Project 2007-09 Generator Verification
PRC-024-1 Generator Performance
During Frequency and Voltage Excursions
Unofficial Comment Form

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 January 11, 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 Performance During Frequency and Voltage Excursions, from September 28 through October 31, 2012 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 GVSDT also previously revised R4 to improve clarity. A majority of the stakeholders agreed that the revision had improved clarity. Some stakeholders were still unclear if the activities described in this requirement were to be performed by request only, so the SDT rearranged the sentences to clarify that the activities were to be performed upon request. Some stakeholders pointed out the RCs and TOPs can request such information via requirements in other standards (IRO-010-1a and TOP-003-2), so these two functional entities were removed from this requirement, as well as R6.

Based on comments from a majority of stakeholders, Requirement R5 (along with its associated Measure M5 and VSL's) was removed from the Standard. The SDT believes that Requirement R4 achieves the reliability objective of Paragraph 1787 of FERC Order 693 that Requirement R5 was written to address. Other changes were made in response to comments from several stakeholders including:

- Additional wording in the Effective Date section for jurisdictions where regulatory approval is required to address the situation in some Canadian provinces.
- A modification to the high frequency allowable trip point in Attachment 1 for the Eastern and ERCOT Interconnections to match IEEE and IEC standards for generator manufacturers.
- A modification to the final voltage value of the low voltage curve and time duration of Attachment 2 to coordinate with the requirements of PRC-025 Generator Relay Loadability.

- Reference to impedance relays and voltage controlled overcurrent relays was removed from Footnote 1 to eliminate overlap and possible coordination conflict with PRC-025 Generator Relay Loadability.

- Rearrangement of the sentences in Requirement R4 to better clarify that developing the estimate of performance is to be done only upon request of certain planning entities.

- Removal of the Reliability Coordinator and Transmission Operator from the list of functional entities who can request a performance estimate in Requirement R4 and protection settings information in Requirement R6 to eliminate duplication with standards IRO-010 and TOP-003.

- Various wording changes made to improve consistent use of terminology and to improve readability.

Several stakeholders pointed out that a portion of the allowable high frequency trip curve for the Eastern, ERCOT, and Quebec Interconnections (Attachment 1) exceeded the off-nominal frequency limits in IEEE C50.13 and IEC 60034 that are used by equipment manufacturers to design generators. The drafting team revised the high frequency portion of the curve from zero to two seconds for the Eastern and ERCOT Interconnections to meet the IEEE and IEC standards. This leaves no margin between the high frequency allowance for UFLS designers in frequency overshoot for that amount of time, but the drafting team feels this is acceptable.

**Coordination with Phase 2 of Relay Loadability – Generation Drafting Team (Project 2010-13.2)**

In the previous draft of this standard the voltage ride-through curves in Attachment 2 extended out for 600 seconds before returning to normal operating voltages (95% – 105% of nominal). Also, the final step in the low voltage recovery curve was at 90% of nominal after three seconds. Commenters to the Generator Relay Loadability project pointed out that this could potentially cause conflicts with coordination of settings for relay loadability, since they need to be evaluated for steady-state stressed system conditions of voltages at 85% of nominal. In response, the drafting team has moved the final step of the low voltage recovery curve down from 90% to 85% at three seconds and has shortened the curves so that they end at four seconds. The drafting team believes this clarifies the intent of this standard to address the transient conditions without conflicting with steady state relay loadability.

You do not have to answer all questions. Enter all comments in simple text format. Formatting such as bullets and font changes will not be retained.
Questions

1. The GVSDT has removed Requirement R5 from the standard. The standard drafting team believes that Requirement R4 meets the reliability objective of the directive in Paragraph 1787 of FERC Order 693. In addition, the SDT agrees with stakeholders who indicated that the additional resources that would be required to design, build, operate and maintain synchronous generating facilities that could ride through any of the defined excursions without fail would not justify the resulting incremental gain in grid reliability. Do you agree with this revision? If not, please explain in the comment area below.

☐ Yes
☐ No

Comments:

2. Several stakeholders pointed out that a portion of the allowable high frequency trip curve for the Eastern, ERCOT, and Quebec Interconnections (Attachment 1) exceeded the off-nominal frequency limits in IEEE C50.13 and IEC 60034 that are used by equipment manufacturers to design generators. The drafting team revised the high frequency portion of the curve from zero to two seconds for the Eastern and ERCOT Interconnections to meet the IEEE and IEC standards. This leaves no margin between the high frequency allowance for UFLS designers in frequency overshoot for that amount of time, but the drafting team feels this is acceptable. Do you agree with this change? If not, please provide specific suggestions for change in the comment area.

☐ Yes
☐ No

Comments:

3. In the previous draft of this standard the voltage ride-through curves in Attachment 2 extended out for 600 seconds before returning to normal operating voltages (95% – 105% of nominal). Also, the final step in the low voltage recovery curve was at 90% of nominal after three seconds. Commenters to the Generator Relay Loadability project pointed out that this could potentially cause conflicts with coordination of settings for relay loadability, since they need to be evaluated for stressed system conditions of voltages at 85% of nominal. In response, the drafting team has moved the final step of the low voltage recovery curve down from 90% to 85% at three seconds and has shortened the curves so that they end at four seconds.
The drafting team believes this clarifies the intent of this standard to address the transient conditions without conflicting with relay loadability. Do you agree with this approach? If not, please provide specific suggestions for change in the comment area.

☑ Yes
☐ No

Comments: The Curve Data Points table on page 18 of Draft 5 has not been updated to reflect the changes mentioned above.

4. Footnote 1 has been revised to remove reference to impedance relays and voltage controlled overcurrent relays which are load-affected protective functions. This was done to remove overlap and potential conflict of coordination with the Generator Relay Loadability project. Do you agree with this approach? If not, please provide specific suggestions for change in the comment area.

☑ Yes
☐ No

Comments:

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

Comments: