Consideration of Comments

Project 2010-13.3 Phase 3 of Relay Loadability: Stable Power Swings

The Project 2010-13.3 Drafting Team thanks all commenters who submitted comments on the standard. These standards were posted for a 21-day public comment period from November 4, 2014 through November 24, 2014. Stakeholders were asked to provide feedback on the standards and associated documents through a special electronic comment form. There were 42 sets of comments, including comments from approximately 142 different people from approximately 88 companies representing all 10 Industry Segments as shown in the table on the following pages.

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]

Summary of Changes to the Standard

The following is a summary of the revisions to Draft 4 that were made to the proposed PRC-026-1 NERC Reliability Standard in order to provide additional clarity of the Standard. Revisions were based on industry stakeholder comments from Draft 3 of the Standard.

Applicability

- No change

Background

- The Background section was updated for clarity

Effective Dates

- No change

Requirement R1

- Minor editorial revisions based upon comments
- Footnote added to draw attention to new detail provided in the Guidelines and Technical Basis concerning the inclusion of "unstable" in Criterion 4

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

Requirements R2

- The word "determine" was removed from the main requirement body based on comments as it is duplicative of Parts 2.1 and 2.2
- Footnote added to draw attention to examples provided in the Guidelines and Technical Basis of how an entity would "become aware" of a stable or unstable power swing
- Footnote added to draw attention to new detail provided in the Guidelines and Technical Basis concerning the inclusion of "unstable" in Part 2.2
- The rationale box text was updated for clarity

Requirement R3

- The phrase "pursuant to Requirement R2" was inserted based on comments to provide a referential link to the previous requirement which triggers performance under Requirement R3
- The clause "or more" was deleted based on comments to remove confusion about whether either or both of the Corrective Action Plan options were required. Although an entity may perform both under certain circumstances, the standard drafting team concluded that performing one of the two bulleted items would achieve the reliability goal of the standard
- The rationale box text was updated for clarity

Requirement R4

- No change

Measures M1-M4

- No change

Compliance Section

- No change

Violation Severity Levels

- No change

PRC-026-1 – Attachment A

- The phrase "provided the distance element is set in accordance with the criteria outlined in the standard" has been removed from a bullet in the PRC-026-1 – Attachment A (protection system functions that are excluded from the standard) pertaining to phase fault detector relay elements that supervise other load-responsive phase distance elements. The removal of the phrase does not change any performance under requirements of the standard, however, it does eliminate any inadvertent confusion that may be introduced by this phrase. Phase distance elements are on the PRC-026-1 – Attachment A inclusion list and must be set in accordance with PRC-026-1 – Attachment B, Criterion A if the protected Element (i.e., transmission line, transformer, or generator BES Element) is determined to be applicable to the standard pursuant to Requirement R1 and/or Requirement R2. Given that:

1. the pickup of the phase fault detector relay element cannot cause a trip without the pickup of the supervised phase distance element, and
2. the phase distance relay element must be set in accordance with PRC-026-1 – Attachment B, Criterion A, the deleted phrase is irrelevant and unnecessary

PRC-026-1 – Attachment B

- The uses of "Criteria" were replaced by "Criterion" for correctness
- The order of "sending-end" to "receiving-end" voltages were reversed and swapped for correctness

Guidelines and Technical Basis

- The Guidelines and Technical Basis received a number of varying revisions to provide additional clarity. Some of the most notable enhancements include:
- Several Figures were corrected due to errors reported through the comments
- Several calculations in the Tables were corrected due to errors reported through the comments, Table 13 in particular
- Several revisions were due to inconsistencies within the document on how information is presented
- The format of the document was updated for consistency with the NERC style guide
- The section, "Justification for Including Unstable Power Swings in the Requirements" was appended to provide an understanding of why "unstable" power swings are relevant to the performance of the Standard.

Implementation Plan

- Clarification to the section, "Notifications Prior to the Effective Date of Requirement R2" was made to clarify an entity's obligations during the implementation plan period

VRF and VSL Justifications

- Several paragraphs that were redundant with other information were removed
- Minor corrections made in the text

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	Joe DePoorter	MRO NERC Standards Review Forum		X	X	X	X	X				

	Additional Member	Additional Organization	Region	Segment Selection
1.	Amy Casucelli	Xcel Energy	MRO	1, 3, 5, 6
2.	Chuck Wicklund	Otter Tail Power	MRO	1, 3, 5
3.	Dan Inman	Minnkota Power Cooperative	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.	Ken Goldsmith	Alliant Energy	MRO	4
8.	Mahmood Safi	Omaha Public Power District	MRO	1, 3, 5, 6
9.	Marie Knox	MISO	MRO	2
10.	Mike Brytowski	Great River Energy	MRO	1, 3, 5, 6
11.	Randi Nyholm	Minnesota Power	MRO	1, 5
12.	Scott Nickels	Rochester Public Utilities	MRO	4
13.	Terry Harbour	MidAmerican Energy	MRO	1, 3, 5, 6
14.	Tom Breene	Wisconsin Public Service	MRO	3, 4, 5, 6

Group/Individual	Commenter	Organization	Registered Ballot Body Segment									
			1	2	3	4	5	6	7	8	9	10

15. Tony Eddleman	Nebraska Public Power District	MRO	1, 3, 5

Group/Individual	Commenter	Organization	1	2	3	4	5	6	7	8	9	10
2. 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 System Operator	NPCC	2
4.	Sylvain Clermont	Hydro-Quebec TransEnergie	NPCC	1
5.	Kelly Dash	Consolidated Edison Co. of New York Inc.	NPCC	1
6.	Gerry Dunbar	Northeast Power Coordinating Council	NPCC	10
7.	Milke Garton	Dominion Resources Services, Inc.	NPCC	5
8.	Kathleen Goodman	ISO - New England	NPCC	2
9.	Ben Wu	Orange and Rockland Utilities Inc.	NPCC	1
10.	Mark Kenny	Northeast Utilities	NPCC	1
11.	Helen Lainis	Independent Electricity System Operator	NPCC	2
12.	Alan MacNaughton	New Brunswick Power Corporation	NPCC	9
13.	Bruce Metruck	New York Power Authority	NPCC	6
14.	Silvia Parada Mitchell	NextEra Energy, LLC	NPCC	5
15.	Lee Pedowicz	Northeast Power Coordinating Council	NPCC	
16.	Robert Pellegrini	The United Illuminating Company	NPCC	1
17.	Si Truc Phan	Hydro-Quebec TransEnergie	NPCC	1
18.	David Ramkalawan	Ontario Power Generation, Inc.	NPCC	5
19.	Brian Robinson	Utility Services	NPCC	8
20.	Ayesha Sabouba	Hydro One Networks Inc.	NPCC	1
21.	Peter Yost	Consolidated Edison Co. of New York, Inc.	NPCC	3
22.	Wayne Sipperly	New York Power Authority	NPCC	5

Group/Individual	Commenter	Organization	1	2	3	4	5	6	7	8	9	10
3. Group	Sandra Shaffer	PacifiCorp						X				

N/A

Group/Individual	Commenter	Organization	1	2	3	4	5	6	7	8	9	10
4. Group	Greg Campoli	ISO RTO Council Standards Review Committee		X								

	Additional Member	Additional Organization	Region	Segment Selection
1.	Charles Yeung	SPP	SPP	2

Group/Individual		Commenter	Organization	1	2	3	4	5	6	7	8	9	10

2.	Ben Li	IESO	NPCC	2
3.	Matt Goldberg	ISONE	NPCC	2
4.	Lori Spence	MISO	MRO	2
5.	Cheryl Moseley	ERCOT	ERCOT	2
6.	Mark Holman	PJM	RFC	2

Group/Individual		Commenter	Organization	1	2	3	4	5	6	7	8	9	10
5.	Group	David Greene	SERC Protection and Controls Subcommittee										

	Additional Member	Additional Organization	Region	Segment Selection
1.	Paul Nauert	Ameran		
2.	Russ Evans	SCE&G		
3.	Phil Winston	Southern Company Services		
4.	David Greene	SERC		

Group/Individual		Commenter	Organization	1	2	3	4	5	6	7	8	9	10
6.	Group	Connie Lowe	Dominion			X		X	X				

	Additional Member	Additional Organization	Region	Segment Selection
1.	Randi Heise	NERC Compliance Policy	SERC	1, 3, 5, 6
2.	Louis Slade	NERC Compliance Policy	RFC	5, 6
3.	Mike Garton	NERC Compliance Policy	NPCC	5
4.	Larry Nash	Electric Transmission Compliance	SERC	1, 3
5.	Larry Bateman	Electric Transmission Compliance	SERC	1, 3
6.	Christopher Mertz	Electric Transmission	SERC	1, 3

Group/Individual		Commenter	Organization	1	2	3	4	5	6	7	8	9	10
7.	Group	Shannon Mickens	SPP Standards Review Group		X								

	Additional Member	Additional Organization	Region	Segment Selection
1.	Karl Diekevers	Nebraska Public Power District	MRO	1, 3, 5
2.	Joe Fultz	Grand River Dam Authority	SPP	1
3.	Louis Guidry	Cleco Power	SPP	1, 3, 5, 6
4.	Greg Hill	Nebraska Public Power District	MRO	1, 3, 5
5.	Stephanie Johnson	Westar Energy	SPP	1, 3, 5, 6
6.	Bo Jones	Westar Energy	SPP	1, 3, 5, 6
7.	Mike Kidwell	Empire District Electric	SPP	1, 3, 5
8.	Tiffany Lake	Westar Energy	SPP	1, 3, 5, 6

Group/Individual	Commenter	Organization	Registered Ballot Body Segment									
			1	2	3	4	5	6	7	8	9	10

9.	James Nail	City of Independence, MO	SPP	3, 5
10.	Robert Rhodes	Southwest Power Pool	SPP	2
11.	Lynn Schroeder	Westar Energy	SPP	1, 3, 5, 6
12.	Jason Smith	Southwest Power Pool	SPP	2

Group/Individual	Commenter	Organization	1	2	3	4	5	6	7	8	9	10
8. Group	Michael Lowman	Duke Energy			X		X	X				

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

Group/Individual	Commenter	Organization	1	2	3	4	5	6	7	8	9	10
9. Group	Brent Ingebrigtson	PPL NERC Registered Affiliates			X		X	X				

	Additional Member	Additional Organization	Region	Segment Selection
1.	Charlie Freibert	LG&E and KU Energy, LLC	SERC	3
2.	Brenda Truhe	PPL Electric Utilities Corporation	RFC	1
3.	Annette Bannon	PPL Generation, LLC	RFC	5
4.		PPL Susquehanna, LLC	RFC	5
5.		PPL Montana, LLC	WECC	5
6.	Elizabeth Davis	PPL EnergyPlus, LLC	MRO	6
7.			NPCC	6
8.			RFC	6
9.			SERC	6
10.			SPP	6
11.			WECC	6

Group/Individual	Commenter	Organization	1	2	3	4	5	6	7	8	9	10
10. Group	Thomas McElhinney	JEA			X		X					

	Additional Member	Additional Organization	Region	Segment Selection
1.	Ted Hobson		FRCC	1
2.	Garry Baker		FRCC	3
3.	John Babik		FRCC	5

