

Unofficial Comment Form for Relay Loadability Order (No. 733) (Project 2010-13)

Please **DO NOT** use this form. Please use the electronic form located at the link below to submit **INFORMAL** comments on the proposed **applicability test contained in Attachment B** to PRC-023-2. The electronic comment form must be completed **by October 12, 2010**.

If you have questions please contact Stephanie Monzon at Stephanie.monzon@nerc.net or by telephone at 610-608-8084.

Background Information

NERC Standard PRC-023-1 – Transmission Relay Loadability was approved by FERC as mandatory and enforceable in March 2010, with direction that NERC make a number of changes.

The Standard Drafting Team made changes to PRC-023-1 to address the several directives from Order 733 and posted the proposed changes for comment from August 19, 2010 – September 19, 2010. The proposed changes did NOT include Attachment B to the standard as it was at the time still a work in progress. Attachment B is intended to contain the test that the Planning Coordinators must use to determine whether a sub-200kV facility is critical to the reliability of the Bulk-Power System. The inclusion of a test is a directive in Order No. 733:

- p. 69 . . . modify Requirement R3 of the Reliability Standard to specify the test that planning coordinators must use to determine whether a sub-200 kV facility is critical to the reliability of the Bulk-Power System.

Requirement R5 (previously R3) of PRC-023-2 states:

R5. Each Planning Coordinator shall apply the criteria in Attachment B to determine which of the facilities (transmission lines operated below 200 kV and transformers with low voltage terminals connected below 200 kV) in its Planning Coordinator Area are critical to the reliability of the BES to identify the facilities below 200 kV that must meet Requirement R1 to prevent cascading when protective relay settings limit transmission loadability. [Violation Risk Factor: High] [Time Horizon: Long Term Planning]

- 5.1 The Planning Coordinator shall have a process to use the criteria established within Attachment B to determine the facilities that are critical to the reliability of the Bulk Electric System.
- 5.2 Each Planning Coordinator shall maintain a current list of facilities determined according to the process described in Requirement R5 Part 5.1.
- 5.3 Each Planning Coordinator shall provide a list of facilities to its Regional Entity, Reliability Coordinators, Transmission Owners, Generator Owners, and Distribution Providers within 30 calendar days of the establishment of the initial list and within 30 calendar days of any changes to that list.

Applicability Testing Criteria

NERC Reliability Standard PRC-023 — Transmission Loading Availability was developed in answer to relay loadability problems highlighted during the blackout of 2003. Relay loadability has been either causal or contributory to a majority of major system disturbances dating back to the 1965 blackout and beyond. The proposed Standard is intended to prevent circuits when thermally overloaded from prematurely tripping due to relay loadability. The concept is to allow some time for system operators to intervene and alleviate the overloads.

If any circuit trips under adverse conditions, even if the loss of that circuit does not itself cause a cascade, the resultant weakened transmission system leaves the bulk electric system more exposed to possible cascading outages. Therefore, applicability of PRC-023 should not only be for operationally significant circuits that could cause a cascade, but also for circuits that are prone to overloads (relievable through operator action) during contingencies.

Planning coordinators test for conformance with the TPL standards through various contingency analyses that should prevent critical circuits from becoming overloaded. The TPL criteria contingencies studied normally screen for susceptibility to cascading and system instability. However, overloading of circuits for short periods of time is permissible, and assumes operator action can alleviate such overloads in a timely fashion. Although the planning tests are fairly rigorous they are usually limited to N-1 or N-2 level contingencies. However, it is for the unforeseen combinations of outages that we want assurance that circuits would not trip for relay loadability reasons.

The recommendations stemming from the 2003 blackout called for review of circuits 200 kV and above. Logically, all circuits, including those below 200 kV, that are operationally significant to the reliability of the bulk electric system (BES) should be tested for susceptibility.

System studies go to great lengths to determine transfer capabilities on critical transmission interfaces. Planning and operational studies are routinely conducted to determine the transfer capabilities of circuits such as those that are part of interconnection reliability operating limits (IROLs), flowgates in the Eastern Interconnection, Commercially Significant Constraints in the Texas Interconnection, or Rated Paths in the Western Interconnection. Any circuit that is important enough to reliability to be actively managed to prevent overloads should also be important enough to prevent it from inadvertently tripping due to relay loadability for combinations of outages that are not normally tested.

