

Meeting Notes

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

March 25-28, 2013

In-person meeting with ReadyTalk Web Access
PG&E
Fresno, CA

Administrative

1. Introductions

The meeting was brought to order by Charles Rogers, chair, at 1:10 p.m. PT, Monday, March 25, 2013. Mr. Rogers thanked the host member Mr. Jenson and PG&E for hosting the meeting. He also noted that the goal of the meeting was to respond to industry stakeholder comments from the draft 2 posting of the PRC-025-1 standard. Mr. Uchiyama asked about the approval rating from the initial ballot. Mr. Barfield responded that the initial ballot of draft 2 ending on March 11, 2013 which received 54.65% industry approval. Mr. Rogers noted the approval level achieved is considered positive for an initial ballot of a new standard. Those in attendance were:

Name	Company	Member/ Observer	In-person (IP) or Conference Call/Web (W)			
			3/25	3/26	3/27	3/28
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	W	-	W	W
Steven Hataway	Florida Power and Light Company	Member	-	-	-	-
Jonathan Hayes	Southwest Power Pool, Inc.	Member	IP	IP	IP	IP
Mike Jenson	Pacific Gas and Electric Company	Member	IP	IP	IP	IP
Xiaodong Sun	Ontario Power Generation	Member	-	W	W	W

Name	Company	Member/ Observer	In-person (IP) or Conference Call/Web (W)			
			3/25	3/26	3/27	3/28
	Inc.					
Sudhir Thakur	Exelon Generation	Member	-	IP	IP	IP
Joe T. Uchiyama	U.S. Bureau of Reclamation	Member	IP	IP	IP	IP
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
Erika Chanzes (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	W	W

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 eight of the eleven members were present. On day two, quorum was achieved as nine of the eleven members were present. Quorum was achieved on the third day as ten of the eleven members were present. On day four, quorum was achieved as ten of the eleven 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. Each subsequent day of the meeting Mr. Rogers reminded in-person attendees and audio participants that the NERC Antitrust Compliance Guidelines and public disclaimer remain in effect.

4. Review Roster

Mr. Barfield noted there have been no changes to the roster since updating Mr. Thakur's entity name at the last meeting (conference call) on March 15, 2013.

Agenda

1. Review of meeting notes (Reviewed)

The March 15, 2013 meeting notes were reviewed and received only minor editorial changes and corrections to typographical errors.

2. Open business from last meeting (Reviewed)

a. Mr. Barfield:

- i. Issue a Doodle to determine availability for a follow up meeting the second week of April to address quality review or potentially a call to finalize any outstanding issues from the Fresno meeting. Mr. Rogers suggested scheduling the call for four to six hours to allow sufficient time to discuss all matters. (Complete – need a few more members to respond)
- ii. Be prepared to cover the schedule in detail to show opportunities where the team can shorten durations and potentially deliver an industry approved PRC-025-1 standard to the NERC Board of Trustees in August 2013 which will facilitate an on-time regulatory filing of September 30, 2013. (Complete)

b. Mr. Rogers requested volunteers for assignments to respond to the Consideration of Comment questions. Mr. Rogers also recommended that question #6 (all other issues) be left open for discussion at the Fresno meeting. There were no objections and the following assignments were taken. (Complete)

- i. Mr. Youngblood – Questions 1 and 2 (Advised Mr. Barfield that he would bring edits to the meeting)
- ii. Mr. Vuong – Question 3 (provided Mr. Barfield responses on Friday, March 22, 2013)
- iii. Mr. Burch – Question 4 (Complete)
- iv. Mr. Rogers – Question 5 (Complete)

3. Respond to comments

Mr. Rogers recommended that the team start the meeting with responding to comments. The team started with those comments by entities that support other entities. Mr. Youngblood, having prepared for Question one and two, presented the team a breakdown of the common themes of commenters. About one-third of the commenters agreed with the bright line between the two proposed standards PRC-023-3 and PRC-025-1. The remaining two-thirds of commenters disagreed with the proposed applicability changes.

The issue between the two standards is:

1. How to determine what standard equipment is applicable to (i.e., PRC-023 or PRC-025)
2. The applicable entities (i.e., Generator Owner) PRC-023-2 only requires lines operated between 100 kV and 200 kV to be included when required by the Planning Coordinator and PRC-025-1 requires the Generator Owner to include all Facilities which meet the definition of the Bulk Electric System (BES). The issue gives preference or exception to the Generator Owner in PRC-023-2, but not in PRC-025-1. This may impact reliability for those load-responsive protective relays under PRC-023-2 that have not been identified by the Planning Coordinator. These relays may be set at a lower loadability than what is anticipated by the proposed PRC-025-1.

