

Unofficial Comment Form

Project 2007-06 System Protection Coordination PRC-027-1 (Draft 5)

DO NOT use this form for submitting comments. Use the [electronic form](#) to submit comments on draft 5 of **PRC-027-1 – Coordination of Protection System Performance During Faults**. The form must be completed and submitted by **8 p.m. Eastern, Friday, May 15, 2015**.

If you have questions, contact Standards Developer, [Al McMeekin](#), (via email) or at (404) 446-9675.

The project page may be accessed by clicking [here](#).

Background Information

The System Protection Coordination Standard Drafting Team (SPCSDT) created a new results-based standard, PRC-027-1, with the stated purpose: *“To maintain the coordination of Protection Systems installed for the purpose of detecting Faults on BES Elements and isolating those faulted Elements, such that the Protection Systems operate in the intended sequence during Faults.”* Draft 4 of PRC-027-1 was posted for comment and ballot from 11/4/13 - 12/31/13. Following the posting, FERC staff from the Office of Electric Reliability raised concerns regarding the posted draft. The primary concern was that the proposed standard did not address the coordination of Protection Systems within a Transmission Owner’s footprint, referred to as “internal” or “intra-entity” Protection Systems. Following discussions with NERC and FERC staff, the SPCSDT prepared a preliminary draft 5 of PRC-027-1 and sought stakeholder input on the conceptual standard during a 21-day informal comment period. Based on stakeholder comments received during the informal comment period, the drafting team modified the proposed standard.

Draft 5 of PRC-027-1 modifies the applicability of the standard to include *“Protection Systems installed for the purpose of detecting Faults on BES Elements and isolating those faulted Elements,”* whereas, prior drafts of the standard limited the applicability to *“Protection Systems installed for the purpose of detecting Faults on Interconnecting Elements.”* With this change to the applicability, the coordination of Protection Systems for all “internal” or “intra-entity” connections between BES Elements are addressed. PRC-027-1 clarifies the coordination aspects and incorporates the reliability objectives of Requirements R3 and R4 from PRC-001-1.1(ii); therefore, the SPCSDT is proposing the retirement of those Requirements from PRC-001-1.1(ii). The SPCSDT has included a redlined version of PRC-001-1.1(ii) and a clean PRC-001-3. PRC-001-3 contains the remaining Requirements R1, R2, R5, and R6 as well as updated pro forma language for the “Effective Date” and “Compliance” sections of the standard.

Draft 5 of PRC-027-1 consists of two proposed requirements.

Requirement R1 mandates that entities establish a process to develop settings for its BES Protection Systems to operate in the intended sequence during Faults; and stipulates certain attributes that must be included in the process. Because entities' Protection System designs and philosophies vary greatly, the drafting team has included flexibility in developing the coordination processes.

Requirement R2 mandates that entities implement the process established in accordance with Requirement R1. The drafting team asserts that implementing each of the elements of the process will facilitate a consistent approach in the development of accurate Protection System settings, minimize the possibility of introducing errors, and maximize the likelihood of maintaining a coordinated Protection System.

The Project 2007-06 System Protection Coordination Standard Drafting Team (SPCSDT) is posting draft 5 of Reliability Standard PRC-027-1 "Protection System Coordination for Performance During Faults" for comment from April 1, 2015 to May 15, 2015.

Questions:

1. Do you agree that Parts 1.1 through 1.5 of Requirement R1 are the essential elements of a successful coordination process? Are there others that should be included? If not, please provide the basis for your disagreement and any proposed revisions or additions.

Yes

No

Comments: Requirement R1 should be revised to read "...establish a process or processes" instead of "a process." An Entity may choose to implement a separate process for each Part.

Part 1.1. "A method to review and update the information required to develop new or revised Protection System settings." requires entities to develop a process that includes a method to review information used in two studies: Short Circuit Study and Protective Device Coordination Study. Part 1.1 only addresses the 'what' but does not address the 'when'. The 'when' for the review of the information used in the Protective Device Coordination Study is addressed in Parts 1.2 and 1.3. The 'when' for the review of information used in the Short Circuit Study is never addressed. The only evidence that is required for this standard with respect to the review of information used for the Short Circuit Study will be documentation of the 'what'; no evidence is required of 'when' it was followed. Also, Part 1.1 is not results-based; it is overly prescriptive and an inherent and necessary element for developing new or revised Protection System settings. We suggest it be removed as it does not add any value to Requirement R1. If the drafting team decides that Part 1.1 is necessary, then additional clarification is recommended regarding the scope of information to be reviewed and to what extent the review needs to be performed. Alternative wording could also be considered such as, "A procedure to track changes to the primary system and associated information required to develop new or revised Protection System settings."

It was mentioned in the April 27, 2015 Webinar that System changes will reset the baseline for Fault current studies. If that is the case, then it should be made clear in the standard.

Proving system changes will be onerous. In the Rationale Box for Requirement R1, the section referring to Part 1.2 is open ended and may leave the impression that every change, even minor ones, will be considered a System change. The standard should better define "System changes."

