

Meeting Notes

Project 2010-13.2 Phase 2 of Relay Loadability: Generation Standard Drafting Team

June 3-6, 2013

In-person meeting with ReadyTalk Web Access
Denver Federal Center
U.S. Bureau of Reclamation
Denver, Colorado

Administrative

1. Introductions

The meeting was brought to order by Charles Rogers, chair, at 1:20 p.m. MT, Monday June 3, 2013. Mr. Uchiyama hosted the meeting for the team. Mr. Rogers noted the standard was passed by the industry during the successive ballot. Those in attendance were:

Name	Company	Member/ Observer	In-person (IP) or Conference Call/Web (W)			
			6/3	6/4	6/5	6/6
Charles Rogers (Chair)	Consumers Electric	Member	IP	IP	IP	IP
Jeff Billo	ERCOT	Member	IP	IP	IP	IP
S. Bryan Burch, P.E.	Southern Company	Member	IP	IP	IP	IP
Steven Hataway	Florida Power and Light Company	Member	W	W	W	W
Jonathan Hayes	Southwest Power Pool	Member	-	-	-	W
Mike Jensen	Pacific Gas and Electric Company	Member	IP	IP	IP	IP
Sudhir Thakur	Exelon Generation	Member	IP	IP	IP	IP
Joe T. Uchiyama	U.S. Bureau of Reclamation	Member	IP	IP	IP	IP

Name	Company	Member/ Observer	In-person (IP) or Conference Call/Web (W)			
			6/3	6/4	6/5	6/6
Benson Vuong	Salt River Project	Member	IP	IP	IP	IP
David Youngblood	Luminant	Member	IP	IP	IP	IP
Syed Ahmad	Federal Energy Regulatory Commission	Observer	W	W	W	W
Scott Barfield- McGinnis (Standard Developer)	North American Electric Reliability Corporation	Observer	IP	IP	IP	IP
Stephen Eldridge (Standard Developer)	North American Electric Reliability Corporation	Observer	IP	IP	IP	IP
Phil Tatro (Technical Advisor)	North American Electric Reliability Corporation	Observer	IP	IP	IP	IP
Rob Delsman	Entergy	Observer	-	W	W	-
Amy Hanson	Oglethorpe Power Corporation	Observer	-	-	-	W
Cesar Rincon	Entergy	Observer	-	-	W	W
Kelly Simmons	Xcel Energy	Observer	IP	IP	IP	IP

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 on the first day as nine of the ten members were present. On day two, quorum was achieved as nine of the ten members were present. Quorum was achieved on the third day as nine of the ten members were present. On day four, quorum was achieved as ten of the ten members were present.

3. NERC Antitrust Compliance Guidelines and Public Announcement

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. Each subsequent day of the meeting Mr. Rogers reminded in-person attendees and audio participants that the NERC Antitrust Compliance Guidelines, public disclaimer, and policies remain in effect.

4. Review Roster

Mr. Barfield noted that a request was made to the Standard's Committee to accept member Xiaodong Sun's resignation effective April 30, 2013. Once accepted, Mr. Barfield stated he would update and repost the revised team roster. Mr. Rogers noted that NERC staff should consider the need to have Canadian representation on the team. Mr. Barfield took an action item and noted a request would be made following the meeting to seek another representative so that a potential new member would be selected in time for the next meeting.

5. Review meeting agenda and objectives

The agenda and objectives were reviewed by Mr. Rogers. Discussion was held about the next steps of the standard depending on what changes may occur. Mr. Barfield noted that the standard remains within the window where it could proceed to recirculation, advance to the NERC Board of Trustees for adoption in August, and meet the September 30, 2013 FERC filing deadline. Mr. Barfield noted that the team will need to identify what items may warrant the standard going to a second successive ballot. A synopsis of what type of changes would require the standard to go to successive ballot such as adding new entities to the Applicability of PRC-025-1 which was an area of comment concerns. Mr. Barfield noted that when the performance of the standard changes or who and when conditions change result in a substantive change. Clarifications and editorial corrections are not substantive and the quality review determines if a standard is eligible for recirculation, not the drafting team. Currently, going to a second successive ballot may not allow the standard to be recirculated prior to the August NERC Board meeting and places achieving the FERC filing deadline of September 30, 2013 in jeopardy.

Agenda

1. Review of meeting notes (Reviewed)

A review of the meeting notes was tabled to focus on more urgent items.

