Unofficial Comment Form
Project 2010-13.2 Generator Relay Loadability (PRC-025-1)

Please DO NOT use this form for submitting comments. Please use the electronic form to submit comments on the Standard. Comments must be submitted by 8 p.m. ET Monday, March 11, 2013. If you have questions please contact Scott Barfield-McGinnis at Scott.Barfield@nerc.net or by telephone at (404) 446-9689.

http://www.nerc.com/filez/standards/Project_2010-13.2_Summary_Table.html

Background Information
This posting is soliciting formal comments in a 45-day formal comment period.

The Standard Authorization Request (SAR) for this project was initiated on August 5, 2010 and approved by the Standards Committee (SC) on August 12, 2010. It established the scope of work for Project 2010-13.2 for what is the second phase of Order 733, Transmission Relay Loadability Reliability Standard.\(^1\) Phase I resulted in the NERC Reliability Standard PRC-023-1 and Phase II concerning this project specifically addresses protecting the generator, generator step-up (GSU) transformer, and unit auxiliary transformers (UAT) in the proposed new standard, PRC-025-1. The SC moved this project into active development on March 8, 2012.

During analysis of many of the major disturbances in the last 25 years on the North American interconnected power system, generators have been found to have tripped for conditions that did not apparently pose a direct risk to those generators and associated equipment within the time period where the tripping occurred. This unnecessary tripping has often been evaluated to have extended the scope and/or duration of that disturbance. This was noted, in detail, to be a serious issue in the August 2003 “blackout” in the northeastern North American continent.

During the recoverable phase of a disturbance, the disturbance may exhibit a “voltage disturbance” behavior pattern, where system voltage is widely depressed. In order to support the system during this phase of a disturbance, this standard establishes criteria for setting load-responsive relays such that individual generators may provide Reactive Power within their dynamic capability during transient time periods to help the system recover from that voltage disturbance. The premature or unnecessary tripping of generators resulting in the removal of dynamic Reactive Power exacerbates the severity of the voltage disturbance, and as a result changes the character of the system disturbance. In addition, the loss of Real Power could initiate or exacerbate a frequency disturbance.

The Standard Drafting Team (SDT) has developed draft two of the standard to provide requirements that address these concerns, and is presenting this draft to industry for a formal comment period to get industry comments to aid in further development.

Summary of changes
The generator relay loadability SDT has revised the draft PRC-025-1 – Generator Relay Loadability based on stakeholder comments received during the first formal 30-day posting of the standard. The following narrative is a summary of the significant improvements made to the standard.

- Standard
  - The Purpose statement was revised to better reflect the intent of the standard based on industry comment
  - The Applicability section was revised to clarify the Facilities
    - Clarifying change in section 3.1.1 to eliminate potential overlap with the standard, PRC-023-2.2
    - Section 3.2.4 Generator interconnection Facility(ies) was added to the Applicability to comport with proposed changes to PRC-023-2
  - Requirement R1 was revised to replace the word “install” with “apply” to be more consistent with industry terminology and usage
  - Measure M1 was revised to comport with the revision to Requirement R1
  - Typographical correction in the compliance monitoring section
  - Added Violation Severity Levels
  - Attachment 1: Relay Setting (significant changes)
    - Revised introductory text to clarify “field-forcing” and calculations
    - Added load-responsive protective relay exclusions
    - Restructured Table 1: Relay Loadability Evaluation Criteria
      - Organized by Application and relay type
      - Formatted using colors for clarity
      - Improved notation between option, where applicable
      - Added phase directional time overcurrent relay (67) – directional toward the Transmission system relay type

2 The drafting team has posted a supplemental Standard Authorization Request to make conforming revisions to PRC-023-2 – Transmission Relay Loadability to eliminate potential overlap between the proposed PRC-025-1 standard.
• Guidelines and Technical Basis
  o Separated into its own document for manageability
  o Reorganized to comport with Table 1 restructuring and additions
  o Individual sections for each main option provided for easier location of information
  o Added example calculations covering all options

• Implementation Plan
  o The implementation plan was revised to provide additional information about the factors considered
  o Revised the implementation plan to provide industry a two-phase approach to implementing the standard

You do not have to answer all questions. Enter All Comments in Simple Text Format.

Please note that the official comment form does not retain formatting (even if it appears to transfer formatting when you copy from the unofficial Word version of the form into the official electronic comment form). If you enter extra carriage returns, bullets, automated numbering, symbols, bolding, italics, or any other formatting, that formatting will not be retained when you submit your comments.

• Separate discrete comments by idea, e.g., preface with (1), (2), etc.
• Use brackets [ ] to call attention to suggested inserted or deleted text.
• Insert a “check” mark in the appropriate boxes by double-clicking the gray areas.
• Do not use formatting such as extra carriage returns, bullets, automated numbering, bolding, or italics.
• Please do not repeat other entity’s comments. Select the appropriate item to support another entity’s comments. An opportunity to enter additional or exception comments will be available.
Questions

1. In the Applicability, section 3.2.4, “Generator interconnection Facility(ies)” was added to address potential overlap with the approved PRC-023-2. Also, the SDT has posted a draft SAR and redline proposed PRC-023-3 for consideration. Do the changes to PRC-023-2 and the proposed PRC-025-1 provide a bright line between the two standards? If not, provide specific suggestions to improve or clarify the performance between the standards.