Mr. Hayes was concerned about trying to amend the standard's applicability for a minority configuration and the team agreed that the amount of detail that was trying to be achieved may be too much. After considerable discussion, Mr. Rogers suggested the following seven items to the team:

1. Retain the Applicability in PRC-025-1;
2. Append the Guidelines and Technical Basis with a description of how the applicability applies to the Generator Owner;
3. Add illustrations in the Guidelines and Technical Basis for:
 - One generator and one transmission line
 - Two generators and one transmission line
 - One generator and parallel transmission lines (i.e., 2 lines)
 - One generator and network transmission lines
4. Remove the Generator Owner from PRC-023-2;
5. Revise PRC-025-1 Options 14a and 14b to reflect the effective transformers losses and revise PRC-023-2, Requirement R1, Criterion #6 to mirror Options 14a and 14b;
6. Modify PRC-023-2, Attachment B to require the Planning Coordinator to declare low voltage (i.e., 100 kV to 200 kV) generator tie lines as subject to the standard; and
7. Modify PRC-023-2 technical document called, Determination and Application of Practical Relaying Loadability Ratings Version 1 developed by the System Protection and Control Task Force of the NERC Planning Committee, June 2008.

The following lists the advantages and disadvantages of the above seven items:

Advantages: Leaving the applicability as-is retains the needed clarity, maintains consistency with the objectives of the standard, the current language is easy to understand, and the Requirement is based on who owns the load-responsive protective relays and not BES Elements. Appending the Guidelines and Technical Basis would help entities to understand the applicability. Illustrations would

provide clarity between the proposed PRC-023-3 and PRC-025-1 standards. Removing the Generator Owner from PRC-023-2 seems beneficial in establishing the bright line between the two standards. Revising PRC-023-2, Requirement R1, Criterion 6 to comport with PRC-025-1, Requirement R1, Table 1, Options 14a and 14b would eliminate questions about the use of the 230% margin in PRC-023-2. Modifying PRC-023-2, Attachment B to automatically include facilities between 100 and 200 kV would remove the gap in coverage for load-responsive protective relays in that voltage class now covered in the proposed PRC-025-1 standard. Modifying the PRC-023-2 technical document called, Determination and Application of Practical Relaying Loadability Ratings would be helpful to industry overall.

Disadvantages: Adding clarity to the Guidelines and Technical Basis may initiate the need to craft the same document for the proposed PRC-023-3 standard. The disadvantage to adding illustrations is that it may spur additional questions about other configurations not addressed in the example figures. Removing the Generator Owner from PRC-023-2 may introduce a gap not identified by the team or industry. PRC-023-2, Criterion #6 is less secure than what is proposed in PRC-025-1 and might limit loadability. It would be the team's desire to have this requirement just as secure as or slightly more secure than the PRC-025-1, Table 1 criteria. The concern is that the Distribution Provider or Transmission Owner (i.e., in PRC-023-2) that owns load-responsive protective relays would need the generator's information and may not also have access to modeling for simulation. Modifying the PRC-023-2 technical document called, Determination and Application of Practical Relaying Loadability Ratings may fall under the purview of the NERC Planning Committee and will require budgeting time and resources to address the necessary revisions.

The team agrees that the seven items are an acceptable approach. The next question regarding this approach was what generator step-up (GSU) transformer impedance to use in the determination of the PRC-025-1, Options 14a and 14b criteria that will be used in PRC-023-2 to achieve consistency between standards. The team considered a range of impedances from 8.0 to 12.0 percent. The team agreed that an impedance of 10 percent for a GSU transformer represented the majority of facilities. This resulted in proposing that the setting of transmission line relays applied on transmission lines connected to generation stations remote to load so they do not operate at or below 180% (plus margin) of the aggregated generation nameplate capability at a 50 degree power factor at 0.85 per unit of the nominal Transmission system voltage.

On the second day the team refocused on the response to comments document. The team discussed feedback from Mr. Youngblood regarding the applicability with the objective stated in the purpose of the standard. For example, the term "generator" should be removed because

the subject load-responsive protective relays include generator relays, but also include the generator step-up (GSU) transformer, and unit auxiliary transformers (UAT) facilities which are not technically “generator” relays. Mr. Sun made the same suggestion. The team agreed the first occurrence of “generator” should be stricken from the PRC-025-1 standard’s purpose. The purpose also referenced the relays as those relays which are associated with “generation Facilities.” Mr. Sudhir recommended revising the Purpose’s phrase “...risk of damaging the generator” to “risk of damage” for clarity. The team concurred the change was beneficial.

The team continued with addressing comments about what transformers are applicable to the standard. Mr. Youngblood pointed out an inconsistency between the last sentence of footnote one in draft two of the proposed PRC-025-1 standard and the Guidelines and Technical Basis. Comments challenged whether or not unit auxiliary transformers (UAT) should be included. The team reviewed FERC Order No. 733, Paragraph 104 and concluded that the standard must address UAT facilities in the standard.

The team addressed comments about Blackstart resources. The team considered the circumstances regarding smaller generators and the need to include these units within the scope of the standard’s applicability. The conclusion was that the loss of such smaller units due to loadability events could exacerbate the severity of the voltage disturbance, and as a result change the character of the system disturbance. In addition, the loss of Real Power could initiate or exacerbate a frequency disturbance.

