Unofficial Comment Form
Project 2007-09 Generator Verification PRC-024-1 Generator Frequency and Voltage Protective Relay Settings

Instructions
Please DO NOT use this form for commenting. Please use the electronic comment form to submit comments on the proposed revisions to PRC-024-1. Comments must be submitted by by 8 p.m. ET Monday, February 25, 2013. If you have questions please contact Stephen Crutchfield at stephen.crutchfield@nerc.net or by telephone at 609-651-9455.

Background Information
The Generator Verification Standard Drafting Team posted PRC-024-1 - Generator Frequency and Voltage Protective Relay Settings, from December 12, 2012 through January 11, 2013 for a 30-day concurrent comment/successive ballot period. The GVSDT received valuable feedback from stakeholders regarding improvements to the standard. Many of the suggested edits were incorporated into the revised standard.

The vast majority of stakeholders agreed with the removal of R5 from the standard. Several stakeholders suggested that there were issues with R4. These commenters pointed out that the requirement was ambiguous and provided no discernible reliability benefit while subjecting entities to potential compliance violations for making optimistic estimations. Stakeholders believe that the use of language such as “sound engineering judgment” is subject to interpretation and vague. Based on these comments, the GVSDT removed R4 from the standard. PRC-024-1 is now a relay setting standard.

Minority issue: Under FERC Order 661A, the wind industry is currently subject to more stringent voltage and frequency ride-through standards than other generation types, and keeping PRC-024 as a generator performance standard would have helped to level the playing field in this regard. The proposed draft of PRC-024 does not accomplish this. The GVSDT points out that the requirements contained in FERC Order 661A are enforced through Generator Interconnection Agreements and not NERC Standards.

A large majority of stakeholders agreed with the change made to Attachment 1. Some stakeholders questioned the potential impact this change might make due to the elimination of the margin between the allowable UFLS overshoot and the generator overfrequency trip setpoints. The GVSDT pointed out that setting overfrequency tripping at this point would be allowed under the previous curve as a technically-based exemption under Requirement R3 and the change made removes a conflict with internationally-recognized technical standards.
Most stakeholders agreed with the revisions to the voltage ride-through curves in Attachment 2. Several stakeholders had concerns with the low voltage ride-through criteria being lowered to 85% for the 3-4 second interval. Stakeholders pointed out that transmission systems are designed to operate between 90% to 110% and not down to 85% and as such we do not expect generators to ride through voltages as low as 85% for an extended period of time. The GVSDT agrees with these comments and has revised the voltage ride-through chart 85% voltage level to the original 90%. This is due to removing all generator loadability relays from PRC-024 allowing the relay setting criteria for loadability to be in PRC-025. The 85% point-of-interconnection voltage for relay loadability for transmission and generation relays remains in their respective standards (PRC-023 for transmission and PRC-025 for generator). The majority of commentators agreed with the removal of loadability relays from PRC-024. The majority of comments expressed agreement with the removal of loadability relays from PRC-024. One commentator recommended that the Generator Relay Loadability drafting team vet the removal of these relay types from Footnote 1. The GVSDT had previous discussions with that drafting team and they concurred with the revision to PRC-024.

Stakeholders provided valuable input regarding suggested improvements to language within the standard. Based on these comments, the following improvements were made to the draft standard:

- Removed R4 from the standards because of ambiguous language and dubious reliability benefit.
- Revised the title of the standard to “Generator Frequency and Voltage Protective Relay Settings” and the Purpose Statement to “Ensure Generator Owners set their generator protective relays such that generating units remain connected during defined frequency and voltage excursions.
- Revised “generating unit(s)” to “applicable generating unit(s)” to reflect that the standard only applies to units that meet the registry criteria.
- Revised language of R1 to match that of R2.
- Added “regulatory or” language regarding limitations to reflect that NERC, environmental or regulatory requirements may cause a limitation in generator performance.
- Revised R2 so that the sentences were shorter and easier to read.
- Removed the last bullet from R3 and added and new bullet referencing frequency impacts on turbines as follows: “Creation or adjustment of an equipment limitation caused by consumption of the cumulative turbine life-time frequency excursion allowance.”
- Revised R5 (now R4) to indicate that the trip settings to be provided are only those “associated with Requirements R1 and R2” and not all relays.
- Revised the measures based on requirement revisions.
- Updated the VSLs for R3 and R4 to allow 30 day increments between levels rather than the original 10 days. This comports with other standards developed under this project.
- Updated the table in Attachment 2 (this was missed in the previous revision).
• Made clarifying revisions to “Voltage Ride-Through Curve Clarifications” on the last page of the standard.

• Clarified Footnote 3 to: “Excludes limitations that are caused by the setting capability of the generator frequency and voltage protective relays themselves but does not exclude limitations originating in the equipment that they protect.”

Questions
1. The GVSDT has removed Requirement R4 from the standard. Stakeholders suggested that the requirement was ambiguous and provided no discernible reliability benefit while subjecting entities to potential compliance violations for making optimistic estimations. Stakeholders believe that the use of language such as “sound engineering judgment” is subject to interpretation and vague. Do you agree with this revision? If not, please explain in the comment area below.

☐ Yes
☐ No

Comments:

2. Do you have any other comment, not expressed in question above, for the GVSDT?

Comments: