

Meeting Notes

Project 2008-02 Undervoltage Load Shedding Standard Drafting Team

June 24, 2013 | 12:00–5:00 p.m. ET
 June 25–26, 2013 | 8:00 a.m.–5:00 p.m. ET
 June 27, 2013 | 8:00 a.m.–12:00 p.m. ET

In-person Meeting with ReadyTalk Web Access
 PJM Conference & Training Center
 Norristown, PA

Administrative

1. Introductions and chair remarks

E. Chanzas, NERC brought the meeting to order at 1:00 p.m. ET. Chairman G. Vassallo, BPA, thanked B. Harm, PJM for hosting the meeting. The team members introduced themselves. Those in attendance were:

Name	Company	Member/ Observer	In-person (IP) or Conference Call / Web (W)			
			6/24	6/25	6/26	6/27
Greg Vassallo (Chair)	BPA	Member	IP	IP	IP	IP
José Conto	ERCOT	Member	IP	IP	IP	IP
Bill Harm	PJM	Member	IP	IP	IP	IP
Brigham Joffs	Luminant	Member	W	W	X	W
Sharma Kolluri	Entergy	Member	IP	IP	IP	X
Charles-Eric Langlois	Hydro-Quebec	Member	IP	IP	IP	IP
Manish Patel	Southern Co.	Member	X	IP	IP	IP
Fabio Rodriguez	Duke Energy	Member	X	X	X	W

Name	Company	Member/ Observer	In-person (IP) or Conference Call / Web (W)			
			6/24	6/25	6/26	6/27
Hari Singh	Xcel Energy	Member	X	IP	X	X
Anthony Sleva	Altran	Member	IP	IP	IP	X
Matthew Tackett	MISO	Member	W	W	X	W
Erika Chanzas (Standard Developer)	NERC	Observer	IP	IP	IP	IP
Barb Nutter	NERC	Observer	IP	IP	IP	IP
Juan Villar	FERC	Observer	IP	IP	IP	IP
Neil Burbure	NERC	Observer	IP	IP	X	X

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.

	Monday, 6/24	Tuesday, 6/25	Wednesday, 6/26	Thursday, 6/27
Members present	8 of 11	10 of 11	7 of 11	8 of 11
Quorum achieved	Yes	Yes	No	Yes

3. NERC Antitrust Compliance Guidelines and Public Announcement

The NERC Antitrust Compliance Guidelines and public announcement were reviewed by E. Chanzas. E. Chanzas also provided copies and gave an overview of the Participant Conduct and Email Listserv policies. There were no questions raised. The participants were reminded of the NERC Antitrust Guidelines and public announcement each morning.

4. Review team roster

E. Chanzas reviewed the team roster and asked the team members to review their contact information. There were no corrections or updates.

5. Review meeting agenda and objectives

E. Chanzas reviewed the meeting agenda items. She noted that as a result of further careful inspection of the Standards Process Manual (SPM), item #4, SAR response to comments will not need to be completed. She also remarked that revisions to the SPM were set to be approved by FERC soon, at which point she will review subsequent impacts to the project schedule. E. Chanzas concluded with the objectives for the meeting, which were to continue requirement drafting, conduct results-based standard training, and begin developing an outreach action plan.

Agenda Items

1. Review of meeting notes

E. Chanzas brought up the meeting notes from the May 28–31, 2013 SDT meeting, which had been sent to the team beforehand. J. Conto, ERCOT and S. Kolluri, Entergy provided corrections to their attendance record. B. Harm provided corrections to his statement, Agenda Item 2.r.

2. Open business from last meeting

- a. E. Chanzas reviewed the items from the last meeting's notes that needed to be addressed and kept in the forefront.
- b. In response to the open issue of coordinating UFLS and UVLS so that they don't operate at the same time and shed too much load, it was noted that the SPS standards say you have to coordinate with UFLS, but the current UVLS standards do not.
- c. C. Langlois, Hydro-Quebec, noted that NPCC has SPS and UVLS systems and follows the SPS standards, which are more stringent. There is a lot to think about in terms of the stringency of our standard for these more complex systems.
- d. E. Chanzas noted that the team needs to operate in isolation of the current SPS standards, as they are slated to be revised after the UVLS standard is complete (Project 2010-05 Phase 2). If considering SPS requirements, the team should be looking at the SPCS and SAMS recent SPS standard revision recommendations.
- e. It was noted that when UVLS was excluded from the SPS definition, the distinction was likely based on UVLS being local and did not consider centralized systems.

- f. A. Sleva, Altran brought up that the team needs to think about how the power system reacts/responds, and drew the following diagram:

Scheme	Condition					
	Insufficient MW	Excess MW	Insufficient MVAR	Excess MVAR	Excess Current	
UFLS	X					
OFGS		X				
SPS	X	X	X	X	X	Load Bias
UVLS			X			Load Bias

- g. A. Sleva noted that he would expect either a frequency or voltage event to occur, not both at once. You have to think about how the basic system operates: if it's a weak system, and it is trying to prevent voltage collapse, in certain instances then you might call it an SPS.
- h. B. Harm indicated that A. Sleva's diagram does articulate this well: frequency is always the same, but voltage is all over, and local. If there is a weak system or a power transfer problem and the consequence is to lose area supply and collapse that system, then maybe the centralized system is more of an SPS than a UVLS program.
- i. The fact that UVLS and UFLS are excluded from the definition of an SPS was again raised. In response, it was suggested: if it's a voltage input, then it's UVLS. If it's not, then it's something else.
- j. G. Vassallo noted that the team needs to be focusing on what the standard needs to look like, and that we are talking about a number of different issues. E. Chanzas agreed, and broke down the core issues that need to be addressed: 1) Coordinating UVLS and UFLS; 2) Defining the bright line between SPS and UVLS; and 3) How to approach multiple-ownership scenarios for centrally-controlled UVLS program Misoperations (from previous meeting).
- k. M. Tackett, MISO further articulated the issue: Last month the team was approaching UVLS as a planning solution to a category C or D. After listening to the discussion today, he wonders if the team is looking at it as a planning solution or a safety net. If it's a safety net, it is characterized by the fact that when all else has failed and voltage is coming down, load is shed. He's torn between which one it is, and maybe it can be both but, if so, does the standard need to address them differently.

- l. The team reviewed the SPCS and SAMS recommended definition for SPS. The phrase “the following schemes do not constitute an SPS in and of themselves” was noted. It does not exclusively exclude UVLS, it’s just saying it’s not only an SPS. If it has additional SPS characteristics, then you would apply SPS standards.
- m. S. Kolluri remarked that Entergy has a centralized scheme that is EMS-controlled. But they call it a UVLS and follow UVLS standards.
- n. The following point was raised: the redundancy requirements that go along with communications and relays are rigorous in the SPS standards. If you call it a UVLS scheme, you have the autonomy to make the decision as to what your redundancies are. Where do you draw the line between what is your call?
- o. It was remarked that a locally-controlled and a centrally-controlled system are two very different animals, and it’s difficult to address both in one standard. In response, the question arose as to whether other standards cover some of the issues.
- p. This led to an evaluation of PRC-005 with regard to protection system maintenance, and a review of the terms distributed and non-distributed UVLS. In the related info attached to PRC-005-2, the team found an FAQ doc that explained that non-distributed is a centralized system.
- q. The team agreed that from a maintenance aspect, PRC-005-2 covers centrally-controlled UVLS with the same stringency as the SPS standards. The team needs to consider what other aspects of a centrally-controlled system need to be covered with more stringency.
- r. J. Villar, FERC pointed out that the team seems to be moving toward establishing a bright line between UVLS and SPS. E. Chanzas added that the team should do this since a centrally-controlled UVLS system appears to fall under both. She then brought up the definition of an Automatic UVLS Program that the team had written at the last meeting and asked if that’s where they should start.
- s. Upon review, the term “wide area” was questioned. It was noted that the language is from the *Guidelines for Developing a UVLS Evaluation Program* (from the yellow box) technical paper, which loosely defines what is meant by a wide area. The team agreed that it should be clarified in the standard’s Guidelines and Technical Basis that it’s up to the entity to determine what “wide area” means to them.
- t. It was also noted that the term “safety net” is not used, even though *Guidelines for Developing a UVLS Evaluation Program* uses this term. E. Chanzas reviewed the meeting notes from the last meeting and showed why the team decided not to use the term “safety net”, referencing that the decision was that the definition should not be so specific to the idea of voltage collapse.
- u. The previously stated concern was reiterated: are we defining UVLS for the purpose of this standard as a safety net or a planning solution?