The team discussed issues raised about the Applicability item 3.2.4 “Generator interconnection Facility(ies).” The team noted that this phase does not require defining and is consistent with the work completed under Project 2010-07 – Generator Requirements at the Transmission Interface. Additionally, the proposed PRC-025-1 Guidelines and Technical Basis currently describe this applicability item in greater detail. Other applicability issues raised by commenters were addressed by the team’s changes to the applicability in the proposed draft 2 of PRC-023-3 and clarifications in draft 3 of the proposed PRC-025-1 standard.

To further establish the bright line between the two proposed standards, the team proposed modifying the PRC-023-3, Attachment A, Item 2.4 (“Generator protection relays that are susceptible to load.”) to specifically reference relays applied at the terminals of generation Facilities pursuant to the proposed PRC-025-1 standard and its successors. This is consistent in construct as item 2.5 found in the current PRC-023-2, Attachment A. Mr. Billo raised a concern about how the team was addressing the revision of Item 2.4 in the draft 2 of the proposed PRC-023-2, Attachment A. His colleagues provided feedback that adding this was an unnecessary change in Attachment A and should be in addressed in the Applicability. This resulted in the team changing their strategy in aligning the proposed PRC-023-3 standard with PRC-025-1 standard noted in the above seven items by changing item 6 to the following:

6. Modify the proposed draft 3 of the PRC-023-3 standard, Applicability to include a new item 4.2.1.7 to address the transmission facilities exiting the generation units or plants.

The team debated the Applicability issue considering the following issues:

- Requiring the inclusion of transmission lines in the proposed PRC-023-3, Attachment B falls under the Planning Coordinator's purview. This unnecessarily subjects the Planning Coordinator to compliance obligations to list the set of lines from 100 kV to 200 kV and provide the list to the Distribution Provider and Transmission Owner. Whereas, the intent of the team is only to include the Transmission Owner and the Distribution Provider.
- How to structure clear Applicability language that captures the various configurations and voltages less 200 kV. This raised concern with the team that industry may find this contentious by the inclusion of such a large group of transmission lines connecting to generation in the current PRC-023-2 standard. Also, this would be viewed as an expansion of the standard.
- The team was concerned that given the Applicability of the proposed PRC-025-1 standard that the current PRC-023-2 standard creates a reliability gap by not addressing loadability on transmission lines connecting BES generation at voltages less than 200 kV.

The team addressed an issue regarding aggregate generation as to whether load-responsive protective relays on the collector system (e.g., wind farms) are included within the scope of the draft 2 of PRC-025-1. The drafting team agrees that the collector system is within the scope of the standard in draft 2 and in the proposed draft 3 of PRC-025-1. The team noted that there are differences between the Phase 1 BES definition and Phase 2 BES definition work relative to collector systems that are used for aggregating generation. The changes proposed in the BES definition project work uses an approach which sums the aggregate generation to determine the physical points in which elements are included in the BES. Contrary to this approach, the team did intend that Elements, like collector systems, of generating units or generating plants to be applicable to the proposed PRC-025-1 standard, and all of the Elements identified within the Facilities 3.2 of the proposed PRC-025-1 standard are within scope of the standard; however, the team agreed that not addressing collector systems for aggregate generation configurations (e.g., dispersed generation resources) constitutes a lack of clarity and a potential gap in the proposed PRC-025-1 standard. To address this concern, the team agreed to propose an additional Element (i.e., Facilities 3.2.5) to the proposed draft 3 of PRC-025-1 standard to specifically identify collector systems. The team is concerned that this change would be perceived as an expansion of the applicability of the PRC-025-1 standard.

There were comment concerns about the location of voltage transformers (VT) and current transformers (CT) for each of the options. The team agreed that adding a figure to illustrate the locations for the options would add clarity and understanding to the standard for stakeholders.

Mr. Tatro developed and provided four example diagrams for discussion over the course of the meeting to address item 3 of 7 above and as noted below (See Exhibit A below for figures):

- One generator and one transmission line (Figure 1)
- Two generators and one transmission line (Figure 2)
- One generator and parallel transmission lines (i.e., Two lines) (Figure 3)
- One generator and network transmission lines (Figure 4)

The team agreed that Figure 1 would illustrate discussions regarding the “generator interconnection Facilities”, and serve to illustrate that the “line” connecting generation to the network, regardless of ownership, would be properly captured with the changes to PRC-023-3.

The team agreed that Figure 2 would not be necessary. It was noted that two generators on a single transmission line provided no additional clarity relative to Figure 1.

The team agreed that Figure 3 would result in the following condition. If a transmission line were tapped for load between the generation plant bus (like Bus A in Figure 4) on the right and the remote buses on the left (like Bus D in Figure 4) of the diagram, the breakers on the right (like Bus A in Figure 4) of the generation plant bus are subject to PRC-023; if no tap is present, the breakers on the right (like Bus A in Figure 4) of the generation plant bus are subject to PRC-025.

The team agreed that Figure 4 provides a reasonable representation of what breakers fall into what standard. Bus A (left side) is PRC-025-1 and Bus A (right side) is PRC-023-3. Buses C and D are PRC-023-3.

The team discussed Luminant’s comment that PRC-025-1, Attachment 1, Table 1 does not provide any guidance for load-responsive protective relays that may be installed on generators tied to a 345/138/20 kV auto-transformer. The team was concerned that if an entity were to try to solve for the multi-winding condition, that it would actually find that the result would lead to a situation that would not be practical. The team could not reach consensus on how to provide specific detail in Table 1 to address multi-winding transformers. As an alternative, the team provided general guidance in the Guidelines and Technical Basis until more detail can be developed. For example, “Applications that use more complex topology, such as generators connected to a multiple winding transformer, are not directly addressed by the criteria in the table. Entities with these topologies should set their relays in such a way that they do not operate for the conditions being addressed in this standard and should be prepared to demonstrate that their relays are set accordingly.” Mr. Tatro offered to do some calculations to provide additional information for decision making by the team. A general analysis revealed that depending on the situation, one of the windings may result in a setting more restrictive than what is practical.

The team discussed the situation presented by a commenter where synchronous and asynchronous generation is connected at the same generation interconnection Facility. The team considered adding additional options within Table 1, but concluded this would be difficult to address especially if presented with an increasing number of non-standard configurations. The balance of generation between synchronous and asynchronous posed additional issues in

how to address a minority configuration. The team decided the best approach would be to add an additional paragraph to the PRC-025-1 Attachment 1 document and address synchronous and asynchronous generation that is connected at the same generation interconnection Facility in the same manner as the exceptions to the standard and no-load (NLTC) and on-load (OLTC) tap changer transformers. The team made the following clarification in Attachment 1: “If synchronous and asynchronous generator types are combined on a generator step-up transformer or on a generator interconnection Facility, the pickup setting criteria shall be determined by vector summing the pickup setting criteria of each generator type.”

Mr. Delsman, an observer, provided valuable feedback regarding the team’s response to the SERC RRO comments on Question #3 that it may not be responsive based on his participation in the SERC RRO’s discussions. Mr. Tatro noted that the System Protection and Control Subcommittee (SPCS) is developing a work plan to address concerns about the PRC-023-2 standard’s reference documents. He further noted that the work plan is subject to the Planning Committee’s review and approval. Mr. Delsman further expressed that the protective relay function (i.e., 51 V-R) is not reliable and should not be addressed in the standard. The team agreed that this function is not reliable and is best avoided; however, disagreed that the function should be eliminated from the standard since there may be entities applying the relay on its Facilities.

The team discussed an issue concerning the use of the wording in the proposed draft 3 of PRC-025-1, “capability reported to the Planning Coordinator or Transmission Planner.” The issue is that the new NERC Board of Trustees adopted MOD-025-2 uses language that the Generator Owner reports its capability to the Transmission Planner only. The MOD-025-2 standard replaces the two standards, MOD-024-1 and MOD-025-1 which contain language that the Generator Owner must report its capability value according to the Regional Reliability Organization (RRO) and not the Transmission Planner or Planning Coordinator. The team was uncertain as how to address. Mr. Barfield suggested that he reach out to team’s NERC Legal staff person, Mr. Edwards for an opinion on how to address this issue.

The following day Mr. Barfield reported to the team the outcome of the legal discussion about the use of Transmission Planner and Planning Coordinator. The conclusion is to remove the Planning Coordinator from the proposed draft of the PRC-025-1 standard and include the Regional Reliability Organization (RRO). This will bridge the change from MOD-024-1 and MOD-025-1 to MOD-025-2. Also, in making the change, Mr. Edwards suggested providing a sunset provision in the PRC-025-1 Implementation Plan for removing the RRO language. This will allow NERC staff to make, for example, an errata revision once the standards MOD-024-1 and MOD-025-1 are no longer applicable. The team agreed to the approach and Mr. Tatro suggested to further refine the proposal to use “...or other entities as specified by the Regional Reliability Organization (RRO),” rather than just replacing the Planning Coordinator with the RRO. The team agreed that this was the best approach. Mr. Barfield suggested that when updating this provision in the general text (introduction) of the PRC-025-1, Attachment 1 that a footnote be

added to clarify why the older use of RRO has been placed in a new standard and the current term used by industry for the RRO is now the Regional Entity (RE). The team agreed to the concept and to carry the change throughout the project documentation, but not adding a footnote.

A comment from ACES in Question 4 disagreed with the standard because in their opinion the standard requires the Generator Owner to replace all their electromechanical relays that cannot meet the settings of PRC-025-1 in order to comply with this standard. The team disagreed that the proposed PRC-025-1 standard requires replacement. This is evident in the (1) discussion contained in the Guidelines and Technical Basis; and in (2) the Implementation Plan on the basis that entities have 48 months to comply where existing relays can meet the standard and 72 months where the Generator Owner determines an existing application cannot comply with the requirements of the standard. Also, ACES notes that rather than forcing replacement to allow for equipment limitations like what is provided for in the new and industry approved PRC-024-1. The team discussed the application of PRC-024-1 and noted that equipment characteristics in PRC-024-1 must be considered to prevent equipment damage; whereas, the proposed PRC-025-1 standard was developed with a technical basis that requires settings within the equipment's (e.g., generator, GSU, or UAT) capability and not its limit. Both standards are consistent that a relay limitation is not a reasonable basis for an exception. ACES' further noted that the Planning Coordinator should have a greater role in determining the settings for which Generator Owner's must comply. The team disagreed with allowing the Planning Coordinator discretion because this creates opportunity for varying criteria for setting load-responsive protective relays. The team agreed the NERC Rules of Procedure provides an exception process for those generator units that meet the definition of the BES. Generators, by definition, are those that are materially important to BES reliability and include single units 20 MVA and larger and plants 75 MVA and larger.

The team considered issues regarding Cost Effective Analysis Process (CEAP). Alternatives that the team theorized that would be suitable would actually prove more costly and less effective and efficient concerning industry. For example, adding Static Var Compensators (SVC) as an alternative approach would need to support the reactive power required in the system and would be limited by location and number of installations. Additionally, approaches such as reducing the capability of generating units to a level which achieves the desired field-forcing within the limitations that may be encountered by existing relays would be cost prohibitive due to the reduction in energy sales to the market and may be a discriminatory practice.

The last day started with a discussion about overload protection. Comments revealed that the proposed draft PRC-025-1 standard continues to create confusion about the objectives of the standard while protecting the generator. Mr. Tatro noted that the standard is intended to prevent fault protective relays from tripping generators unnecessarily for loading conditions within the generator capability; and that the drafting team was not intending to prevent the use of generator overload protection as defined in clause 4.1.1.2 of the C37.102-2006 IEEE

Guide for AC Generator Protection. To address the issue and the perception that the standard is requiring entities to relax settings and place the generator at risk, the team has modified Attachment 1 to provide exclusion for generator overload protection designed to coordinate with the generator short time capability as described in C37.102-2006. See the next to last bullet in the Attachment 1, Exceptions, for the addition in the proposed draft 3 PRC-025-1 standard.

The team further discussed issues that the proposed PRC-025-1 standard as raised by stakeholders is narrow in scope by basing the settings criteria on one event (i.e., August 14, 2003 Blackout) and simulation rather than real world event data and historical performance. The belief is that the standard is only based on 8.6% of the total affected generators in the August 14, 2003 Blackout. The drafting team understands there is limited empirical data regarding generator relays tripping due to insufficient relay loadability. However, as noted in the NERC document 'Power Plant and Transmission System Coordination' – July 2010, at least 28 generators were tripped on August 14, 2003 by load-responsive phase protection; eight of those by phase distance and 20 more by 51V protection. Generators tripping by these load-responsive relays is significant because these protective relays are subject to operation during the phase of a disturbance during which the system may be capable of recovering, whereas other protective relays that are not responsive to load are more likely to operate after the system has become unstable or during a system collapse. It is therefore more important to focus attention on preventing operation of load-responsive relays from tripping generators, which may cause or contribute to an otherwise recoverable event resulting in cascading, instability, or uncontrolled system separation.

The drafting team notes that the depressed voltage condition observed on August 14, 2003, with sustained transmission voltage of 0.85 per unit, represents a realistic stressed system voltage condition for an extreme, but recoverable system event. Selection of this condition in the proposed PRC-025-1 standard is based on Recommendation 8a of the NERC Actions to Prevent and Mitigate the Impacts of Future Cascading Blackouts (Approved by the Board of Trustees, February 10, 2004), which formed the basis for industry-wide evaluation of transmission relays for relay loadability and NERC Reliability Standard PRC-023. Use of this system condition provides consistency between the approved transmission relay loadability standard PRC-023-2 and the proposed draft generator relay loadability standard PRC-025-1.

The team discussed the concern raised about the clarity that the proposed output reported to the Transmission Planner (or RRO as discussed earlier) is gross output. The team decided that the word "gross" needed to be added to the proposed draft 3 PRC-025-1 standard. The reasoning behind making the change was to avoid confusion between values that are associated with the output at the generator unit terminals versus the output at the high-side of the generator step-up (GSU) transformer.

Mr. Barfield presented concerns about the significant changes made to create the bright-line between the proposed draft 2 of PRC-023-3 and draft 3 of PRC-025-1 standard. The concern

was in reference to FERC rulings about applicability of the Generator Owner in the PRC-023-1 standard. FERC ruled in version one that Generator Owners that are not also registered as a Transmission Owner are not required to comply with the PRC-023-1 standard; however, upon approval of PRC-023-2, this ruling could not be applied to the Generator Owner and is discussed further in the [NERC Compliance Bulletin 2012-001](#)¹ document. Since there was significant visibility in PRC-023 concerning the Generator Owner and now that the Generator Owner is proposed for removal, Mr. Barfield recommended that the team provide a written summary which provides a clear discussion on how the transition does not create a gap when creating the bright-line between the proposed standards PRC-023-3 and PRC-025-1. Mr. Tatro noted he had draft text for the Guidelines and Technical Basis document which could be used as a starting point for providing additional documentation for the future filing.

The drafting team discussed concerns about the proposed draft PRC-025-1 standard concerning "...while maintaining reliable fault protection." Commenters were concerned about the treatment of this phrase within the scope of an audit. Mr. Barfield noted that his recollection was that the rationale boxes are moved to the "Application Guidelines" section of the standard which is not a lettered section of the standard; therefore, is not an enforceable part of the standard, but a part of the basis on which the standard was developed. The team concluded that this phrase is also used in the current PRC-023-2 standard and is widely understood.

The team discussed the Implementation Plan concerns regarding the proposed PRC-023-3. Commenters noted that the team removed components of the PRC-023-2 Implementation Plan and the provision with respect to Requirement R6 where the Planning Coordinator may include critical circuits. The team agreed that the provision was an oversight and that it would be re-inserted because the Transmission Owner must have an implementation period to become compliant with the inclusion of new circuits determined critical by the Planning Coordinator. The team also raised a similar issue if the same period of 39 months was sufficient for the Transmission Owner and Distribution Provider to become compliant for those facilities now proposed for inclusion in the proposed revisions to PRC-023-3 for generator circuits ranging from 100-200 kV. The team initially thought 39 months would be more consistent with the current PRC-023-2 implementation; however, realized that the particular applicable generator circuits would subject to the same considerations of implementation by the Generator Owner in its outage scheduling. Further discussion considered 48 months, but then the team decided that the same implementation plan provided to the Generator Owner in PRC-025-1 should be afforded to the Distribution Provider and Transmission Owner for consistency and since the same factors affected their ability to comply.

The team revisited the issue about the changes made to PRC-023-3 regarding the removal of the Generator Owner. The concern was brought to the surface regarding Hydro Quebec's comment in Question 6. The issue stemmed from ownership of the generator step-up (GSU)

¹ http://www.nerc.com/files/Bulletin_2012-001_Applicability_of_PRC-023-1_for_GOsR1.pdf

transformer and how that applied to the team's revisions to the proposed PRC-023-3 standard. Mr. Billo suggested to review this further off-line and table for further discussion during the conference call next week. The team agreed.

4. Review Cost Effective Analysis Process Report

The CEAP working group was scheduled to meet after the drafting team's planned meeting; therefore, a final report prior to the team's meeting was not available. As an alternative, Mr. Guy Zito, NPCC provided some highlights for the team to consider.

5. Revise standard and other documents in response to comments

The drafting team responded to 90-95% of the comments from the Consideration of Comments, made initial changes to the proposed PRC-023-3 and PRC-025-1 standards. None of the other following documents were addressed by the team at this meeting.

- a. PRC-025-1 Standard
- b. PRC-025-1 Guidelines and Technical Basis
- c. PRC-025-1 Implementation Plan
- d. PRC-025-1 VRF/VSL Justifications
- e. PRC-025-1 Consideration of Issues and Directive
- f. PRC-023-3 Supplemental SAR
- g. PRC-023-3 Standard
 - i. Address
- h. PRC-023-3 Implementation Plan
- i. PRC-023-3 Attachment A and B
- j. PRC-025-1 Petition Input Document
- k. PRC-025-1 RSAW
- l. Future Webinar Content
 - i. Purpose statement changes
 - ii. Attachment and Table 1 changes
 1. Address the new use of RRO and removal of PC
 2. CT/VT locations and figure
 3. Gross vs. net
 - iii. Guidelines and Technical Basis revisions

1. Updated calculations
2. Simulation example
3. Multi-winding GSUs
4. Address Overload protection (IEEE C37.91 & .102)
- iv. Implementation Plan
 1. Eight years too long
- v. Cost burden
 1. Exceptions like PRC-024 – this standard is based on equipment limitations and 025 is within the generator unit’s capability
 2. Alternatives – SVCs, reducing output to ensure field-forcing is within equipment limitations
 3. Burden to small entities (number of relays should be commensurate with entity size)
- vi. PRC-023-3 and PRC-025-1 bright line changes
 1. Determination of applicability – see figures
 2. Common setting between standards (PRC-023, Attachment A/B, PRC-025 Options 14a & 14b)
 3. the [NERC Compliance Bulletin 2012-001](#) document concerning GOs
 4. Inclusion of 100-200 kV in PRC-023
 5. Address how the definition of BES (Phase 1 and 2) may differ from the PRC-025-1 standard applicability (i.e., wind farms, collector systems, etc.)
- vii. Address why the VRF is High and VSL is Severe
6. **Develop comment questions for posting**
Deferred to next meeting
7. **Recap and final check**
The team did not reach a point to which everything could be recapped and given a final check.
8. **Review of the schedule**
Mr. Barfield reviewed the schedule with the team noting that if the standard and associated documents were posted by April 19, the successive comment and ballot period would end on May 17, 2013. Pending a report of the comment being prepared and sent to the team, the team could meet as early as the short week of the Memorial Day week. Mr. Rogers recommended the team

retain the previous tentative in-person week of June 3-7, 2013 due to holidays and other obligations such as drafting team meetings.