2. Open business from last meeting (Reviewed)

a. Mr. Barfield:

- i. Issue the Consideration of Comments report to the team when available following the end of the comment period on March 24, 2013. The raw comments were sent May 28, 2013 to the team followed by the formal comment report on May 30, 2013. (Complete)

3. Respond to comments

The drafting team revealed the following potential issues to consider including whether there should be a compelling reason to have the proposed PRC-025-1 standard go to recirculation.

1. The posting of PRC-023 revealed that the drafting team (and industry) missed the relay conditions required by PRC-023-2, R1, Attachment A, Criterion 1.6 – 1.6. Phase over current supervisory elements (i.e. phase fault detectors) associated with current-based communication-assisted schemes (i.e. pilot wire, phase comparison, and line current differential) where the scheme is capable of tripping for loss of communications.
2. Unit Auxiliary Transformer (UAT) criteria may be too restrictive. For example, the UAT in the proposed PRC-025-1, Table 1 language (Option 13a and 13b) “that trips the generator either directly or via an interposing auxiliary/lockout relay” is specific.
3. Situation where the UAT relays owned by the Distribution Provider or Transmission Owner are not addressed by either standard and may be perceived as a potential gap in reliability when requesting regulatory approval. Including the UAT in the proposed PRC-023-3 standard is not favorable; therefore, lends more credibility to adding the Distribution Provider and Transmission Owner entities to the proposed PRC-025-1 standard.
4. A number of comments stated confusion with the drafting team’s proposal of two new requirements in R7 and R8 in the proposed PRC-023-3 standard. The drafting team evaluated the risk prior to the posting and concluded that including the Distribution Provider or Transmission Owner in the proposed PRC-025-1 standard would have been unfavorable by industry.
5. Removing the RRO language PRC-025-1, Table 1 and the Guidelines and Technical Basis which will require obtaining NERC legal advice to ensure a gap is not created. The drafting team originally added the RRO language to provide a transition from the NERC Board of Trustees adopted, but not FERC approved MOD-024-1 and MOD-025-2 standards. Including the RRO was believed to provide clarity to industry regarding what megawatt value (MW) is reported (i.e. used for the calculations) and the value that the drafting team is referring to in the proposed PRC-025-1 standard. The recently filed with regulatory authorities MOD-025-2 standard combined the previous MOD-024 and MOD-025 which now names the Transmission Planner as the entity that receives the reported MW value.
6. The drafting team introduced “generator interconnection facility” in PRC-023-3 and in doing so shifted away from the generally accepted understanding by industry and that of FERC and the GO/TO NERC Standard Project 2010-07 – Generator Requirements at the Transmission Interface. It is generally understood that only the Generator Owner owns the Facilities related to the “generator interconnection facility.” With the inclusion of this phrase in the proposed PRC-023-3 standard, it now includes the Distribution Provider and Transmission Owner as owners of these facilities; therefore, the drafting team shifted from the common understanding of “generator interconnection facilities.” The drafting team created this ambiguity when adding Requirements R7 and R8 in the proposed PRC-023-3 standard to address cases where the Distribution Provider and

Transmission Owner may own load-responsive protective relays on both the generator step-up transformer and generator interconnection facilities. Commenters suggest the drafting team define the phrase; however, the drafting team agrees the phrase is understood and defining it may inadvertently impact other standards.

Prior to the team meeting, Mr. Barfield had been discussing with Mr. Hataway potential concerns about how dispersed generation is handled in the proposed PRC-025-1 standard; therefore, Mr. Barfield requested the team look at the work of the BES Definition drafting team under Project 2010-17.2 and the proposed changes from the approved Phase I to the proposed Phase II definition. The Phase I guidance document shows that dispersed resources are in scope, but not the facilities such as the collector bus and generator step-up transformer. The currently posted Phase 2 definition shows all dispersed resources are in scope of the proposed PRC-025-1 standard. The first concern is that the previous posting noted that the drafting team did not intend to include in the individual units in an aggregated dispersed generation scenario. Additionally, the drafting team stated that these units and feeders are in scope during the May 15, 2013 webinar which contradicted the response given in the posted consideration of comments.

As proposed in the PRC-025-1 Applicability, these units are in scope because the BES definition determines if the generating unit or generating plant is within scope, and if so, the Elements listed under the Facilities in the Applicability section are in scope. The drafting team discussed this issue and concluded that all dispersed generation units, once determined in scope by the standard's Applicability based on a single unit 20 MVA or greater, or an aggregate site MVA of 75 or greater.

The second concern expressed by Mr. Barfield is that industry may be confused by the BES Guidance document, but noted that after communicating with the BES Definition Standard Developer, Ed Dobrowolski and Sean Cavote that it should not be an issue. Supposedly, the BES Definition team's current plan is to move the Inclusion I4 (Dispersed Resources) to the generator section Inclusion I2. Based on this change there should not be a clarity issue for entities regarding the Applicability of the Elements listed in the proposed PRC-025-1 standard. No further action is required concerning the BES Definition work.

A commenter suggested that the drafting team define a NERC Glossary Term for "generator interconnection Facility." The drafting team spent a significant amount of discussion during the May 15, 2013 webinar covering Figures 1, 2, and 3 in the proposed PRC-025-1 Guidelines and Technical Basis concerning "generator interconnection Facility (ies)." The drafting considered the suggestion and noted the term is using the generally accepted understanding by industry to describe a facility (i.e., radial line) that is intended to provide energy from the generator to the transmission system and would not be operated as a part of the transmission network. However, Mr. Tatro reminded the drafting team as in previous team discussions that this use of the phrase shifted away from the generally understood use and the work of the GO/TO Team under Project 2010-07.

The team provided a response about “generation interconnection facility(ies), but noted this issue will be resolved if the proposed Requirements R7 and R8 are eliminated from the proposed PRC-023-3 standard and the Distribution Provider and Transmission Owner entities are added to the Applicability of the proposed PRC-025-1 standard. The drafting team upon further discussion discovered an issue in the proposed PRC-023-3 standard regarding how lines to generation facilities are handled for Requirement R1. The issue is that these lines are not excluded from the Requirement R1 performance of transmission lines given the Applicability for entities in 4.2.1.1 and the Facilities sections 4.2.2.1 and 4.2.2.2 of the PRC-023-3 standard.

To address this issue, the drafting team added “except lines and transformers that are used exclusively to export energy directly from a BES generating unit or generating plant to the network” to the proposed PRC-023-3 sections 4.2.1.1, 4.2.2.1, and 4.2.2.2. The drafting team further revised the proposed PRC-023-3 Applicability section 4.2.3.1 to remove the first word “Transmission” and only specify “Lines” so that there is no confusion and that the only lines connecting generation resources are applicable, not transmission lines.

The posting of PRC-023 revealed that the drafting team (and industry) missed the relay configuration(s) required by PRC-023-2, R1, Attachment 1.6 which states:

“1.6. Phase overcurrent supervisory elements (i.e. phase fault detectors) associated with current-based, communication-assisted schemes (i.e. pilot wire, phase comparison, and line current differential) where the scheme is capable of tripping for loss of communications.”

The drafting team agreed that this is important to the standard as found in the current PRC-023-2 standard. This is a substantive change as it changes the performance of several options in Table 1 of the proposed PRC-025-1 standard.

The drafting team considered starting response to comments about how the addition of Requirement R7 and R8 in the proposed PRC-023-3 standard is confusing and alternatively should be removed and the Distribution Provider and Transmission Owner entities placed in the Applicability of the proposed PRC-025-1 standard. The drafting team agreed that the suggestion to add the Distribution Provider and Transmission Owner was an approach; however, decided to table the concern to see if other comments revealed the need to make other substantive changes.

Another issue which complicates having the two Requirements R7 and R8 in the proposed PRC-023-3 is the need for an accompanying Guidelines and Technical Basis like the one included within the proposed PRC-025-1 standard. The current PRC-023-2 standard also has a supporting reference document which further complicates the issue by having two separate reference documents. Mr. Rogers suggested adding the necessary technical basis to the proposed Attachment C referenced by Requirements R7 and R8. Mr. Barfield agreed this was an approach and would need to be revisited pending a conclusion whether or not

to remove Requirements R7 and R8 and include the Distribution Provider and Transmission Owner in the proposed PRC-025-1 standard.

Commenters revealed an issue with the Unit Auxiliary Transformer (UAT) that the proposed language (Option 13a and 13b) “that trips the generator either directly or via an interposing auxiliary/lockout relay.” The comments were concerned that the current language excluded those UAT installations where the loss of the station service transformers (i.e. UAT) would result in a unit trip, but does not trip the unit directly or via an interposing auxiliary/lockout relay. The loss of the UAT would result in the eventual loss of the unit and the current language excludes this condition.