- v. J. Villar asserted that a safety net is a last resort if a planning solution fails. Therefore, the terms should not be interchangeable.
- w. Attention was brought to the distinction between a scheme and a program. It was noted that UVLS should be referred to as a program—a UFLS program is coordinated for an entire region, but a UVLS program is coordinated only within an entity's established system preservation footprint. There is an opportunity here to make a clear distinction.
- x. It was then raised that the team's new purpose statement does not align with the existing one in terms of the concept of voltage collapse. In response, it was noted that the reason for this is because the existing purpose statement and requirements don't line up. The existing purpose statement appears to indicate that a UVLS program is required, whereas the requirements only address those that have UVLS programs. The team realized that gap, and changed the purpose statement so as to not dictate that you need to have the program.
- y. The brought back up the issues of a planning solution versus a safety net, and that this is an important item to discuss. H. Singh, Xcel Energy pointed to the sub bullets on pages 2 and 3 of *Guidelines for Developing a UVLS Evaluation Program*, showing that it has both flavors.
- z. E. Chanzas restated what she was hearing: 1) UVLS can be both a safety net and a planning solution. How does this affect our scope and/or requirements? 2) Where is the line as to when UVLS is an SPS? And how will this affect the requirements?
- aa. C. Langlois went to the board to illustrate the following solutions that a planner has to address a C or D Contingency:
 - 1) Building a 735 kV line
 - 2) Distributed UVLS scheme
 - 3) Centrally-controlled UVLS scheme
 - 4) Centrally-controlled SPS
- bb. It was asked: why wouldn't the requirements for #4 be the same as #3? In response, it was noted that they are different because UVLS is thought of as local. Our centrally-controlled-specific requirements should only address aspects of when a centrally-controlled system fails.
- cc. The idea was raised: you have to think about the intended purpose. Is it to prevent voltage instability or collapse? Are we focusing on what we're trying to prevent, or what the trigger is?
- dd. J. Villar suggested that instead of using the phrase "severe voltage conditions" it should be "conditions that lead to voltage instability or collapse" to capture the intended purpose.
- ee. The team decided that they would move on and later revisit the definition. The team also decided to move on to working on the requirements without addressing centrally-controlled. The team will focus on distributed systems and then see how centrally-controlled should be addressed.

3. Requirement drafting and results-based training

- a. E. Chanzas presented a quick overview of results-based standard principles, format, and best-practices. Questions were answered as raised.
- b. E. Chanzas then brought up the work team members had completed as part of their assignments from the May 28–31 SDT meeting. The team began by looking at the edits for Requirements R1 and R2.
- c. The value of R1 was questioned, since the handoff is implicitly understood. It was suggested to keep it as is, and then go back later to see if it needs to be deleted. The team agreed and moved on to R2, which requires the PC and TP to conduct an assessment of the UVLS program.
- d. M. Patel, Southern Company explained that in R2, he removed the term “coordination” because the term “effectiveness” essentially includes the concept of coordination. The team agreed.
- e. J. Conto pointed out that R2 does not explicitly require an assessment of system behavior of years zero through five. The team tentatively added this as the third sub part of R1.
- f. The team then decided to address the use of “applicable entities” by defining “UVLS entities” (for the purpose of this standard) in the Applicability section of the standard template, defining it as all entities that are responsible for the ownership, operation, or control of UVLS equipment, including DPs and TOs.
- g. J. Villar suggested that the team break down R1 into multiple requirements rather than sub requirements, as he anticipates the VRFs and VSLs being difficult to write as is.
- h. The team broke down R1 and R2 into four Requirements: R1 – TP or PC provides specifications; R2 – TP or PC provides an implementation schedule; R3 – UVLS entities execute the program as specified (formerly R9); and R4 – TP or PC verify that the program was implemented as specified. R5 retained the requirement to conduct an assessment every five years.
- i. It was suggested to change R4 so it requires the entity to assess at year zero with certain criteria, and to repeat that every five years. In response, it was remarked that this brings up the need and effectiveness of the program at year zero. While the TPL standard encompasses identifying the problem and solution, what the solution looks like is not part of the TPL standard. It was then argued that if the specifications have been developed, the assessments have already been done. It is implicit that year zero as already been assessed. The team agreed that R4 is a sticking point that needs to be revisited in terms of the PC doing an initial assessment.
- j. The team moved on to the edit that was done to what was originally R2.1, now R5.1, which requires the assessment to include coordination, in which “System steady state voltage limits” was removed. The team agreed with the deletion.

