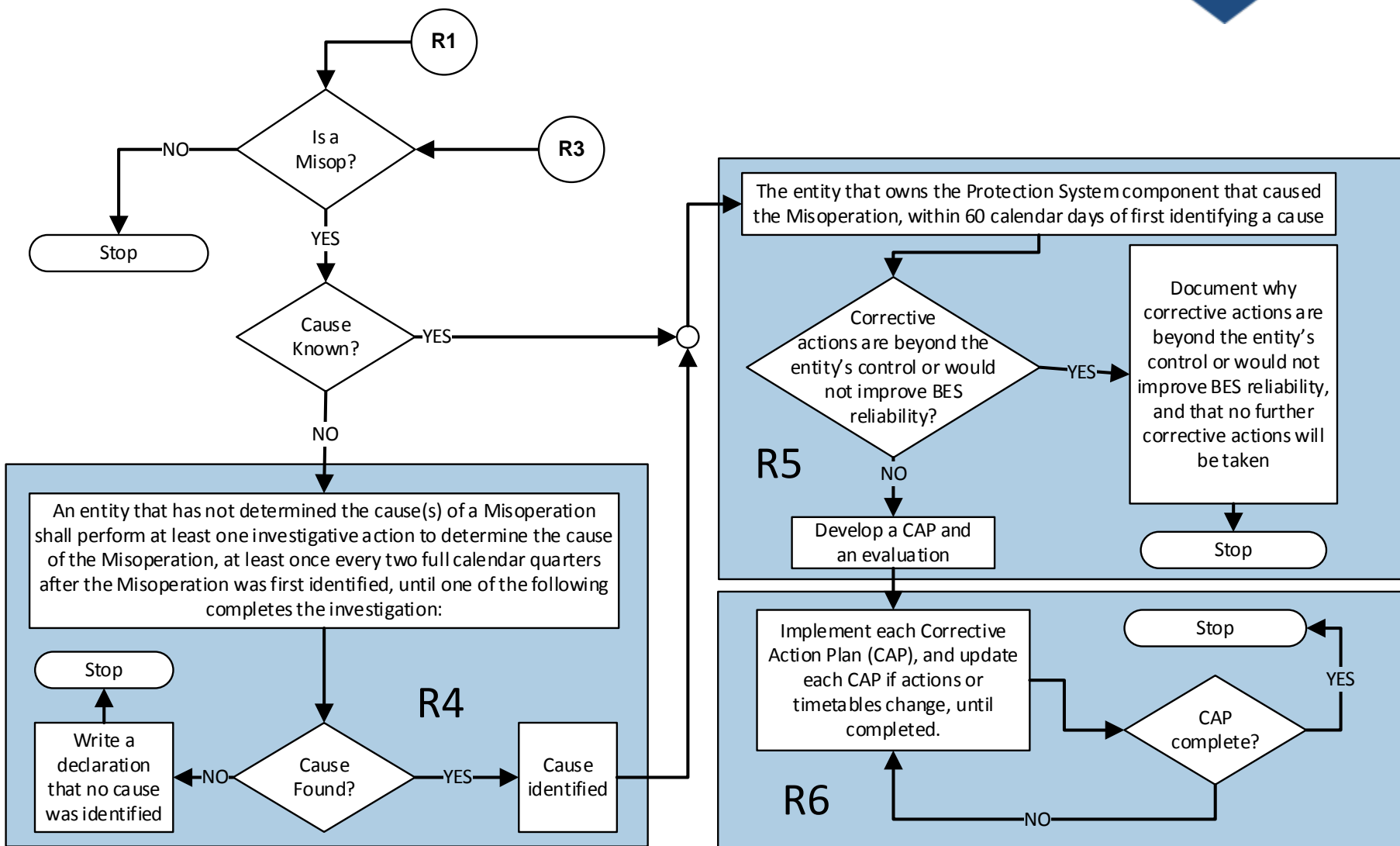
¹<http://www.nerc.com/comm/PC/System%20Protection%20and%20Control%20Subcommittee%20SPCS%20DL/PRC-003-004-016%20Report.pdf>