The drafting team discussed this issue in significant detail on how to address the concerns without inadvertently including other bus or auxiliary plant relays. Team members rose other concerns about what relays were included under the proposed PRC-005-2 which is pending regulatory filing. Mr. Barfield noted that PRC-005 is specific in that it includes UAT relays that connect to the generator bus, but is silent on other configurations. Mr. Rogers noted that any gap created in another standard would have to be addressed by another team. Other issues were raised about the location of the UAT relays, whether these relays could be identified on the terminals of the high-side or low-side. Mr. Hataway noted that his firm actually has relays not on the terminals of the UAT, but on the breakers. The drafting team reached consensus after taking three polls related to variations in defining the relays for the UAT. Team consensus was achieved to require that Options 13a and 13b be limited to the relay(s) which cause the loss of the unit and not the current condition of “...that trips the generator either directly or via an interposing auxiliary/lockout relay.” Mr. Youngblood agreed to craft language for the UAT for the Guidelines and Technical Basis.

Several commenters continue to have concerns about overloading with respect to the performance expected by the standard. The concern was that the PRC-025-1 standard will create a situation where the generator would not be protected from overloads. The drafting team agreed that the current draft and references to other documents sufficiently address the issue of overloads.

Comments revealed clarity issues between the Figures 4 and 5 and certain calculations for Options 4 and 10, and Option 5. The drafting team previously included static Mvar resources that were not seen by certain relays, but included them in the calculations. There were other industry questions about why the drafting team used 0.95 per unit voltage rather than the 1.0 per unit voltage for mixed generation comprised of synchronous and asynchronous generation. The drafting team agreed that these issues were in fact errors and agreed to alternatives to correct the error. Mr. Jensen offered to provide revised figures and calculations to clarify these concerns.

At the conclusion of the third day, the drafting team reached a point where the tabled decision to deal with the potential removal of Requirements R7 and R8 from PRC-023-3 was compounding problems in the revisions the team wanted to make. Mr. Rogers asked for

team feedback. Mr. Tatro expressed that he continues to not support Requirements R7 and R8 in PRC-023 because it does not achieve the clearest bright line between the standards. Mr. Barfield stated that his chief concern was the fact that two different standards had the same performance, but for different functional entities. He admitted that he wish this issue was clearer when the team decided on this approach at the March 25, 2013 Fresno meeting. He noted this may cause problems in the long run if criteria changes – forcing a revision to two standards rather than one.

A drafting team member asked what the circumstances were that led the team to use the approach of adding the new Requirements R7 and R8 to the PRC-023-3 standard. Others offered varying beliefs which include; maintaining PRC-025-1 as a “generator owner only” standard, concerns that the Distribution Provider and Transmission Owner may take issue with the approach and delay an on-time filing of PRC-025-1, the team believed that the addition of Requirements R7 and R8 would allow the Generator Owner to be eliminated from PRC-023, and that the Generation Owner has a perceived overlap between the two standards concerning generation interconnection Facilities.

Additionally, Mr. Barfield noted that after discussing this issue that he prepared a pros and cons of continuing forward with the same approach and for removing Requirements R7 and R8 from the proposed PRC-023-3 standard and including the Distribution Provider and Transmission Owner in the proposed PRC-025-1 standard. The following represents what the team considered when evaluating both approaches.

Removing R7 and R8 from PRC-023-3 and adding DP and TO to PRC-025-1	
PROS	CONS
Simplifies standard – remaining closely the same as version2	May not be considered favorable by DP/TO; however, may experience the same when adding to PRC-025-1
Include exclusion language to exclude lines that are used exclusively to export energy directly from a BES generating unit or generating plant to the network.	Places PRC-025 at risk of missing deadline (applies to both conditions – whether left as is or change)
Allows elimination of “generator interconnection Facilities” from PRC-023 – may retain general understanding by remaining in PRC-025 for generation Elements (notwithstanding the DP/TO addition)	
May slow further development of PRC-023 standard	
Eliminates the need for a Guidelines and Technical Basis and/or the SPCS reference document	
Makes PRC-023 only for load-responsive	

protective relays on Transmission system Elements (i.e., network lines)	
Makes PRC-025 only for load-responsive protective relays on generation Elements (i.e., radial lines)	
Eliminates the 100-200 kV issues in PRC-023 related to generation Facilities	
Makes UAT applicable to DP/TO	
Eliminates questions about lines that connect generation and the GSU for 100-200 kV Elements	
Similar technical criteria/requirements will be in one standard, not two (probably the most significant point)	
Leave as is	
PROS	CONS
PRC-025-1 can move forward lessening the risk to the schedule	May reduce further development of standard
Update generation interconnection Facilities to “lines that are used exclusively to export energy directly from a BES generating unit or generating plant to the network.”	May cause regulatory authorities to hold PRC-025 to consider PRC-023
	PRC-023 may not follow PRC-025 timely
	May not resolve industry’s perception of complicating standard(s)
	DP/TO that own UATs will not be included
	If PRC-025 passes and PRC-023 fails and causes the SDT to go fix PRC-025
	Potential risk of having similar technical criteria/requirements in two discrete standards
	Places PRC-025 at risk of missing deadline (applies to both conditions – whether left as is or change)

