Consideration of Comments

Project 2008-02 Undervoltage Load Shedding (UVLS) & Underfrequency Load Shedding (UFLS)

The Project 2008-02 Drafting Team thanks all commenters who submitted comments on the Project 2008-02 Undervoltage Load Shedding (UVLS) draft standard PRC-010-1. These standards were posted for a 45-day public comment period from June 24, 2014 through August, 7, 2014. Stakeholders were asked to provide feedback on the standards and associated documents through a special electronic comment form. There were 38 sets of comments, including comments from approximately 127 different people from approximately 75 companies representing 9 of the 10 Industry Segments as shown in the table on the following pages.

Summary Consideration: The drafting team has carefully considered all comments and suggested revisions. First, some commenters proposed revisions to the language of the proposed NERC Glossary definition of UVLS Program. The drafting team carefully considered all suggested definition revisions. Ultimately, the drafting team determined that the language in the currently proposed UVLS Program definition is sufficient to identify the types of UVLS subject to the standard, however, the drafting team has implemented non-substantive revisions to refine the structure of the definition so that the drafting team's intent is further clarified.

Next, some commenters recommended that the drafting team include Transmission Planners as applicable entities to the Requirements that address UVLS Program databases. The drafting team determined that, as Planning Coordinators have data on all of the programs in their area, and additionally maintain access to adjacent area data, Planning Coordinators have the most comprehensive information available. While Transmission Planners may also maintain data, they may lack the visibility of the system available to the Planning Coordinator, and may access that data through the Planning Coordinator.

Finally, some commenters recommended that the drafting team address Requirement R1 as two separate requirements, one of which would address UVLS Program development, and the other of which would address provision of the UVLS Program's specifications and implementation schedule to the UVLS entities responsible for implementing the UVLS Program. The drafting team agrees that the requirement could have been approached in this manner, yet, ultimately determined that providing program specifications for implementation by UVLS entities is a necessary part of the development of "an effective UVLS Program," and therefore decided not to decouple development with the natural result of that development. As a related matter, there were recommendations to provide a mechanism by which UVLS entities could provide input during the development of a UVLS Program. The team drafted the Requirements with the understanding that a PC or TP must necessarily engage the UVLS entity in an iterative and collaborative process during the development of a UVLS Program or a Corrective Action Plan, to include responding appropriately to inconsistencies, erroneous or incomplete

All comments submitted may be reviewed in their original format on the standard's project page.

If you feel that your comment has been overlooked, please let us know immediately. Our goal is to give every comment serious consideration in this process. If you feel there has been an error or omission, you can contact the Director of Standards, Valerie Agnew, at 404-446-2566 or at valerie.agnew@nerc.net . In addition, there is a NERC Reliability Standards Appeals Process.[1]

---

[1] The appeals process is in the Standard Processes Manual: http://www.nerc.com/comm/SC/Documents/Appendix_3A_StandardsProcessesManual.pdf

2

Consideration of Comments: Project 2008-02 Undervoltage Load Shedding (UVLS) & Underfrequency Load Shedding (UFLS)
Posted: September 9, 2014

The Industry Segments are:

1 — Transmission Owners

2 — RTOs, ISOs

3 — Load-serving Entities

4 — Transmission-dependent Utilities

5 — Electric Generators

6 — Electricity Brokers, Aggregators, and Marketers

7 — Large Electricity End Users

8 — Small Electricity End Users

9 — Federal, State, Provincial Regulatory or other Government Entities

10 — Regional Reliability Organizations, Regional Entities

Group/Individual	Commenter	Organization	Registered Ballot Body Segment									
			1	2	3	4	5	6	7	8	9	10
1. Group	Guy Zito	Northeast Power Coordinating Council										X

	Additional Member	Additional Organization	Region	Segment Selection
1.	Alan Adamson	New York State Reliability Council, LLC	NPCC	10
2.	David Burke	Orange and Rockland Utilities Inc.	NPCC	3
3.	Greg Campoli	New York Independent Sysem Operator	NPCC	2
4.	Sylvain Clermont	Hydro-Quebec TransEnergie	NPCC	1
5.	Chris de Graffenried	Consolidated Edison Co. of New York, Inc.	NPCC	1
6.	Gerry Dunbar	Northeast Power Coordinating Council	NPCC	10
7.	Mike Garton	Dominion Resources Services, Inc.	NPCC	5
8.	Kathleen Goodman	ISO - New England	NPCC	2
9.	Michael Jones	National Grid	NPCC	1
10.	Mark Kenny	Northeast Utilities	NPCC	1
11.	Peter Yost	Consolidated Edison Co, of New York, Inc.	NPCC	3
12.	Helen Lainis	Independent Electricity System Operator	NPCC	2
13.	Alan MacNaughton	New Brunswick Power Corporation	NPCC	9

Group/Individual	Commenter	Organization		Registered Ballot Body Segment									
				1	2	3	4	5	6	7	8	9	10
14. Bruce Metruck	New York Power Authority	NPCC	6										
15. Silvia Parada Mitchell	NextEra Energy, LLC	NPCC	5										
16. Lee Pedowicz	Northeast Power Coordinating Council	NPCC	10										
17. Robert Pellegrini	The United Illuminating Company	NPCC	1										
18. Si Truc Phan	Hydro-Quebec Trans-Energie	NPCC	1										
19. David Ramkalawan	Ontario Power Generation, Inc.	NPCC	5										
20. Brian Robinson	Utility Services	NPCC	8										
21. Ayesha Sabouba	Hydro One Networks Inc.	NPCC	1										
22. Brian Shanahan	National Grid	NPCC	1										
23. Wayne Sipperly	New York Power Authority	NPCC	5										
24. Ben Wu	Orange and Rockland Utilities Inc.	NPCC	1										
2. Group	Janet Smith	Arizona Public Service Co		X		X		X	X				
N/A													
3. Group	Louis Slade	Dominion		X		X		X	X				

Additional Member	Additional Organization	Region	Segment Selection
1. Mike Garton	NERC Compliance Policy	NPCC	5, 6
2. Connie Lowe	NERC Compliance Policy	RFC	5
3. Randi Heise	NERC Compliance Policy	SERC	1, 3, 5, 6
4. Chip Humphrey	Power Generation Compliance	SERC	5
5. Jarad L Morton	Power Generation Compliance	NPCC	5
6. Larry Whanger	Power Generation Compliance	RFC	5
7. Larry Nash	Electric Transmission Compliance	SERC	1, 3
8. Candace L Marshall	Electric Transmission Compliance	SERC	1, 3
9. Angela Park	Electric Transmission Compliance	SERC	1, 3
10. Jeffrey N Bailey	Nuclear Compliance	NA - Not Applicable	5

Group/Individual	Commenter	Organization		1	2	3	4	5	6	7	8	9	10
4. Group	Mike O'Neil	Florida Power & Light		X									
N/A													
5. Group	Dennis Chastain	Tennessee Valley Authority		X		X		X	X				

Additional Member	Additional Organization	Region	Segment Selection
1. DeWayne Scott		SERC	1
2. Ian Grant		SERC	3

Consideration of Comments: Project 2008-02 Undervoltage Load Shedding (UVLS) & Underfrequency Load Shedding (UFLS)
Posted: September 9, 2014

Group/Individual	Commenter	Organization	Registered Ballot Body Segment									
			1	2	3	4	5	6	7	8	9	10
3. Brandy Spraker		SERC 5										
4. Marjorie Parsons		SERC 6										
6. Group	Joe DePoorter	MRO NERC Standards Review Forum	X	X	X	X	X	X				

	Additional Member	Additional Organization	Region	Segment Selection
1.	Amy Casuscelli	Xcel Energy	MRO	1, 3, 5, 6
2.	Chuck Wicklund	Otter Tail Power Company	MRO	1, 3, 5
3.	Dan Inman	Minnkota Power Coop	MRO	1, 3, 5, 6
4.	Dave Rudolph	Basin Electric Power Coop	MRO	1, 3, 5, 6
5.	Kayleigh Wilkerson	Lincoln Electric System	MRO	1, 3, 5, 6
6.	Jodi Jensen	WAPA	MRO	1, 6
7.	Joseph DePoorter	Madison Gas & Electric	MRO	3, 4, 5, 6
8.	Ken Goldsmith	Alliant Energy	MRO	4
9.	Mahmood Safi	Omaha Public Power District	MRO	1, 3, 5, 6
10.	Marie Knox	MISO	MRO	2
11.	Mike Brytowski	Great River Energy	MRO	1, 3, 5, 6
12.	Randi Nyholm	Minnesota Power	MRO	1, 5
13.	Scott Nickels	Rochester Public Utilities	MRO	4
14.	Terry Harbour	MidAmerican Energy	MRO	1, 3, 5, 6
15.	Tom Breene	Wisconsin Public Service	MRO	3, 4, 5, 6
16.	Tony Eddleman	Nebraska Public Power District	MRO	1, 3, 5

Group/Individual	Commenter	Organization	Registered Ballot Body Segment									
7. Group	Patricia Robertson	BC Hydro	X	X	X		X					

	Additional Member	Additional Organization	Region	Segment Selection
1.	Venkataramakrishnan Vinnakota	BC Hydro	WECC	2
2.	Pat G. Harrington	BC Hydro	WECC	3
3.	Clement Ma	BC Hydro	WECC	5

Group/Individual	Commenter	Organization	Registered Ballot Body Segment									
8. Group	David Greene	SERC Protection and Controls Subcommittee										

	Additional Member	Additional Organization	Region	Segment Selection
1.	Charles Fink	Entergy		
2.	Paul Nauert	Ameren		

Consideration of Comments: Project 2008-02 Undervoltage Load Shedding (UVLS) & Underfrequency Load Shedding (UFLS)
Posted: September 9, 2014

Group/Individual	Commenter	Organization	Registered Ballot Body Segment									
			1	2	3	4	5	6	7	8	9	10
3. Rebika Yitna	MEAG											
4. David Greene	SERC											
9. Group	Colby Bellville	Duke Energy	X		X		X	X				

Additional Member	Additional Organization	Region	Segment Selection
1. Doug Hils	Duke Energy	RFC	1
2. Lee Schuster	Duke Energy	FRCC	3
3. Dale Goodwine	Duke Energy	SERC	5
4. Greg Cecil	Duke Energy	RFC	6

Group/Individual	Commenter	Organization	Registered Ballot Body Segment									
10. Group	Greg Campoli	IRC Standards Review Committee		X								

Additional Member	Additional Organization	Region	Segment Selection
1. Ben Li	IESO	NPCC	2
2. Charles Yeung	SPP	SPP	2
3. Ali Miremadi	CAISO	WECC	2
4. Cheryl Moseley	ERCOT	ERCOT	2
5. Matt Goldberg	ISONE	NPCC	2
6. Lori Spence	MISO	MRO	2
7. Stephanie Monzon	PJM	RFC	2

Group/Individual	Commenter	Organization	Registered Ballot Body Segment									
11. Group	Carol Chinn	Florida Municipal Power Agency	X		X	X	X	X				

Additional Member	Additional Organization	Region	Segment Selection
1. Tim Beyrle	City of New Smyrna Beach	FRCC	4
2. Jim Howard	Lakeland Electric	FRCC	3
3. Greg Woessner	Kissimmee Utility Authority	FRCC	3
4. Lynne Mila	City of Clewiston	FRCC	3
5. Cairo Vanegas	Fort Pierce Utility Authority	FRCC	4
6. Randy Hahn	Ocala Utility Service	FRCC	3
7. Stanley Rzad	Keys Energy Services	FRCC	4
8. Don Cuevas	Beaches Energy Services	FRCC	1
9. Mark Schultz	City of Green Cove Springs	FRCC	3
10. Tom Reedy	Florida Municipal Power Pool	FRCC	6
11. Steve Lancaster	Beaches Energy Services	FRCC	3