- k. The concern about the listing of protection systems to coordinate with in R5.1 was brought up, asking how you can really coordinate UVLS and UFLS. The kinds of conditions that cause voltage issues most likely will not be the same as those that cause frequency issues, and it is almost impossible to predict coordinating load for each.
- l. J. Villar remarked that this is why you need to model it and test the coordination aspects. It was asked: how you can simulate an event that models both? It's inversely proportional—if you have an undervoltage condition and shed load, frequency will go up. It was added that coordination is especially difficult for planners.
- m. It was proposed to remove UFLS from R5.1. The proposal was then amended to reflect removing the entire list of protection systems, noting that it's implicitly covered in the planning stage in regard to what is important for a given system.
- n. E. Chanzas pointed out that the language that the team is proposing to remove is from the project's attached Order 693 directive, Paragraph 1509. J. Villar asked: Is the team leaning toward not following this directive? He also asked: what does the directive language mean by "coordinated approach"?
- o. E. Chanzas asked how the UFLS standard handled this. N. Burbure, NERC noted that the UFLS standard discusses coordination only with regard to generator low voltage ride-through.
- p. It was explained that it depends on the system in terms of what you want to coordinate with. You have to coordinate with protection systems that are deemed applicable. As a result, the team removed the list of protection systems from R5.1 so that it just read that the assessment shall include coordination with "other protection systems". It was noted that what is meant by this can be covered in the rationale.
- q. A discussion over R4, which requires the TP and PC to verify that the program was implemented as specified, began. The concern that the program needs to be evaluated for effectiveness when it is initially installed was again raised. It was suggested to take out R4 and merge it into R5, which requires the periodic assessment of the program.
- r. R4 was deleted, and R5 became R4, with the agreement that the accompanying rationale should include that the assessment includes an assessment of system behavior of years zero through five. The team also changed "shall conduct and document an assessment" to "shall perform an assessment".
- s. The team then moved what was R4's sub part, which requires that the assessment include coordination with other protection systems, to R1, creating R1.1, which indicates that the development of the program shall address coordination with other protection systems. It was agreed that the Guidelines and Technical Basis of section should expand upon this.

- t. The team then moved on to addressing the Misoperations-related requirements. The remark was made that the team needs to address both equipment Misoperations and program deficiencies.
- u. J. Villar referenced the work on PRC-004-3, noting that you have to do an analysis, determine if it was a Misoperation, and determine if it impacted the BES. He also noted that reporting for that standard is handled through the 1600 Data Request.
- v. The team reviewed how the UFLS standard addressed Misoperations. As a result, R5, which requires the TO and DP to identify Misoperations, was broken down into two sub parts: R5.1 – For an event when UVLS equipment operation was expected, determine whether it operated as intended; and R5.2 – For when UVLS equipment operation occurred unnecessarily, determine why it operated.
- w. The team then moved on to flushing out the requirement that addresses the CAP for R5, which became R6, indicating that a CAP should be developed within two years of the identified Misoperation.
- x. R7 was then written to mimic R5, but in relation to the PC or TP identifying program deficiencies. R8 was then written to mimic R6, with regard to the CAP.
- y. The team then moved on to addressing the UVLS database requirements. The team began by mimicking the corresponding UFLS requirements, requiring the PC or TP to maintain a database necessary to model its UVLS program, update the database annually, and provide the database to other PCs or TPs within the Interconnection upon request. The UVLS entity is required to provide data to the PC or TP to support the database.
- z. R12's reference to supplying data according to a specific format and schedule was questioned, considering UVLS programs aren't required. G. Vassallo noted that if an entity is requesting information, it is that entity's responsibility to explain exactly what they need and in what format. The team agreed.
- aa. It was noted that the team is not absorbing the PRC-021 requirement to report data to the Regional Entity, as this should be a regional standard. This follows the approach of the revised UFLS standard and will be supported accordingly in the mapping document.
- bb. B. Harm remarked that though there might be more than one TP or PC in a given area, there needs to be one master database. The team agreed.
- cc. The team then concluded that they addressed revisions/drafting of all currently identified standards for a distributed UVLS program.
- dd. The team decided to look back at the work they had done on the requirements thus far. It was suggested that R1.1, which requires development to include coordination with other protection systems, should be brought back down to R4, which requires the PC or TP or perform a periodic assessment.

- ee. This led the team to determine that coordination with other protection systems belongs in both development and assessment. As a result, R1 was broken up into two sub parts: R1.1 – PC or TP shall include coordination with other applicable protection systems; and R1.2 – PC or TP shall provide specifications to UVLS entities.
- ff. J. Villar pointed out that the directive requires an integrated and coordinated approach, not just a coordinated assessment. The team decided that the Rationale and/or Guidelines and Technical Basis for R1.1 should expand upon this.
- gg. The team then decided to break up R4 into two sub parts: R4.1 – PC or TP performs an assessment to verify the programs' continued need and effectiveness; and R4.2 – PC or TP performs an assessment to verify the continued coordination with other protection systems.
- hh. B. Joffs, Luminant asked about the lack of a reporting requirement. Who does the CAP get submitted to? M. Patel responded by saying that is up to the Regions to determine.
- ii. The question was raised as to whether the wording for the CAP-related requirements should be “develop and implement a CAP” rather than just “develop”. J. Villar noted that this is what PRC-004-3 ran into: the handoff from the BES interrupting device owner, etc. He wondered if there is a case in which someone other than the UVLS program owner would identify a Misoperation. The team did not think this would happen.
- jj. The discussion turned back to adding the word “implement”. As a result, R6 was broken into two requirements: R6 – UVLS entities develop a CAP; and R7 – UVLS entities implement the CAP. Former R7 became R8, which requires the PC or TP to identify program deficiencies. R9 and R10 became requirements for the PC or TP to develop and implement the CAP, respectively. The remaining requirements were renumbered accordingly.
- kk. The team then discussed the time frames. J. Villar noted that two years is generous. In response, it was pointed out that you need to consider the time frames for the program deficiency and equipment failures separately. Also, the time frames originated from looking at what the UFLS standard has.
- ll. It was then decided that requirements to implement the CAPs should not carry timeframes, as there a lot of variables, and the CAP itself will include a timetable. The team noted that this should be explained in the accompanying rationale box.
- mm. As the meeting was getting close to conclusion, the team turned back to discussing centrally-controlled UVLS programs. It was noted that if an entity has a centrally-controlled program that it defines as UVLS and follows UVLS standards, the team's current requirements do not address centrally-controlled program aspects that are covered by SPS standards (redundancy requirements, etc.).
- nn. J. Villar asked if certain centrally-controlled devices might belong to another standard. C. Langlois replied by saying that the SPS standards could cover this, but the definition of SPS

excludes UVLS. If we were working on an SPS definition, we could include centrally-controlled UVLS in that.

- oo. As the meeting was concluding, the team decided to make C. Langlois's assignment to look at the current drafted requirements in terms of how much they can cover centrally-controlled programs, and then to articulate in writing what his concerns are in regard to more SPS-related aspects that the standard isn't covering.