Group/Individual	Commenter	Organization	1	2	3	4	5	6	7	8	9	10
11. Group	Jason Marshall	ACES Standards Collaborators						X				

Group/Individual	Commenter	Organization	Registered Ballot Body Segment									
			1	2	3	4	5	6	7	8	9	10

	Additional Member	Additional Organization	Region	Segment Selection
1.	Kevin Lyons	Central Iowa Power Cooperative	MRO	1
2.	Ellen Watkins	Sunflower Electric Power Corporation	SPP	1
3.	John Shaver	Arizona Electric Power Cooperative/ Southwest Transmission Cooperative, Inc.	WECC	1, 4, 5
4.	Shari Heino	Brazos Electric Power Cooperative, Inc.	ERCOT	1, 5
5.	Ryan Strom	Buckeye Power, Inc.	RFC	3, 4, 5
6.	Mike Brytowski	Great River Energy	MRO	1, 3, 5, 6
7.	Scott Brame	North Carolina Electric Membership Corporation	RFC	3, 4, 5
8.	Mark Ringhausen	Old Dominion Electric Cooperative	RFC	3, 4
9.	Ginger Mercier	Prairie Power, Inc.	SERC	3
10.	Bob Solomon	Hoosier Energy Rural Electric Cooperative, Inc.	RFC	1

Group/Individual	Commenter	Organization	1	2	3	4	5	6	7	8	9	10
12. Group	Kathleen Black	DTE Electric Co.			X	X	X					

	Additional Member	Additional Organization	Region	Segment Selection
1.	Kent Kujala	NERC Compliance	RFC	3
2.	Daniel Herring	NERC Training & Standards Development	RFC	4
3.	Mark Stefaniak	Merchant Operations	RFC	5

Group/Individual	Commenter	Organization	1	2	3	4	5	6	7	8	9	10
13. Group	Dennis Chastain	Tennessee Valley AUthority			X		X	X				

	Additional Member	Additional Organization	Region	Segment Selection
1.	DeWayne Scott	Tennessee Valley Authority	SERC	1
2.	Ian Grant	Tennessee Valley Authority	SERC	3
3.	Brandy Spraker	Tennessee Valley Authority	SERC	5
4.	Marjorie Parsons	Tennessee Valley Authority	SERC	6

Group/Individual	Commenter	Organization	1	2	3	4	5	6	7	8	9	10
14. Group	Patricia Robertson	BC Hydro		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	1	2	3	4	5	6	7	8	9	10
15. Group	Paul Haase	Seattle City Light			X	X	X	X				

Group/Individual		Commenter	Organization	Registered Ballot Body Segment									
				1	2	3	4	5	6	7	8	9	10

	Additional Member	Additional Organization	Region	Segment Selection
1.	Pawel Krupa	Seattle City Light	WECC	1
2.	Dana Wheelock	Seattle City Light	WECC	3
3.	Hao Li	Seattle City Light	WECC	4
4.	Mike Haynes	Seattle City Light	WECC	5
5.	Dennis Sismaet	Seattle City Light	WECC	6

	Group/Individual	Commenter	Organization	1	2	3	4	5	6	7	8	9	10
16.	Group	Andrea Jessup	Bonneville Power Administration			X		X	X				

	Additional Member	Additional Organization	Region	Segment Selection
1.	Dean Bender	System Control Engineering	WECC	1
2.	Jim Gronquist	Transmission Planning	WECC	1
3.	Chuck Matthews	Transmission Planning	WECC	1

	Group/Individual	Commenter	Organization	1	2	3	4	5	6	7	8	9	10
17.	Group	Phil Hart	Associated Electric Cooperative, Inc.			X		X	X				

	Additional Member	Additional Organization	Region	Segment Selection
1.	Central Electric Power Cooperative		SERC	1, 3
2.	KAMO Electric Cooperative		SERC	1, 3
3.	M & A Electric Power Cooperative		SERC	1, 3
4.	Northeast Missouri Electric Power Cooperative		SERC	1, 3
5.	N.W. Electric Power Cooperative, Inc.		SERC	1, 3
6.	Sho-Me Power Electric Cooperative		SERC	1, 3

	Group/Individual	Commenter	Organization	1	2	3	4	5	6	7	8	9	10
18.	Group	Erika Doot	Bureau of Reclamation					X					
N/A													
19.	Individual	Alshare Hughes	Luminant Generation Company, LLC					X	X	X			
20.	Individual	Maryclaire Yatsko	Seminole Electric Cooperative, Inc.			X	X	X	X				
21.	Individual	Reena Dhir	Manitoba Hydro			X		X	X				
22.	Individual	Andrew Z. Pusztai	American Transmission Company, LLC										
23.	Individual	David Jendras	Ameren			X		X	X				
24.	Individual	John Seelke	Public Service Enterprise Group			X		X	X				
25.	Individual	Michelle D'Antuono	Ingleside Cogeneration LP					X					
26.	Individual	Kayleigh Wilkerson	Lincoln Electric System			X		X	X				

Group/Individual		Commenter	Organization	Registered Ballot Body Segment									
				1	2	3	4	5	6	7	8	9	10
27.	Individual	Oliver Burke	Entergy Services, Inc.										
28.	Individual	John Merrell	Tacoma Power			X	X	X	X				
29.	Individual	Jamison Cawley	Nebraska Public Power District			X		X					
30.	Individual	Brett Holland	Kansas City Power and Light			X		X	X				
31.	Individual	Thomas Foltz	American Electric Power			X			X				
32.	Individual	Sonya Green-Sumpter	South carolina Electric & Gas			X		X	X				
33.	Individual	Amy Casuscelli	Xcel Energy			X		X	X				
34.	Individual	Michael Moltane	ITC										
35.	Individual	Steve Rueckert	Western Electricity Coordinating Council										X
36.	Individual	Sergio Banuelos	Tri-State Generation and Transmission Association, Inc.			X		X					
37.	Individual	Muhammed Ali	Hydro One			X							
38.	Individual	Anthony Jablonski	ReliabilityFirst										X
39.	Individual	Richard Vine	California ISO		X								
40.	Individual	Spencer Tacke	Modesto Irrigation District			X	X		X				
41.	Individual	Scott Berry	Indiana Municipal Power Agency				X						
42.	Individual	John Brockhan	CenterPoint Energy Houston Electric, LLC										

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 appreciates entities for supporting the comments of other entities rather than duplicating the same or similar comments. Having single sets of comments with documented support greatly improves the efficiency of the standard drafting team. This format also ensures the drafting team has a clearer picture of the number of industry stakeholders supporting the same concerns or suggestions as the case may be. Please see the responses to the entity's comments that are being supported here.

Organization	Agree	Supporting Comments of "Entity Name"
Ameren	Agree	Ameren adopts the SERC PCS comments for PRC-026-1
Lincoln Electric System	Agree	MRO NERC Standards Review Forum (NSRF)
Hydro One	Agree	NPCC - RSC
Indiana Municipal Power Agency	Agree	Comments submitted by Public Service Enterprise Group.

1. **The Protection System Response to Power Swings Standard Drafting Team believes it has addressed industry comments in such a manner that industry consensus can be achieved. If there are remaining unresolved issues in the proposed PRC-026-1 Reliability Standard, please provide your comments here:**

Summary Consideration: The following summary discusses the most significant concerns by industry stakeholders. There were several comments that resulted in the standard drafting team making clarifying revisions. There were a number comments that did not result in revisions, in part, because the commenters were asking for feedback on a particular question.

The following summarizes the clarifying revisions made to the Standard beginning with the most notable first. Four comments supported by 30 individuals reported various errors, inconsistencies, or requested clarifying enhancements. The standard drafting team was able to address the vast majority of these observations resulting in a much improved Standard. Four comments supported by 19 industry stakeholder raised concerns about the phrase "become aware" in Requirement R2, Part 2.2. Concerns ranged from who would initiate a review to find out whether or not a stable or unstable power swing was present, how auditors would interpret the phrase, and how this phrase impacts Elements that trip when the entity reviews its Protection System operations. To address this, the standard drafting team appended a footnote to reference the Guidelines and Technical Basis which provide examples that answer stakeholder concerns. The phrase "become aware" was initially inserted into Requirement R2, Part 2.2 during draft 3 to make it clear that an entity is not having to analyze every Protection System operation for a stable or unstable power swing. It is only when an entity "becomes aware" of a power swing on an Element and that Element tripped in response to a stable or unstable power swing would the entity be obligated to evaluate its load-responsive protective relays applied on that Element.

Five comments supported by 26 individuals continue to be concerned about the use of "unstable" in the Requirements. Some believe the use of "unstable" over-reaches the Federal Energy Regulatory Commission (FERC) Order No. 733. Others believe it is unnecessary to evaluate load-responsive protective relays for unstable power swing while others believe that the Standard is mandating that entities set relays properly for unstable power swings. Because of these few remaining concerns, the standard drafting team appended a justification to the end of the Guidelines and Technical Basis to illustrate the importance of having "unstable" as a criterion in the Standard. The Requirements are constructed in a manner that the "unstable" power swing condition only determines that an Element is susceptible along with stable power swings. An Element that trips on an unstable power swing is most likely subjected to numerous stable power swings that may challenge the Protection System. By identifying these Elements, an entity can then evaluate its load-responsive protective relays applied on these Elements and develop a Corrective Action Plan (CAP) when those relays are determined not to meet the PRC-026-1 – Attachment B criteria. The use of "unstable" is not over-reaching the FERC Order No. 733 because the

Requirements only mandate that an entity ensure their load-responsive protective relays are expected to not trip in response to a "stable" power swing during non-Fault conditions.

Four comments supported by 20 stakeholders questioned the use of "one or more" in Requirement R3 regarding the two bulleted items for developing a CAP. The standard drafting team notes that it is possible that both options may be performed to meet the obligations for correcting any load-responsive protective relays that do not meet the PRC-026-1 – Attachment B criteria. After further consideration, the standard drafting team concluded that it is acceptable to limit performance to one of the two available options to achieve the reliability objective of the Standard; therefore, the "or more" phrase was eliminated to avoid confusion that only one bullet had to be performed to be meet the Requirement.

Four comments supported by 19 individuals questioned the potential redundancy with the PRC-004-3 standard that addresses Misoperation identification and correction of Protection Systems. The standard drafting team considered the connection between PRC-004-3 and PRC-026-1 with regard to the Corrective Action Plan (CAP) at great length over the development of the Standard. In the case where an Element trip occurs due to a stable power swing and the trip is identified as a Misoperation (under PRC-004-3) a single CAP is permitted to satisfy both PRC-004 and PRC-026-1. However, in the broader sense, the CAP for PRC-026-1 is specifically intended to ensure that load-responsive protective relays are expected to not trip in response to stable power swings during non-Fault conditions and PRC-004 is intended to identify and correct the causes of Misoperations. In most cases, the action required under each standard will remain separate and distinct whether included in one CAP or separate CAPs. The standard drafting team believes that entities are able to administratively work around, from a compliance standpoint, any special nuances that arise for CAPs that address an identified Misoperation whether due to a stable or unstable power swing and CAPs to meet the PRC-026-1 – Attachment B criteria.