Consideration of Comments: Project 2008-02 Undervoltage Load Shedding (UVLS) & Underfrequency Load Shedding (UFLS)
Posted: September 9, 2014

Group/Individual		Commenter	Organization	Registered Ballot Body Segment									
				1	2	3	4	5	6	7	8	9	10
12. Richard Bachmeier		Gainesville Regional Utility	FRCC 1										
13. Mike Blough		Kissimmee Utility Authority	FRCC 5										
12.	Group	Jason Marshall	ACES Standards Collaborators						X				

	Additional Member	Additional Organization	Region	Segment Selection
1.	John Shaver	Arizona Electric Power Cooperative	WECC	4, 5
2.	John Shaver	Southwest Transmission Cooperative	WECC	1
3.	Shari Heino	Brazos Electric Power Cooperative	ERCOT	1, 5
4.	Kevin Lyons	Central Iowa Power Cooperative	MRO	1
5.	Michael Brytowski	Great River Energy	MRO	1, 3, 5, 6
6.	Mark Ringhausen	Old Dominion Electric Cooperative	SERC	3, 4
7.	Karl Kohlrus	Prairie Power	SERC	3
8.	Bill Hutchison	Southern Illinois Power Cooperative	SERC	1, 5
9.	Ellen Watkins	Sunflower Electric Power Corporation	SPP	1
10.	Bob Solomon	Hoosier Energy	RFC	1

Group/Individual		Commenter	Organization	Registered Ballot Body Segment									
13.	Group	Robert Rhodes	SPP Standards Review Group		X								

	Additional Member	Additional Organization	Region	Segment Selection
1.	Jonathan Hayes	Southwest Power Pool	SPP	2
2.	Shannon Mickens	Southwest Power Pool	SPP	2
3.	James Nail	City of Independence, MO	SPP	3

Group/Individual		Commenter	Organization	Registered Ballot Body Segment									
14.	Group	Sandra Shaffer	PacifiCorp						X				
N/A													
15.	Individual	Muhammed Ali	Hydro One	X		X							
16.	Individual	Si Truc PHAN	Hydro-Quebec TransEnergie	X									
17.	Individual	Dan Inman	Minnkota Power Cooperative	X									
18.	Individual	Russ Schneider	Flathead Electric Cooperative, Inc.			X	X						
19.	Individual	Amy Casuscelli	Xcel Energy	X		X		X	X				
20.	Individual	Andrew Z Pusztai	American Transmission Company LLC	X									
21.	Individual	Thomas Foltz	American Electric Power	X		X		X	X				

Consideration of Comments: Project 2008-02 Undervoltage Load Shedding (UVLS) & Underfrequency Load Shedding (UFLS)
Posted: September 9, 2014

Group/Individual		Commenter	Organization	Registered Ballot Body Segment									
				1	2	3	4	5	6	7	8	9	10
22.	Individual	Puget Sound Energy	Puget Sound Energy	X		X		X					
23.	Individual	Trevor Schultz	Idaho Power Company	X									
24.	Individual	Mark Wilson	Independent Electricity System Operator		X								
25.	Individual	Chris Scanlon	Exelon Companies	X		X		X	X				
26.	Individual	Larry Watt	Lakeland Electric	X									
27.	Individual	Kayleigh Wilkerson	Lincoln Electric System	X		X		X	X				
28.	Individual	Paul Shipps	Lakeland Electric						X				
29.	Individual	John Pearson/ Matt Goldberg	ISO New England		X								
30.	Individual	Texas Reliability Entity, Inc.	Texas Reliability Entity, Inc.										X
31.	Individual	Anthony Jablonski	ReliabilityFirst										X
32.	Individual	David Jendras	Ameren	X		X		X	X				
33.	Individual	Gul Khan	Oncor Electric Delivery LLC	X									
34.	Individual	Richard Vine	California ISO		X								
35.	Individual	Steve Rueckert	WECC										X
36.	Individual	Marc Donaldson	Tacoma Power	X		X	X	X	X				
37.	Individual	Cheryl Moseley	Electric Reliability Council of Texas, Inc.		X								
38.	Individual	David Kiguel	N/A								X		

Consideration of Comments: Project 2008-02 Undervoltage Load Shedding (UVLS) & Underfrequency Load Shedding (UFLS)
Posted: September 9, 2014

If you support the comments submitted by another entity and would like to indicate you agree with their comments, please select "agree" below and enter the entity's name in the comment section (please provide the name of the organization, trade association, group, or committee, rather than the name of the individual submitter).

Summary Consideration: The drafting team thanks you for your comments. The drafting team has carefully considered all comments and suggested revisions.

Organization	Agree	Supporting Comments of "Entity Name"
Lakeland Electric	Agree	FMPA
Lakeland Electric	Agree	FMPA
ISO New England	Agree	ISO RTO Council Standards Review Committee (SRC)
California ISO	Agree	ISO/RTO Standards Review Committee (SRC)

1. **The drafting team has proposed a new NERC Glossary term, "UVLS Program," and has included supporting information in an accompanying Rationale box and in the standard document's Guidelines and Technical Basis section. Does the defined term and supporting information provide the clarity necessary to understand which types of UVLS are applicable to the standard? If no, please indicate your concerns in the comment section and provide specific suggested changes.**

Summary Consideration: The drafting team has carefully considered all suggested definition revisions. The drafting team has determined that the language in the currently proposed UVLS Program definition is sufficient to identify the types of UVLS subject to the standard, however, the drafting team has implemented non-substantive revisions to refine the structure of the definition so that the drafting team's intent is further clarified. The drafting team notes that there has been much consideration given to using words such as "local" and "contained" to help qualify those programs that are excluded from the definition (as per the example given in the Guidelines and Technical Basis). However, these terms are considered ambiguous and are not transportable on a continent-wide basis, and could therefore potentially be interpreted differently by auditors and the applicable functional entities. The intent of the definition is to provide latitude for the Planning Coordinator or Transmission Planner to determine if UVLS falls under the defined term based on the impact on the reliability of the BES (voltage instability, voltage collapse, or Cascading). The phrase "impacting the Bulk Electric System" has been added to the definition for further clarification, and this latitude has been further clarified in the accompanying Rationale box.

Organization	Yes or No	Question 1 Comment
Northeast Power Coordinating Council	No	The defined term, the Rationale for Definition, and Guidelines for UVLS Program Definition do not provide clarity for the scope of the UVLS Program. Each section subtly defines the term and objective differently. All three do emphasize in a similar manner that the term UVLS Program applies to distributed relays and controls and not to centrally controlled programs.
		Differences are: The definition utilizes the words "mitigate undervoltage conditions", whereas the Guidelines state "a UVLS Program must mitigate risk of one or more of the following:" and Item 1 of the Rationale says "with respect to the impact on the reliability of the BES."
		Standardizing on the UVLS program mitigates the risk of an undervoltage condition that will result in voltage instability, voltage collapse, or Cascading across a majority of Elements in an Interconnection. The

Consideration of Comments: Project 2008-02 Undervoltage Load Shedding (UVLS) & Underfrequency Load Shedding (UFLS)
Posted: September 9, 2014

Organization	Yes or No	Question 1 Comment
		present definition uses the concept of impacting the BES, but this is problematic because voltage instability can impact a small portion of the BES as pointed out in the Technical Guideline. In the proposed revision suggest using the word Interconnection.

RESPONSE: The drafting team thanks you for your comments. The drafting team notes that the first quote is directed to the intended function of a UVLS program as defined, and the definition incorporates the language to which the commenter refers: "[A] UVLS Program must mitigate risk of one more of the following: voltage instability, voltage collapse, or Cascading impacting the BES." (Guidelines and Technical Basis document p.18.). Each document describes the UVLS program using language and terms that complement one another without contradiction, to provide a comprehensive description of the components of a UVLS Program as defined. Taken together, the documents clarify the term and thereby facilitate a more perfect understanding of what elements constitute a UVLS Program to which the standard is directed.

We support the intention of the definition of the new term "UVLS Program", primarily the exclusion of centrally controlled undervoltage-based load shedding and the inclusion of only the UVLS used to mitigate serious impacts to the BES. However, although we agree to use the Guidelines as clarification for the definition, we feel that the concept of "contained area" (that we support) introduced in the Guidelines (radial BES with limited impact versus rest of the BES) is totally absent from the definition itself.

The term "impacting the BES" used in the definition does not differentiate between a widespread BES undervoltage consequence and a contained "local area" issue. Without reviewing the whole definition, the SDT should consider at least introducing this concept in the definition. It brings a crucial clarification in classifying a UVLS scheme. |

Organization	Yes or No	Question 1 Comment
		RESPONSE: The drafting team thanks you for your comment. The phrase "impacting the Bulk Electric System" has been added to the definition to further clarify the applicable UVLS. The drafting team also notes that, regardless of where the UVLS relays and controls are located and where they shed load, if a UVLS program is there to protect the BES, it falls under the definition and is subject to the standard.

Suggest that the standard explicitly define or describe that there are three Categories of UVLS schemes (or systems):1. Centrally controlled undervoltage based schemes (or systems), which would be RAS.2. UVLS Programs, as defined in the proposed PRC 010 1 (with additional clarity suggested below), to which PRC 010 1 applies.3. The remaining UVLS schemes (or systems), meant to resolve local undervoltage issues or protect equipment, etc., which are neither RAS nor part of the UVLS Program.

The lack of explicit distinction between Categories 2 and 3 (and some of the language in the proposed PRC 010 1) leads to the interpretation that all UVLS schemes are either RAS or UVLS Program, as is apparently the case in the revised definition of RAS (Project 2010 05.2), where it includes Category 1 in RAS and excludes Category 2 from RAS, but does not recognize and mention Category 3.

RESPONSE: The drafting team thanks you for your comment. There is coordination between drafting teams, and changes will be made as appropriate to account for circumstances that occur during standards development. The drafting team has implemented non-substantive revisions to the definition of UVLS Program to refine the structure of the definition so that the drafting team's intent is further clarified, and revised the examples in the Guidelines and Technical Basis section to further illustrate the distinctions between UVLS Programs and other UVLS.

To distinguish between UVLS Programs and non Programs (Categories 2 and 3), the standard proposes examining the impact of the contingency which |

Consideration of Comments: Project 2008-02 Undervoltage Load Shedding (UVLS) & Underfrequency Load Shedding (UFLS)
Posted: September 9, 2014

Organization	Yes or No	Question 1 Comment
		the UVLS scheme (or system) is intended to mitigate. In the proposed definition of UVLS Program, if the contingency is "impacting the BES" the UVLS becomes a Program. This could lead to the interpretation that if the impact is even on only one BES element that is directly affected by the contingency, the UVLS is a Program.
		Since voltage instability or collapse could be very localized, we suggest clarifying the definition by changing "impacting the BES" to "impacting the BES outside the contained area" as indicated in the Guidelines and Technical Basis section, or a similar description to provide clarity for differentiating the UVLS Program from non Programs.
		RESPONSE: The drafting team thanks you for your suggestion. The drafting team notes that there has been much consideration given to using words such as "local" and "contained" to help qualify those programs that are excluded from the definition (as per the example given in the Guidelines and Technical Basis). However, these terms are considered ambiguous and are not transportable on a continent-wide basis, and could therefore potentially be interpreted differently by auditors and the applicable functional entities. The intent of the definition is to provide latitude for the Planning Coordinator or Transmission Planner to determine if a UVLS falls under the defined term based on the impact on the reliability of the BES (voltage instability, voltage collapse, or Cascading). The phrase "impacting the Bulk Electric System" has been added to the definition for further clarification, and this latitude has been further clarified in the accompanying Rationale box. The drafting team has also implemented non-substantive revisions to the definition of UVLS Program to refine the structure of the definition so that the drafting team's intent is further clarified, and revised the examples in the Guidelines and Technical Basis section to further illustrate the distinctions between UVLS Programs and other UVLS.

Organization	Yes or No	Question 1 Comment
Dominion	No	The definition of UVLS Program states in part, "An automatic load shedding program..." while the Rational for Definition item #3 states "the definition of UVLS Program is independent of whether the undervoltage load shedding relays are armed manually or automatically..."
		Dominion suggests that the SDT provide clarity on this perceived conflict. The definition of the UVLS program uses both the term "voltage instability" and "voltage collapse." In the NERC glossary of terms, Stability is defined as "The ability of an electric system to maintain a state of equilibrium during normal and abnormal conditions or disturbances." Voltage instability, then, means that the voltage never reaches an equilibrium. In other words, it continues to fall (collapses) towards zero. Therefore "voltage instability" and "voltage collapse" are the same term and redundant. One might have a voltage stability problem for a voltage rise such as due to the Ferranti effect, but certainly a UVLS program would not help with that.
		Dominion suggests the drafting team should either 1) delete the term "voltage instability" and use the term "voltage collapse" only or say instead "...to mitigate undervoltage conditions leading to voltage instability (voltage collapse) or Cascading impacting ..."
		RESPONSE: The drafting team thanks you for your comments. The drafting team notes that: "When a generator of a heavily loaded electric power system reaches a reactive power limit, the system can become immediately unstable and a dynamic voltage collapse leading to blackout may follow." Dobson, I; Lu, L., "Voltage collapse precipitated by the immediate change in stability when generator reactive power limits are encountered," *Circuits and Systems I: Fundamental Theory and Applications, IEEE Transactions on*, vol.39, no.9, pp.762,766, Sept. 1992.

Organization	Yes or No	Question 1 Comment
		Voltage instability, therefore, does not necessarily result in voltage collapse, rather, voltage instability may result in voltage collapse. The drafting team notes that, whether automatic or manual, the arming is in response to system conditions indicative of voltage concerns rather than in response to the actual instability or collapse.
Duke Energy	No	Duke Energy requests further clarification from the standard drafting team on whether this standard would apply to UVLS relays that only protect small a area (e.g. a small city). In this instance, this would not be considered to be a "distributed relays and controls," however, it is possible that voltage collapse, as referenced in the definition, could occur in a small area. This could be interpreted as a UVLS application, and one that is not centrally controlled.
		Furthermore, we request the standard drafting team to more clearly define what constitutes a "program," as opposed to one relay that protects one city to prevent voltage collapse in that specific area. In this instance, would this be considered an SPS/RAS, or would it fall under the "UVLS Program" definition?
		RESPONSE: The drafting team thanks you for your suggestion. The drafting team notes that there has been much consideration given to using words such as "local" and "contained" to help qualify those programs that are excluded from the definition (as per the example given in the Guidelines and Technical Basis). However, these terms are considered ambiguous and are not transportable on a continent-wide basis, and could therefore potentially be interpreted differently by auditors and the applicable functional entities. The intent of the definition is to provide latitude for the Planning Coordinator or Transmission Planner to determine if UVLS falls under the defined term based on the impact on the reliability of the BES (voltage instability, voltage collapse, or Cascading). The phrase "impacting the Bulk Electric System" is included in the definition to provide further clarification,

Organization	Yes or No	Question 1 Comment
		and this latitude has been further clarified in the accompanying Rationale box. The drafting team has also implemented non-substantive revisions to the definition of UVLS Program to refine the structure of the definition so that the drafting team's intent is further clarified, and revised the examples in the Guidelines and Technical Basis section to further illustrate the distinctions between UVLS Programs and other UVLS.
IRC Standards Review Committee	No	The proposed definition still needs improvement. The drafting team has added the phrase "impacting the Bulk Electric System (BES)" to the definition in an attempt to clarify that local programs are not included in the definition of UVLS Program. However, the impact would be only to the local area if a single BES element is affected. Thus, the definition should clearly state that local programs do not fall under the definition of UVLS Program.

We recommend adopting this language: Undervoltage Load Shedding Program (UVLS Program): An automatic load shedding program consisting of relays and controls that operated in a coordinated manner to mitigate undervoltage conditions leading to voltage instability, voltage collapse, or Cascading that have an impact beyond the local area as determined by the Planning Coordinator or Transmission Planner. Centrally controlled undervoltage based load shedding or multiple independent relays are not included.

In addition, in its response to comments received on the previous version of the standard, the drafting team states that "the intent of the definition is to provide flexibility for the Planning Coordinator or Transmission Planner to determine if a UVLS system falls under the defined term with respect to the impact on the reliability of the BES." The SRC does not believe that the proposed definition provides that flexibility.

RESPONSE: The drafting team thanks you for your suggestion. Upon consideration, the drafting team replaced the prior language of the |

Organization	Yes or No	Question 1 Comment
		explanatory material with the term "latitude" to more clearly describe the drafting team's intention that the Planning Coordinator or Transmission Planner work within the boundaries of the standard to determine if UVLS falls under the defined term based on the impact on the reliability of the BES.
		The drafting team also states that "multiple independent relays do not constitute a program" and that a UVLS program "would include relays that are coordinated and act in concert for this purpose." The SRC suggests that these concepts be expressly reflected in the definition of UVLS Program.
		RESPONSE: The drafting team thanks you for your suggestion. The drafting team has also implemented non-substantive revisions to the definition of UVLS Program to refine the structure of the definition so that the drafting team's intent is further clarified, and revised the examples in the Guidelines and Technical Basis section to further illustrate the distinctions between UVLS Programs and other UVLS.
		The standard, technical paper and definition need to clarify the distinction between 'centrally controlled' and 'locally applied'. There seems to be a contradiction for the exclusion allowed in the definition and the exception explained in the FAQ.
		RESPONSE: The drafting team thanks you for your suggestion. The drafting team notes that there has been much consideration given to using words such as "local" and "contained" to help qualify those programs that are excluded from the definition (as per the example given in the Guidelines and Technical Basis). However, these terms are considered ambiguous and are not transportable on a continent-wide basis, and could therefore potentially be interpreted differently by auditors and the applicable functional entities. The intent of the definition is to provide latitude for the Planning Coordinator or Transmission Planner to determine if a UVLS falls under the defined term based on the impact on the reliability of the BES

Organization	Yes or No	Question 1 Comment
		(voltage instability, voltage collapse, or Cascading). The phrase "impacting the Bulk Electric System" has been added to the definition for further clarification, and this latitude has been further clarified in the accompanying Rationale box. The drafting team has also revised the examples in the Guidelines and Technical Basis section to further illustrate the distinctions between UVLS Programs and other UVLS.
ACES Standards Collaborators	No	While we believe the changes improve the definition, we believe there is still significant ambiguity in the definition that needs to be addressed. First, the example described in the last paragraph of the Guidelines and Technical Basis section on page 18 of the standard is not clearly excluded from the definition as the example implies. Because voltage collapse and instability are often difficult to assess accurately, undervoltage conditions could be a sign of a pending voltage collapse or instability.

Thus, we suggest either the definition or example should be modified for clarification.

RESPONSE: The drafting team thanks you for your comments. The drafting team agrees with the comments regarding the example on page 18 of the Guidelines and Technical and has modified the example in accordance with your comment.

Second, since "Cascading" would impact the BES by definition the inclusion of the clause "impacting the Bulk Electric System (BES)" after the term creates confusion and ambiguity. Is this term intended to apply to "Cascading" only or all items in the list including "voltage collapse" and "voltage instability"?

RESPONSE: The drafting team thanks you for your comments. The drafting team agrees that Cascading as a defined term is applicable to the BES. The phrase "impacting the Bulk Electric System" has been added to the definition for the purpose of clarification and is intended to apply to |

Organization	Yes or No	Question 1 Comment
		"voltage instability, voltage collapse, or Cascading". The drafting team has also implemented non-substantive revisions to the definition of UVLS Program to refine the structure of the definition so that the drafting team's intent is further clarified, and revised the examples in the Guidelines and Technical Basis section to further illustrate the distinctions between UVLS Programs and other UVLS. Third, what is the intended difference between "voltage collapse" and "voltage instability"? Can one occur without the other occurring? If not, this creates ambiguity because it is not clear what was the drafting team intended to differentiate by including both terms. RESPONSE: The drafting team thanks you for your comments. The drafting team notes that: "When a generator of a heavily loaded electric power system reaches a reactive power limit, the system can become immediately unstable and a dynamic voltage collapse leading to blackout may follow." Dobson, I; Lu, L., "Voltage collapse precipitated by the immediate change in stability when generator reactive power limits are encountered," *Circuits and Systems I: Fundamental Theory and Applications, IEEE Transactions on*, vol.39, no.9, pp.762,766, Sept. 1992. Voltage instability, therefore, does not necessarily result in voltage collapse, rather, voltage instability may result in voltage collapse. Fourth, we believe the inclusion of the clause "impacting the Bulk Electric System (BES)" is grammatically incorrect. It should be "that impacts the Bulk Electric System (BES)." RESPONSE: The drafting team thanks you for your suggestion. The drafting team has implemented non-substantive revisions to the definition of UVLS Program to refine the structure of the definition so that the drafting team's intent is further clarified.

Organization	Yes or No	Question 1 Comment
SPP Standards Review Group	No	In the 3rd item in the Rationale for Definition wouldn't it be better if we said '...are armed manually or automatically providing the arming is done in anticipation of extreme conditions...'? Using 'since' makes it appear that this is an assumption but using 'providing' makes it a condition to qualify. RESPONSE: The drafting team thanks you for your comment. The drafting team considers "since" acceptable because the distinction is associated with timing of the arming rather than the intent (qualifying condition) of the arming.
Hydro One	No	We suggest that the standard explicitly define or describe that there are three categories of UVLS schemes (or systems):1. Centrally-controlled undervoltage-based schemes (or systems), which would be RAS.2. UVLS Programs, as defined in the proposed PRC-010-1 (with additional clarity suggested below), to which PRC-010-1 applies.3. The remaining UVLS schemes (or systems), meant to resolve local undervoltage issues or protect equipment, etc., which are neither RAS nor UVLS Program. The lack of explicit distinction between Category 2 and 3 (and some of the language in the proposed PRC-010-1) leads to the interpretation that all UVLS schemes are either RAS or UVLS Program, as is apparently the case in the revised definition of RAS (Project 2010-05.2), where it includes category 1 in RAS and excludes category 2 from RAS, but does not recognize and mention category 3. To distinguish between UVLS Programs and non-Programs (category 2 and 3), the standard proposes examining the impact of the contingency which the UVLS scheme (or system) is intended to mitigate. In the proposed definition of UVLS Program, if the contingency is "impacting the BES", the UVLS becomes a Program. This could lead to the interpretation that if the impact is even on only one BES element, that is directly affected by the contingency, the UVLS is a Program.

