

Minutes System Protection and Control Subcommittee

August 5, 2014 | 1 p.m. – 5 p.m. Central
August 6, 2014 | 8 a.m. – 5 p.m. Central
August 7, 2014 | 8 a.m. – 12 p.m. Central

Xcel Energy
414 Nicollet Mall - Conference Room 1B
Minneapolis, MN 55401

SPCS chair Phil Winston presided over the meeting. A list of attendees is attached as Exhibit A.

Introductions and Chair's Remarks

Phil Winston welcomed members to the meeting, noted the full agenda, and emphasized the need to remain on-task.

Host Arrangements and Safety

Mark Gutzmann reviewed safety, site, and meeting logistics.

NERC Antitrust Compliance Guidelines and Public Announcement (Tuesday: 1:15 – 1:20 p.m.)

Phil Tatro reviewed the NERC antitrust compliance guidelines and the NERC open meeting notice reminding participants that SPCS meetings are open meetings and that attendees and telephone participants may include members of the press and representatives of governmental authorities.

Agenda Items

1. Agenda

The SPCS adopted the agenda with minor modifications.

2. Meeting Minutes

Phil Tatro reported that draft minutes of the October 2013, February 2014, and May 2014 meetings have been distributed by email. SPCS members will review and provide comments to Phil by August 18. Phil will incorporate comments, resend final draft minutes, and provide one week for members to approve. If no comments are received, the minutes will be considered approved.

3. Review of PRC Standards Under Development

Al McMeekin and Phil Tatro provided an overview of the protection-related Reliability Standards under development.

PRC-001-2 and PRC-027-1, System Protection Coordination (Project 2007-06): NERC staff and the drafting team leadership are developing alternatives to address FERC staff concerns with the proposed standard PRC-027-1. The drafting team will reconvene once a path forward is identified.

PRC-004-3, Protection System Misoperation Identification and Correction (Project 2010-05.1): The standard was approved with 74.53 percent approval in an additional ballot that closed July 9. The standard is posted for final ballot through August 7.

PRC-005-3, Protection System and Automatic Reclosing Maintenance (Project 2007-17.2): The FERC Notice of Proposed Rulemaking (NOPR) recommended approval of the standard and requested input on three items. Comments are due September 29. NERC is developing comments and will discuss them with the trade groups. The three items are: (i) whether to direct NERC to collect data and make an informational filing assessing whether the applicability addresses all autoreclosing relays that could affect reliable operation of the bulk power system; (ii) whether the standard should include maintenance and testing of devices that supervise autoreclosing relays; and (iii) whether the specified period for data retention is necessary. Bill Edwards noted that the data retention has been addressed in PRC-005-X to address concerns raised by the Office of Management and Budget.

PRC-005-X; Protection System, Automatic Reclosing, and Sudden Pressure Relaying Maintenance (Project 2007-17.3): The standard was posted for a 45-day comment period through June 3 with an initial ballot during the last 10 days of the posting. The standard achieved 47.89 percent approval. The drafting team has subsequently removed the proposed requirement for Balancing Authorities to provide data on the generating unit with the highest capacity in a Balancing Authority Area, in response to stakeholder comments that this is an administrative task. The standard is now posted for a 45-day comment period through September 12 with an additional ballot to be conducted during the last 10 days of the posting.

PRC-006-2; Automatic Underfrequency Load Shedding (Project 2008-02): A sub-team of the UVLS drafting team, supplemented by additional members with UFLS expertise, has been appointed to address an open directive from FERC Order No. 763 which approved PRC-006-1. The Order directs NERC to make explicit the time period in which an entity must implement corrections after a deficiency is identified by a Planning Coordinator assessment. The project also will address Paragraph 81 and Independent Expert Review Panel (IERP) recommendations. A revised SAR was posted for comment through June 23. The revised standard will be posted later in August for a 45-day formal comment period with an initial ballot during the last 10 days of the posting

PRC-010-1; Undervoltage Load Shedding (Project 2008-02): The standard is posted for a 45-day comment period through August 8 with an initial ballot during the last 10 days of the posting. The proposed standard consolidates the four existing UVLS-related standards into one standard, addresses

issues raised in FERC Order No. 693 and the SPCS review of UVLS standards, and also addresses Paragraph 81 and IERP recommendations.