Similarly, any circuit that is operationally significant to nuclear plant off-site power design criteria for maintaining voltage, regardless of its operating voltage, should also be protected from inadvertently tripping due to relay loadability for combinations of outages that are not normally tested.

The relay loadability screening described below offers another layer of defense-in-depth.

Note: These criteria define the family of circuits that would have their protection system reviewed for conformance to the PRC-023 loadability criteria. If the protection system passes, no further action is necessary. If it fails, then the condition would have to be mitigated.

Strategy of Testing

The tests for the applicability of PRC-023 should leverage as much existing work as possible, including existing system analyses routinely performed by the planning coordinators, transmission planners, and transmission operators, and minimize the creation of additional analytical workload.

Mitigation Timeframes

If the protection systems of a circuit are tested and found out of conformance with PRC-023 loadability criteria, the protection systems must be mitigated. After the initial application of these criteria, which will be governed by the standard implementation plan, the following time frames for mitigation should be used:

- If found in the planning analyses: circuits should be mitigated within 24 months or by the time the overload problem would be expected.
- If found in the normally performed seasonal operational planning analyses: loadability concerns should be mitigated before the operating time being analyzed. If not possible to mitigate prior to the operating time being studied, operators should be made aware of the loadability limitation and operate the system accordingly.

To expedite the project to address the directives from FERC Order No. 733, the Standard Drafting Team is posting Attachment B to PRC-023-2 for an abbreviated 20-day informal comment period.

Please note that the posting of Attachment B to PRC-023-2 is an **INFORMAL** posting.

1. Attachment B is intended to contain the test that the Planning Coordinators must use to determine whether a sub-200kV facility is critical to the reliability of the bulk power system. Do you agree that the method proposed in Attachment B is a technically sound approach to determine whether a sub-200kV facility is critical to the reliability of the bulk power system?

Yes

No

Comments:

In general, Midwest Reliability Organization's NERC Standards Review Subcommittee (NSRS) agrees with the proposed criteria. However, there should be further clarification and qualification of the criteria noted below.

In the introduction, the wording of "determine if that circuit needs to be evaluated for conformance with PRC-023" does not clearly tie to Requirement R5.1 or use the same language. We suggest revised wording to more clearly refer to Requirement R5.1 by using the more similar language of, "determine the circuits that are critical to the reliability of the BES".

For Criteria #4, add the qualification that the outage condition is assessed for the near term planning horizon (years 1 to 5), rather imply that the criteria includes consideration of the less certain longer term planning horizon (years 6 to 10). We suggest adding the words, "for the near term planning horizon", to the end of criteria #4.

For Criteria #6, clearly limit the types of double contingencies that should be considered to those identified in TPL-003 (e.g. more severe Category B), rather than imply any and all double contingencies beyond TPL-003. In addition, there is no bound on all the N-1-1 contingencies that must be considered (in TPL-003, the planner is allow to at least restrict the scope of study to the more severe contingencies. We suggest revising the wording to, ". . . as a result of double contingencies that are required in the TPL-003 standard and in addition, the more severe contingencies of loss of a single circuit, followed by the loss of a second circuit, without system adjustments in between".

We do not believe that a flowgate should be automatically included in the criteria. The NERC Glossary of Terms definition of flowgate would require every flowgate in the IDC to be identified. This is a problem because flowgates are included in the IDC for many reasons not just because reliability issues are identified. Flowgates could be included to simply study the impact of schedules on a particular interface as an example. It does not mean the interface is critical. Furthermore, the list of flowgates in the IDC is dynamic. The master list of IDC flowgates is updated monthly and IDC users can add temporary flowgates at anytime. Criterion 1 would imply that any monitored facility then becomes subject to the standard. Furthermore, IDC is more of a congestion management tool than a reliability tool. FERC recognized this in Order 693, when they directed NERC to make clear in IRO-006 that the IDC should not be relied upon to relieve IROLs that have been violated. Rather, other actions such as redispatch must be used in conjunction. Thus, it would appear that inclusion of a flowgate in the IDC does not indicate that it is critical.

For Criteria #5, we suggest that the applicable entities be changed. The Transmission Planner should be added because they have local planning responsibilities and knowledge that should be factored into the consideration of critical circuit classification. We suggest that the Regional Entity be removed because it does not fall within the Reliability Assurer functional tasks.