NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Meeting Notes

Project 2010-13.3 – Relay Loadability: Stable Power Swings Standard Drafting Team

February 27, 2014
3:00-5:00 p.m. Eastern

Conference Call

Administrative

1. Introductions and chair remarks

The meeting was brought to order by Bill Middaugh, chair, at 3:00 p.m. Eastern Thursday, February 27, 2014. He thanked everyone for joining and noted that Mr. Barfield would be providing background on the project which will form the basis for the standard's development. Those in attendance were:

Name	Company	Member/ Observer
Bill Middaugh, P.E.	Tri-State Generation & Transmission Association, Inc.	Chair
Kevin W. Jones, P.E.	Xcel Energy, Inc.	Vice Chair
David Barber, P.E.	FirstEnergy	Member
Steven Black	Southern Company Services	Member
Ding Lin	Manitoba Hydro	Member
Slobodan Pajic	General Electric Energy	Member
Fabio Rodriquez	Duke Energy - Florida	Member
John Schmall	Electric Reliability Council of Texas (ERCOT)	Member
Matthew H. Tackett, P.E.	Midcontinent Independent System Operator (MISO)	Member
Ken Hubona	Federal Energy Regulatory Commission (FERC)	Observer
Scott Barfield-McGinnis (Standard Developer)	North American Electric Reliability Corporation (NERC)	Observer

Name	Company	Member/ Observer
Michael Gildea (Reliability Standards Advisor)	North American Electric Reliability Corporation	Observer
Al McMeekin (Standards Developer)	North American Electric Reliability Corporation	Observer
Eric Loiselle	Hydro Québec	Observer
Si Truc Phan	Hydro Québec	Observer
Katie Schnider	Schweitzer Engineering Laboratories, Inc.	Observer
Sudhir Thakur	Exelon Generation	Observer
Phil Winston	Southern Company	Observer
David Youngblood	Consultant (Luminant Energy)	Observer

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2. Determination of quorum

The rule for NERC Standard Drafting Team (SDT or team) states that a quorum requires two-thirds of the voting members of the SDT. Quorum was achieved as all nine members were present.

3. NERC Antitrust Compliance Guidelines and Public Announcements[1]

NERC Antitrust Compliance Guidelines and public disclaimer were reviewed by Mr. Barfield. There were no questions. Mr. Barfield also referred everyone to the two new NERC policies and demonstrated where to find them on the NERC website. The policies are related to use of the email listserv and standard drafting team meeting conduct.

4. Review team roster

Mr. Barfield noted that the roster posted on the NERC project page is the initial roster approved by the Standards Committee.

5. Review meeting agenda and objectives

Mr. Barfield reviewed the meeting agenda and objectives.

[1] See attached.

Agenda

6. SAR

Mr. Barfield presented a summary of the Standards Authorization Request (SAR). The summary included the relevant paragraphs and a summary of the key points which the team should focus their attention in developing the standard's applicability and requirements.

7. Order Nos. 733, 733-A, and 733-B

Mr. Barfield presented a summary of the FERC Order No. 733. The summary included the relevant paragraphs concerning power swings and a summary of the key points which the team should focus. He noted that he was unable to complete summaries for the Order Nos. 733-A and 733-B and would develop those over the next few days and distribute the document to the team. As a side note, the subsequent A and B orders primarily reaffirm the Commission's original Order.

8. SPCS Report[2]

Mr. Middaugh directed the next topic to the SPCS report, chapter 3 discussing the subcommittee's recommended approach to a standard. Mr. Youngblood asked about the first bullet (Lines terminating…) on page 21 of 61 as to whether or not the SPCS's intent was to include all generation or only those plants with where a generating plant stability constraint is addressed by an operating limit or Special Protection System (SPS) (including line - out conditions). The team was uncertain.

Mr. Middaugh noted that the team would be responsible for determining what entities and which facilities would be applicable to the proposed standard (PRC-026-1 – Relay Loadability: Stable Power Swings). Mr. Middaugh asked what the team thought about the role of the Reliability Coordinator (RC) in the applicability of the proposed standard as the SPCS suggests. Mr. Tackett noted that the RC would need to be involved from an operational point of view and wide-area view. He further noted that it seems that there are two approaches to the problem. First, a stability study approach to determine where the electrical center will occur. Second, a relay approach to determine what relays are susceptible, such as long lines.

Mr. Schmall noted that the SPCS report seems to be more transmission focused rather than generator protection focused. Coordination between transmission and generation appears to be an important factor in that he theorizes that it would be more desirable for generator out-of-step (OOS) relays to trip before impedance transmission relays would trip. Obviously, it is more desirable for a generator to ride through a stable power swing, but there is a point at which secure tripping is needed for an unstable swing.

Mr. Middaugh moved the discussion back to the applicability concerning the RC. Mr. Jones responded that the function with the largest awareness should be applicable. For example, the team would need to determine if that is the Planning Coordinator (PC) or Transmission Planner (TP) or if both should be considered. He theorizes that the RC is going to have a good macro view with

[2] NERC System Protection and Control Subcommittee technical report, Protection System Response to Power Swings, August 2013. (http://www.nerc.com/comm/PC/System%20Protection%20and%20Control%20Subcommittee%20SPCS%2020/SPCS%20Power%20Swing%20Report_Final_20131015.pdf)

inter-regional flows; however, they may not have adequate granularity to make the necessary assessments concerning power swings. PC or TP would have more knowledge of regional issues.

Mr. Tackett noted that at MISO the RC function has more of an operating horizon role and the TP has more of the planning horizon role. The RC is only going to look one year out; whereas, the TP will look beyond one year. The distinction is not the wide-area view, it's the study projection or period. Mr. Middaugh noted that the Western Electric Coordinating Council (WECC) RC is somewhat different than the MISO RC. At WECC the RC has the wide-area view and there are multiple PCs that do the local planning. Mr. Jones noted that there may be some regional differences to consider based on how planning is coordinated. He also asked about the Distribution Provider (DP) being applicable to the standard. Mr. Middaugh noted that some other standards included the DP where the entity connects generation to the system. One concern is adding additional entities would impact approval. Mr. Winston pointed out there are situations where the DP owns transmission facilities. This is one of those registration issues where the DP should be registered as a Transmission Owner (TO). Mr. Winston speculated that an effort is underway to address this at NERC. Mr. Barfield noted that just because the DP is identified in the SAR, does not necessarily mean the function must be in the standards. The team needs to be able to justify why or why not. As the team goes forward, it may be important to investigate various areas to see if this is relevant.

Mr. Tackett referring back to applicability on whether this applies to generation or transmission, he believes the focus is on relays installed for detecting faults and are sensing power swings is what the Commission is concerned about. Mr. Black agreed that the Order was directing to address fault detecting relays that may operate for stable power swings.

Mr. Thakur noted that if the power swing goes through the generation step-up (GSU) transformer or generator unit they will need to consider OOS protection. Exelon's plant engineers look at both stable and unstable power swings provided by the TP and considers the appropriate protection. Mr. Youngblood agrees with Mr. Thakur and notes that he believes the goal is to avoid the operating of generation relays during a stable power swing. Mr. Jones agrees with this application and notes that it is the use of distance relays (#21) that are susceptible to tripping for a stable power swings. Use of these susceptible relays (distance) at generation plants is evident by their inclusion in PRC-025-1 – Relay Loadability: Generation.

Mr. Youngblood notes that PRC-025-1 is for steady state loading and the proposed new standard PRC-026-1 would address stable power swings. Mr. Barfield echoed that conclusion is correct and noted that two previous PRC-025-1 members, Mr. Thakur and Mr. Youngblood were observers on the call. Mr. Tackett concurred those relays are used on both the generating unit and GSU transformer. Mr. Middaugh agreed and noted that any impedance based protection can be impacted by power swing issues. He also noted that the SPCS thought the PC, RC, and TP are better suited to know of stable power swings concerns. Additionally, the team needs to be conscientious about the unintended consequence of not tripping for an unstable power swing.

Mr. Middaugh encouraged the team to consider what functions should be included in terms of replacing or updating relays and the approach to avoid including all the facilities. Mr. Schmall questioned when the standard should apply. Should the standard apply to real-time operations, or planning, such as, N-1 and N-2? What conditions, to what extent? Mr. Lin believed the SPCS report

intent is to focus the approach toward specific criteria and he recommended following the SPCS report suggestions. Also, at minimum, the decision needs to be between the RC and PC to determine the areas that are in scope.

Mr. Jones noted that also having the TP included is a good thing. The Southwestern Public Service (SPS) is the PC for ERCOT, but he does not believe on their own that they have the necessary knowledge of the system regarding power swings. Mr. Tackett agreed that the PC should also be engaged and thought the GO and TO should be communicating with the appropriate planners. Mr. Middaugh, in contrast, notes that the asset owners would be waiting be notified of where stable power swings occur in the system so that they can address relay capability more so than the asset owners providing input to the planners. Mr. Lin echoed that the planners must identify the circuits first.

