



Coordination of Protection on Shared Facilities

Process for Performing Relay Work (settings/design) for Interconnection Lines in the PJM system

Mission: To develop and maintain an “auditable” and “defensible” process where transmission owning or generation owning companies sharing an interconnection line (100 kV and above) will follow prescribed coordination check points to ensure that all companies involved are aware of and agree to any relay setting or relay design related work being performed. Please note that this process is to be utilized for relay work on ties between separate companies, both PJM member and non-PJM member. If the same PJM company relay group is performing the relay work at both ends of the tie, then this process need not be followed.

Major Tasks/Activities

- The Relay Subcommittee (RS) shall maintain a central repository that will store relay settings on ties between Transmission Owners (TO) or Generation Owner (GO) called the *Interconnection Relay Setting Database*. Each PJM TO, Generator Operator (GOP) or GO will be responsible for updating/uploading¹ their own in-service relay settings. This repository of data exists on the PJM secure RS SharePoint website.
- If a GO or GOP installs a new system or initiates a change that affects the transmission system, it is the responsibility of the GOs or GOPs to contact the local interconnected TO in addition to notifying PJM at Regional_Compliance@pjm.com. PJM TOs coordinating protection with any interconnected GO or GOP shall post coordination communication (e-mails, meeting minutes or memos) in the *Interconnection Relay Setting Database*².
- The RS will have a standing agenda item in the RS meeting agenda to facilitate communications between companies regarding the specific relay work being performed. The meeting minutes will document the coordination and reflect the following checks, which indicate the work progression and agreement between parties.
 - **Phase 1 - Notification of work and agreement of scope.** The initiating TO, GOP or GO will notify the TOs, GOPs, or GOs affected by the proposed work. The requirement for this phase to be considered complete is an agreement by all affected parties of the general description of work to be performed and an agreement of the approximate work schedule.

¹ If any GO, GOP or TO chooses to archive this evidence of compliance using their internal systems, the GO, GOP or TO shall post a file in the Interconnection Facilities Database describing what is archived and clear directions on how PJM can obtain this information. It is expected that a TO will be able to provide all requested documentation within two calendar weeks.

² If any GO, GOP or TO chooses to archive this evidence of compliance using their internal systems, the GO, GOP or TO shall post a file in the Interconnection Facilities Database describing what is archived and clear directions on how PJM can obtain this information. It is expected that a GO, GOP or TO will be able to provide all requested documentation within two calendar weeks.



- **Phase 2 –Agreement on relay setting/design changes.** During this phase, the proposed relay settings should be exchanged for review by all TOs, GOPs, or GOs affected by the proposed work. The requirement for this phase to be considered complete is an agreement by all affected TOs, GOPs or GOs of the adequacy of proposed relay setting modifications and/or specific design modifications.

- **Phase 3 – Commissioning complete.** During this phase, the final relay settings should be uploaded¹ to the *Interconnection Relay Setting Database*. The requirement for this phase to be considered complete is an agreement by all affected TOs and GOs that the final relay settings and/or design modifications have been agreed to, have been tested by qualified technicians using appropriate testing practices (ref. PJM RTS documents *PJM Relay Subcommittee Relay Testing and Maintenance Practices*³ and *PJM Requirements for End to End Line Protection Testing*⁴), and have been placed into service.

Background: In the final DOE/NERC report of the August 14, 2003 blackout, Recommendation 5 states:

Establish a Program to Track Implementation of Recommendations. The August 14 blackout shared a number of contributing factors with prior large-scale blackouts, including:

- Conductors contacting trees
- Ineffective visualization of power system conditions and lack of situational awareness
- Ineffective communications
- Lack of training in recognizing and responding to emergencies
- Insufficient static and dynamic reactive power supply
- Need to improve relay protection schemes and coordination

The third and sixth bullets mentioned above are the main drivers for this initiative. Although there is no documented evidence that there was any communication breakdown between utilities from a protection standpoint, the intent of the recommendation is to ensure that all work being performed between companies is properly communicated, documented and tracked.

³ <http://www.pjm.com/-/media/committees-groups/subcommittees/rts/postings/relay-testing-and-maintenance-practices.ashx?la=en>

⁴ <http://www.pjm.com/-/media/committees-groups/subcommittees/rts/postings/pjm-requirements-for-bes-end-to-end-protection-testing.ashx?la=en>