4. SAR response to comments

Upon further inspection of the SPM, the team does not need to respond to comments on the original SAR as per Section 4.2: "For SARs that are limited to addressing regulatory directives . . . authorize posting the SAR for a 30-day informal comment period with no requirement to provide a formal response to comments received". Also, since the original SAR was outdated by the time the team was formed and there was a decision to revise it, responding to comments would be unproductive.

5. Outreach action plan

- a. E. Chanzas brought up a table of possible outreach opportunities and asked the team to identify any that they are familiar with or to suggest new ones.
- b. E. Chanzas highlighted those that team members identified, including the NERC SAMS MWG meeting (J. Conto); the ISO/RTO Council IRC Planning Committee (M. Tackett); the NATF Modeling and Analysis Working Group (B. Harm); the PJM Reliability Standards and Compliance Subcommittee (B. Harm); the MISO Standards Collaboration Call (M. Tackett); the SERC Regional Studies Meeting (S. Kolluri); the NPCC Reliability Standards Committee; and the FRCC PC and OC (J. Villar). G. Vassallo indicated that he will reach out to Steve Rueckert at WECC to identify appropriate WECC opportunities.
- c. E. Chanzas noted that she will reach out to coordinate with these groups for upcoming meetings and will draft an initial outreach message to share with the team.

6. Review of schedule

- a. E. Chanzas informed the team that the SPM revisions had just been approved by FERC. These revisions include the removal of the requirement to have an initial formal 30-day comment period, an increase in the duration of successive ballots (from 30 to 45 days), and the removal of the requirement to respond to individual comments at every revision iteration. High-level responses will accompany substantive standard revisions, and individual responses only need to be completed just before the recirculation ballot.
- b. E. Chanzas explained that this affects the schedule by essentially adding an extra month to the development stage. The team can continue to do informal outreach to develop the SAR and the draft standard documents, and can plan on posting them together at the first formal comment period and ballot, which would be late December through February. This means development would need to conclude in late November so there is time for quality review.

- c. E. Chanzas also reminded the team of all the deliverables that need to be completed by the end of development: Standard document (Background, Requirements, Measures, Rationale Boxes, VRFs and VSLs, and Guidelines and Technical Basis), SAR, Mapping Document, VRF and VSL Justification, Consideration of Issues and Directives, and optional reference or white papers.

7. Action items or assignments

- a. Review requirements and revise as necessary; create initial drafts of measures and rationale: M. Tackett – R1; G. Vassallo – R2 and R3; J. Conto – R4; M. Patel – R5, R6, and R7; B. Harm – R8, R9, and R10; and S. Kolluri (with help from F. Rodriguez and B. Joffs as needed) – R11, R12, R13, and R14.
- b. C. Langlois (with help from S. Kolluri and F. Rodriguez) – Review current requirements and determine what would need to be modified and/or added to the standard or supplemental docs in regard to centrally-controlled UVLS programs. Document concerns about the more philosophical issue of defining or not defining centrally-controlled UVLS as an SPS.
- c. All – Review white paper drafted by A. Sleva and think about its development in relation to your assignment.
- d. E. Chanzas – Send a clean copy of draft requirements in the standards template; create a more summarized format of the May meeting notes for posting; coordinate getting the calendar of team activities/project schedule posted to the project page; and draft an initial outreach message for upcoming opportunities.

8. Next steps

E. Chanzas noted that she will send out an invite for a conference call in mid-July to touch base on assignment work. She will also reach out to individuals for support as July outreach events are scheduled. The team will need to focus on finalizing requirements and drafting measures and rationales at the next in-person drafting meeting August 5–8.

9. Future meeting(s)

- a. Conference call July 12, 2013
- b. August 5–8, 2013 in Atlanta
- c. August 26–28, 2013 in Denver
- d. September 16–19, 2013, to be determined

10. Adjourn

The meeting adjourned at 10:33 a.m. ET on Thursday, June 27, 2013.