The above time line is predicated on completing documentation on April 3, responding to quality review and finalizing issues on April 12. Mr. Barfield will work to coordinate a posting on or before Friday, April 19, 2013.

9. Action items or assignments

- a. Mr. Barfield:
 - i. Contact Ed Dobrowolski and/or Peter Heidrich, FRCC about obtaining the BES Guidance document Visio illustrations to use in the team's Guidelines and Technical Basis.
 - ii. Modify the Implementation Plan for new relays subject to the PRC-023-3 standard so that it comports with the initial Implementation Plan of PRC-023-2 upon approval of the revised standard.
 - iii. Address the situation where Generator Owners that are not Transmission Owners concern in PRC-023-3.
 - iv. Coordinate the next posting on or before Friday, April 19, 2013.
 - v. Issue announcements for the April 3 and 12 conference calls.
 - vi. Send appointments out to block out team calendars for April 3 and 12, and the week of June 3-8, 2013.
- b. Mr. Tatro
 - i. Review Generator Owner and Transmission Owner (GOTO) documentation for consistency with the PRC-025-1 content.
 - ii. Provide the simulation example from the SPCS Power Plant document to add as an example in the PRC-025-1 Guidelines and Technical Basis.
 - iii. Request the Planning Committee to plan to modify PRC-023-2 technical document called, Determination and Application of Practical Relaying Loadability Ratings Version 1 developed by the System Protection and Control Task Force of the NERC Planning Committee, June 2008.
- c. Mr. Youngblood
 - i. Develop calculations for multi-winding transformers.
- d. Mr. Jensen
 - i. Revise the calculations for based on errors observed by commenters.
 - ii. Address "feeders" to the aggregate generating units.
 - iii. Create a figure to denote the location of CTs and VTs for the Table 1 options.

- e. Mr. Billo
 - i. Review the change to PRC-023-2, Attachment A to require the Transmission Planner to include all generator relays. (Criterion 6 and 10) remove Generator Owner.
- f. Erika
 - i. Update Madison Electric to MRO NSRF
 - ii. Replace Southwest Power Pool RRO with "SRC" and move Southwest Power Pool RRO down into the list of group responders. Mr. Barfield confirmed with Mr. Yeung that SRC should be the group name on March 28, 2013 via email.
- g. Unassigned
 - i. Revise the PRC-023-2 technical document called, Determination and Application of Practical Relaying Loadability Ratings Version 1 developed by the System Protection and Control Task Force of the NERC Planning Committee, June 2008.

10. Next steps

- a. Continue to study the Applicability concerns and options regarding PRC-023-3.
- b. Conference call on Wednesday, April 3, 2013 to complete responding to comments from the successive comment and ballot period.
 - i. Address the items remaining in section 5 above.
- c. Clean up the documents and forward for quality review by April 5, 2013.
- d. Conference call on Friday, April 12, 2013 to respond to quality review feedback.
- e. Post draft 3 of PRC-025-1 for successive comment and ballot along with other project documents the week of April 15, 2013.
- f. Block off the week for an in-person meeting to respond to comments from the draft 3 successive ballot the week of June 3-7, 2013.

11. Future meeting(s)

Team conference call on Wednesday, April 3, 2013 at 10:00 a.m.-5:00 p.m. ET to address remaining issues to achieve a mid-April successive comment and ballot posting

Team conference call on April 12, 2013 at 1:00-5:00 p.m. ET to address quality review feedback

Team in-person meeting tentatively set for June 3-7, 2013, location to be considered:

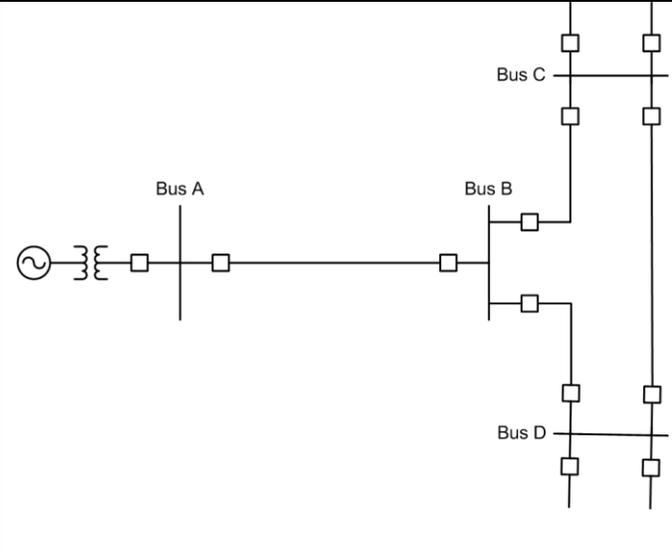
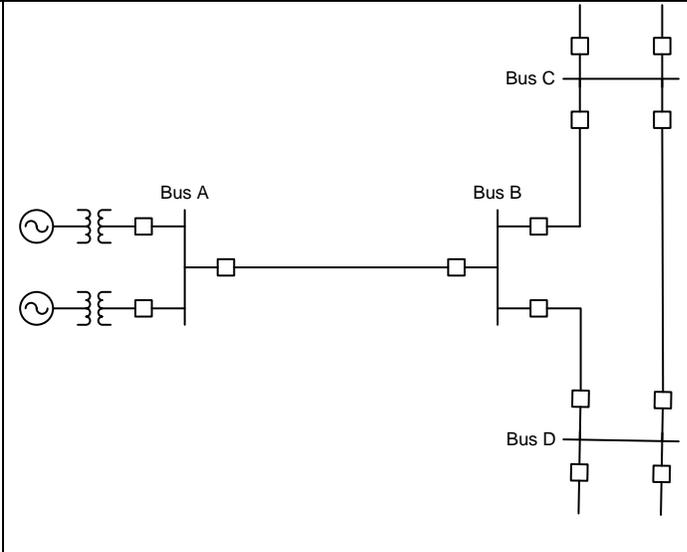
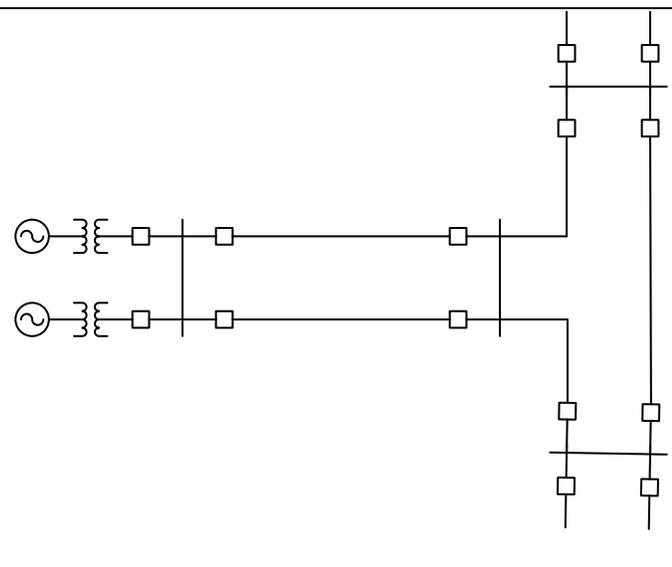
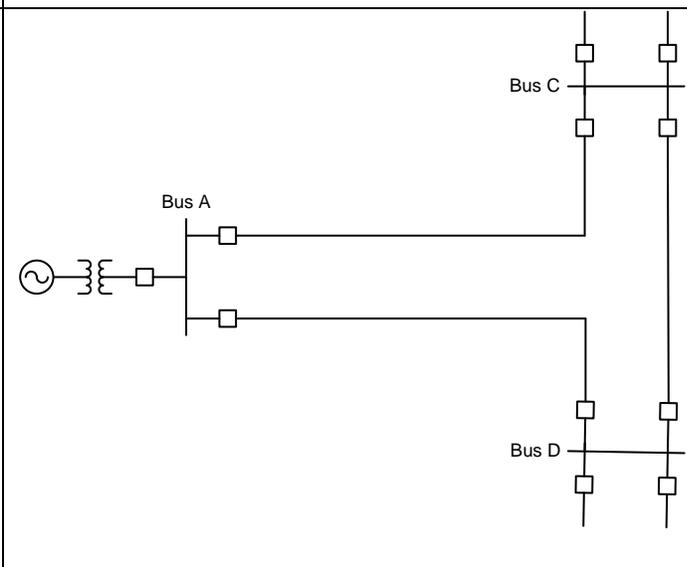
- Atlanta, GA
- Denver, CO
- Phoenix, AZ

12. Adjourn

The meeting adjourned at 5:05 p.m. PT on Thursday, March 28, 2013.

DRAFT

Exhibit A

Figure 1	Figure 2 (not used)
 <p>Figure 1 is a single-line diagram of a power system. It features a power source (represented by a circle with a tilde symbol) connected to Bus A. Bus A is connected to Bus B. Bus B is connected to Bus C and Bus D. Each bus (A, B, C, and D) has two breakers (represented by small squares) on its respective busbar. The diagram shows a horizontal line connecting Bus A to Bus B, and vertical lines connecting Bus B to Bus C and Bus D.</p>	 <p>Figure 2 (not used) is a single-line diagram similar to Figure 1, but it features two power sources connected to Bus A. The rest of the diagram, including the connections to Bus B, Bus C, and Bus D, and the breakers, is identical to Figure 1.</p>
Figure 3	Figure 4
 <p>Figure 3 is a single-line diagram showing two power sources connected to Bus A. Bus A is connected to Bus B. Bus B is connected to Bus C and Bus D. Each bus (A, B, C, and D) has two breakers on its busbar. The diagram shows a horizontal line connecting Bus A to Bus B, and vertical lines connecting Bus B to Bus C and Bus D.</p>	 <p>Figure 4 is a single-line diagram showing one power source connected to Bus A. Bus A is connected to Bus B. Bus B is connected to Bus C and Bus D. Each bus (A, B, C, and D) has two breakers on its busbar. The diagram shows a horizontal line connecting Bus A to Bus B, and vertical lines connecting Bus B to Bus C and Bus D.</p>