

**Individual or group. (42 Responses)**  
**Name (24 Responses)**  
**Organization (24 Responses)**  
**Group Name (18 Responses)**  
**Lead Contact (18 Responses)**  
**Question 1 (38 Responses)**

Individual
Alshare Hughes
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.
Individual
Maryclaire Yatsko
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. 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. 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)?
Individual
Reena Dhir
Manitoba Hydro
Individual
Andrew Z. Pusztai
American Transmission Company, LLC
ATC accepts the SDT changes.
Group
MRO NERC Standards Review Forum
Joe DePoorter
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. 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.” 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 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. 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.

Individual

David Jendras

Ameren

Individual

John Seelke

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. 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.

Individual

Michelle D’Antuono

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: 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. 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.

Individual

Kayleigh Wilkerson

Lincoln Electric System

Individual

Oliver Burke

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."

Individual

John Merrell

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. 2. In the Rationale for R3, it seems like the reference to Requirement R2 should be a reference to Requirement R3. 3. The criteria headings in Attachment B should read as Criterion A and Criterion B. 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.

Group

Northeast Power Coordinating Council

Guy Zito

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. The page numbers refer to the pages in the clean copy of PRC-026-1. 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? 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...". Page 30--the caption for Figure 3 should read: "System impedances as seen by Relay R. (voltage connections for relay not shown.)" 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)." Page 33--In equation (8), ZTR was given as  $= ZL \times 10^{10}$ , which equals  $(4 + j20) \times 10^{10}$ , not  $(4 + j20)^{10}$  as used in the 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). Page 36--same comment for Equation (16) as for Equation (8) above. Page 36--for Table 4 and Equation (24), the same comment as for Equation (8) above. Pages 38-42--for Tables 5, 6, and 7 the same comment as for Equation (8) above. 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...". Page 69--The last blue box in Table 14 should read "Total system current". Current direction is irrelevant. 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. Page 74--in Table 15, X'd was changed to X'd, but "sub-transient" was not corrected to read "saturated transient reactance". 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"). Pages 74-75--there are two different values for Ze and both are in ohms, not per unit. Page 75--in Equation (107)  $j0.3845 + j0.171 + 0.06796$  does is not equal to  $0.6239 \angle 90^\circ$ . Page 75-- Zsys is defined as  $0.6239 \angle 90^\circ \Omega$  in Equation (107) of Table 16, but defined as  $0.6234 \angle 90^\circ \Omega$  in Equation (109) of Table 16 and in Equation (110) of the Instantaneous Overcurrent Relay section. 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. 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.

Individual

Jamison Cawley

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. 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 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. 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. In addition to these comments, we also support the comments submitted by SPP.
Individual
Brett Holland
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.
Individual
Thomas Foltz
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? 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:".
Group
PacifiCorp
Sandra Shaffer
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.
Individual
Sonya Green-Sumpter
South carolina Electric & Gas
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." 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." 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."
Individual
Amy Casuscelli
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.] 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.

Individual

Michael Moltane

ITC

Edit R2.2 to include, "...due to the operation of its protective [functions described in Attachment A], determine..." 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"? Does the SDT believe this contributes to the reliability of the BES? Edit page 79, "Double blinder schemes are more complex [than] the single..." 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.

Group

ISO RTO Council Standards Review Committee

Greg Campoli

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: 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.

Individual

Steve

Rueckert

I don't have any concerns with the standard as drafted. However, you may wish to make a grammatical 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.

Group

SERC Protection and Controls Subcommittee

David Greene

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." 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." 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." 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.

Individual

Sergio Banuelos

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.

Group

Dominion

Connie Lowe

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" 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.

Group

SPP Standards Review Group

Shannon Mickens

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.

Group

Duke Energy

Michael Lowman

"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."

Group
PPL NERC Registered Affiliates
Brent Ingebrigtsen
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
Individual
Muhammed Ali
Hydro One
Group
JEA
Thomas McElhinney
We are concerned that this standard may have unintended consequences and hurt the reliability of the BES.
Group
ACES Standards Collaborators
Jason Marshall
(1) The drafting team has continued improving this standard and we thank you for the improvements. (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]. (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. (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. (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. (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. (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 Requirement R2 a VRF of High would seem to a complete rejection of this recommendation. Is this what is intended by the drafting team? (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." (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?  
(8) Thank you for the opportunity to comment.

Group

DTE Electric Co.

Kathleen Black

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.

Group

Tennessee Valley Authority

Dennis Chastain

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. 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. 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. 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? 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." 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. 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.

Individual

Anthony Jablonski

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:  
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.

Individual

Richard Vine

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.

Individual
Spencer Tacke
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 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.
Individual
Scott Berry
Indiana Municipal Power Agency
Individual
John Brockhan
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 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. (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 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.
Group
BC Hydro
Patricia Robertson
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.

Group

Seattle City Light

Paul Haase

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 to 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 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.

Group

Bonneville Power Administration

Andrea Jessup

BPA has no unresolved issues.

Group

Associated Electric Cooperative, Inc.

Phil Hart

AECEI 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.

Group

Bureau of Reclamation

Erika Doot

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.

**Additional Comments:**

**Xcel Energy**  
**Amy Casuscelli**

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."

**END OF REPORT**