Two comments by 12 individuals believed that FAC-014 is more appropriate for referencing established System Operating Limits (SOL) by the Planning Coordinator than the FAC-010 Standard. The standard drafting team agreed with the comment that FAC-014 more effectively represented the intent; therefore, updated the footnote to point to FAC-014, R3 that is specific to the Planning Coordinator establishing SOLs.

Two comments supported by six stakeholders requested for Requirement R1, Criterion 3 that the word "where" be replaced with "only if." The standard drafting team agreed that it was clearer and did not change the intent of the Criterion. One comment by five individuals reported various grammatical issues with text in the body of the standard, including the Guidelines and Technical Basis. The standard drafting team agreed with many of the observations and made the corresponding corrections. Two individuals noted that the use of "determine" in the main body of Requirement R2 was redundant with its use in Parts 2.1 and 2.2. The standard drafting team agreed that the use of "determine" in the main body of Requirement R2 could be eliminated without changing the intent. Single comments that did result in a revision to the Standard are not summarized here and are responded to individually below.

The following summarizes comments made by stakeholders where the standard drafting team did not make any changes to the Standard. Four comments supported by 21 individuals believe a standard is not necessary. The standard drafting team provided a detailed explanation in the Consideration of Comments[2] to Draft 1 of the Standard in the introductory remarks regarding the need for a standard to meet regulatory directives. Two comments supported by 17 stakeholders do not believe the Requirement R1, Criterion 3 concerning islanding should be included. The standard drafting team noted that Requirement R1, Criterion 3 does not require the Planning Coordinator to develop criteria for identifying islands. If the Planning Coordinator has criteria (i.e., as determined under PRC-006) where the island is formed by tripping the Element due to angular instability, then the Planning Coordinator must notify the respective Generator Owner and Transmission Owner. Further, the standard drafting team included this criterion to remain consistent with the PSRPS Report[3] recommendation for facilities to consider.

Two individuals commented that the Planning Coordinator should provide information (e.g., impedance plots) for identified Elements to the respective Generator Owner and Transmission Owner. The standard drafting team did not include any such requirement because this information is not essential for an entity to determine whether its load-responsive protective relays meet the PRC-026-1 – Attachment B criteria. Also, adding a Requirement for the exchange of information does not comport with the results-based standard (RBS) structure. Moreover, a goal during standard development was to keep the burden low on all entities. This included not requiring the Planning Coordinator to develop additional assessments or simulations. For the Generator Owner and Transmission Owner, to only have to evaluate the set of Elements identified by the Planning Coordinator and any Elements that actually trip in response to a stable or unstable power swing. Single comments that did not result in a revision are not summarized here and are responded to individually below.

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[22] http://www.nerc.com/pa/Stand/Project%202010133%20Phase%203%20of%20Relay%20Loadability%20stabl/Project_2010_13.3_Consideration_of_Comments_2014_08_22_to_Draft_1.pdf.

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

Organization	Question 1 Comment
SERC Protection and Controls Subcommittee	1) Please make R1, Criterion 3 clearer by replacing 'where' with 'only if'. It then reads "An Element that forms the boundary of an island in the most recent underfrequency load shedding (UFLS) design assessment based on application of the Planning Coordinator's criteria for identifying islands, **only if** the island is formed by tripping the Element due to angular instability." **Response:** Change made. 2) Please expand Application Guidelines p20 explanation of Criterion 3 by adding, 'PC area boundary tie lines, or BA boundary tie lines' at the end of the last sentence so that it reads "The criterion does not apply to islands identified based on other considerations that do not involve angular instability, such as excessive loading, PC area boundary tie lines, or BA boundary tie lines." **Response:** Change made. 3) R1 Criteria 3 and 4, and R2 2.2 identify BES Elements tripped for instability. The Standard's Purpose is 'To ensure that load-responsive protective relays are expected to not trip in response to stable power swings during non-Fault conditions.' (Why do relays that trip on instability need to be evaluated and required to meet this standard?) Please explain that these BES Elements are included because they could be more likely to be challenged by power swings. Their inclusion does not mean that the relays tripping these Elements were necessarily inappropriate. Such an explanation could fit well on page 18 just after "The first step uses criteria to identify the Elements on which a Protection System is expected to be challenged by power swings." **Response:** The standard drafting team has provided additional clarification in the Standard in the Guidelines and Technical Basis section, "Justification for Including Unstable Power Swings in the Requirements" why "unstable" is included. 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.
CenterPoint Energy Houston Electric, LLC	(1) CenterPoint Energy still feels strongly that there is redundancy between PRC-004 and PRC-026 regarding Corrective Action Plans (CAPs) **and must again vote negative.** Redundancy is included in the

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	NERC Paragraph 81 (P.81) project as item "B7. Redundant". Item "B7. Redundant" states the following: "The Reliability Standard requirement is redundant with: (i) another FERC-approved Reliability Standard requirement(s); (ii) the ERO compliance and monitoring program or (iii) a governmental regulation (e.g., Open Access Transmission Tariff, North American Energy Standards Board ("NAESB"), etc.). This criterion is designed to identify requirements that are redundant with other requirements and are, therefore, unnecessary. Unlike the other criteria listed in Criterion B, in the case of redundancy, the task or activity itself may contribute to a reliable BES, but it is not necessary to have two duplicative requirements on the same or similar task or activity. Such requirements can be removed with little or no effect on reliability and removal will result in an increase in efficiency of the ERO compliance program." Based on our understanding, from responses to comments and also from the recent Q&A webinar, the SDT believes that PRC-026 is more stringent than PRC-004; therefore, PRC-026 requirements for a CAP would supersede those in PRC-004. Mainly, PRC-026 will require a CAP, whereas PRC-004 does not require a CAP if explained "in a declaration why corrective actions are beyond the entity's control or would not improve BES reliability, and that no further corrective actions will be taken." We believe such duplicative requirements could send mixed signals where a CAP does not appear to be required (PRC-004) when, in fact, one is required (PRC-026). Should standard PRC-026 be approved as currently written, CenterPoint Energy recommends, due to redundancy, that NERC initiate a project to remove the requirement for a CAP for Protection System operations from power swings in standard PRC-004. **Response:** The standard drafting team considered the connection between PRC-004 and PRC-026 with regard to the Corrective Action Plan (CAP) being redundant at great length over the development of the standard. The standard drafting team notes that in the case where an Element trip occurs due to a stable power swing and is identified as a Misoperation (under PRC-004-3) a single CAP is permitted to be developed to satisfy both PRC-004 and PRC-026. However, in the broader sense, the CAP for PRC-026-1 is specifically intended to ensure that load-responsive protective relays are expected to not trip in response to stable power swings during non-Fault conditions and PRC-004 is to identify and correct the causes of Misoperations of Protection Systems for Bulk Electric System (BES) Elements. In most cases, the action required for each standard will remain separate and distinct whether included in one CAP or separate CAPs. (2) CenterPoint Energy technically disagrees with the SDT's response that operator-initiated switching to reconnect islands, to restore load during Black Start activities, or to synchronize a generating unit to the system should be applicable to PRC-026. We believe that any Element that tripped in response to a stable

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	or unstable power swing involving restoration and black-starting would be addressed in after-action reviews of those events. We expect that entities will need to coordinate with their Regional Entities to address such circumstances. **Response:** The standard drafting team concluded exclusions for system restoration or black-starting should not be provided because it could be detrimental to reliability. Any Element that tripped in response to a stable or unstable power swing must be addressed, especially involving restoration and black-starting because those are conditions where power swings would be expected and it is critical that load-responsive protective relays are secure for stable power swings. No change made.
ACES Standards Collaborators	(1) The drafting team has continued improving this standard and we thank you for the improvements. **Response:** The standard drafting team thanks you for your comment. (2) We question the need for this standard. In its "Protection System Response to Power Swings" (on page 5) document dated August 2013, the NERC System Protection and Control Subcommittee (SPCS) concluded "that a NERC Reliability Standard to address relay performance during stable power swings is NOT needed, and could result in unintended adverse impacts to the Bulk-Power System reliability" [emphasis added]. **Response:** The standard drafting team thanks you for your comment and provided a detailed explanation in the Consideration of Comments[4] to Draft 1 of the Standard in the introductory remarks regarding the need for a standard to meet regulatory directives. (3) The footnote in criterion 2 for Requirement R1 is technically inaccurate and should be modified. An Element would be identified through the application of the PC's SOL methodology which is required in FAC-014-2 not FAC-010. The methodology must be developed in FAC-010 but application is required in FAC-014-2 R3 and R4. **Response:** The standard drafting team agrees that using "FAC-014-2, Requirement R3" more clearly describes the Planning Coordinator establishing a System Operating Limit or SOL. Clarification made.

[4] http://www.nerc.com/pa/Stand/Project%202010133%20Phase%203%20of%20Relay%20Loadability%20stabl/Project_2010_13.3_Consideration_of_Comments_2014_08_22_to_Draft_1.pdf.

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	(3) Why is the word “full” added to “six full calendar months”? We think it only adds confusion in other areas where it is not included. The words six calendar months imply the inclusion of a “full” calendar month. **Response:** The standard drafting team added the clarifier “full” based on previous comments received in early postings of the standard to be clear that partial months are not counted. For example, if the starting point is in the middle of a calendar month, the entity will have until the end of the last month of the stated period. No change made. (4) Requirement R4 should be modified to avoid a registered entity being in technical violation for simply updating their Corrective Action Plan (CAP). As it is written, the applicable entity must both implement the CAP and update the CAP. The problem is that they may be updating the CAP because implementation on the original timeline is not possible. As R4 is written with an “and” condition, this is not possible without a technical violation of the requirement. We suggest changing the second “and” to “or” to address this concern. **Response:** The standard drafting team contends that the primary action in Requirement R4 is to implement the Corrective Action Plan (CAP). The clause after the “and” is conditional based on the entity changing actions or timetables. No change made. (5) Criterion 4 of Requirement R1 requires further explanation. In response to our previous comment questioning the inclusion of unstable power swings in criterion 4 of Requirement R1, the drafting team stated that “this standard does not require that entities assess Protection System performance during unstable swings.” If this is the case, this would support removing “unstable power swings” from criterion 4. What reliability purpose does the PC notifying the GO and TO of Elements susceptible to unstable power swings serve, if the GO and TO are not required to do anything with the information. **Response:** The standard drafting team has provided additional clarification in the Standard in the Guidelines and Technical Basis section, “Justification for Including Unstable Power Swings in the Requirements” why “unstable” is included. (6) Any VRFs that are greater than Lower would seem to be inconsistent with the recommendation of the SPCS (see our point two for the recommendation) that a standard is not needed. Especially, assigning