- **Functional Entities**
 - Transmission Owner
 - Generator Owner
 - Distribution Provider
- **Facilities**
 - Protection Systems for BES Elements with the following exclusions:
 - Non-protective functions that are embedded within a Protection System
 - Protective functions intended to operate as a control function during switching
 - Special Protection Systems (SPS)
 - Remedial Action Schemes (RAS)
 - Underfrequency load shedding (UFLS) that is intended to trip one or more BES Elements

- R1 – BES interrupting device operation initiates standard
 - Owner of the device initiates review
 - All three criteria (1.1-1.3) must be met to be a reviewable operation
 - Includes manual intervention in response to Protection System failure
 - Provides 120 calendar days to identify a Misoperation, if any
- R2 – BES interrupting device owner make notification(s)
 - Sub-part 2.1
 - All three criteria (2.1.1-2.1.3) must be met to require notifying others
 - Sub-part 2.2
 - Addresses the case for notifying others when backup protection was provided

- R3 – Notified entity reviews its component(s) for Misoperation
 - Minor edit made
- R4 – For an identified Misoperation (with no cause)
 - If a cause was not revealed (R1/R3), investigative action must be taken
 - At least one action every two full calendar quarters
 - Clarity added to Application Guidelines about investigative actions
- R5 – For an identified cause of a Misoperation
 - Develop a Corrective Action Plan (CAP) and evaluate the CAP's applicability to other Protection Systems, or
 - Explain in a declaration why corrective actions are...
- R6 – Implement the CAP





- Provides additional context
 - Proposed definition of “Composite Protection System”
 - The six categories of Misoperation
 - Examples
- Non-protective functions
- Control functions
 - Clarified intent
- Requirements
 - Clarifying narratives
 - Updated R2 narrative due to Requirement revision
 - Added example (R2b)



Response to Industry Comments

- **Applicability**
 - Re-inserted the SPS and RAS exclusion for clarity
- **Application Guidelines**
 - Added examples for definitions
 - Clarify what is (or is not) a Misoperation
 - Clarified the use of control functions
- **R1 – Changed “when” to “under the following circumstances”**
- **R2 – Appended to close a gap and clarify notifications**
 - Non-operation of a BES interrupting device
 - Language revised to require notifications to the other owner(s) that share Misoperation identification responsibility
 - Also changed “when” to “under the following circumstances”

- R3 – Minor grammatical revision
- R4 – Added phrase for clarity
- R5 and R6 – No revision
- Updated all Measures to be consistent with SDT guidance
- Implementation period same for all Regions
- Revised flowchart (R2)

- BES interrupting device initiates the review for Misoperation
 - Device contains the trip coil (a component of the Protection System)
 - Device owners are in the best position to be aware of operations
- GO's relay that operates a TO's BES interrupting device
 - TO communicates with GO to determine applicability to standard
 - If applicable, TO initiates review for Misoperation (R1)



Other Documents

- Standard and definitions become effective together
- 12-month implementation provides entities sufficient time
 - To update review processes
 - To adjust for new/revised definitions
- Regional Variation
 - All interconnections will implement standard on the same timeline
 - Earlier conflict was thought to have existed with PRC-004-WECC-1
 - Re-evaluation reveals no conflict; entities are able to comply with both Reliability Standards.