Organization	Yes or No	Question 1 Comment
		Since voltage instability or collapse could be very localized, we suggest clarifying the definition by changing "impacting the BES" to ""impacting the BES outside the contained area" as indicated in the Guidelines and Technical Basis section, or a similar description to provide clarity for differentiating UVLS Programs from non-Programs
		RESPONSE: The drafting team thanks you for your suggestion. The drafting team notes that there has been much consideration given to using words such as "local" and "contained" to help qualify those programs that are excluded from the definition (as per the example given in the Guidelines and Technical Basis). However, these terms are considered ambiguous and are not transportable on a continent-wide basis, and could therefore potentially be interpreted differently by auditors and the applicable functional entities. The intent of the definition is to provide latitude for the Planning Coordinator or Transmission Planner to determine if UVLS falls under the defined term based on the impact on the reliability of the BES (voltage instability, voltage collapse, or Cascading). The phrase "impacting the Bulk Electric System" has been added to the definition for further clarification, and this latitude has been further clarified in the accompanying Rationale box.
Flathead Electric Cooperative, Inc.	No	The phrase "Cascading impacting the Bulk Electric System (BES)" is not really specific to what UVLS is, but rather what the standard should apply too and don't think it fits in the definition. Only UVLS equipment that could result in these types of impacts should be in scope, but that isn't really the definition of UVLS per se.
		RESPONSE: The drafting team thanks you for your suggestion. The drafting team has implemented non-substantive revisions to the definition of UVLS Program to refine the structure of the definition so that the drafting team's intent is further clarified, and revised the examples in the Guidelines and

Organization	Yes or No	Question 1 Comment
		Technical Basis section to further illustrate the distinctions between UVLS Programs and other UVLS.
American Transmission Company LLC	No	ATC remains concerned that the temporary UVLSs used to support maintenance or construction outages in the Real Time and Operations Planning time horizons are not explicitly excluded from PRC-010-1. ATC recommends the inclusion of text that explicitly states that the standard does not apply to the development and implementation of temporary UVLS Programs for maintenance or construction outage purposes in the Operations Planning horizon. ATC recommends revising the second sentence in the proposed definition of Undervoltage Load Shedding Program (UVLS Program) to read, "Centrally-controlled undervoltage-based load shedding and temporary undervoltage-based load shedding developed and implemented for maintenance and construction outage purposes in the Operations Planning horizon are not included."

As an alternative to modifying the definition of UVLS Program, ATC recommends adding text such as, " The development and implementation of temporary UVLS Programs for maintenance or construction outage purposes in the Operations Planning horizon do not apply to this standard" at the end of Section A.4. "Applicability" or Section A.5. "Background."

RESPONSE: The drafting team thanks you for your comment. Upon consideration, the drafting team maintains that the requested explicit qualification that UVLS Programs are not temporary schemes is not necessary on the basis that the nature of such a scheme would not meet the attributes of the defined term. In addition, the drafting team has implemented non-substantive revisions to the definition of UVLS Program to refine the structure of the definition so that the drafting team's intent is further clarified, and revised the examples in the Guidelines and Technical Basis section to further illustrate the distinctions between UVLS Programs and other UVLS. |

Organization	Yes or No	Question 1 Comment
American Electric Power	No	AEP appreciates the efforts of the drafting team to provide clarification that the programs specified are only those which impact the BES, however as written, the definition could possibly be misinterpreted that only the word "cascading" is associated with the phrase "impacting the Bulk Electric System (BES)".
		To avoid potential misinterpretation, AEP suggests using "An automatic load shedding program consisting of distributed relays and controls used to mitigate undervoltage conditions leading to BES voltage instability, BES voltage collapse, or BES Cascading.
		RESPONSE: The drafting team thanks you for your comments. Upon consideration, the drafting team has implemented non-substantive revisions to the definition of UVLS Program to refine the structure of the definition so that the drafting team's intent is further clarified, and revised the examples in the Guidelines and Technical Basis section to further illustrate the distinctions between UVLS Programs and other UVLS.
		"In addition, the callout states "The definition provides flexibility for the Planning Coordinator or Transmission Planner to determine if a UVLS system falls under the defined term…" We do not believe "flexibility" is an appropriate attribute of a definition.
		Might the team actually mean "clarity" rather than "flexibility"? Please explain.
		RESPONSE: The drafting team thanks you for your comment. Upon consideration, the drafting team has determined that the term "latitude" more clearly describes the drafting team's intentions in relation to the rationale box to which you refer, and as such, has made the appropriate revisions to the explanation contained therein.
Arizona Public Service Co	Yes	RESPONSE: The drafting team thanks you for your support.

Organization	Yes or No	Question 1 Comment
Florida Power & Light	Yes	RESPONSE: The drafting team thanks you for your support.
Tennessee Valley Authority	Yes	RESPONSE: The drafting team thanks you for your support.
MRO NERC Standards Review Forum	Yes	: Recommend that the word "failures" be added after Cascading to a line with the definition of Reliable Operation. RESPONSE: The drafting team thanks you for your comments. Upon consideration, the drafting team has implemented non-substantive revisions to the definition of UVLS Program to refine the structure of the definition so that the drafting team's intent is further clarified, and revised the examples in the Guidelines and Technical Basis section to further illustrate the distinctions between UVLS Programs and other UVLS.
BC Hydro	Yes	RESPONSE: The drafting team thanks you for your support.
SERC Protection and Controls Subcommittee	Yes	RESPONSE: The drafting team thanks you for your support.
Florida Municipal Power Agency	Yes	RESPONSE: The drafting team thanks you for your support.
PacifiCorp	Yes	RESPONSE: The drafting team thanks you for your support.
Hydro-Quebec TransEnergie	Yes	Hydro-Quebec supports the intention of the definition of the new term "UVLS Program", mainly the exclusion of Centrally controlled undervoltage-based load shedding and the inclusion of only those UVLS used to mitigate serious impacts on the BES. However, although we agree to use the guidelines as additional inputs to the definition, we feel that the concept of "contained area" (that we support) introduced in the guidelines (radial BES with limited impact versus rest of the BES) is totally absent from the definition itself. The terms

Organization	Yes or No	Question 1 Comment
		"impacting the BES" used in the definition do not bring any nuance between a widespread BES undervoltage consequence and a contained "local area" issue. Without reviewing the whole definition, it seems like the SDT should consider at least introducing this concept in the definition, as it brings a crucial clarification in classifying a UVLS scheme.
		RESPONSE: The drafting team thanks you for your suggestion. The drafting team notes that there has been much consideration given to using words such as "local" and "contained" to help qualify those programs that are excluded from the definition (as per the example given in the Guidelines and Technical Basis). However, these terms are considered ambiguous and are not transportable on a continent-wide basis, and could therefore potentially be interpreted differently by auditors and the applicable functional entities. The intent of the definition is to provide latitude for the Planning Coordinator or Transmission Planner to determine if UVLS falls under the defined term based on the impact on the reliability of the BES (voltage instability, voltage collapse, or Cascading). The phrase "impacting the Bulk Electric System" has been added to the definition for further clarification, and this latitude has been further clarified in the accompanying Rationale box. The drafting team has also implemented non-substantive revisions to the definition of UVLS Program to refine the structure of the definition so that the drafting team's intent is further clarified, and revised the examples in the Guidelines and Technical Basis section to further illustrate the distinctions between UVLS Programs and other UVLS.
Minnkota Power Cooperative	Yes	Is it possible that the word "program" could be replaced with a more generic term (such as "system" as used in page 18 in the Guidelines and Technical Basis document). We would recommend that a search be done for all the instances of the word "program" (lower case "p") in the standard, and they be change in like manner to avoid confusion with the definition. So, the definition would read: Undervoltage Load Shedding Program (UVLS Program): An automatic load shedding system consisting of distributed

Organization	Yes or No	Question 1 Comment
		relays and controls used to mitigate undervoltage conditions leading to voltage instability, voltage collapse, or Cascading impacting the Bulk Electric System (BES). Centrally -controlled undervoltage-based load shedding is not included. RESPONSE: The drafting team thanks you for your comments. The drafting team has also implemented non-substantive revisions to the definition of UVLS Program to refine the structure of the definition so that the drafting team's intent is further clarified, and revised of instances of "UVLS program" and "UVLS system" to "UVLS" to address this issue.
Xcel Energy	Yes	RESPONSE: The drafting team thanks you for your support.
Puget Sound Energy	Yes	RESPONSE: The drafting team thanks you for your support.
Idaho Power Company	Yes	It was actually a phone call from a drafting team member that helped provide clarity more than anything else. RESPONSE: The drafting team thanks you for your comment.
Independent Electricity System Operator	Yes	RESPONSE: The drafting team thanks you for your support.
Exelon Companies	Yes	RESPONSE: The drafting team thanks you for your support.
Texas Reliability Entity, Inc.	Yes	RESPONSE: The drafting team thanks you for your support.
Ameren	Yes	RESPONSE: The drafting team thanks you for your support.
Oncor Electric Delivery LLC	Yes	RESPONSE: The drafting team thanks you for your support.
WECC	Yes	RESPONSE: The drafting team thanks you for your support.

Consideration of Comments: Project 2008-02 Undervoltage Load Shedding (UVLS) & Underfrequency Load Shedding (UFLS)
Posted: September 9, 2014

Organization	Yes or No	Question 1 Comment
Tacoma Power	Yes	RESPONSE: The drafting team thanks you for your support.

Consideration of Comments: Project 2008-02 Undervoltage Load Shedding (UVLS) & Underfrequency Load Shedding (UFLS)
Posted: September 9, 2014

2. **Do you have any concerns with the standard itself, including the Applicability section, Requirements, Measures, Violation Risk Factors (VRFs), and Violation Severity Levels (VSLs)? If yes, please indicate your concerns in the comment section and provide specific suggested changes**

Summary Consideration: It has been suggested that the drafting team address Requirement R1 as two separate requirements, one of which would address UVLS Program development, and the other of which would address provision of the UVLS Program's specifications and implementation schedule to the UVLS entities responsible for implementing the UVLS Program. The drafting team agrees that the requirement could have been approached in this manner. Ultimately, it has determined that providing program specifications for implementation by UVLS entities is a necessary part of the development of "an effective UVLS Program," and therefore has determined not to decouple development with the natural result of that development. As a related matter, there were recommendations to provide a mechanism by which UVLS entities could provide input during the development of a UVLS Program. The Requirements were drafted with the understanding that a PC or TP must necessarily engage the UVLS entity in an iterative and collaborative process during the development of a UVLS Program or a Corrective Action Plan, to include responding appropriately to inconsistencies, erroneous or incomplete information, misunderstandings, or issues regarding implementation plans or other obligations that the UVLS entity brings to the attention of the PC or TP. To design an effective UVLS Program or Corrective Action Plan, a PC or TP must coordinate and cooperate with a ULVS entity that is to implement that UVLS Program or Corrective Action Plan. It is expected that the developing entity will revise a Corrective Action Plan that is determined compromised by circumstances that prevent a UVLS entity from fulfilling obligations imposed by that plan, including schedule.

Organization	Yes or No	Question 2 Comment
MRO NERC Standards Review Forum	No	RESPONSE: The drafting team thanks you for your support.
SERC Protection and Controls Subcommittee	No	RESPONSE: The drafting team thanks you for your support.
PacifiCorp	No	See Response to Question 3.

Consideration of Comments: Project 2008-02 Undervoltage Load Shedding (UVLS) & Underfrequency Load Shedding (UFLS)
Posted: September 9, 2014

Organization	Yes or No	Question 2 Comment
		RESPONSE: The drafting team thanks you for your input, please see Response to Question 3 comment.
Hydro-Quebec TransEnergie	No	RESPONSE: The drafting team thanks you for your support.
Minnkota Power Cooperative	No	RESPONSE: The drafting team thanks you for your support.
Flathead Electric Cooperative, Inc.	No	RESPONSE: The drafting team thanks you for your support.
American Transmission Company LLC	No	RESPONSE: The drafting team thanks you for your support.
American Electric Power	No	RESPONSE: The drafting team thanks you for your support.
Idaho Power Company	No	RESPONSE: The drafting team thanks you for your support.
Independent Electricity System Operator	No	RESPONSE: The drafting team thanks you for your support.
Exelon Companies	No	RESPONSE: The drafting team thanks you for your support.
Ameren	No	RESPONSE: The drafting team thanks you for your support.
Oncor Electric Delivery LLC	No	RESPONSE: The drafting team thanks you for your support.
WECC	No	RESPONSE: The drafting team thanks you for your support.
Northeast Power Coordinating Council	Yes	R1 should be divided into two separate requirements. One requirement should be to develop an effective UVLS Program, and the second requirement should be to provide the program specifications to UVLS Entities.

Organization	Yes or No	Question 2 Comment
		RESPONSE: The drafting team thanks the commenter for the suggestion, and agrees that the requirement could have been approached in this manner. The drafting team, however, determined that providing program specifications for implementation by UVLS entities is a necessary part of the development of "an effective UVLS Program," and therefore it is prudent to couple development with the natural result of that development.
		In R1 replace the word "developing" with the phrase "identifies the need for a UVLS Program…"
		RESPONSE: The drafting team thanks you for your comment. The drafting team agrees that using the phrase "identifies the need for a UVLS Program" would serve as an acceptable alternative to using the term "developing" in Requirement R1. The drafting team notes that identification of the need for a UVLS Program is the first step of development. Therefore, the drafting team has determined that the language "Each Planning Coordinator or Transmission Planner that is developing a UVLS Program . . ." clearly expresses the expectation that the identification of the need for a ULVS Program will initiate development of a ULVS Program.
		Also, it is unclear if the phrase in R1 "but is not limited to…" is applied to the criteria for evaluation in Parts 1.1 and 1.2, or if it applies to the "studies and analyses".
		RESPONSE: The phrase "is not limited to . . ." is intended to convey that at a minimum, studies and analyses must be conducted that evaluate the particularities of the UVLS Program as required by R3, Part 3.1 and Part 3.2. The phrase indicates that any other available tools or methods that further inform evaluation of the UVLS Program may be available for use.
		R1 would be revised to: Each Planning Coordinator or Transmission Planner that identifies the risk of undervoltage contingencies that will result in voltage instability, voltage collapse, or Cascade across a majority of Elements in an Interconnection shall develop a UVLS Program to address these risks. The UVLS program shall at a minimum: 1.1 Resolve or mitigate the identified risks it was required to mitigate.

Organization	Yes or No	Question 2 Comment
		1.2 Integrate through coordination with generator voltage ride through, etc.....The implementation portion of R1 would become a new requirement. The PC or TPL that develops a UVLS program shall provide the program specifications and implementation schedule to the UVLS Entities responsible for the UVLS Program implementation. The SDT should consider if a time period between completion assessment and delivery of implementation is required similar to R5.The need for studies and analyses in R1 would move to M1 as a measure.
		RESPONSE: The drafting team thanks you for your comment. The drafting team agrees that this approach would serve as an acceptable alternative to the approach selected by the drafting team. However, the drafting team asserts that the language expressed by Requirement R1 as currently drafted clearly conveys the expectation that the identification of the need for a ULVS Program will initiate development of a ULVS Program.
		We have a concern with Requirement R2 in that it gives considerable authority to the Planning Coordinator or Transmission Planner. Nowhere in the new standard is there any proviso for an UVLS entity such as a TO to comment or advise on the feasibility of the program specification, and particularly the implementation schedule. There should be an opportunity for the UVLS entity to provide input to the plan and schedule, and a mechanism for resolving disagreement. We have a similar concern with Requirement R5 with regard to the specification and execution of the CAP.
		RESPONSE: The drafting team thanks you for your comment. Requirement R2 was drafted with the understanding that a PC or TP must necessarily engage the UVLS entity in an iterative and collaborative process during the design and development of a UVLS program, to include responding appropriately to inconsistencies, erroneous or incomplete information, or misunderstandings that the UVLS entity brings to the attention of the PC or TP. To design an effective UVLS Program, a PC or TP must coordinate and cooperate with a ULVS entity that is to implement that UVLS Program.

Organization	Yes or No	Question 2 Comment
		It is unclear if the phrase in R3 "but is not limited to,..." is applying to the criteria for evaluation in Parts 3.1 and 3.2, or if it applies to the studies and analyses.
		RESPONSE: The drafting team thanks you for your comment. The phrase "is not limited to . . ." is intended to convey that at a minimum, studies and analyses must be conducted that evaluate the particularities of the UVLS Program as required by R3, Part 3.1 and Part 3.2. The phrase indicates that any other available tools or methods that further inform evaluation of the UVLS Program may be available for use.
		Consider revising the second sentence in R3 to read "The PC or TPL shall at a minimum evaluate the existing UVLS program for the following criteria:"R3 is about an evaluation of the effectiveness of an existing program. So Part 3.1 should address that the program continues to resolve the risks. Suggest revising Part 3.1 to "The UVLS Program continues to resolve the risk of undervoltage contingencies identified in R1 that will result in voltage instability, voltage collapse, or Cascading across a majority of Elements in an Interconnection."
		RESPONSE: The drafting team thanks you for your comment. Requirement R3 is intended to address any identified issues or contingencies, rather than addressing only the "contingencies identified in R1." The drafting team has determined that revising the language of R1 as suggested would narrow the requirement beyond the issues or contingencies that are appropriately addressed by Requirement R3.
		R4 presently requires a post-event evaluation that evaluates whether the UVLS Program resolved the undervoltage issues associated with the event. Post-event analysis should evaluate two items; whether the UVLS Program operated as designed, and whether it prevented the undervoltage issue leading to voltage instability, voltage collapse or Cascading.
		RESPONSE: The drafting team thanks you for your comment. The drafting team notes that the defined term UVLS Program includes as part of its definition "used to mitigate undervoltage conditions leading to voltage instability, voltage collapse, or Cascading impacting the Bulk Electric System (BES)." Therefore, the specific issues

Consideration of Comments: Project 2008-02 Undervoltage Load Shedding (UVLS) & Underfrequency Load Shedding (UFLS)
Posted: September 9, 2014

Organization	Yes or No	Question 2 Comment
		identified by the commenter are already incorporated into R4 by reference to the defined term UVLS Program. "[W]hether the UVLS Program operated as designed" is inherently addressed in the requirement as written.
		In R5 consider replacing "deficiencies" with the phrase "needed modifications".
		RESPONSE: The drafting team thanks you for your comment. The SDT's position is that the word "deficiencies" correctly reflects the intention of the team as the trigger for R5, and clearly signals the required time for an entity to act under R5 to comply with the requirements of the standard. The drafting team agrees that an entity may determine that it is appropriate to act in the manner prescribed in Requirement R5 to further improve a UVLS Program beyond that required by Requirement R5, and notes that there is no language in the Requirement that prohibits such a conservative approach that goes beyond that required by Requirement R5.
Arizona Public Service Co	Yes	Requirement R7 is unnecessary. R2 requires each UVLS entity to adhere to UVLS program designed by Transmission Planner. It is not necessary for UVLS entities to turn around and supply the same data back to Transmission Planner. They already have the data.
		RESPONSE: The drafting team thanks you for your comment. The drafting team notes that the information the UVLS entity is required to provide by Requirement R7, to include load data--is not static in nature. Furthermore, the data supplied by the UVLS entity will be actual data following installation rather than simply the design specifications provided by the Planning Coordinator or Transmission Planner. The Planning Coordinator should have the best data available to inform its database rather than initial design specifications.
Florida Power & Light	Yes	R1.2 and R3.2 require studies and analyses that evaluate whether the UVLS program is integrated through coordination with generator voltage ride-through capabilities and other protection and control systems. The generator low voltage ride through capabilities may be extremely difficult to determine without performing load threatening staged tests. R1.2 and R3.2 should require "coordination with known or

Organization	Yes or No	Question 2 Comment
		assumed generator voltage ride-through capabilities," similar to TPL-001-4. If precise generator undervoltage relay settings are used this will be a minor concession and will significantly reduce the compliance burden to the UVLS entity. RESPONSE: The drafting team thanks you for your comments. The drafting team notes that the Requirements do not prevent an entity from using the best available data.
Tennessee Valley Authority	Yes	R6 requires that the UVLS database be updated each calendar year. If the PC has not made any changes to the UVLS schemes over the previous year they should not be required to update the database. The requirement should require the PC to review the database each year and update as needed based on that review. RESPONSE: The drafting team thanks you for your comment. With respect to the indication that the database update needs to be performed only as the UVLS Program is revised, the drafting team notes that the data being updated, particularly load, is not static in nature—the annual time frame allows the Planning Coordinator to periodically capture cumulative effects of small changes that would not warrant updates by themselves.
BC Hydro	Yes	It's not clear what the reliability standard is when a UVLS Program is designed. It's clear that the UVLS Program is designed for under-voltage conditions which will lead to voltage instability, voltage collapse, or cascading impacting the BES. But it not clear for application of the program under what kind of contingency categories. Can the scheme be designed for TPL Category B events? RESPONSE: The drafting team thanks you for your comment. The drafting team agrees that the standard's requirements address development, evaluation, and reliable operation of a UVLS Program. A UVLS Program may be developed and implemented to serve to further system integrity in the event of an extreme Contingency or to achieve specific system performance for known transmission Contingencies for which dropping of load is allowed under Transmission Planning (TPL) Reliability Standards. Therefore, program application, particularly regarding

Organization	Yes or No	Question 2 Comment
		defined categories of events, is beyond the scope of the standard as currently drafted.
Duke Energy	Yes	Requirements: R1) No commentR2) No commentR3) With regard to the 60 calendar month timeframe with which an entity must perform its comprehensive assessment, when does the 60 calendar month timeframe begin? Does the day that the standard obtains regulatory approval start the clock for the 60 calendar month timeframe? Or does the 60 calendar month timeframe begin prior to the standard's implementation date? Please clarify when the 60 calendar month timeframe officially begins. RESPONSE: The drafting team appreciates your request for clarification. The 60 calendar month timeframe to perform the comprehensive assessment is counted from implementation of a UVLS Program if the UVLS Program is developed after the standard becomes enforceable. If a UVLS Program is already in place, then the 60 calendar month timeframe to perform the comprehensive assessment is counted from the last program evaluation triggered by compliance with PRC-010-0, currently subject to enforcement. R4) No commentR5) We request the drafting team's consideration of whether a clause should be inserted to address the necessity of coordinating for potential unforeseen circumstance in the implementation schedule of the Corrective Action Plan. It is possible for instances to occur that may prevent a UVLS entity to fully implement all obligations designated to it in the CAP. Should there be a provision to allow for communication and coordination between the PC/TP and the UVLS entity in the event a deadline cannot be met? RESPONSE: The drafting team thanks you for your suggestion. Requirement R5 was drafted with the understanding that a PC or TP must necessarily engage the UVLS entity in an iterative and collaborative process during the development of a Corrective Action Plan, to include responding appropriately to inconsistencies, erroneous or incomplete information, or misunderstandings that the UVLS entity brings to the attention of the PC or TP. To design an effective Corrective Action Plan,

Organization	Yes or No	Question 2 Comment
		a PC or TP must coordinate and cooperate with a ULVS entity that is to implement that Corrective Action Plan.
		R6) No commentR7) No commentR8) We request the drafting team's consideration of inserting a provision in R8 that specifically states that the format that a PC provides its UVLS Program database to others, only be required to be in the format used by the PC providing the database. Requiring a PC to change its own format to satisfy the requestor seems to be overly burdensome.
		RESPONSE: The drafting team thanks you for your suggestion. Requirement R8 does not direct the PC to provide the database in a particular format.
		VRF/VSL:R2) Duke Energy believes that the VRF/VSL for R2 should be amended based on the concerns we outlined for R5 above. If unforeseen circumstances arose, and a UVLS entity could not execute an obligation per the CAP implementation schedule, the UVLS entity would be in non-compliance of R2 with the potential severity level of being High or Severe.
		RESPONSE: The drafting team thanks you for your suggestion. As stated above, Requirement R5 was drafted with the understanding that a PC or TP must necessarily engage the UVLS entity in an iterative and collaborative process during the development of a Corrective Action Plan, to include responding appropriately to inconsistencies, erroneous or incomplete information, misunderstandings, or issues regarding implementation plans or other obligations that the UVLS entity brings to the attention of the PC or TP. To design an effective Corrective Action Plan, a PC or TP must coordinate and cooperate with a ULVS entity that is to implement that Corrective Action Plan. It is expected that the developing entity will revise a Corrective Action Plan that is determined compromised by circumstances that prevent a UVLS entity from fulfilling obligations imposed by that plan, including schedule.
IRC Standards Review Committee	Yes	Under R5, the Planning Coordinator or Transmission Planner is required to develop a Corrective Action Plan (CAP). The Planning Coordinator or Transmission Planner can

Organization	Yes or No	Question 2 Comment
		determine the necessary performance requirements. However, the UVLS entities should be required to develop the CAP, not the Planning Coordinator or Transmission Planner. We note that, in the current Guidelines and Technical Basis, CAP Examples 1 and 2 under "Guidelines for Requirement 2" reflect that the equipment owner (i.e. the UVLS entity) of the UVLS entity develops the CAP.
		RESPONSE: The drafting team thanks you for your suggestion. The examples provided in the Guidelines and Technical basis illustrate the expectation that the PC or TP and UVLS entity will work together to develop and implement Corrective Action Plan, because, a UVLS entity may not have access to the complete information to the network model needed to develop an effective CAP. Requirement R5 was drafted with the understanding that a PC or TP must necessarily engage the UVLS entity in an iterative and collaborative process during the development of a Corrective Action Plan, to include responding appropriately to inconsistencies, erroneous or incomplete information, misunderstandings, or issues regarding implementation plans or other obligations that the UVLS entity brings to the attention of the PC or TP. To design an effective Corrective Action Plan, a PC or TP must coordinate and cooperate with a ULVS entity that is to implement that Corrective Action Plan.
Florida Municipal Power Agency	Yes	The revised Measures are very rigid and prescriptive which goes against the flexibility afforded by the Requirements themselves. The use of the terms "must include" and "date-stamped" are of particular concern.
		RESPONSE: The drafting team thanks you for your suggestion. The drafting team drafted the Measures to avoid uncertainty and provide specificity as to the evidence required to demonstrate compliance with those Requirements. Further, the drafting team intentionally limited the measures that identify the particular evidence required to specific cases where there is only a particular item that could reasonably serve as evidence the requirement was met; e.g., for R5 the only evidence a CAP was developed within three months is a date-stamped CAP.

Organization	Yes or No	Question 2 Comment
SPP Standards Review Group	Yes	In the last line of the 1st paragraph following the bullet items on Page 5 (clean copy) in the Background section, insert a hyphen after SPS such that the line reads 'by SPS- or RAS-related Reliability Standards.' Also in the Background section, in the last sentence of the 1st paragraph on Page 6 (clean copy), the SDT indicates that PRC-010-1 uses the proposed term Remedial Action Scheme (RAS) rather than the traditional Special Protection System (SPS). We found this to be the case in the formal sections of the standard but note it apparently doesn't apply to the Rationale Box for the Definition and the Background section of the standard. Wouldn't it be better to do it throughout all the documentation?
		RESPONSE: The drafting team thanks you for your comments. The drafting team notes that both the term Remedial Action Scheme (RAS) and the term Special Protection System (SPS) are NERC Glossary defined terms, and that there is coordination between drafting teams, and changes will be made as appropriate to account for circumstances that occur during standards development.
		The term 'protection system' is used in the Background section, the Rationale Box for R3 and the Guidelines and Technical Basis section of the standard; in the FAQ document; and in the RSAW. Shouldn't this be the capitalized version which is defined in the Glossary of Terms?
		RESPONSE: The drafting team thanks you for your suggestions. The drafting team selected the broader term "protection system" to avoid situations whereby equipment or systems that are not included in the narrower NERC Glossary defined term "Protection System" would be neglected during an event analysis.
		In Requirement R1 the applicable entity is required to take two (2) actions - evaluate and provide. In order to avoid this multi-action requirement and the associated VSL complexity, shouldn't R1 be split into two separate requirements - one for the evaluation of the UVLS Program and the second for the distribution of the UVLS Program specification and implementation schedule to the UVLS entities? The Severe VSL for R1 confirms this. The assumption in the VSL is that if the applicable entity

		didn't evaluate the program, then they subsequently didn't distribute the specification and implementation schedule. This may not be the case. How would this VSL be applied if the evaluation was done but the distribution didn't occur? Splitting the requirement makes it much easier to handle situations like this.
		RESPONSE: The drafting team thanks the commenter for the suggestion, and agrees that the requirement could have been approached in this manner. The drafting team, however, determined that providing program specifications for implementation by UVLS entities is a necessary part of the development of "an effective UVLS Program," and therefore it is prudent to couple development with the natural result of that development.
		Be consistent with the use of hyphenation in phrases such as 60-calendar days, 12-calendar months, three-calendar months, etc. In some places the SDT uses a hyphen and in others it does not. Please use the hyphen throughout.
		Sometimes the term Part (when referring to a portion of a requirement) is capitalized and sometimes it is not. It should be capitalized, just like Requirement is when it refers to a specific requirement in the standard.
		RESPONSE: The drafting team thanks you for your comment. The drafting team implemented the appropriate copy-edit suggestions above as per the NERC Style Guide (August 2014), and made other revisions to conform with the currently adopted standards conventions.
		In Requirement R6, the Planning Coordinator is charged with maintaining the UVLS database for those UVLS Programs which exist within its Planning Coordinator area. UVLS Programs are local in nature and it is doubtful that impacts from one Transmission Planner's UVLS Program will bleed over into another Transmission Planner's area. In this situation, the Planning Coordinator doesn't need to play a role in either program so why is it charged with maintaining the UVLS database? If indeed the Planning Coordinator does own a UVLS Program, then it would be logical for the Planning Coordinator to maintain the database for that program only. In a similar

Organization	Yes or No	Question 2 Comment
		vein, Requirement R7 requires the UVLS entities to provide data to the Planning Coordinator in order to maintain the UVLS Program database. If a program is owned by a Transmission Planner, there is no way for that program owner to obtain that data short of specifically requesting the data in Requirement R8. This seems awkward and a bit contrived. Shouldn't the Transmission Planner be added to Requirement R7 and the data be provided by the UVLS entities to the applicable owner of the program? We propose the following changes to Requirements R6, R7 and R8 to address these issues.R6 - Each Planning Coordinator or Transmission Planner that has a UVLS Program in its area shall update a database containing data necessary to model its UVLS Program for use in event analyses and assessments of the UVLS Program at least once each calendar year. R7 - Each UVLS entity shall provide data to the applicable UVLS Program owner according to the format and schedule specified by the UVLS Program owner to support maintenance of a UVLS Program database.R8 - Each applicable UVLS Program owner (Planning Coordinator or Transmission Planner) shall provide its UVLS Program database to other impacted functional entities with a reliability need, within 30-calendar days of receiving a written request. The proposed language for Requirement R8 also resolves another issue with the use of the phrase 'within its Interconnection'. Although this usage is in conjunction with a request for information, it is still too broad and would require the Planning Coordinator to provide information to entities which are not directly impacted by the Planning Coordinator's or Transmission Planner's UVLS Program. Our suggested changes address this issue by narrowing the focus of this requirement.

RESPONSE: The drafting team thanks you for your comment. A Planning Coordinator has data for all the programs in its area, as well as access to adjacent area data. Therefore, the Planning Coordinator has the most comprehensive information available. A Transmission Planner may also maintain data, but lacks the visibility of the system available to the Planning Coordinator. Databases maintained by Planning Coordinators ensure Transmission Planners have access to broader system visibility.

The interpretation of both parts of the Severe VSL for Requirement R7 is that being more than 90-calendar days late is the same as not providing the data at all. If this is |

Organization	Yes or No	Question 2 Comment
		the case, then change the VSL to a simple statement such as 'The applicable entity failed to provide data in accordance with Requirement R7 within 90-calendar days of the specified schedule.' The same logic applies to the Severe VSL for Requirement R8 and a similar fix should be applied. RESPONSE: The drafting team thanks you for your comment. The drafting team agrees that the requirement could have been approached in this manner, yet, ultimately determined that maintaining the structure as written more clearly indicates the drafting team's intention that both conditions, that updating a database or providing data more than 90 days late is to be subject to the same Violation Severity Level as not updating the database or providing data at all. In the 5th line of the 2nd paragraph under Guidelines for UVLS Program Definition on Page 18 (clean copy), delete the 'for' at the end of the line. In the 3rd line of the 3rd paragraph under Guidelines for UVLS Program Definition on Page 18 (clean copy), insert an 'or' between 'one' and 'more'. The term load(s) is used often in the Application Guidelines. Should this term be the capitalized version defined in the Glossary of Terms? In the 2nd line of the 2nd paragraph and in the 3rd line of the 3rd paragraph under Guidelines for Requirement R1 on Page 19 (clean copy), replace 'is' with 'be' in the phrase '...UVLS Program be coordinated with...'.In the 1st line of the 3rd paragraph under Guidelines for Requirement R3 on Page 21 (clean copy), delete the 'and' in 'system and topology'. In the 3rd line of the last paragraph under Guidelines for Requirement R3 on Page 22 (clean copy), replace '60-month' with '60-calendar month'. Make the same change in the 1st line of the 3rd bullet under Guidelines for Requirement R5 on Page 23 (clean copy). RESPONSE: The drafting team thanks you for your comment. The drafting team implemented the appropriate copy-edit suggestions above as per the NERC Style

Organization	Yes or No	Question 2 Comment
		Guide (August 2014), and made other revisions to conform with the currently adopted standards conventions.
Puget Sound Energy	Yes	This Standard enforces sanctions on PC's and TP's in cases where UVLS is designed only as a safety-net for events outside of the scope of the TPL standards. We own such a safety-net that has never operated and maintain it because it may minimize the potential for a wide-area black-out due to a beyond Category D event. The effect of anticipated sanctions has led several area utilities to disable their safety-net UVLS Programs. There is continued concern that utilities will not invest in safety-net programs if they are accompanied by the potential for NERC fines. It is also unclear what metrics are to be used to evaluate the effectiveness of the program. There are no defined metrics to meet for contingencies outside of the scope of the TPL standards.

