

## Minutes System Protection and Control Subcommittee

October 21, 2014 | 8 a.m. – 5 p.m. Pacific  
October 22, 2014 | 8 a.m. – 5 p.m. Pacific  
October 23, 2014 | 8 a.m. – 12 p.m. Pacific

Pacific Gas & Electric  
77 Beale St, Conference Room 301-302  
San Francisco, CA

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 and guests to the meeting.

Phil Winston acknowledged the significant contributions by Bill Miller during his term as chair of the SPCS and presented Bill with a Resolution of Appreciation from the SPCS in recognition of his invaluable contributions during his chairmanship of the SPCS from June 2012 through June 2014; honoring his dedicated service, leadership, and unwavering devotion to the standards of professional excellence and the principles of electric service reliability; and expressing their sincere thanks and deep appreciation for his assiduous dedication, sound advice, and wise counsel.

Phil Tatro announced this would be his last meeting as the SPCS coordinator, as he would be leaving NERC to accept a position at Energy Initiatives Group. Phil Winston and SPCS members thanked Phil for his efforts on behalf of the subcommittee.

### **Host Arrangements and Safety**

Jonathan Sykes reviewed safety, site, and meeting logistics.

### **NERC Antitrust Compliance Guidelines and Public Announcement**

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 as presented.

## 2. Meeting Minutes

Phil Tatro reported that minutes of the October 2013, February 2014, and May 2014 meetings have been approved by email as discussed at the August 2014 meeting. Minutes for the August 2014 meeting were not available and will be distributed subsequent to this meeting.

## 3. 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. Modifications included:

- Added a footnote referencing the transition from Category B contingencies under TPL-002-0b to P2 Planning Events under TPL-001-4.
- Revised the statement at the end of the *Background* section to eliminate reference to compliance and replace it with a reference to the applicability of PRC-005; i.e., whether these devices (turbine generator vibration monitors and circuit breaker arc extinguishing systems ) should be included in the applicability of PRC-005.
- Added a discussion that if a pressure switch failure results in tripping a breaker, an element may be removed from service or one terminal of a transmission line or transformer may be opened; however, for many bus configurations, the only impact will be opening a circuit breaker with no effect on transmission system power flow.

Phil Tatro will revise the report based on the direction provided at the meeting and send to the SPCS for final review. The report will be sent to the drafting team by the end of the October.

## 4. Power Plant and Transmission System Protection Coordination

SPCS members reviewed sub-team revisions to the report and the Consideration of Comments document, and discussed the comments remaining to be addressed. The Consideration of Comments document includes a list of action items in the form of highlighted issues that require resolution. The open issues include:

- Consistent and appropriate use of the terms “must” and “required” – the document is a Reliability Guideline and should not imply that entities are required to follow the guidance in the document.
- A review of the document to assure that the summary tables are consistent with changes made to the text in the document.
- Revisions to figures in the document to correct spelling and other minor errors.
- Consistent and appropriate use of Planning Coordinator versus Transmission Planner and Planning Reliability function versus Transmission Planning function.

- Review of the equations in Appendix E and revision or clarification, if deemed necessary.
- Review of the generator stator ground protection section to provide clarity regarding applicability to various winding configurations on generator step-up transformers.

#### 5. Order No. 754 Data Request

SPCS members reviewed and discussed the draft report. Phil Tatro provided caution on use of the draft report – specifically, that the report at this time is a collection of ideas under consideration and is not ready for distribution outside the SPCS and System Analysis and Modeling Subcommittee (SAMS).

Rich Quest discussed analysis of protection system misoperation data as it pertains to single point of failure events. Rich has reviewed 19 misoperations involving communication system failures and 15 misoperations involving ac inputs. Of the 19 communication system failures, nine were related to one piece of equipment misoperating over a three-month period, three were excessive trips, three were associated with relay failures not involving the communication system, one was failure of a pilot wire system, and three were bona fide failures of direct transfer trip systems. Of the 15 ac input failures, five were related to problems in polarizing circuits of electro-mechanical directional ground relays, two were repeated failures to trip on a 69 kV line, one was due to vandalism damaging redundant CTs, and two were bona fide failures. This analysis highlights the limited ability to draw conclusions from the raw misoperation data and the need for thorough review prior to drawing conclusions from the data. SPCS members discussed that to provide a consistent basis for interpretation of the misoperation data, it would be valuable to have similar analysis for the other misoperation cause codes. Rich will target November 15 for analysis of the other misoperation cause codes.

Mark Gutzmann presented information on an unavailability data approach to evaluating the potential impact of protection system single points of failure. The approach could be used to bracket analysis to allow comparison of impacts for different protection system components. For example, if we reach agreement that protective relay failures should be addressed, the relative unavailability of other protection system components could be used to determine that other components with similar or lower availability should also be addressed, and protection system components with significantly better availability should be excluded. SPCS members discussed the merits of having an analytical approach, but expressed concern with the ability to justify the underlying data needed to implement such an approach.

SPCS members reviewed the data from the Section 1600 data request. Members agreed that the data for buses operated at 100-200 kV is consistent with the higher voltages and does not warrant any different conclusions or exceptions for this voltage class. Members expressed concern with the dc control circuit data reported for buses operated at 400-600 kV and whether the higher incidence of single points of failure reflects actual protection system designs or could be a misreporting of data.

Phil Winston reported that one entity in SERC has a legacy design in this voltage class with one dc control circuit from the control building to the yard.

SPCS members agreed that the raw data should be included as an appendix to the report.

## 6. Protection System Misoperations

SPCS members discussed the role of the SPCS in reviewing regional misoperation data and providing input to NERC Performance Analysis and drafting team efforts. SPCS members repeated concerns with use of the protection system misoperation data as highlighted, for example, by the analysis Rich Quest performed on the Order No. 754 data. SPCS members also noted concerns with consistent reporting among Regions and entities within Regions. SPCS members believe it is imperative to convey these concerns to NERC Performance Analysis. Rich Quest noted that he would be meeting with Howard Gugel and would convey the SPCS concerns. Tom Bradish noted that decisions are being made based on the data and therefore, we must have confidence in the data.

## 7. 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): Al reviewed the PRC-027 strawman standard that was posted for comment. SPCS members asked questions based on a perceived fill-in-the-blank nature of Requirement R1. Al discussed how the NERC Reliability Assurance Initiative (RAI) and use of Reliability Standard Audit Worksheets (RSAW) would provide guidance to clarify the requirement. Al indicated the drafting will discuss the concern.

PRC-002-2; Disturbance Monitoring and Reporting Requirements (Project 2007-11): The 45-day posting and additional ballot closed on October 22. The standard achieved 71.38 percent approval. The drafting team will review stakeholder comments and expects to move the standard to final ballot.

PRC-004-3, Protection System Misoperation Identification and Correction (Project 2010-05.1): The NERC Board of Trustees adopted the proposed standard on August 14 and NERC filed a petition for FERC approval on September 15.

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: (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.

NERC and stakeholders have filed comments on the NOPR. FERC staff indicated they may request a meeting to discuss the NERC comments.

PRC-005-4; Protection System, Automatic Reclosing, and Sudden Pressure Relaying Maintenance (Project 2007-17.3): The standard was posted for a 45-day comment period and additional ballot through September 12. The standard achieved 76.03 percent approval. The standard is posted for a final ballot through October 29.

PRC-006-2; Automatic Underfrequency Load Shedding (Project 2008-02): The standard was posted for a 45-day comment period and initial ballot through October 8. The standard achieved 84.05 percent approval. The standard is posted for a final ballot through October 31.

PRC-010-1; Undervoltage Load Shedding (Project 2008-02): The standard achieved 80.69 percent approval in a final ballot that closed on September 18. The standard will be presented for adoption by the NERC Board of Trustees at their November meeting.

PRC-026-1; Protection System Response to Power Swings (Project 2010-13.3): The standard was posted for a 45-day comment period and additional ballot through October 6. The standard achieved 53.02 percent approval. The Standards Committee approved process deviations to allow the drafting team to meet the schedule filed with FERC. The standard will be posted for a 21-day comment period with a 10-day additional ballot during the last 10 days of the posting.

Standards Applicability for Dispersed Generation Resources (Project 2014-01): Revisions to PRC-004 to address dispersed generation resources are progressing through balloting. PRC-004-2.1(X) achieved 94.75 percent approval and PRC-004-4 achieved 93.98 percent approval in additional ballots that closed on October 22. The drafting team will consider stakeholder comments and, if needed, make revisions to the standard and post it for an additional ballot. If the comments do not show the need for significant revisions, the standard will proceed to a final ballot.

Definition of Special Protection System (Project 2010-05.2): The revised definition of Remedial Action Scheme (RAS) was posted for a 45-day comment period and additional ballot through October 14. The definition achieved 75.79 percent approval. The drafting team will review stakeholder comments and expects to move the standard to final ballot.

## 8. Unit Auxiliary Transformer (UAT) Protection

Therron Wingard reviewed the sub-team progress on the draft report. SPCS members discussed the draft report and developed a plan for completion. The sub-team will incorporate information from the drafting team analysis to provide a comparison of the maximum load currents developed by the drafting team with the representative protective relay settings under development by the SPCS. Members inquired whether the calculations and setting information developed by the sub-team are

representative of industry practice. Therron believes that the information may be more conservative if it is not representative. The information has been reviewed by PG&E and Salt River Project staff. SPCS members will circulate the information among colleagues to obtain additional input. Phil Tatro agreed to ask NERC administrative staff to convert the report into NERC report template format. Jonathan Sykes and Forrest Brock agreed to edit the report and develop a next draft for SPCS review in mid-November.

#### **9. Future Meeting Schedule**

- 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).
- April 7-9 or 21-23, 2015, Oncor Electric Delivery, Ft. Worth, TX – Phil Winston will send a poll to SPCS members to determine which dates are preferred. The length of the meeting will be determined based on SPCS work load.

**Attendees**  
**System Protection and Control Subcommittee Meeting**  
**October 21-23, 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 – Jonathan Sykes, PG&E  
Federal/Prov. Utility – Joe Uchiyama, USBR  
[REDACTED] - Bill Miller, Exelon  
RRO-ERCOT – Sam Francis, Oncor (by phone)  
RRO-ERCOT – David Penney, TRE (A)  
RRO-FRCC – Mike Putt, Next Era  
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 (by phone)  
RRO-SERC – David Greene, SERC (A)  
RRO-SPP – Lynn Schroeder, Westar Energy  
RRO-WECC – Baj Agrawal, APS (10/21-22)  
(A) = Alternate  
(P) = Proxy

**Guests**

Syed Ahmad, FERC (by phone, 10/22-23)  
Tom Bradish, FERC (by phone)  
Bryan Gwyn, Quanta Technology (10/22-23)  
Ken Hubona, FERC (by phone, 10/22)  
Michael Gildea (by phone, 10/22)  
Sandeep Sandanadan, FERC (by phone)  
Hari Singh (by phone, 10/23)  
Juan Villar, FERC (by phone, 10/22-23)

**NERC Staff**

Al McMeekin