Mr. Tackett noted that somehow the standard should have the PC and TP work together to determine the stable power swing areas. Mr. Jones noted that earlier material raised consideration of islanding; therefore, the PC and TP will have to be involved in that determination. Mr. Tackett had the same thought along the lines in that should the standard consider the case where relays should not operate for either stable or unstable power swings because it is not the best place to separate the system. The other problem is that there may be relays in the appropriate place, but cannot detect the stable or unstable swing. Mr. Middaugh noted that the standard does not necessarily have to initiate tripping at the actual boundary upon detection of unstable power swings. He further noted that Tri-State has locations where the detection of a swing initiates transfer trip to another line in response to the swing.

Mr. Middaugh asked about next steps and potential outreach. Mr. Barfield noted that both Mr. Pajic and Mr. Rodriquez were involved with developing the SPCS Report. Also that Mr. Schmall and Mr. Tackett represent entities which are RC functions.

Mr. Barfield noted that the key point is to answer the directive which is to develop a Reliability Standard that requires use of protective relay systems that can differentiate between faults and stable power swings, and phase out protective relays that cannot meet this requirement. Another thought is to not only consider what is included, but also any exclusion of facilities. For example, the SPCS's list of things to consider could form the criteria for which a PC or TP would base their assessment within a Requirement. The team discussed the DP earlier, this would comport with the risked-based approach. Depending on the outcome of future team investigation, the DP could end up becoming a very low risk entity and not warrant inclusion; however, that was caveated with team having to consider future implications should the conditions change on which the basis of exclusion (i.e., not being applicable) was made, for example, a change in a definition.

9. Review of the schedule

Mr. Barfield noted that the standard has a deadline of December 31, 2014 and presents a significant challenge in achieving the goal for filing an industry approved and NERC Board of Trustees (BOT) adopted standard. The timeline allows for two 45-day ballot periods and requires a delivery to the November BOT meeting. He presented the Gantt chart of the schedule to illustrate the compressed timeline.

In looking at the near term schedule, Mr. Barfield noted that he desires to have the team meet twice each week over the next two weeks and has issued a poll for next week. The third week is open due to running another meeting that also includes Mr. Middaugh. He further recommends that if the team has a good straw man for industry discussion by March 14, to hold an industry webinar the fourth week of March, possibly Tuesday, March 25. The webinar will provide industry an opportunity to provide informal broad-based feedback prior to the in-person team meeting on March 31. Anywhere outreach can occur, especially in identifying regional differences will be good.

10. Action items or assignments

All team members

1. Question, how do the RC, PC, and TP relate to identifying facilities susceptible to power swings?
2. Consider whether the DP should be considered within scope. Why or why not. Team members should poll others in their areas for feedback once more information is known on the direction of the standard.
3. Add a placeholder to the second and third week of June for a potential in-person meeting following the first comment and ballot period.
4. Think about the RC, PC, and TP's roles in identifying the facilities, coordinating/communicating information, and the relevance of time horizons.
5. Review the Needs, Goals, and Objectives (NGO) that Mr. Barfield will send following the meeting. Use the NGO to spark thought and to provide a clear path to focus the team's work.

Mr. Barfield

1. Add additional notes to 733-A and 733-B and forward to the team and FERC observers.
2. Issue the meeting dates/times for next week.

Mr. Schmall – being from ERCOT which is also an RC entity if he could reach out to his colleagues for input on the RC's role in power swings. How would "Applicability" work based on the SPCS Report recommendation?

Mr. Tackett – being from MISO which is also an RC entity if he could reach out to his colleagues for input on the RC's role in power swings. How would "Applicability" work based on the SPCS Report recommendation?

Mr. Black - being from Southern Company which is not an RC entity, but if he could reach out to Southern's RC for input on its role in power swings. How would "Applicability" work based on the SPCS Report recommendation?

11. Next steps

As time permits, go back and re-read the SPCS report since it will be the foundation of the standard. If any team members come across a document of value, provide it to Mr. Barfield for inclusion on the team information sheet.

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12. Future meeting(s)

To be determine based on the poll currently being circulated.

13. Adjourn

The conference call adjourned at 4:59 p.m. ET on February 27, 2014.

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