Standards Applicability for Dispersed Generation Resources (Project 2014-01): This project has been initiated in response to a stakeholder-submitted SAR to review applicability of NERC Reliability Standards to dispersed generation resources. The drafting team has posted a white paper to inform industry of proposed applicability changes and revised three high-priority standards. The high-priority standards include PRC-004 and PRC-005. Revisions to PRC-004-2.1a and PRC-004-3 are posted for a 45-day comment period through August 25 with initial ballots during the last 10 days of the posting. Revisions to PRC-005-2, PRC-005-3, and PRC-005-X were posted for a 45-day comment period through July 29 with initial ballots during the last 10 days of the posting. The standards achieved 91.38 percent, 92.20 percent, and 89.51 percent approval respectively. The drafting team is reviewing stakeholder comments.

Definition of Special Protection System (Project 2010-05.2): The revised definition was posted for a 45-day comment period through July 25 with an initial ballot during the last 10 days of the posting. The definition achieved 58.88 percent approval. The proposed definition is substantially the same as the straw-man definition developed by SPCS and SAMS. The drafting team is reviewing the stakeholder comments.

PRC-002-2; Disturbance Monitoring and Reporting Requirements (Project 2007-11): Lee Pedowicz, drafting team chair, joined the meeting to review industry concerns with PRC-002-2 and the drafting team's proposed revisions. Lee reviewed the proposed changes, requirement by requirement, and SPCS members provided feedback. The drafting team is meeting the last week of August and plans to post by September 4 for a 45-day comment period with an additional ballot during the last 10 days of the posting.

4. **Unit Auxiliary Transformer (UAT) Protection**

Phil Tatro reviewed the presentation made to the Planning Committee (PC) in June and the assignment to assess whether a reliability gap exists by excluding UAT low-side relays from PRC-025-1. Phil noted the PC requested a status report and schedule in September, would like the SPCS to coordinate with the North American Generator Forum (NAGF), and requested that SPCS prepare a draft report without recommendations for discussion with the PC. Phil Winston indicated he will discuss the assignment with Bill Schultz from Southern Company, who is active with the NAGF.

Therron Wingard and Rich Quest indicated they have not observed a UAT relay operate on load, only for low-side breaker failure conditions. Therron discussed typical margins in settings for relays applied on motors, the UAT low-side, and the UAT high-side and discussed the coordination from the motor up to the UAT. He also noted that generating plant equipment is not overloaded due to the lack of

through flow, relatively fixed load, and loss-of-life associated with operating equipment overloaded; e.g., motor life reduced 50 percent for a 10°F rise above rated temperature.

Phil Winston inquired whether industry guides exist for protection of plant equipment. Rich Quest indicated only for motor protection – beyond that, it just a matter of stacking the protection settings to provide coordinated settings. Therron Wingard confirmed that universally-applied guides do not exist.

SPCS members discussed the 50 percent margin above UAT nameplate rating or measured load current at full generator output. The margin addresses the effect on load current during a depressed transmission voltage event plus 15 percent margin. Members observed this setting would cover a 30 percent increase in load current during depressed transmission system voltage which, upon initial consideration, may be overly conservative.

The SPCS developed an outline for the report and assigned members to develop first drafts of each section for consideration at the October meeting.

1. General description of the systems on the low side of the UAT: Therron Wingard will develop a draft; Rich Quest and Jonathan Sykes will serve as the review team.
2. General description of coordination involved, starting from individual loads and stacking up through the UAT low-side and high-side relays: Jonathan Sykes will develop a draft; Therron Wingard will review.
3. Discussion of the current expected during a voltage depression on the transmission system: Phil Winston will develop a draft in consultation with David Youngblood and NAGF.

Phil Tatro will send a copy of the standard drafting team report to the SPCS for reference. The SPCS will develop a schedule at the October meeting, tentatively planning on presenting to the PC in March or June of 2015.