RESPONSE: The drafting team thanks you for your comment. The team drafted the standard with the understanding that, should a PC or TP establish or maintain an existing UVLS Program, such Requirements are necessary, "[t]o establish an integrated and coordinated approach to the design, evaluation, and reliable operation of Undervoltage Load Shedding Programs (UVLS Programs)." |
| Lincoln Electric System | Yes | As currently written PRC-010-1 does not define a role for the Transmission Planner (TP) in the submission of its UVLS Program to the Planning Coordinator's (PC) database. Although Requirement R7 has each UVLS entity providing data to its PC per the format and schedule specified by the PC, the standard fails to account for the TP-developed UVLS Programs. In consideration that the TP is required to provide ongoing assessments to evaluate its effectiveness both on a 60 month cycle (R3) and after a voltage excursion event that triggers operation of the UVLS Program (R4), it seems the TP should have some supporting role in the submission of its UVLS Program to the PC and, at a minimum, be included in the communications between the PC and UVLS entity. Furthermore, the UVLS entity may not be familiar with the |

Consideration of Comments: Project 2008-02 Undervoltage Load Shedding (UVLS) & Underfrequency Load Shedding (UFLS)
Posted: September 9, 2014

Organization	Yes or No	Question 2 Comment
		power flow and dynamic models being used by both the PC and TP in their assessments.
		RESPONSE: The drafting team thanks you for your comment. The drafting team notes that a Planning Coordinator will always have data for all the programs in its area regardless of whether or not it developed the program. A Transmission Planner may also maintain data, but there is no requirement to do so as it would be duplicative to what the Planning Coordinator already does.
Texas Reliability Entity, Inc.	Yes	1) Texas Reliability Entity, Inc. (Texas RE) supports the rationale for Requirement R1 to include the phrase "Planning Coordinator or Transmission Planner" to provide flexibility for applicability to the entity that will perform the action. Texas RE recommends applying that rationale to Requirements R6, R7 and R8 as well. Conceivably, TPs may be the only entity to have a UVLS Program. If the TP has the UVLS Program, then the TP should maintain a database containing necessary data to model its UVLS Program and a UVLS entity should provide data to support maintenance of that database to the TP with the UVLS Program. However, it seems burdensome to for the TP to have to request UVLS entity data that it needs to perform assessment of its own UVLS Program from the PC (per Requirement R8). We recognize the importance of the PC having UVLS Program data but assert that the TP needs to obtain this data from UVLS entities for its Program as well. Texas RE recommends adding "or Transmission Planner" after "Planning Coordinator" to Requirements R6, R7 and R8.
		RESPONSE: The drafting team thanks you for your comment. In response to the addition of the Transmission Planner to Requirement R6-8, the drafting team notes that a Planning Coordinator will always have data for all the programs in its area. A Transmission Planner may also maintain data, but there is no requirement to do so as it would be duplicative to what the Planning Coordinator already does, and the Transmission Planner will have access to the Planning Coordinator's database.

Organization	Yes or No	Question 2 Comment
		2) Texas RE recommends updating Requirement R3 language to mirror Requirement R1 as follows: "...every 60 calendar months and subsequently provide the UVLS Program's specifications to the UVLS entities responsible for implementing the program..." 3) Texas RE also recommends updating the Requirement R3 VSL to mirror Requirement R1 VSL as follows: "...60 calendar months and subsequently provide the UVLS Program's specifications to the UVLS entities responsible for implementing the program..." RESPONSE: The drafting team thanks you for your comment. Any action that will result from the assessments required by R3 and R4 is covered by the requirements of R5, which requires the distribution of Corrective Action Plans that address identified deficiencies.
Tacoma Power	Yes	Did the SDT consider explicitly including UFLS schemes and controls of shunt capacitors, reactors, and statis Var systems under Requirements R1 and R3 as items to be coordinated with UVLS Programs? In the current draft, these are itemized in the Application Guidelines and Technical Basis. RESPONSE: The drafting team thanks you for your comment. The drafting team drafted the Requirements with the intent that they should not be overly prescriptive, but rather, that specific examples and lists of inclusion are more appropriately addressed in ancillary documents such as the Guidelines and Technical Basis document.
Electric Reliability Council of Texas, Inc.	Yes	The SDT should revisit the assignment of responsibility under the standard with respect to all requirements. This review should be conducted relative to the functional model to ensure the responsibilities under the standard align with the scope of responsibilities under the functional model. Additionally, the SDT should separate the responsibilities of the relevant functions under the standard (e.g. TP and PC) into separate requirements, and, again, the responsibilities under the

Organization	Yes or No	Question 2 Comment
		requirements should be based on the appropriate responsibilities for the functions consistent with the NERC functional model. RESPONSE: The drafting team thanks you for your comment. The drafting team considered various approaches and determined that the currently proposed language and structure of the standard will best address entity variations across the continent. The drafting team notes that the assignment of responsibility is consistent with the NREC Reliability Functional Model and that Requirements R1, R3, R4 and R5 are not applicable to both the Planning Coordinator and Transmission Planner—they are applicable to one or the other. For example, the language of Requirement R1 clearly states that the responsibility is to the entity that developed the UVLS Program.
N/A	Yes	- R2 obligates the UVLS entity to adhere to the UVLS Program and implementation schedule developed by its PC or TP. The standard should include provisions for the UVLS entity to comment and agree with the program and its implementation. RESPONSE: The drafting team thanks you for your comment. Requirement R2 was drafted with the understanding that a PC or TP must necessarily engage the UVLS entity in an iterative and collaborative process during the design and development of a UVLS program, to include responding appropriately to inconsistencies, erroneous or incomplete information, or misunderstandings that the UVLS entity brings to the attention of the PC or TP. To design an effective UVLS Program, a PC or TP must coordinate and cooperate with a ULVS entity that is to implement that UVLS Program. - R4 should contain provisions for the RC or TOP to inform the PC and TP on the occurrence of events resulting in voltage excursions for which the UVLS program was designed to operate. The PC and TP are not directly involved in the operation of the BES thus may not have events information. RESPONSE: The drafting team thanks you for your comment. The Requirements were drafted with the understanding that the PC and TP have a duty to remain informed of events that trigger their compliance responsibilities.

Organization	Yes or No	Question 2 Comment
		- R5: Identification of deficiencies should be done with participation of the corresponding UVLS entity.
		RESPONSE: The drafting team thanks you for your suggestion. Requirement R5 was drafted with the understanding that a PC or TP must necessarily engage the UVLS entity in an iterative and collaborative process during the development of a Corrective Action Plan, to include responding appropriately to inconsistencies, erroneous or incomplete information, or misunderstandings that the UVLS entity brings to the attention of the PC or TP. To design an effective Corrective Action Plan, a PC or TP must coordinate and cooperate with a ULVS entity that is to implement that Corrective Action Plan.
Xcel Energy		no comment
		RESPONSE: The drafting team notes that a comment was not presented here, therefore, there is no corresponding response.

3. **Do you have any concerns with items not addressed by the previous questions (e.g., the Implementation Plan or the coordination that is occurring with other projects)? If yes, please indicate your concerns in the comment section and provide specific suggested changes.**

Summary Consideration: There were recommendations that the drafting team include Transmission Planners as applicable entities to the Requirements that address UVLS Program databases. The drafting team considered this suggestion, but determined that, as Planning Coordinators have data for all the programs in their area, and additionally maintain access to adjacent area data, Planning Coordinators have the most comprehensive information available. While Transmission Planners may also maintain data, they may lack the visibility of the system available to the Planning Coordinator, and may access that data through the Planning Coordinator.

Organization	Yes or No	Question 3 Comment
Arizona Public Service Co	No	RESPONSE: The drafting team thanks you for your support.
Dominion	No	RESPONSE: The drafting team thanks you for your support.
Florida Power & Light	No	RESPONSE: The drafting team thanks you for your support.
Tennessee Valley Authority	No	RESPONSE: The drafting team thanks you for your support.
MRO NERC Standards Review Forum	No	RESPONSE: The drafting team thanks you for your support.
BC Hydro	No	RESPONSE: The drafting team thanks you for your support.
Duke Energy	No	RESPONSE: The drafting team thanks you for your support.
Hydro-Quebec TransEnergie	No	RESPONSE: The drafting team thanks you for your support.
Minnkota Power Cooperative	No	RESPONSE: The drafting team thanks you for your support.

Organization	Yes or No	Question 3 Comment
Flathead Electric Cooperative, Inc.	No	RESPONSE: The drafting team thanks you for your support.
Xcel Energy	No	RESPONSE: The drafting team thanks you for your support.
American Transmission Company LLC	No	RESPONSE: The drafting team thanks you for your support.
Puget Sound Energy	No	RESPONSE: The drafting team thanks you for your support.
Idaho Power Company	No	RESPONSE: The drafting team thanks you for your support.
Independent Electricity System Operator	No	RESPONSE: The drafting team thanks you for your support.
Exelon Companies	No	RESPONSE: The drafting team thanks you for your support.
N/A	No	RESPONSE: The drafting team thanks you for your support.
Northeast Power Coordinating Council	Yes	In the Guidelines for Requirements R6-R8 on page 23, there is a list of specific items to be included in the UVLS Program database. This should be written as items to be considered for database inclusion. If the SDT intends to make these items mandatory then they should be in a Requirement, and be auditable. RESPONSE: The drafting team thanks you for your comment. The drafting team drafted the Requirements with the intent that they should not be overly prescriptive, but rather, that specific examples and lists of inclusion are more appropriately addressed in ancillary documents such as the Guidelines and Technical Basis document. To further clarify this intention, the drafting team has revised the language to which you refer to "the UVLS Program database may include, but is not limited to" before the list of items.

Organization	Yes or No	Question 3 Comment
SERC Protection and Controls Subcommittee	Yes	Is a 'Centrally controlled undervoltage based load shedding system' the same as a 'non-distributed UVLS system' as referred to in PRC-005-2? How does the definition of a UVLS Program impact the maintenance requirements for a Centrally controlled undervoltage based load shedding system? The comments expressed herein represent a consensus of the views of the above-named members of the SERC EC Protection and Control Subcommittee only and should not be construed as the position of SERC Reliability Corporation, its board, or its officers. RESPONSE: The drafting team thanks you for your comment. As indicated in the quoted material below, a "Centrally controlled undervoltage based load shedding system" is the same as a "non-distributed UVLS system" as referred to in PRC-005-2: **What is the difference between a distributed UFLS/UVLS and a non-distributed UFLS/UVLS scheme?** A distributed UFLS or UVLS scheme contains individual relays which make independent Load shed decisions based on applied settings and localized voltage and/or current inputs. A distributed scheme may involve an enable/disable contact in the scheme and still be considered a distributed scheme. A non-distributed UFLS or UVLS scheme involves a system where there is some type of centralized measurement and Load shed decision being made. A non-distributed UFLS/UVLS scheme is considered similar to an SPS scheme and falls under Table 1 for maintenance activities and intervals. PRC-010-1 addresses the attributes of a UVLS Program, and does not address maintenance requirements.
IRC Standards Review Committee	Yes	We recommend a general review to improve clarity and understanding across all the corresponding documentation related to this standard. RESPONSE: The drafting team thanks you for your recommendation. The drafting team performed a general review and made changes for clarity where deemed

Organization	Yes or No	Question 3 Comment
		appropriate, to include implementing the appropriate copy-edit revisions as per the NERC Style Guide (August 2014), and made other revisions to conform with the currently adopted standards conventions.
Florida Municipal Power Agency	Yes	FMPA requests the drafting team consider adding a requirement similar to PRC-006-1 R14 which would require the PC or TP to contemplate comments provided by UVLS entities in development of the UVLS Program. As an example, without the ability to provide input, a PC or TP could obligate a UVLS entity to adhere to a UVLS Program with an implementation schedule that is not feasible. Additionally, it does not appear that centrally controlled undervoltage-based load shedding has been addressed by the Project 2010-05.2 - Special Protection Systems (Phase 2 of Protection Systems) team.

RESPONSE: The drafting team thanks you for your comment. The currently proposed PRC-010-1 Requirements were drafted with the understanding that a PC or TP must necessarily engage the UVLS entity in an iterative and collaborative process during the design and development of a UVLS program, to include responding appropriately to inconsistencies, erroneous or incomplete information, or misunderstandings that the UVLS entity brings to the attention of the PC or TP. To design an effective UVLS Program, a PC or TP must coordinate and cooperate with a ULVS entity that is to implement that UVLS Program. The drafting team is coordinating with Project 2010-05.2 and will pass this comment along to the Project 2010-05.2 drafting team.