☐ Yes
☒ No

Comments: The applicability to the Generator Owner in PRC-023-3 overlaps the applicability to the Generator Owner in PRC-025-1. The draft SAR and proposed standards PRC-023-3, PRC-025-1 fail to provide a clear distinction as to whether the standard is meant to apply to the owner of a protection system designed to protect transmission elements (which we believe is the intent of PRC-023-3) or the owner of a protection system designed to protect generation elements (which we believe is the intent of PRC-025-1). An approach that could be considered is one similar to that used in PRC-006-1 where the SDT chose to create a ‘standard specific entity’; UFLS entities. Alternatively, the applicability could be modified to more closely match the intent as indicated in the Applicability section of the Guideline and Technical Basis document, and in wording of the Supplemental SAR for Project 2010-13.2 Relay Loadability Order 733 Phase 2 (Relay Loadability: Generation). Because there are instances where a Transmission Owner owns relays within a plant, combining these two Standards into one Relay Loadability standard would allow for wording to eliminate the overlap, and eliminate the double jeopardy possibility.

The standard should be applied to the owner of the particular type of protection system, not applied to a particular function. There are circumstances where an entity registered as a Transmission Owner owns the protection system that protects for faults on the element(s) owned by an entity registered as a Generator Owner which are solely used to interconnect their generator to the bulk power system. There are also circumstances where the Generator Owner owns not only the element(s) which are solely used to interconnect their generator to the bulk power system, but the protection system that protects for faults on those generator interconnection element(s) as well. In both of these cases, the protection system is designed to protect the bulk power system from the fault, not the generator itself.

The changes in the proposed PRC-023-3 and PRC-025-1 attempt to establish a bright line, but the functional entity of Generator Owners is still included in PRC-023-3 so this results in confusion as to which standard applies for the elements that connect the generator to the BES. Some Transmission Owners own GSU assets, but in the new standard, and as stated on the Webinar, “leads assets” will fall under PRC-025-1. There is still confusion in this area so a bright line still has not been established.
2. Does the restructured and reformatted PRC-025-1, Attachment 1: Relay Settings, Table 1: Relay Loadability Evaluation Criteria clearly identify the criteria for setting load-responsive protective relays for each Option 1 through 19? If not, provide specific detail that would improve the clarity of Table 1.

☑ Yes
☐ No

Comments: Attachment 1 is a good guideline for relay setting philosophy. However, Table 1 is too detailed and prescriptive to be in a standard. As is, the wording in Requirement 1 and Attachment 1 should be revised to allow for relay setting exceptions. The exceptions should allow for relay settings that do not exceed the safe operating range of the generator as determined by the generator manufacturer.

3. Does PRC-025-1, Guidelines and Technical Basis provide a clear understanding of the various criteria, including the options (e.g., 1a, 1b, 1c, 2a, etc.) for setting load-responsive protective relays? If not, provide specific detail that would improve the Guidelines and Technical Basis.

☐ Yes
☒ No

Comments: In the Guidelines and Technical Basis document under Applicability the terms transmission Facilities and generator leads are mentioned. It should be noted that some companies use different terms when referring to the leads connecting the generator Facility to the BES facility. The leads connection between the generator Facility GSU transformer and the BES Facility breakers may be referred to GSU leads and not Generator leads. Generator leads may be those located inside the generator Facility between the GSU low side and the generator itself. The terminology should be clarified.
4. The drafting team considered industry feedback and provided a listing of “general considerations” that affect the period which industry should need to become compliant. Do you agree with the proposed Implementation Plan of:

a. 48-months to apply load-responsive protective relay settings, where relay replacement is not required, and

b. 72-months to apply load-responsive protective relay settings, where relay replacement is required?

If not, provide an alternative implementation plan with specific rationale for such an alternative period.

☐ Yes
☒ No

Comments: Suggested changes to the Implementation Plan:
Each Generator Owner that owns load-responsive protective relays applicable to this standard shall be 100% compliant for the following:
• For each load-responsive protective relay, where determined by the Generator Owner that replacement is not necessary, 48 60 months beyond the effective date of this standard.
• For each load-responsive protective relay, where determined by the Generator Owner that replacement is necessary, 72 84 months beyond the effective date of this standard.”

5. Do you agree that the provided Violation Risk Factor and Violation Severity Level Justifications are in accordance with FERC and NERC guidelines for constructing VRFs and VSLs? If not, provide specific rationale why the VRF or VSL does not meet the guidelines.

☐ Yes
☐ No

Comments:

6. Do you have any other comments? If so, please provide suggested changes and rationale.

☒ Yes
☐ No

Comments:
• Section 3.1.1 – Change to: “Generator Owner that applies load-responsive protective relays at the terminals of BES facilities.”
• Section 3.2 – remove the entire section (3.2, 3.2.1, 3.2.2, 3.2.3, and 3.2.4), the revised Section 3.1.1 now will cover this section.
• R1 – remove the following words: "while maintaining reliable fault protection." – it is not possible to measure or prove this statement.

• In Section C., the Table of Compliance Elements there should be Lower, Moderate, and High VSL’s. The “all or nothing” approach does not reflect an entity’s success at achieving compliance.

• Table 1. Relay Loadability Evaluation Criteria, 1a, (1): “Real Power output – 100% of the MW capability reported to the Planning Coordinator or Transmission Planner”, this should be generator nameplate rating. The MW capability reported can change.

• Table 1. Relay Loadability Evaluation Criteria, 14a or 14b: What is the definition of “Generator interconnection Facilities”?