5. **PRC-026-1; Protection System Response to Power Swings**

The SPCS met with the Project 2010-13.3 standard drafting team to discuss development of PRC-026-1. Drafting team chair, Bill Middaugh, noted the drafting team is developing the standard based on the SPCS report, *Protection System Response to Power Swings*. Bill noted the most common concerns the drafting team has encountered are: whether the standard is required, the requirement to assess applicability retrospectively based on events back to 2003, and inclusion of elements based on unstable swings. Bill also reviewed changes to the standard, focusing on comments received from SPCS and SAMS during the July 28 webinar.

Bill noted restructuring of Requirement R4, changes to requirements for a Corrective Action Plan (CAP), and revisions to Attachment 1 to provide lists of included and excluded relays similar to PRC-

023. Jonathan Sykes inquired regarding the selection of 15 cycles as a threshold for applicability and whether a stable swing could remain in a zone 2 relay characteristic for 15 cycles, particularly on a long transmission line. Kevin Jones, drafting team member, explained the rationale and the desire to exclude high-speed protection while including typical zone 2 protection, which would have a minimum time delay of 15 cycles. The drafting team considers this time threshold to be an acceptable threshold above which operation on a stable swing is unlikely to occur.

6. Order No. 754 Data Request

Phil Tatro reviewed the presentation made to the PC in June which focused on the SPCS and SAMS work-to-date, remaining work, and schedule. The SPCS discussed a number of issues to be included in the report.

As noted previously by the SPCS, the data suggests the exposure to single points of failure is broader than the specific list of devices in TPL-001-4, which only considers protective relays, lockout relays, and auxiliary tripping relays. The report will discuss the differences between TPL-001-4 and the interpretation of TPL-003a and TPL-004-0 requested by SPCS following the FERC technical conference. While the data demonstrates exposure for other protection system components, especially below 400 kV, SPCS will supplement the data with misoperation data to present a risk-based assessment of the appropriate protection system components for consideration.

The SPCS also discussed and agreed based on observations from Order No. 754, the FERC technical conference, and the data request, that the concern is with how protection system single points of failure are considered in planning assessments. Thus, SPCS is firm in its position that a standard mandating protection system redundancy for bulk power system elements is not necessary, nor is it an appropriate method for addressing the concern.

The report will present a menu of alternatives for addressing the concern. The final recommendations could be one or more items from the menu, including revisions to NERC Reliability Standards (e.g., TPL-001), a Reliability Guideline, or an Industry Alert. The PC supported the proposed schedule to present a draft report in September, and a final report for approval in December, with the understanding that the data for buses operated between 100 kV and 200 kV will not be in the September version of the report. SPCS will add analysis of this data and address any PC comments during the fourth quarter for inclusion in the final report.

7. Additional Input on Order No. 758 for Project 2007-17.3

SPCS members reviewed and discussed the draft report and made minor revisions during the discussion. Syed Ahmad informed the SPCS of an AIEE paper by ConEd referencing a device in service since 1942, which may be relevant to the discussion.

SPCS members reviewed each event documented in the report. David Greene provided information on the first event. SERC issued a reliability bulletin documenting the lesson learned.

George Wegh provided information on the second event which resulted in a station service supply interruption that occurred when a 480 V breaker was racked out for maintenance. When the breaker was racked out, a station service throw-over scheme operated which resulted in another 480 V breaker tripping on overload and interrupting the supply to heaters in 345 kV circuit breakers.

Tom Bradish inquired whether the SPCS has researched a January 2014 event that affected the tie lines between Ontario and New York. George Wegh provided information on the event in which cold weather caused breakers to open on low air pressure due to a rapid drop in ambient temperature. The SPCS concluded that, in both events, the pressure switches operated as designed to trip the affected breakers.

Phil Tatro will revise the report based on the direction provided during the discussion and send to the SPCS for final review.

8. Power Plant and Transmission System Protection Coordination

SPCS members reviewed stakeholder comments from the public posting. Given the number of comments received, and because the SPCS is waiting for comments from one of the PC reviewers, the SPCS concluded it will not be possible to present a final draft at the September PC meeting. Phil Tatro will coordinate a conference call of the sub-team to review the comments and develop draft responses and proposed revisions to the document. Mark Gutzmann and Al McMeekin offered to join the sub-team. Forrest Brock offered to perform a final review of the document when the revisions are complete.