The RAS SDT modified the exclusion in the RAS definition to:

Schemes for automatic underfrequency load shedding (UFLS) and automatic undervoltage load shedding (UVLS) comprised of only distributed relays

The existing Glossary of Terms Used in NERC Reliability Standards definition of SPS/RAS excludes UFLS and UVLS because they are protective functions that have |

Consideration of Comments: Project 2008-02 Undervoltage Load Shedding (UVLS) & Underfrequency Load Shedding (UFLS)
Posted: September 9, 2014

Organization	Yes or No	Question 3 Comment
		unique design and implementation considerations that are covered by NERC Reliability Standards PRC-006-1 and PRC-010-1. This exclusion emphasizes "distributed" UVLS relays to highlight that the exclusion covers UVLS Programs. The SDT accepts this exclusion consistent with industry practice. Centrally controlled undervoltage-based load shedding is a RAS.
ACES Standards Collaborators	Yes	(1) Protection systems should be capitalized throughout the Guidelines and Technical Basis section since it is a NERC defined term. RESPONSE: The drafting team thanks you for your suggestion. The drafting team selected the broader term "protection system" to avoid facilitating a situation whereby equipment or systems that are not included in the narrower NERC Glossary defined term "Protection System" would be neglected during an event analysis (2) The example described in the last paragraph of the Guidelines and Technical Basis section on page 18 should be made consistent with the BES definition. A radial facility serving only load cannot be part of the BES. If the intention is that the loads in the one-line diagram actually are networked sub-transmission systems greater than 50 kV, then the lines are technically not radial per the BES definition. RESPONSE: The drafting team thanks you for your comments. The drafting team agrees with the comments regarding the example on page 18 of the Guidelines and Technical and has modified the example in accordance with your comment. (3) Thank you for the opportunity to comment. RESPONSE: The drafting team thanks you for your comments.
SPP Standards Review Group	Yes	In the FAQ document: In the 3rd question, replace 'potential' with 'potentially'. RESPONSE: The drafting team thanks you for your comments. The drafting team corrected the document as suggested.

Organization	Yes or No	Question 3 Comment
PacifiCorp	Yes	PacifiCorp generally supports the June 24, 2014 version of PRC-010-1, and recommends the Standard Drafting Team add "Transmission Planner" to Requirement R7 to read: "Each UVLS entity and Transmission Planner shall provide data to its Planning Coordinator according to the format and schedule specified by the Planning Coordinator to support maintenance of a UVLS Program database." Adding the Transmission Planner helps ensure the Planning Coordinator will have the needed information to perform UVLS studies and for event analysis. RESPONSE: The drafting team thanks you for your comment. A Planning Coordinator has data for all the programs in its area, as well as access to adjacent area data. The Planning Coordinator, therefore, has the most comprehensive information available. A Transmission Planner may also maintain data, but lacks the visibility of the system available to the Planning Coordinator. Databases maintained by Planning Coordinators ensure Transmission Planners have access to broader system visibility.
Texas Reliability Entity, Inc.	Yes	Texas RE is concerned that centrally controlled ULVS may be overlooked by entities or even by Regions since it is explicitly excluded from the ULVS definition but is not explicitly included in the proposed definition of Remedial Action Scheme (RAS). The PRC-010-1 FAQ document addresses the issue very well, but after balloting is complete the document may not be reviewed by registered entities again. Texas RE requests the PRC-010-1 SDT work with the RAS SDT to add language in the standard specifying the inclusion of centrally controlled undervoltage-based shedding. RESPONSE: The drafting team thanks you for your suggestion. There is coordination between the teams. The drafting team will pass this comment along to the Project 2010-05.2 drafting team.
ReliabilityFirst	Yes	ReliabilityFirst submits the following comments for consideration: 1. Requirement R1, Part 1.2 - ReliabilityFirst believes the term "coordination" by itself is ambiguous and needs further clarification to avoid confusion. ReliabilityFirst recommends the following for consideration: "The UVLS Program [does not conflict]

Consideration of Comments: Project 2008-02 Undervoltage Load Shedding (UVLS) & Underfrequency Load Shedding (UFLS)
Posted: September 9, 2014

Organization	Yes or No	Question 3 Comment
		with generator voltage ride through capabilities and [settings of] other protection and control systems..."
		RESPONSE: The drafting team thanks you for your comment. The drafting team notes that the wording used, "integrated through coordination", is to be consistent with the FERC order. The drafting team notes that the evaluation required by Requirement R1 as a whole requires the UVLS Program to be validated. The Guidelines and Technical Basis provides sufficient guidance to provide clarity.
		2. Requirement 3, Part 3.2 - ReliabilityFirst believes the term "coordination" by itself is ambiguous and needs further clarification to avoid confusion. ReliabilityFirst recommends the following for consideration: "The UVLS Program [does not conflict] with generator voltage ride through capabilities and [settings of] other protection and control systems..."
		RESPONSE: The drafting team thanks you for your comment. The drafting team notes that the wording used, "integrated through coordination", is to be consistent with the FERC order.
		3. Requirement R3 - ReliabilityFirst recommends removing the term "comprehensive" since it adds little or no value to the requirement. ReliabilityFirst recommends the following for consideration: "Each Planning Coordinator or Transmission Planner shall perform [an in depth Protection System coordination] assessment to evaluate the effectiveness..."
		RESPONSE: The drafting team thanks you for your comment. The drafting team notes that the word "comprehensive" is used to distinguish the UVLS requirement from an annual TPL standard assessment. The UVLS comprehensive assessment supplements the TPL-001-4 annual assessment requirement to evaluate the impact of protection systems. Therefore, the UVLS assessment should include an evaluation of each UVLS Program to ensure continued integration through coordination. The drafting team notes that this intention is supported in the respective Rationale box and Guidelines and Technical Basis.

Organization	Yes or No	Question 3 Comment
Ameren	Yes	(1) We support the SERC PCS comments for Project 2008-02 UVLS and include them by reference.
		RESPONSE: The drafting team thanks you for your comment. Please see response to SERC Protection and Controls Subcommittee (PCS) comments above.
		(2) We believe that the Transmission Planner (TP) should develop the program, not the Planning Coordinator (PC). In our opinion the TP is more familiar with the BES in their area. We are concerned that R1, R3, R4, and R5 now say 'TP or PC' therefore it is not clear who leads this effort. We believe that it makes more sense for the TP to decide if UVLS is needed then report up to PC for coordination with neighboring PC and TP.
		RESPONSE: The drafting team thanks you for your comment. The drafting team notes that Requirements R1, R3, R4 and R5 are not applicable to both the Planning Coordinator and Transmission Planner—they are applicable to one or the other. For example, the language of Requirement R1 clearly states that the responsibility is to the entity that developed the UVLS Program.
		The drafting team maintains that the flexibility of applicability to either the Planning Coordinator or Transmission Planner is necessary. Depending on agreements, memorandums of understanding, or tariffs, either entity may be responsible for designing and coordinating a UVLS Program.
Oncor Electric Delivery LLC	Yes	The SPS term was replaced with RAS throughout the standard. With the July 24, 2014 ballot for project 2010-5.2, revised definition of SPS/RAS, not receiving sufficient affirmative votes for approval we recommend that the standard be restored to its original verbiage.

Organization	Yes or No	Question 3 Comment
		RESPONSE: The drafting team thanks you for your comment, and notes that changes will be made as appropriate to account for circumstances that occur during standards development.
WECC	Yes	In the last sentence in what I believe is the seventh paragraph of the Background section, it is stated that the drafting team for Project 2010-05.2 is prposing to change the term from SPS to RAS and accordingly PRC-010-1 uses the term RAS instead of SPS. I agree. Howeever, in the rational for the definition of UVLS Program section, SPS is used several times. It is also used in the Background section sveral times ahead of the statement that it is not being used anymore. Should this term (SPS) be removed?
		RESPONSE: The drafting team thanks you for your comment, and notes that changes will be made as appropriate to account for circumstances that occur during standards development.
		In Requirement R3 the Rational addresses situations where assessments should be conducted sooner than the 60-month period if there are material changes to system topology or operating conditions. I support this. However, in the language of Requirement R3 the words "or sooner if material changes are made to system topology or operating conditions" were struck. Why were the words removed from the requirement? It seems like they should be there to clarify the requirement identified in the Rational Box.
		RESPONSE: The term "material changes" was removed from the standard to mitigate any subjective interpretation of the term, and thereby minimize potential compliance issues. The term was included in the Rationale box to convey that, should an entity determine that it would be prudent to conduct an assessment earlier than the 60 calendar month time frame due to changes in topology or system conditions, the standard does not prohibit an earlier assessment.
		In the Rational for Applicability section it clarifies that PCs or TPs may develop UVLS Programs. In Requirement R1 It says each "PC or TP" that is developing a UVLS Program... In R2 UVLS Entities are required to adhere to implmentation schedules

Organization	Yes or No	Question 3 Comment
		determine by its "PC or TP." Requirement R3 requires each "PC or TP" to perfomr conprehensive assessments to evaluste the effectiveness of each UVLS Program. Requirement R4 requires each "PC or TP" to assess program performance for each event that resultes in a voltage excursion for which its UVLS Program was designed to operate. In Requirement R5 "PCs and TPs" are again referenced. All of this supports the fact that either the PC or TP could develope UVLS Programs, and I suport this. However, in Requirements R6 and R7 only the PC is identified. IN R6 only the PC has to update its database and in R7 UFLS Entities only have to provide data to the PC. The TP has been left out. Is this intentional? Is it becasue only a PC develops and maintains a UVLS database?

RESPONSE: The drafting team thanks you for your comment. The reference to the Planning Coordinator only in Requirements R6 and R7 is intentional. A Planning Coordinator has data for all the programs in its area, as well as access to adjacent area data. The Planning Coordinator, therefore, has the most comprehensive information available. A Transmission Planner may also maintain data, but lacks the visibility of the system available to the Planning Coordinator. Databases maintained by Planning Coordinators ensure Transmission Planners have access to broader system visibility. |
| Tacoma Power | Yes | In the Compliance section, under 1.2 for Evidence Retention, there should be a maximum evidence retention period. In the extreme, as written now, if an entity is not audited on PRC-010-1, it seems like the entity could have to keep the evidence forever.

RESPONSE: The drafting team thanks you for your comment, and has adjusted the evidence retention period to which you refer.

When developing a CAP, the Transmission Planner or Planning Coordinator should consult, as necessary, with the UVLS entity. Otherwise, the Transmission Planner or Planning Coordinator could specify activities or an implementaiotn schedule that is unreasonable. Rather than modifying the Requirements themselves, this issue |

Organization	Yes or No	Question 3 Comment
		should be addressed in the Application Guidelines and Technical Basis. Similarly, in the Application Guideline and Technical Basis, the Guidelines for Requirement R2 discusses "deferrals or other relevant changes to the UVLS Program specifications or CAP…" While changes to a CAP should be an option, a UVLS entity should consult with the Transmission Planner or Planning Coordinator since the Transmission Planner or Planning Coordinator developed (hopefully in consultation with the UVLS entity) the CAP.
		RESPONSE: The drafting team thanks you for your comment. Requirement R2 was drafted with the understanding that a PC or TP must necessarily engage the UVLS entity in an iterative and collaborative process during the design and development of a UVLS program, to include responding appropriately to inconsistencies, erroneous or incomplete information, or misunderstandings that the UVLS entity brings to the attention of the PC or TP. To design an effective UVLS Program, a PC or TP must coordinate and cooperate with a ULVS entity that is to implement that UVLS Program. Similarly, to design an effective Corrective Action Plan, a PC or TP must coordinate and cooperate with a ULVS entity that is to implement that Corrective Action Plan.

END OF REPORT