- VRFs
 - SDT assigned all six new Requirements a VRF of “Medium”
 - (High VRF) – If violated, could be expected to directly cause or contribute to BES instability, separation, or a cascading sequence of failures
 - (Medium VRF) – If violated could directly affect the electrical state or the capability of the BES, or the ability to effectively monitor and control the BES
 - Assignment of “Medium” comports with other similar standards
 - Previous version (2.1a), all three Requirements are a VRF of “High”
 - Varying degrees of performance co-mingled
 - e.g., R1 and R2 – analyze, develop, and implement (CAP)
- VSLs
 - Gradated based on performance and time

- Three directives from Order No. 693
 - P1460 – PRC-003-1 requires regional procedures for entities
 - Considered a “Fill-in-the-blank” standard and unenforceable
 - SDT is retiring PRC-003-1 since PRC-004-3 explicitly establishes objectives
 - P1461 – Need for greater consistency (Reporting/Regional differences)
 - Achieved by replacing PRC-003-1 with PRC-004-3
 - Section 1600 Data Request for reporting Misoperations
 - P1469 – Consider including Load Serving Entities (LSE) and Transmission Operators (TOP)
 - SDT considered including these other entities not in version 2.1a
 - Determined that only Protection System “owners” should be included in the standard’s Applicability (DP, GO, and TO)



Section 1600 Data Request

- NERC has reviewed stakeholder comments and is coordinating changes to the data request with other relevant projects
 - Project 2010-05.1 – Protection Systems: Phase 1 (Misoperations)
 - Project 2014-01 – Standards Applicability for Dispersed Generation Resources
 - Protection System Misoperation Task Force (PSMTF) recommendations
- Section 1600 data request will be submitted to the NERC Board of Trustees concurrent with PRC-004-3
- Reporting under the data request is proposed to become effective upon retirement of PRC-004-2.1a

- General agreement that the data request:
 - Is similar in substance and form to the data presently collected pursuant to Reliability Standard PRC-004-2a
 - Will not require significant incremental effort
 - Is reasonable and data is attainable
 - Follows a reasonable implementation plan
 - Will not require significant incremental cost to develop a system to export Misoperation data
- Desire to continue review of Misoperation data at the Regional level, citing recommendations in the Protection System Misoperation Task Force (PSMTF) report

- Concern that NERC could use data to develop metrics comparing performance among individual entities
- Concern with differences between the existing reporting template and the proposed data request template:
 - Event descriptions
 - Corrective Action Plan (CAP)
- Concern that reporting will be required for individual wind and solar generation components and other small generating units



Closing Remarks

- Respond to industry comments
 - In-person SDT meeting, July 7-11, 2014, Toronto (Hydro One)
 - See www.nerc.com Standards calendar for details
- Anticipated next steps
 - Final ballot – End of July
 - Present to NERC Board of Trustees – August
 - File with regulatory jurisdictions – Q4

- Effective feedback:
 - Specific to question, brevity is best
 - Provide suggestions or alternative approaches
 - Indicating agreement with others is preferred over copying the comments (e.g., “ABC agrees with XYZ’s comments...” or “ABC agrees with XYZ’s comments except for...”)
 - Provide proposed change and rationale
- Less effective feedback:
 - Repeating same comment multiple times
 - No reference to where suggested change should occur
 - Non-specific concerns (e.g., “This change is not needed.”)

- Please submit your questions via the chat window
 - This session is intended to help general understanding
 - Please reference slide number, standard section, etc.
 - Presenters will respond to as many questions as possible
 - Some questions may have to be deferred to the team
- Comments for the official record
 - Comments must be submitted via the project page during the open comment period (**ends Monday, June 30, 2013 at 8:00 p.m. ET**)
 - Webinar and chat comments are not a part of the official project record

- NERC Standard Developer, Scott Barfield-McGinnis
 - Email: scott.barfield@nerc.net
 - Telephone: 404-446-9689
 - To receive project announcements and updates
 - Request to be added to PSMSDT_Plus
- Timeline
 - PRC-004-3 ballot begins June 20, 2014
 - 45-day comment/ballot period – **ends June 30 – 8:00 p.m. Eastern**
- RSAW Posted
 - Comment period ends Monday, June 30 at 8:00 p.m. Eastern
- Webinar slides and recording will be posted to project page
 - See “Standards Bulletin” for link (should be next Monday)