After review of the pros and cons of whether to continue with the same approach or to remove Requirements R7 and R8 and add the Distribution Provider and Transmission Owner functional entities to the proposed PRC-025-1 standard, the drafting team members present for the meeting unanimously agreed to remove Requirements R7 and R8 and add the

Distribution Provider and Transmission Owner functional entities to the proposed PRC-025-1 standard.

Additionally, the drafting team unanimously agreed to change the language about “generation interconnection Facilities” to “Elements that connect a GSU to the Transmission system that are used exclusively to export energy directly from a BES generating unit or generating plant.” This concluded the day’s activities with Mr. Rogers issuing action items to prepare for the final day of the meeting.

4. Revise standard and other documents in response to comments

The documents related to the responses given in the consideration of comments were modified during the meeting and by NERC staff following each meeting to increase the effectiveness of the in-person meeting. The drafting team participated in the review of the following documents:

- a. Draft 3 of the proposed PRC-023-3 standard
- b. Draft 3 of the proposed PRC-023-3 Implementation Plan
- c. Draft 3 of the proposed PRC-023-3 VRF/VSL Justifications – however, Mr. Barfield recommended that this document be eliminated because it is no longer relevant to the revision of PRC-023-3. The current VRF/VSLs are sufficient and no straw ballots of the VRF/VSLs are needed.
- d. Draft 4 of the proposed PRC-025-1 standard
- e. Draft 4 of the proposed PRC-025-1 Implementation Plan
- f. Draft 4 of the proposed PRC-025-1 VRF/VSL Justifications
- g. Draft 4 of the Consideration of Issues and Directives – Mr. Barfield noted that he would update accordingly and handle as an administrative task since there was not any change in how the team addressed the issues and directives.

5. Develop comment questions for posting

The comment question development was tabled for the quality review call.

6. Recap and final check

The team did not reach a point to which everything could be recapped and given a final check.

7. Review of the schedule

The team did not review the schedule.

8. Action items or assignments

- a. Mr. Barfield:
 - i. Request SC to open nominations for Canadian team member (Ongoing).
 - ii. Obtain NERC Legal opinion about the removal of the Regional Reliability Organization (RRO).
 - iii. Obtain NERC Legal opinion about a cleaner way of addressing the exclusion in PRC-023-3, sections 4.2.1.1, 4.2.2.1, and 4.2.2.2. (Completed during meeting) NERC Legal did not see any issues with the appended exclusions in the Applicability of the standard.
 - iv. Determine how to handle response to comments following a recirculation ballot and board adoption.
 - v. Add an issue to the PRC-005 database to review the Applicability of unit auxiliary transformers (UAT) with respect to PRC-025-1. The PRC-005 standard may be too restrictive in what UAT relays are to be included in an entity's maintenance and testing program.
 - vi. Check meeting room availability for the week of August 19 at NERC (address both standards together).
- b. Mr. Jensen
 - i. Guidelines and Technical Basis – Identify and discuss aggregate dispersed generation.
 - ii. Guidelines and Technical Basis – Add discussion about the 51 relay for feeders on dispersed generation.
- c. Mr. Vuong
 - i. Check meeting room availability for the week of August 19 at Salt River Project (SRP).
- d. Mr. Youngblood
 - i. Draft new language for the Guidelines and Technical Basis for the UAT. (Completed during the meeting – need to review at the follow up conference call)

9. Next steps

- a. Respond to Quality Review.
- b. Post the PRC-025-1 standard for a second successive ballot.
- c. Post the PRC-023-3 standard for an initial ballot.

10. Future meeting(s)

Conference call for Monday, June 10, 2013 | 11:00 a.m. – 4:00 p.m. ET to finalize redlined standard documents.

The suggested meeting locations, pending availability for responding to comments following the second successive ballot of PRC-025-1 and the initial ballot of PRC-023-3. Mr. Vuong will check availability at SRP and Mr. Barfield will check availability at NERC.

- Phoenix, AZ
- Atlanta, GA
- Dallas, TX

11. Adjourn

The meeting adjourned at 11:58 p.m. MT on Thursday, June 6, 2013.