Part 1.3. The last part of the description for "Periodic Fault current studies" is confusing. Suggest the wording be changed to the following: "... at the bus under study, and this Fault Current analysis evaluated in a time interval not to exceed six calendar years, or"

In the Rationale for Requirement R1, under Part 1.3, in the second paragraph there is the sentence "To minimize this risk, the drafting team chose a maximum Fault current deviation of 15 percent." Yet in Part

1.3 itself it says “A 15 percent or greater deviation in Fault current...” Suggest adding or removing the words “or greater” to reflect the intent. The Rationale and Part should be consistent.

Regarding the first bullet of Part 1.3, if the entity identifies a Fault current change equal to or greater than 15 percent, the periodic review should apply only to those buses identified as having a 15 percent or greater deviation in Fault current in the study and the connected buses one station away from those buses. Footnote 1 can be revised to:

Based on the Protection System design and/or susceptibility to changes in Fault current, applicable entities (Transmission Owners, Generator Owners, and Distribution Providers) will designate what Protection Systems must be included in the review(s) to ensure these Protection Systems continue to operate in the intended sequence during Faults. For buses where the Fault current changed by 15 percent or greater the Protection Systems will be those applied at the bus with the change in Fault current, and connected stations one bus away.

Part 1.4 is unclear. It is unclear as to what constitutes a “quality review”, and how is it measured. It is not necessary to perform any QR. If the intent is to have this included in the process document to ensure new or revised protection system settings are properly coordinated, then this part should be revised to say, e.g.:

1.4 A check list to verify that the development of the new or revised protection system settings is coordinated among affected entities and that the proposed settings can achieve the intent of fault clearing prior to implementation.

In sub-Part 1.5.1 suggest changing “other functional entities” to “impacted (or affected) functional entities”.

Requirement R2 requires the Entity to implement the R1 process. The plainest reading of the requirement only requires the process to be implemented. Suggest that R1 and R2 be combined and formatted into the CIP table format. R1 becomes “establish and implement a process or processes” and then in a table format list each part and in the adjoining column the measures to demonstrate compliance.

With regard to the discussion on sub-Part 1.3.1 at the Webinar on April 27, 2015, it was stated that once the standard is adopted utilities have 12 months to establish their fault current baseline if using the Periodic Fault Current Study method, or 6 years to perform their next Periodic review of Protection System settings if using that method of compliance. Those time frames should be spelled out in the document, especially the 12 months because it does not appear anywhere. Perhaps the best place for this is in the Implementation Plan.

The existing requirement R3 in PRC-001-1.1 calls for coordination between Generator Operators and Transmission Operators with the Host Balancing Authority:

R3. A Generator Operator or Transmission Operator shall coordinate new protective systems and changes as follows.

R3.1. Each Generator Operator shall coordinate all new protective systems and all protective system changes with its Transmission Operator and Host Balancing Authority.

R3.2. Each Transmission Operator shall coordinate all new protective systems and all protective system changes with neighboring Transmission Operators and Balancing Authorities.

While the language regarding coordination by the Host Balancing Authority is not concise, the Host Balancing Authority should be made aware of relaying changes. PRC-027-1 sub-Parts 1.5.1 and 1.5.2 should be revised as follows:

1.5.1. Communicate the proposed Protection System settings with the other functional entities and the Host Balancing Authority.

1.5.2. Review proposed Protection System settings provided by other functional entities and the Host Balancing Authority, and respond regarding the proposed settings. The response should identify any coordination issue(s) or affirm that no coordination issue(s) were identified.

2. Do you agree with the proposed Measures? If not, please provide the basis for your disagreement and your proposed revisions.

Yes

No

Comments: We do not agree with Measure M1. Refer to our comments above regarding Parts 1.1 and 1.4.

M2 requires evidence that the process was implemented. To be specific this measure is not requiring the entity to retain evidence that each step of the process was implemented or that for each relay

setting a package of information showing the protection system analysis, study files, communications with other Entities was executed. In comparison, PRC-005 requires an entity to maintain and retain evidence of the maintenance of protection systems; not to implement a maintenance program.

3. Do you agree with the proposed Implementation Plan? If not, please provide the basis for your disagreement and your proposed revisions.

Yes

No

Comments: The Implementation Plan needs to address the 6 year review in Part 1.3. Is this 15 percent per year for the first 6 years? Do entities need to demonstrate when the last review was done prior to effective date of the Standard?

The Implementation Plan should be extended to 24 months. As it stands now, the 12 months entities have to develop a process, establish Fault current baseline, and establish a tracking tool for Fault current baseline changes and/or periodic review is not enough time.

4. If you have any other comments that you haven't already provided in response to the above questions, please provide them here.

Comments: We wish to express support for the direction the Standard Drafting Team has taken in this major re-write to formulate Draft 5 of the standard. Some clarifications and extension of the Implementation Plan, as noted in the comments, are all that should suffice to arrive at a future successful draft standard.

The approach that the System Protection Coordination Standard Drafting Team (SPCSDT) has taken by establishing a separate standard for Coordination of Protection System Performance During Faults (PRC -027), while another standard for protection coordination (PRC-001-3 System Protection Coordination) already exists creates an unnecessary administrative burden. The attributes of coordinating fault protection should be contained in a standard on System Protection Coordination. The argument is being made that other protection systems (UFLS, UVLS) have their own standards, and therefore fault clearing should have its own standard. There is an opportunity to consolidate and be less administrative by having only one standard.