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	Requirement R2 a VRF of High would seem to a complete rejection of this recommendation. Is this what is intended by the drafting team? **Response:** The standard drafting team assigned a VRF of High to Requirement R2 because the standard is narrowly focusing performance of a sub-set of BES Elements and not all load-responsive protective relays. The failure to evaluate that the Protection System is expected to not trip in response to a stable power swing during a non-Fault condition for a BES Element could contribute to bulk electric system instability, separation, or a cascading sequence of failures, or could place the bulk electric system at an unacceptable risk of instability, separation, or cascading failures, or could hinder restoration to a normal condition. Therefore, Requirement R2 meets a VRF assignment of High and NERC guidance on determining VRFs. Also, other standards that address similar forms of evaluations for Generator Owners and Transmission Owners have VRFs assignments of High. No change made. (7) Should Requirement R3 allow selection of “one or more of the following” or should it be limited to selecting one option? In other words, can a Protection System meet both Criteria A and B simultaneously? If not, then “one or more of the following” should be changed to “either of the following.” **Response:** The standard drafting team notes that in certain cases an entity may perform either or both to meet the Requirement. The Requirement was revised to state “one of the following.” Clarification made. (8) We do not understand why unstable power swings are included in Part 2.2. Per the purpose statement of the standard and the drafting’s prior response to comments (see our bullet 5), the purpose is to prevent tripping of protective relays in response to stable power swings. It is not intended to prevent tripping due to unstable power swings. Thus, why would Part 2.2 compel an evaluation of load-responsive relays for actual tripping due to unstable power swings? **Response:** The standard drafting team has provided additional clarification in the Standard in the Guidelines and Technical Basis section, “Justification for Including Unstable Power Swings in the Requirements” why “unstable” is included. (8) Thank you for the opportunity to comment.
South carolina Electric & Gas	1) Please make R1, Criterion 3 clearer by replacing ‘where’ with ‘only if’. It then reads

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	"An Element that forms the boundary of an island in the most recent underfrequency load shedding UFLS) design assessment based on application of the Planning Coordinator's criteria for identifying islands, only if the island is formed by tripping the Element due to angular instability." **Response:** Change made. 2) Please expand Application Guidelines p20 explanation of Criterion 3 by adding, 'PC area boundary tie lines, or BA boundary tie lines' at the end of the last sentence so that it reads "The criterion does not apply to islands identified based on other considerations that do not involve angular instability, such as excessive loading, PC area boundary tie lines, or BA boundary tie lines." **Response:** Change made 3) R1 Criteria 3 and 4, and R2 2.2 identify BES Elements tripped for instability. The Standard's Purpose is 'To ensure that load-responsive protective relays are expected to not trip in response to stable power swings during non-Fault conditions.' (Why do relays that trip on instability need to be evaluated and required to meet this standard?) Please explain that these BES Elements are included because they could be more likely to be challenged by power swings. Their inclusion does not mean that the relays tripping these Elements were necessarily inappropriate. Such an explanation could fit well on page 18 just after "The first step uses criteria to identify the Elements on which a Protection System is expected to be challenged by power swings." **Response:** The standard drafting team has provided additional clarification in the Standard in the Guidelines and Technical Basis section, "Justification for Including Unstable Power Swings in the Requirements" why "unstable" is included.
Duke Energy	"Duke Energy would like to reiterate that we do not believe adequate technical justification has been identified for this project to become a standard. Based on the SPCS recommendation, the SDT and NERC should consider moving this project to a Guideline document until such time as a standard is warranted."

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	Response: The standard drafting team thanks you for your comment and provided a detailed explanation in the Consideration of Comments[5] to Draft 1 of the standard in the introductory remarks regarding the need for a standard to meet regulatory directives.
Associated Electric Cooperative, Inc.	AECI believes that the term unstable power swing should be removed from this standard. Reliability risks associated with unstable swings are already handled with relay protection (PRC) and system study standards (TPL). FERC ordered this drafting team to address issues associated with stable power swings, and the addition of unstable swings in the language is unwarranted. In the previous round of commenting the SDT responded by stating this inclusion was inherent in statements made in the PSRPS report. I would encourage the SDT to also read the following statement from page 19 of that same report, "over-emphasizing secure operation for stable powers swings could be detrimental to Bulk-Power System reliability." By including unstable power swings within the screening process of R1 more events will qualify for testing and the SDT will have done the very thing the SPCS warned against. An unwarranted emphasis on stable power swings is created when you use unrelated events like unstable swings to define your testing criteria for stable swings. AECI would respectfully request the drafting team removed "unstable" from PRC-026 and keep stable and unstable power swing standards as completely separate as possible, or provide the reliability based risk that exists without the inclusion of this term within the standard. **Response:** The standard drafting team has provided additional clarification in the Standard in the Guidelines and Technical Basis section, "Justification for Including Unstable Power Swings in the Requirements" why "unstable" is included.
DTE Electric Co.	Agree with PSEG comments. The current draft does provide more detailed evaluation basis and examples, however, not all variations in protection schemes are addressed which could result in misapplication of the evaluation criteria. **Response:** Please see our response to PSEG. The standard drafting team believes that it has provided sufficient examples to understand the application of the evaluation criteria. It is not possible to provide an example for every permutation of a protection system.

[5] http://www.nerc.com/pa/Stand/Project%202010133%20Phase%203%20of%20Relay%20Loadability%20stabl/Project_2010_13.3_Consideration_of_Comments_2014_08_22_to_Draft_1.pdf.

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Xcel Energy	Although the latest draft of PRC-026 is an improvement, Xcel Energy feels that there are additional opportunities for improvement. We respectfully submit the following comments for the drafting team's consideration. A new Requirement should be added requiring the PC to provide the system separation angle as part of the notification in order to ensure proper calculation of relay settings. Suggested wording: [Each Planning Coordinator shall provide notification of the system separation angle of each identified BES Element(s) in its area that met any of the Criteria in R1, if any, to the respective Generator Owner and Transmission Owner.] **Response:** The standard drafting team chose to use the industry accepted 120 degree separation angle as a screening criterion in order to avoid creating an undue burden on the Planning Coordinator by having to do dynamic studies for every element identified in Requirement R1. Note that PRC-026-1 – Attachment B allows "an angle less than 120 degrees where a documented transient stability analysis demonstrates that the expected maximum stable separation angle is less than 120 degrees." This analysis could be performed by an entity other than the Planning Coordinator. No change made. Additionally, the 1.05 V Pu voltage is subjective and not based on a study, and contradicts what the GTB says about the AVR: "it is more likely that the relay would operate during a power swing when the automatic voltage regulator (AVR) is in manual mode rather than when in automatic mode." The statement would lead one to believe that 1- The GO is operating in manual mode in contrast to the VAR standards. 2 - That operating in manual mode would keep the unit voltage at 1.05 pu, which is inherently false. Therefore, the calculations in GTB are hypothetical and should not be in a standard, as they provide no reliability assurance. **Response:** The standard drafting team notes that the AVR may be operated in the manual mode under specific circumstances stated in VAR 002-3 (Requirement R1 and R3). Although operating the AVR in manual mode is not a desired state, VAR 002-3 allows for operation of the AVR in manual mode as directed by the Transmission Operator, during AVR testing, or during unit shutdown. It is also possible that the AVR could be operated in manual mode due to equipment failure (AVR controller failure, generator voltage transformer

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	fuse failure, etc.). It is under these AVR operating scenarios that operating under manual mode with a system perturbation will be most likely to cause a loss of field relay trip during a stable power swing. The reference to 1.05 per unit generator voltage is used to establish a minimum pickup current value for overcurrent relays that are set at or below 15 cycles. The sending and receiving end voltages are established at 1.05 per unit at 120 degree separation. The reference from the Guidelines and Technical Basis is an excerpt from an explanation of the loss-of-field relays and not the overcurrent relays. The generating unit AVR may be operating in "auto" and at this upper voltage level. The reference to FAC-10 in R1 Criterion 2 does not appear to be consistent with its intent since the Planning Coordinator's methodology per se does not identify/establish the SOLs… instead, they are determined based on applying the methodology, which is required in FAC-014-2. Therefore, assuming there is value in retaining a reference in Criterion 2, it should probably be changed to R3 of FAC-014 that requires SOLs to be established by the Planning Coordinator. Or the reference could be changed to R6 of FAC-014, which specifically pertains to identifying the stability limit SOLs. However, it may be sufficient to have no reference in Criterion 2 as follows: "Monitored elements that are part of (angular) stability limit SOLs determined by the Planning Coordinator." **Response:** The standard drafting team agrees that using "FAC-014-2, Requirement R3" more clearly describes the Planning Coordinator establishing a System Operating Limit or SOL. Clarification made.
American Electric Power	Applicability, Section 4.2 (Facilities): Despite the changes proposed in this most recent draft, our interpretation is the same as it was for the previous version. That being the case, we're not certain the proposed changes are serving their intended purpose. Could the team provide some insight into what they were trying to clarify or correct with their most recent changes to this section? **Response:** The standard drafting team revised this phrase in response to comments in quality review to use phrasing that is consistent with other Reliability Standard applicability sections. There is no change to the intent or meaning of Section 4.2.

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	R2 and R2.1: Collectively, these requirements read awkwardly due to multiple uses of the word “determine”. We suggest eliminating the first “determine”, so that R2 instead reads “Each Generator Owner and Transmission Owner shall:”. **Response:** The standard drafting team agreed with the suggestion and that removing the first occurrence of “determine” does not substantively change the intent of the requirement as it pertains to Requirement R2, Parts 2.1 and 2.2.
Public Service Enterprise Group	As explained below, we believe there are two unresolved issues. Background PRC-004-3 overlaps PRC-026-1 in several areas. In PRC-004-3, GOs and TOs examine each operation its BES interruption devices to identify Misoperations. Under R5, they must develop a Corrective Action Plan (CAP) unless they “Explain in a declaration why corrective actions are beyond the entity’s control or would not improve BES reliability, and that no further corrective actions will be taken.” In the process of implementing PRC-004-3, “correct operations” are also identified (i.e., interrupting device operations where a Misoperation DID NOT occur), but PRC-004-3 imposes no requirements on correct operations. Misoperations A relay operation during a stable power swing under subpart 2.2 of PRC-026-1 is a Misoperation reportable under PRC-004-3 and subject to a CAP under R5. This same relay operation would be subject to a CAP under R3 of PRC-026-1. In addition, the CAP timelines are different (60 days to develop a CAP in PRC-004-3 and six months to develop it in PRC-026-1). Two standards should not contain requirements that apply to the same Misoperation. To avoid this, we recommend that a new subpart 3.1 should be added in PRC-026-1 as follows: R3.1 The development of a CAP pursuant to Requirement R3 shall supersede the requirements for a Generator Owner or Transmission Owner to develop and implement a CAP for a Misoperation pursuant to NERC Reliability Standard PRC-004. **Response:** The standard drafting team considered the connection between PRC-004 and PRC-026 with regard to the Corrective Action Plan (CAP) being redundant at great length over the development of the standard. The standard drafting team notes that in the case where an Element trip occurs due to a stable

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	power swing and is identified as a Misoperation (under PRC-004-3) a single CAP is permitted to be developed to satisfy both PRC-004 and PRC-026. However, in the broader sense, the CAP for PRC-026-1 is specifically intended to ensure that load-responsive protective relays are expected to not trip in response to stable power swings during non-Fault conditions and PRC-004 is to identify and correct the causes of Misoperations of Protection Systems for Bulk Electric System (BES) Elements. In most cases, the action required for each standard will remain separate and distinct whether included in one CAP or separate CAPs. Correct operations Subpart 2.2 of PRC-026-1 also requires knowledge of correct relay operations due to an unstable power swing. As explained above, this information is directly derived from PRC-004-3, but performing a power swing analysis for each correct relay operation would be very burdensome to meet subpart 2.2. The “becoming aware of” language in subpart 2.2 is explained in the Application Guidelines on p. 22 of the standard. This explanation removes the onus of an entity being required to examine each relay operation for the presence of a power swing. We recommend the standard add a footnote to subpart 2.2 that states: “See p. 22 for an explanation of implementing the “becoming aware” language in subpart 2.2.” Because a guideline is not enforceable, such a footnote would tie this guideline language solidly to subpart 2.2. **Response:** The standard drafting team agrees that placing a cross reference in a footnote to the guidelines will provide increased awareness of where examples can be found. A reference to the Guidelines and Technical Basis concerning “becoming aware” footnote has been appended to Requirement R2, Part 2.2. However, the addition of the footnote only serves to increase the visibility of where an entity can find examples. It does not make the information in the guideline part of the enforceable requirement.
Dominion	As mentioned in the Webinar, the upper loss of synchronism circle is based on the ratio of sending-end to receiving-end voltage of 1.43. Looking at the REDLINE copy of PRC-026-1 draft 3, this should be revised in several places, Revisions Page 19 of 98: “ [...] (2) an upper loss-of-synchronism circle based on a ratio of the sending-end to receiving-end voltages of 1.43”

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	Page 31 of 98: “The second shape is an upper loss of synchronism circle based on a ratio of the sending-end to receiving-end voltage of 1.43 (i.e., ES / ER = 1.0 / 0.7 = 1.43).” Page 32 of 98: “Eq. (3): E_S/E_R =1.0/0.7=1.43” Page 37 of 98: “Shape 2 - Upper Loss of Synchronism Circle With Sending to Receiving Voltage Ratio of 1.43” Page 72 of 98: Table 13 should have an example calculation where ES < ER for the lower loss of synchronism circle and an example calculation where ES > ER for the upper loss of synchronism circle. As discussed with Kevin Jones at Xcel Energy, a revision of Figure 5, on page 41 of 98, changing “Voltage (p.u.)” to the voltage ratio of “ES/ER”, where the ratio extends from 0.7 to 1.43, would align nicely with the edits above. **Response:** Excellent catches on the errors. The standard drafting team has made the above corrections.
American Transmission Company, LLC	ATC accepts the SDT changes. **Response:** The standard drafting team thanks you for your comment.
Kansas City Power and Light	Attachment A The following protection functions should also be excluded from the Requirement of this standard: Phase distance relay elements that do not reach beyond the next bus. Loss-of-field relay elements that do not reach beyond the generator impedance. **Response:** The standard drafting team contends that all impedance elements with a time delay of less than 15 cycles must be evaluated against the PRC-026-1 – Attachment B criteria. For example, a long transmission line with strong sources at each end could result in a Zone 1 relay tripping on a stable power swing, if the relay is not set according to the PRC-026-1 – Attachment B criteria. Even a relay that does not reach beyond the next bus could have a characteristic that is outside the unstable power swing region. No change made.

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Entergy Services, Inc.	Based on the information contained in the SPCS Power Swing Report Dated August 2013, there is insufficient evidence contained in the historical study cases identified, to warrant implementation of the proposed PRC-026-1 standard." **Response:** The standard drafting team thanks you for your comment and provided a detailed explanation in the Consideration of Comments[6] to Draft 1 of the standard in the introductory remarks regarding the need for a standard to meet regulatory directives.
Tennessee Valley Authority	Based on the proposed implementation plan, it seems that the applicable GO and TO will not be required to perform an initial R2.1 evaluation until the second annual notification is received from the PC. Suggest making the "12 months" in the R1 implementation statement "24 months" unless a practice year was intended for the PC requirement. **Response:** The implementation plan is designed such that the Planning Coordinator will begin notifying the respective Generator Owners and Transmission Owners of any Elements in Requirement R1 based on the effective date language. The 36 months for the Generator Owner and Transmission Owner in Requirement R2 (and Requirements R3 and R4) to become compliant is intended to allow the entity an opportunity to address the initial influx of identified Elements in Requirement R1. There is no obligation on the Generator Owner or Transmission Owner to perform Requirement R2, R3, or R4 until the effective date of these Requirements. Although there is no compliance obligation during the 36 month implementation period, an entity will have the full obligation of Requirements R2, R3, and R4 following the 36 month period. The 36 month implementation period also allows an opportunity for the entity to establish the evaluation of load-responsive protective relays pursuant to Requirement R2 which will provide the point in time that the five year re-evaluation of such relays will occur. "No change made. Consider making the implementation date for R3 and R4 lag the implementation date of R2 by six months. The R3 requirement allows for six months to develop a CAP following completion of work associated with R2.

[6] http://www.nerc.com/pa/Stand/Project%202010133%20Phase%203%20of%20Relay%20Loadability%20stabl/Project_2010_13.3_Consideration_of_Comments_2014_08_22_to_Draft_1.pdf.

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	Response: The standard drafting team notes that in order to begin measuring the six months required as part of the performance in Requirement R3, the requirement itself must be "active." Because there is six months built into the performance of the requirement, the implementation plan would not reflect this timing aspect since the implementation timing has to do with when the requirement becomes effective (i.e., active). The dates have been aligned to accomplish this and entities still have the full six months lag in the requirement before performance would be due. Adding this to the implementation timing would only serve to misalign the timing needed. Requirement R4 begins upon development of the Corrective Action Plan in Requirement R3; therefore, Requirement R4 must become "active" at the same time as Requirement R3. No change made. To align with the change made to requirement R2 regarding evaluations performed in the last five calendar years, consider making the effective date of R2 the "First day of the first full calendar year that is 60 months after the date...."Page number references in the following comments apply to the redline posting. **Response:** The additional time for Requirement R2 to become effective in the implementation plan is provided to handle the initial influx of notifications and identifications of Elements by the Planning Coordinator. The five-year interval is based on the anticipated amount of time before system changes would require re-evaluation of protective relays. The standard drafting team concluded that a five year implementation period was too long and that three years provides adequate time to evaluate the initial influx of notifications and identifications of Elements by the Planning Coordinator. The team considered the 60 months requested and determined that three years is sufficient time to handle the influx of notifications. No change made. Page 19: Within the "Rationale for Attachment B (Criteria A)" box shaded blue, should "... varying from 0.7 to 1.0 per unit..." be changed to "varying from 0.0 to 1.0 per unit..." to match the change made in the preceding Criteria A section? **Response:** The standard drafting team notes that the union of the lens with the two circles limits the voltage range of the unstable power swing region's boundary from 0.7 to 1.0. No change made. Page 24: In the Requirement R1 section, recommend replacing the last sentence with "It is possible that a Planning Coordinator will utilize prior year studies in determining their requirement R1 Elements list each year."

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	Response: Change made. Page 25: In the Requirement R1, Criterion 1 section, suggest changing "The 66 kV transmission line is not electrically joined to the 345 kV and 230 kV transmission lines at the plant site and is not a part of the operating limit or RAS." to "The 66 kV transmission lines are not electrically joined to the 345 kV and 230 kV transmission lines at the plant site and are not a part of the operating limit or RAS." since there is more than one 66 kV line in the example. **Response:** Change made. Page 25: In the Requirement R1, Criterion 2 section, since the acronym SOL is now spelled out in the Criterion 1 section, the acronym can be used in the Criterion 2 section without spelling it out. **Response:** The standard drafting team notes that because a reader may go directly to Criterion 2 without reading the preceding section and may not know what is meant by the acronym SOL, the full phrase is used. No change made.
BC Hydro	BC hydro does not agree with the proposed new reliability standard PRC-026-1. In the past 15 years with approximately 1000 faults per year on the transmission system, there has not been a single undesired protection operation on a stable power swing. There have been some protection operations on power swings, but they were desirable, and separated systems that were about to go out of step. BC Hydro has a very large portion of its transmission system that is subject to stability constraints. Therefore, even the focussed approach proposed in the new standard will present a significant amount of engineering resources to perform the stability checks and protection response checks to determine whether setting modifications or addition of power swing blocking relays or whether exemptions are required. BC Hydro recommends that the new standard not be implemented, or if it is implemented, that the WECC region be exempted in view of the fact that the transmission network is sparse, with many stability constraints. The work required to meet this standard will be excessive, even with the focussed approach proposed.

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	Response: The standard drafting team is addressing Federal Energy Regulatory Commission (FERC) Order No. 733 directives to address stable power swings. The standard is using an equally effective and efficient approach in addressing the directive by implementing the narrow focus recommended by the NERC System Protection and Control Subcommittee technical report on a continent-wide basis. The standard drafting team recognizes that there will be cases where Reliability Standards impact one entity more significantly that others when addressing certain risks. No change made.
Bonneville Power Administration	BPA has no unresolved issues. **Response:** The standard drafting team thanks you for your comment.
ITC	Edit R2.2 to include, "...due to the operation of its protective [functions described in Attachment A], determine..." **Response:** The standard drafting team contends that "due to the operation of its protective relay(s)" is the proper phrase. Any relay trip in response to a power swing is an indication that the Element has experienced a power swing significant enough to warrant evaluation of the Element's load responsive relays. No change made. Modern relays which enable power swing blocking functions result in time-delayed clearing for subsequent 3 phase faults. E.g. SEL-411L manual states "Three-phase faults will be detected with a minimum and maximum time delay of two and five cycles, respectively." More conventional power swing blocking functions result in time delays much longer than 5 cycles, possibly exceeding 1 second. Does the SDT believe this is "dependable fault detection"? **Response:** The standard drafting team notes that the Guidelines and Technical Basis provides information on this phrase. The determination of "dependable fault detection" and acceptable tripping delay is outside the scope of this standard and should be governed by other existing reliability standards and industry practices. No change made. Does the SDT believe this contributes to the reliability of the BES? **Response:** The standard drafting team contends that installing out of step blocking normally promotes reliability of the BES. If the application of power swing blocking using a particular type of protection

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	scheme can be shown to degrade reliability for a given location, other alternatives should be considered to meet the requirements of this standard. No change made. Edit page 79, "Double blinder schemes are more complex [than] the single..." **Response:** The standard drafting team corrected the error. R1 Criteria 3 remains unclear. PRC-006 does not seem to require the level of detail required for PCs to meet this requirement. Our concerns are that PCs will commit much more resources to developing this level of detail or absent that level of detail will identify all or none of the boundary elements as meeting this criteria. **Response:** The standard drafting team contends that it is up to the discretion of the Planning Coordinator as to whether it addresses angular stability under PRC-006-1 – Automatic Underfrequency Load Shedding. No change made.
Western Electricity Coordinating Council	I don't have any concerns with the standard as drafted. However, you may wish to make a gramatical review of the language of R2. the word "determine" is included in the language of R2 (last word) as well as in Parts 2.1 and 2.2. It seems like it is not needed both times. **Response:** The standard drafting team agreed with the suggestion and that removing the first occurrence of "determine" does not substantively change the intent of the Requirement as it pertains to Requirement R2, Parts 2.1 and 2.2.
Tacoma Power	In general, Tacoma Power agrees that the Power Swings Standard Drafting Team has addressed industry comments in such a manner that industry consensus can be achieved. However, Tacoma Power does have some other relatively minor suggestions. (In general, these comments were identified by reviewing the draft with redlines.) 1. Consider modifying Requirement R3 as follows. Change "...does not meet the PRC-026-1 - Attachment B criteria..." to "...does not meet the PRC-026-1 - Attachment B criteria pursuant to Requirement R2..." This may be implied, but the language in Requirement R3 does not tie back to Requirement R2.

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	Response: The standard drafting team agrees with the suggestion that it adds clarity that Requirement R3 is contingent upon Requirement R2. Clarification made. 2. In the Rationale for R3, it seems like the reference to Requirement R2 should be a reference to Requirement R3. **Response:** The standard drafting team agrees and has corrected the reference. 3. The criteria headings in Attachment B should read as Criterion A and Criterion B. **Response:** Change made. 4. Under Attachment B, Criterion B, Condition 2, all transmission BES Elements cannot be in their normal operating state if the parallel transfer impedance has been removed. It is understood that all transmission BES Elements would be in their normal operating state with the exception that the parallel transfer impedance should be removed. **Response:** The standard drafting team notes that "…all transmission BES Elements are in their normal operating state…" when calculating the system impedances (i.e., sending-end, receiving-end, and parallel transfer impedance). The parallel transfer impedance is then removed when evaluating the Element pursuant to the criteria.
Ingleside Cogeneration LP	Ingleside Cogeneration L.P. (ICLP) has carefully read through the latest draft of PRC-026-1 and its supporting documents, but still **must deliver a "No" vote**. We fully understand the regulatory need to adhere to FERC's December 31 deadline, but believe that the intent of the drafting team is not captured in the enforceable parts of the standard itself. On a positive note, this means that we believe that the technical aspects of PRC-026-1 are sound - which means that the most difficult work has been performed. ICLP would like to compliment the project team on their ability to construct a process that narrows the universe of load relays that may improperly react to stable power swings, offsetting the arguments that the standard does not serve a reliability purpose. However, several key logistical issues remain. In our view, if these remain uncorrected, we cannot be sure that CEAs will administer the standard evenly across all eight Regions. Our specific recommendations are as follows:

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	1) There must be clarity in the methods used to identify load relay that react improperly to a stable or unstable power swing. The project team has articulated in their Consideration of Comments that Events Analysis and/or a PRC-004 Misoperation study are the triggers that they visualize. However, these concepts are not binding to CEAs - who we believe will demand evidence that every load relay trip was investigated and proved to be not-applicable. In addition, a TO or GO who does not properly identify a stable or unstable power swing will be held in violation of PRC-026-1. This is not a capability or expertise that equipment owners possess, and should not be held accountable for. The project team resolved a similar issue by adding a footnote reference to FAC-010 in R1, and ICLP believes that the same could be done for R2. The footnote would simply capture the fact that the potentially deficient load relay would be identified through the Events Analysis process and/or a Misoperation study. **Response:** The standard drafting team notes although it cannot address the consistency in auditing across the regions; however, the drafting team appended a footnote to Requirement R2, Part 2.2 to reference the Guidelines and Technical Basis concerning "becoming aware." This will serve to increase the reader's awareness of the intent of this phrase. Requirement R2, Part 2.2 is structured where the stable or unstable power swing must be identified that is connected with the entity's Element tripping to avoid the need to address all Element trips. The explanation and examples in the Guideline referenced through the footnote remain explanatory only and are not part of the mandatory requirement. The NERC standard developer will also share this comment with the RSAW development team for further consideration of clarifying notes in the RSAW. Clarification made. 2) The project team has made it clear that a trip in response to an unstable power swing is a screening factor - not a deficient condition. However, no change has been made despite multiple requests to do so. Perhaps the project team believes that there is already sufficient clarity in the requirements, but ICLP disagrees. As written, we believe that some CEAs will demand corrective action in response to an unstable power swing - an improper use of scarce resources better applied elsewhere. A modification to R2 to address the screening intent of unstable power swings can be easily done in order to avoid this situation. **Response:** The standard drafting team notes that Requirement R2 drives the evaluation of load-responsive protective relays for BES Elements that have been identified by Requirement R2, Parts 2.1 and 2.2 (stable or unstable power swings). Requirement R3 requires the entity to meet the performance where the load-

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	responsive protective relay is expected to not trip in response to a stable power swing by meeting PRC-026-1 – Attachment B criteria (i.e., stable power swings only). If the criteria is not met, the entity must develop a Corrective Action Plan (CAP) that meets the conditions in Requirement R3. No change made.
Nebraska Public Power District	It is clear the drafting team has put a great amount of effort into this standard which is quite complex. This effort is appreciated. Comments for consideration: R2.2 states: Within 12 full calendar months of becoming aware of a generator, transformer, or transmission line BES Element that tripped in response to a stable or unstable power swing due to the operation of its protective relay(s), determine whether its load-responsive protective relay(s) applied to that BES Element meets the criteria in PRC-026-1 - Attachment B. R2.2 hinges on "becoming aware" which seems will be difficult to prove or audit. The drafting team felt that it is not needed to prove how an entity addresses "becoming aware" but the RSAW indicates that an auditor should "(R2) Interview an entity representative to understand the entity's process for identifying applicable load-responsive protective relays applied on the terminals of the BES Elements identified pursuant to Requirement R2, Parts 2.1 and 2.2". R2.2 seems to be a very vague and unpredictable part to R2. The standard would be much cleaner without 2.2. **Response:** The standard drafting team agrees that placing a cross reference in a footnote to the guidelines will provide increased awareness of where examples can be found. A reference to the Guidelines and Technical Basis concerning "becoming aware" footnote has been appended to Requirement R2, Part 2.2. However, the addition of the footnote only serves to increase the visibility of where an entity can find examples. It does not make the information in the guideline part of the enforceable requirement. Requirement R2, Part 2.2 is important to reliability because it addresses actual events. This part is also consistent with the PRSRP Report[7] recommendation. A trip on a stable power swing will most likely be a misoperation and will be addressed per other NERC standards (e.g. PRC-004, PRC-016). A trip on an unstable power swing may or may not be a misoperation depending on if the relaying was set to trip for OOS or not. It seems the only benefit to 2.2 then is to

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

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	identify correct trips for unstable swings and this does not seem to add significant reliability compared to the burden and audit risks. Consider removal of 2.2. **Response:** The standard drafting team has provided additional clarification in the Standard in the Guidelines and Technical Basis section, "Justification for Including Unstable Power Swings in the Requirements" why "unstable" is included. The standard drafting team considered how the determination of Misoperations interacts with the PRC-026-1 standard. PRC-004 addresses the identification and correction of Misoperations and PRC-026-1 addresses Elements that have tripped in response to stable or unstable power swings, and if so, evaluate load-responsive protective relays to ensure these relays are expected to not trip in response to stable power swings according to the PRC-026-1 – Attachment B criteria. The action required for each standard will remain separate and distinct whether included in one CAP or separate CAPs. Requirement R2, Part 2.2 is important to reliability because it addresses actual events. This part is also consistent with the PRSRP Report[8] recommendation. During the 11-13-2014 webinar some concerns were noted regarding the guidelines and technical basis equations and calculations. Since a significant portion of this document is devoted to calculations it is beneficial these be as accurate as possible since it will be a part of compliance. Any reevaluations and rechecks of these calculations are greatly appreciated. There is concern with voting yes until the final checks can be made. **Response:** The standard drafting team notes that comments from Dominion, herein, provide comments on the errors discussed during the November 13, 2014 Questions and Answers session held by the standard drafting team. These errors were addressed with the help of Dominion staff. In addition to these comments, we also support the comments submitted by SPP. **Response:** The standard drafting team thanks you for supporting the comments of others. Please see the responses to the SPP Standards Review Group.

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

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Luminant Generation Company, LLC	Luminant continues to believe that including unstable power swings in the draft standard goes beyond FERC Order 733. Luminant understands that adding unstable power swings in the Requirement only requires the Generator Owner to be compliant with the criteria in Requirement R3 (Attachment B) for any of the load-responsive relays in Attachment A. However, Requirement R1 (part 4) provides information to the Generator Owner that some units may be subject to an out-of-step condition and action on their part may be necessary to enable generator out-of-step protection. Luminant recommends that either "unstable" be removed from the standard in all requirements or add language to Measure M1 for the Planning Coordinator to provide information (for example, impedance plots) to the Generator Owner that describe the location of the electrical center for an out-of-step condition. **Response:** It is important to note that this standard does not require that entities assess Protection System performance during unstable swings and does not require entities to prevent tripping in response to unstable swings. Such requirements would exceed the directive stated in the Federal Energy Regulatory Commission (FERC) Order No. 733. This standard focuses on the identification of Elements by the Planning Coordinator (Requirement R1) and Elements where the Generator Owner or Transmission Owner becomes aware of an Element that tripped in response to a stable or unstable power swing (Draft 3, Requirement R2, 2nd bullet). Requirements R1 and R2 (2nd bullet) is a screen to identify Elements that are subject to the Requirements of the standard. The standard drafting team has provided additional clarification in the Standard in the Guidelines and Technical Basis section, "Justification for Including Unstable Power Swings in the Requirements" why "unstable" is included. The standard drafting team chose not to include communication requirements between the Generator Owner and Transmission Owner for the exchange of impedance plot information at a given transmission interconnection point. A communication Requirement for the exchange of information would be administrative in nature, and would create additional compliance tracking burdens for both entities.
ReliabilityFirst	ReliabilityFirst votes in the Affirmative and believes the PRC-026-1 standard enhances reliability and ensures that load-responsive protective relays are expected to not trip in response to stable power swings during non-Fault conditions. ReliabilityFirst offers the following comments for consideration:

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	1. Requirement R2 - the language regarding who determines whether or not a stable or unstable power swing has occurred is vague. The associated application notes state that the SDT purposefully avoided making the GO or TO responsible for that determination and allude that possibly the GO or TO, the RE or NERC during an event analysis could be the source. Unfortunately, this wording sets up a lot of finger pointing as to who was responsible to launch the analysis of the compliance of PRC-026 with the event. ReliabilityFirst recommends including language clearly identifying the source of who determines whether or not a stable or unstable power swing has occurred as referenced in Requirement R2. **Response:** The standard drafting team agrees that placing a cross reference in a footnote to the guidelines will provide increased awareness of where examples can be found. A reference to the Guidelines and Technical Basis concerning "becoming aware" footnote has been appended to Requirement R2, Part 2.2. However, the addition of the footnote only serves to increase the visibility of where an entity can find examples. It does not make the information in the guideline part of the enforceable requirement. Also, Requirement R2, Part 2.2 does not require re-evaluation on a periodic basis and is only triggered by actual events. The standard drafting team concluded that in those rare cases where an event included tripping in response to stable or unstable power swings, that the Generator Owner and Transmission Owner must evaluate its load-responsive protective relays due to the event; however, subsequent review would not be necessary on an ongoing basis. Clarification made.
Seminole Electric Cooperative, Inc.	Requirement R1"Element" in R1 on page 6 of the redline was revised to "generator, transformer, and transmission line BES Element." It's unclear whether "transmission line BES Element" includes terminal equipment of the transmission line. **Response:** The standard drafting team modified the language in the Applicability section and Requirements in the previous Draft 3 to more clearly note that Requirement R1 is applicable to three types of BES Elements (i.e., "generator, transformer, and transmission line"). By definition of "Element" the terminal equipment may be included as a part of the Element. No change made. It's unclear whether a "generator BES Element" includes a generator Facility, i.e., the generator itself or merely those Elements that make up the generator. Seminole requests the drafting team add additional language as to what is actually covered under R1.

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	Response: The standard drafting team notes that the term "generator," as used in Requirement R1, is specific to the generating unit and not other elements that make up a generator facility. PRC-026-1 - Attachment B Under Criteria B on page 20 of the redline version, #2 states "All generation is in service and all transmission BES Elements are in their normal ... ." Seminole requests the drafting team explain how the "transmission BES Elements" listed here are different than "Transmission BES Elements" (Transmission with a capital T)? **Response:** The standard drafting team revised the use of the capitalized version of "Transmission system" to lower case. The occurrences of "Transmission station" appropriately reflect the standard drafting team's intent to reference the term "Transmission" as defined in the *Glossary of Terms Used in NERC Reliability Standards* (NERC Glossary). Occurrences of the phrase "…generation is in service and all transmission BES Elements..." does not refer to the NERC Glossary and is intended to be used in the normal understanding of "generation" and "transmission."
Seattle City Light	Seattle City Light appreciates the efforts of the Standards Drafting Team to respond to comments and clarify the proposed draft. Seattle, however, continues to believe that the proposed Standard is not warranted by the history of major electrical outages. Seattle further finds the proposed Standard to be based on theoretical concepts rather than practical experience, and as such, proposes a largely untried process to become a rigid federal regulation having continental reach. Recent industry experience suggests the difficulty of such an approach. Consider industry experience with another new concept, that of the NERC "Order 754" effort. Considerable back-and-forth exchange and flexibility was required of this effort before well-meaning entities across the continent--each having different configurations, equipment, and characteristics--were able apply a new, untried process to reach a desired and consistent result. Furthermore, as the drafting team will recall, the Order 754 request required some three years to complete, and first year was spent almost entirely in clarifications and modifications. The clarifications and modifications were necessary to address the differing equipment and configurations of diverse entities, configurations and equipment that had not been considered by the team that framed the request. Matters came up as fundamental as "what is meant by the term 'bus' in the request?" (in the end, 'bus' was defined to mean one thing for one part of the request and defined as something else for another part). Given the

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	diversity of entities in North America, how could any team, no matter how strong, be expected to conceive of all possible arrangements with no application experience to guide them? Consider now that the proposed Standard is just as untried as the Order 754 request and is rather more complex. Moreover, as a mandatory reliability Standard it would lack the implementation flexibility that allowed successful completion of the Order 754 request. Consequently Seattle is deeply concerned about the effectiveness of the proposed approach in improving the reliability of the bulk electric system in the near term. Rather it appears more likely to drive a bow-wave of compliance violations as numerous entities struggle to apply new theoretical processes that do not fit their situation and circumstances, and regulators struggle to figure out how to audit a misfit Standard. As such, Seattle votes Negative on this ballot and expects to do so in future ballots as well. Seattle would consider an Affirmative position if the draft Standard was put on hold and a 1-2 year pilot program run in its place. Such a pilot program could be structured as a mandatory reporting exercise somewhat like the Order 754 effort: reporting would be required but results would not be audited for compliance (rather used for learning). Alternatively, a pilot program might be structured to focus on a small number of entities such as the recent CIP v5 pilot program (with the difference that no PRC-026-1 Standard would be adopted, until after the pilot when lessons learned could be incorporated into it). Once experience had been acquired with the real-world application of the proposed PRC-026-1 requirements, and the Standard revised to accommodate these lessons, then Seattle would consider an Affirmative vote. Should a pilot program be implemented, Seattle would be willing to serve a test entity. **Response:** The standard drafting team thanks you for your comments. The ideas presented concerning a field trial will be referred to NERC staff for further consideration.
Bureau of Reclamation	The Bureau of Reclamation (Reclamation) supports the proposed PRC-026-1. Reclamation appreciates the drafting team's efforts revising the Applicability, Requirements, and Measures to clarify which entities will be required to complete stable power swing analysis for which qualifying facilities and elements. **Response:** The standard drafting team thanks you for your comments.
California ISO	The California ISO does not agree with the change to remove the Transmission Planner in the Applicability section and in Requirement R1. The California ISO supports continuing to include the Transmission Planner in Requirement R1 as suggested by the PSRPS Report.

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	Response: The standard drafting team removed the Transmission Planner (and Reliability Coordinator) as applicable entities in Draft 2 of the proposed standard in response to comments on Draft 1 to address concerns about overlap and potential gaps when identifying Elements in Requirement R1. Although the PSRPS Report[9] suggested entities for applicability, the standard drafting team agreed with industry comments received on Draft 1 that the Planning Coordinator is in the best position to identify the BES Elements for notification to avoid duplication and potential gaps. No change made
PacifiCorp	The drafting team should eliminate or revise criterion 3 under PRC-026-1 R1. PRC-006 studies are performed to help ensure sufficient load is available to be shed during extreme events to help arrest frequency decline within an island. Since there are a large number of potential but very low probability extreme events that could result in island formation, UFLS programs applied to small loads dispersed throughout the interconnected system in order to increase the likelihood that potential islands include load that can be shed. Since many of these potential islands and the elements that open to form them are highly speculative, R1 Criteria 3, if it is kept, should be modified to limit its application to elements associated with actual events or specifically designed island boundaries. The Planning Coordinator should not be required to develop a criteria for identifying islands. **Response:** The standard drafting team notes that Requirement R1, Criterion 3 does not require the Planning Coordinator to develop criteria for identifying islands. If the Planning Coordinator has criteria (i.e., as determined under PRC-006) where the island is formed by tripping the Element due to angular instability, then the Planning Coordinator must notify the respective Generator Owner and Transmission Owner. Further, the standard drafting team included this criterion to remain consistent with the PSRPS Report[10] recommendation for facilities to consider. No change made.
ISO RTO Council Standards Review Committee	The IRC SRC appreciates the drafting team's efforts in addressing industry concerns, especially those we submitted in the prior posting. We believe our concerns have been addressed, but respectfully suggest the following small clarification regarding Requirement R3:

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

[10] Ibid, page 21 of 61, 4th bullet.

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	Each Generator Owner and Transmission Owner shall, within six full calendar months of determining, pursuant to R2, that a load-responsive protective relay does not meet the PRC-026-1 - Attachment B criteria, develop a Corrective Action Plan (CAP) to meet one or more of the following.... Thank you for the additional comment opportunity. **Response:** The standard drafting team agrees with the suggestion that it adds clarity that Requirement R3 is contingent upon Requirement R2. Clarification made.
MRO NERC Standards Review Forum	The NSRF believes that the Industry concerns have not been adequately addressed. Request that the drafting clarify its scope of applicability between NERC defined “Elements” and “Facilities” in Section 4.2. Did the drafting team mean only BES generators, transmission lines, and transformers? If so, please clarify this sub set is the only applicable items. **Response:** The standard drafting team modified the language in the Applicability section and Requirements in the previous Draft 3 to more clearly note the standard is applicable to three types of BES Elements (i.e., “generator, transformer, and transmission line”). By definition of “Element” the terminal equipment may be included as a part of the Element. The drafting team should eliminate or revise criterion 3 under PRC-026-1 R1. UFLS islands are rare and UFLS islands mandated by PRC-006 are likely best guess conditions. Therefore unless criterion 3 under R1 is modified to apply only to known and designed stability power protection systems, the work performed would be a best guess and of little practical value. At a minimum, criterion 3 could be further clarified by adding a sentence such as the following, “Criterion 3 does not apply to other conditions such as excessive loading.” **Response:** The standard drafting team notes that Requirement R1, Criterion 3 does not require the Planning Coordinator to develop criteria for identifying islands. If the Planning Coordinator has criteria (i.e., as determined under PRC-006) where the island is formed by tripping the Element due to angular instability, then the Planning Coordinator must notify the respective Generator Owner and Transmission

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	Owner. Further, the standard drafting team included this criterion to remain consistent with the PSRPS Report[11] recommendation for facilities to consider. No change made. FERC has defined that the requirements govern compliance (FERC O 693 sect. 253), unless the words “non-fault power swings” are added to R2 similar to the PRC-026 purpose correctly limiting the number of evaluations to non-fault conditions, a regulatory entity could determine an entity was in non-compliance for not evaluating stable or unstable power swings for fault conditions after an event for “impedance based relays identified in Attachment **Response:** The standard drafting team contends that the use of “non-Fault” in the Purpose describes the standard’s intent to “…ensure that load-responsive protective relays are expected to not trip in response to stable power swings during non-Fault conditions...” where the non-Fault condition applies to the Element(s) the relays are protecting. The evaluation, in the case of Requirement R2 for actual events, comes into scope upon becoming aware of a generator, transformer, or transmission line BES Element that tripped in response to a stable or unstable power swing due to the operation of its protective relay(s) for a non-Fault condition on the protected Element. The use of “non-fault” in PRC-026 R2 would clearly separate PRC-026 from PRC-004 which already governs analysis and corrective actions for protection systems mis-operations usually with respect to fault conditions. This separation will avoid a potential double jeopardy violation where PRC-026 and PRC-004 could be interpreted to overlap for relay analysis of a misoperation. **Response:** The standard drafting team discussed the relationship between the proposed PRC-026-1 and PRC-004-3 (recently NERC Board adopted). The use of “non-Fault” does not separate PRC-026-1 from PRC-004-3 because PRC-004-3 addresses the categories of “Other Than Fault” with regard to identifying Misoperations. The standard drafting team considered the connection between PRC-004 and PRC-026 with regard to the Corrective Action Plan (CAP) being redundant at great length over the development of the standard. The standard drafting team notes that in the case where an Element trip occurs due to a stable power swing and is identified as a Misoperation (under PRC-004-3) a single CAP is permitted to be developed to satisfy

[11] Ibid, page 21 of 61, 4th bullet.