9. SW Outage Recommendation 21: Acceleration Control Function

SPCS members reported on their findings. Phil Winston reported the device is, as expected, a mechanical device that is not settable. Mark Gutzmann reported the device is not used on the two nuclear units or any other units he investigated. Phil Tatro reported that the WECC website indicates a WECC group is assigned to address this recommendation from the joint FERC-NERC inquiry. Phil will see what information may be available from WECC and also will try to contact the NRC member of the joint inquiry protection review team.

10. Protection System Misoperation

Phil Tatro presented an overview of the Section 1600 Request for Data or Information on protection system misoperations. NERC staff has completed responses to stakeholder comments and revised the data request for approval by the NERC Board of Trustees on August 14.

The most significant change to the data request is to revert back to collecting corrective action plans. This minimizes differences between the existing reporting under PRC-004-2.1a and future reporting under the data request, and also supports work of the Regions in reviewing misoperations. Section 1600 does not restrict how NERC or the Regions use the data collected; however, NERC intends to use the data collected through the data request in the same manner it has used the data collected under PRC-004-2.1a. The data will be used to support bulk power system reliability through development of metrics, identification of trends, and identification of remediation techniques to reduce the rate of occurrence and severity of misoperations.

The other significant concern raised by stakeholders is the burden of reporting misoperations at the individual resource level at dispersed power producing resource sites (e.g., wind farms). NERC has taken the position that reporting under the data request will be consistent with applicability of PRC-004. The Project 2014-01 drafting team is addressing the applicability for dispersed power producing resources.

The SPCS noted that previous revisions to the reporting template associated with the Protection System Misoperation Task Force (PSMTF) recommendations have not been implemented. It will be necessary to roll out the revised template in the next two months for implementation in the first quarter of 2015. Phil Tatro will discuss the template modifications and schedule for roll out with the NERC Director of Performance Analysis.

11. Future Meeting Schedule

- October 21-23, 2014, PG&E office, San Francisco, CA – Tuesday, full-day; Wednesday, full-day; Thursday, half-day.
- February 3-5, 2015, NextEra office, Juno Beach, FL – Tuesday, full-day; Wednesday, full-day; Thursday, half-day (starting and ending time tentative pending SPCS work assignments).

Attendees
System Protection and Control Subcommittee Meeting
August 5-7, 2014

SPCS Officers

Chairman Philip Winston, Southern Company
Vice Chairman Rich Quest, MRO
NERC Staff Coordinator, Philip Tatro

Voting SPCS Members

Cooperative – Forrest Brock, WFEC
Investor Owned Utility – Mike McDonald, Ameren (by phone, 8/5)
Investor Owned Utility – Jonathan Sykes, PG&E)
Federal/Prov. Utility – Joe Uchiyama, USBR
RRO-ERCOT – Sam Francis, Oncor (by phone)
RRO-ERCOT – David Penney, TRE (A) (by phone)
RRO-FRCC – Mike Putt, Next Era (by phone, 8/7)
RRO-MRO – Mark Gutzmann, Xcel Energy
RRO-NPCC – George Wegh, Northeast Utilities
RRO-NPCC – Quoc Le, NPCC (A)
RRO-RFC – Jeff Iler, AEP
RRO-SERC – Robert T. Wingard, Southern Company
RRO-SPP – Lynn Schroeder, Westar Energy (by phone)
(A) = Alternate
(P) = Proxy

Guests

Syed Ahmad, FERC (by phone, 8/6-7)
Tom Bradish, FERC (by phone)
Matthew Luther, NRG
Norris Henderson, FERC
Matthew Tackett, (8/6)
Juan Villar, FERC (by phone)

NERC Staff

William Edwards (by phone, 8/6-7)
Michael Gildea (by phone, 8/6)
Al McMeekin

Project 2010-13.3 SDT (joint discussion, 8/6)

Bill Middaugh, chair, Tri-State G&T Assoc., Inc.
Kevin Jones, vice chair, Xcel Energy
David Barber, First Energy
Ding Lin, Manitoba Hydro
Fabio Rodriguez, Duke Energy-Florida
John Schmall, ERCOT
David Youngblood, representing Luminant
Scott Barfield, NERC
Ken Hubona, FERC (Observer)