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	both PRC-004 and PRC-026. However, in the broader sense, the CAP for PRC-026-1 is specifically intended to ensure that load-responsive protective relays are expected to not trip in response to stable power swings during non-Fault conditions and PRC-004 is to identify and correct the causes of Misoperations of Protection Systems for Bulk Electric System (BES) Elements. In most cases, action required for each standard will remain separate and distinct whether included in one CAP or separate CAPs. Concerns could exist for electromechanical relays. Electromechanical relays do not provide appropriate data to verify operation or misoperation due to a stable or unstable power swing. Electromechanical relays can only provide target data. To verify correct operation due to a stable or unstable power swing, plots of the system impedance characteristic need to be obtained. Suggest that requirement 2.3 be added clearly identifying that limited data where it isn't possible to verify if a relay tripped due to a power swing, the entity can conclude it is unaware of the trip cause and a PRC-026 report isn't required or use of a foot note could be added. **Response:** Issues concerning the ability of an entity being capable of identifying power swings is addressed by the "becoming aware" language in Requirement R2, Part 2.2. See the Guidelines and Technical Basis as footnoted in the revised standard for "becoming aware." Performance under Requirement R2, Part 2.2 starts with becoming aware of the event (i.e., power swing) and then any connection with the entity's Element tripping. No change made.
Modesto Irrigation District	The standard should be applicable to more than just BES elements. I think it is critical that the following phrase be included in Part 4.2 of the Applicability Section: "Any system element, regardless of size or connected voltage, that has been shown to be material to the reliability of the BES". The "bright line" of 100 kV is fine in general, but when it is known that an element connected at less than 100 kV is material to the reliability of the BES, it should be included as an applicable facility for this standard. This is because WECC members have learned over the years to recognize the significant role that smaller size elements play in system response and stability. Also, past WECC studies of major outages have shown that elements connected at less than 100 kV, have played a major role in the impact of outages. In fact, the most accurate duplication of the 1996 major system wide outage and more recent outages that the WECC

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	MVWG has simulated, have shown that the accuracy of the simulated results of actual system outages is highly affected by the accuracy of the modeled system below 100 KV. **Response:** The standard drafting team thanks you for your comment. The standard addresses concerns raised in the Federal Energy Regulatory Order No. 733 using an equally effective and efficient approach based on the PSRPS Report.[12] The standard uses the PSRPS Report's narrow focus for the applicability to the subset of BES Elements that are at an increased risk for power swings. By identifying these specific BES Elements, the Generator Owner and Transmission Owner can ensure that load-responsive protective relays are expected to not trip in response to stable power swings during non-Fault conditions. Entities are not precluded from applying the principles to other BES and non-BES Elements. No change made.
PPL NERC Registered Affiliates	These comments are submitted on behalf of the following PPL NERC Registered Affiliates: LG&E and KU Energy, LLC; PPL Electric Utilities Corporation, PPL EnergyPlus, LLC; PPL Generation, LLC; PPL Susquehanna, LLC; and PPL Montana, LLC. The PPL NERC Registered Affiliates are registered in six regions (MRO, NPCC, RFC, SERC, SPP, and WECC) for one or more of the following NERC functions: BA, DP, GO, GOP, IA, LSE, PA, PSE, RP, TO, TOP, TP, and TSP. Comments: We agree that SDT has largely addressed industry comments on this standard and believe that STD's work on this standard sets a model for future collaborative effort. We have only one remaining concern. Although the Application Guideline has language that satisfactorily explains the intent of the "becoming aware of" language in subpart 2.2, we are concerned that a guideline is not enforceable. We recommend adding a footnote in subpart 2.2 that solidly ties the guideline language to this subpart. If this single change were made to this version of the standard, PPL would vote affirmatively. **Response:** The standard drafting team agrees that placing a cross reference in a footnote to the guidelines will provide increased awareness of where examples can be found. A reference to the Guidelines and Technical Basis concerning "becoming aware" footnote has been appended to Requirement R2, Part 2.2. However, the addition of the footnote only serves to increase the visibility of where an entity can find examples. It does not make the information in the guideline part of the enforceable requirement.

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

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Tri-State Generation and Transmission Association, Inc.	Tri-State believes that Requirement R3 should continue to refer to the Requirement to assess the load-responsive protective relays against the criteria of PRC-026-1 - Attachment B. We recommend adding “pursuant to Requirement R2,” between “PRC-026-1 - Attachment B criteria,” and “develop a Corrective Action Plan (CAP)” in Requirement R3. Without the clarifying clause, the requirement could be referring to any load-responsive protective relay that the entity happens to recognize that does not meet the criteria in the attachment. **Response:** The standard drafting team agrees with the suggestion that it adds clarity that Requirement R3 in contingent upon Requirement R2. Clarification made.
JEA	We are concerned that this standard may have unintended consequences and hurt the reliability of the BES. **Response:** The standard drafting team thanks you for your comment.
SPP Standards Review Group	We have a concern about the significance of Attachment A in the documentation and ask the drafting team to provide more clarity on this documentation. In Requirement R3, the drafting team mentions that the Generator Owner and Transmission Owner has six full calendar months after determining that load-responsive protection relays don’t meet Attachment B criteria and a Correction Action Plan (CAP) needs to be developed. Additionally in the second bullet of the same requirement, the drafting team mentions ‘The Protection System is excluded under the PRC-026-1 - Attachment A criteria’. However in the Rationale Box of R3, the drafting team provides detailed information on the necessity of the CAP and its association with Attachment B. As for Attachment A, there is no explanation of how it impacts the Generator Owner and Transmission Owner or what role it plays in this process. Please provide more detailed information in the Rationale Box of R3 in reference to Attachment A. **Response:** The standard drafting team notes that the rationale box incorrectly referenced Requirement R2 and should have been Requirement R3. The rationale box was revised to provide information about PRC-026-1 – Attachment A. For a load-responsive protective relay that did not meet the PRC-026-1 –

Organization	Question 1 Comment
	Attachment B criteria, the entity must develop a Corrective Action Plan (CAP) meets one of the following (the following is paraphrased for clarity): 1. Modify the Protection System to meet PRC-026-1 – Attachment B criteria or make some other modification (e.g., a system configuration change) such that the Protection System will meet PRC-026-1 – Attachment B criteria (because the system impedance changed), or 2. Modify the Protection System in a manner as to exclude it from the applicability of the standard (by using the list of exclusions in PRC-026-1 – Attachment A). For example, applying power swing blocking supervision to the load-responsive protective relay would be an acceptable CAP and way to meet the objectives of the Standard.
Northeast Power Coordinating Council	With respect to Requirement 1, stability addressed by RAS (Criterion 1), or relay trips observed in Planning Assessments (Criterion 4) often involves remote or local generators and the instability or relay trip does not impact the Bulk Electric System outside the local area. In NPCC, the majority of RAS are classified as Type III SPS, meaning that their failure (and resulting instability) does not adversely impact the Bulk Electric System outside the local area. As in PRC-010-1 that recognizes local issues and "provides 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", it is suggested that PRC-026-1 also provide latitude to the PC to exclude some of the BES Elements identified by Criteria 1 and 4 if the instability or relay trip does not impact the Bulk Electric System outside the local area. **Response:** The standard drafting team has developed the standard consistent with applicability provided in the PSRPS Report.[13] All of the BES Elements that are identified through the Requirements must meet the standard regardless of whether the condition is a local issue or a more widespread problem. No change made. The page numbers refer to the pages in the clean copy of PRC-026-1.

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

Organization	Question 1 Comment
	Page 14--from “The following protection functions are excluded from Requirements of this standard:”, Why are voltage-restrained relays excluded? Wouldn't the voltage dip during a power swing enable these relays to misoperate on load current? **Response:** Voltage controlled time-overcurrent or voltage-restrained time-overcurrent relays are excluded from this standard. When set based on equipment permissible overload capability, a voltage-restrained time-overcurrent operating time is much greater than 15 cycles for the current levels observed during a power swing. Page 18--in the “Pole Slip:” item it should read “a generator’s, or group of generator’s, terminal...”. Page 18--the “Out-of-step Condition:” should read “Same as an Unstable Power Swing.” (Capitalization change).Page 20--line 5 should reads “...identified as BES Elements meeting...”. **Response:** These descriptions are taken directly from the referenced IEEE Power System Relaying Committee WG D6 developed a technical document called *Power Swing and Out-of-Step Considerations on Transmission Lines* (July 2005) technical document. No change made. Page 30--the caption for Figure 3 should read: “System impedances as seen by Relay R. (voltage connections for relay not shown.)” **Response:** Correction made as suggested. Page 33-- The first blue box for Table 2 should read: “Positive sequence impedance data (with transfer impedance ZTR set to a very large value).” **Response:** Clarification made. Page 33--In equation (8), ZTR was given as = ZL x 10^10, which equals (4 + j20) x 10^10, not (4 + j20)^10 as used in the equations. **Response:** Correction made to all related equations. Page 34--In Table 3, the second blue box should read: “Positive sequence impedance data (with transfer impedance ZTR set to a very large value). **Response:** Clarification made.

Organization	Question 1 Comment
	Page 36--same comment for Equation (16) as for Equation (8) above. **Response:** Correction made to all related equations. Page 36--for Table 4 and Equation (24), the same comment as for Equation (8) above. **Response:** Correction made to all related equations. Pages 38-42--for Tables 5, 6, and 7 the same comment as for Equation (8) above. **Response:** Correction made to all related equations. Page 53--For Figure 12 the caption should be rephrased to: “The tripping portion of the mho element characteristic not blocked by load encroachment (i.e., ...) is completely contained within...”. **Response:** Clarification made. Page 69--The last blue box in Table 14 should read “Total system current”. Current direction is irrelevant. Response: The phrase “from sending-end source” was deleted. Page 72--the Drafting Team should consider adding the word “Stable” in the lower right region of the Figure 16 graph, and the word “Unstable”: under the words “Capability Curve” to the right of SSSL. **Response:** Figure 16 illustrates a typical SSSL curve and is not intended to reference the stable and unstable regions as noted in other figures. Page 74--in Table 15, X”d was changed to X’d, but “sub-transient” was not corrected to read “saturated transient reactance”. **Response:** Correction made. Page 75--regarding Table 16, define the Base that the values of Table 15 have been converted to (e.g. “Table 16. Example calculations (Generator) on 941 MVA base”). **Response:** The MVA base was added to Table 16. Pages 74-75--there are two different values for Ze and both are in ohms, not per unit.

Organization	Question 1 Comment
	Response: Values were updated to reference per unit and Z_e was corrected from 86 degrees to 90 degrees to be consistent. Page 75--in Equation (107) j0.3845 + j0.171 + 0.06796 does is not equal to $0.6239\angle 90\Omega$. **Response:** Correction made. Page 75-- Zsys is defined as $0.6239\angle 90\Omega$ in Equation (107) of Table 16, but defined as $0.6234\angle 90\Omega$ in Equation (109) of Table 16 and in Equation (110) of the Instantaneous Overcurrent Relay section. **Response:** Correction made to Equation 107 and Equations 109 and 110 are now correct. Page 78--in Figure 20 add “hashing” to the area between the SSSL (black) curve and the 40-1 (blue) curve with an arrow and note saying “Stable and can trip” or similar wording. **Response:** Figure 20 title was revised to remove the reference to “stable power swing” and to note the figure is a typical loss-of-field R-X plot. Hashing relative to the SSSL curve was not added because the figure is illustrating a test against the unstable power swing region represented by the solid red lines. There are inconsistencies in the use of “per unit” in the tables of the Applications Guidelines. In some instances per unit is used, and in other instances the ohmic value is given. There should be consistency in the Applications Guidelines and standard. **Response:** The standard drafting team revised the calculations so that per unit and ohm values are consistent within each table.

END OF REPORT