



Reliability Standards and Compliance Subcommittee FERC Update

Bill Temple
NERC and Regional
Coordination
RSCS – April 15, 2016

FERC ORDER No. 823

On March 17th, FERC approved Reliability Standard PRC-026-1, "Relay Performance During Stable Power Swings," which is designed to ensure that applicable entities use protective relay systems that can differentiate between faults and stable power swings.

Background

- In Order No. 733 the Commission cited the findings of both NERC and the U.S.-Canada Power System Outage Task Force on the causes of the 2003 Northeast Blackout, explaining that the cascade during this event was accelerated by zone 2 and zone 3 relays that tripped facilities out of service because these devices could not distinguish between a dynamic, but stable, power swing and an actual fault.
- Accordingly, the Commission directed NERC to develop a Reliability Standard to address undesirable relay operation due to stable power swings.

<http://www.ferc.gov/whats-new/comm-meet/2016/031716/E-2.pdf>

- Reliability Standard PRC-026-1 has four requirements and two attachments. NERC explains that Attachment A “provides clarity on which load-responsive protective relay functions are applicable” under the standard. Specifically, Attachment A provides that Reliability Standard PRC-026-1 applies to:
 - any protective functions which could trip instantaneously or with a time delay of less than 15 cycles on load current (i.e., “load-responsive”) ...*
- Implementation plan for Reliability Standard PRC-026-1:
 - Requirement R1 (PC) would become effective 12 months after Commission approval (1/01/2018), and
 - Requirements R2, R3 and R4 (GO & TO) become effective 36 months after Commission approval (1/01/2020).

Requirements:

R1. Each Planning Coordinator shall, at least once each calendar year, provide notification of each generator, transformer, and transmission line BES Element in its area that meets one or more of the following criteria, if any, to the respective Generator Owner and Transmission Owner.

R2. Each Generator Owner and Transmission Owner shall: [Violation Risk Factor: High] [Time Horizon: Operations Planning]

2.1 Within 12 full calendar months of notification of a BES Element pursuant to Requirement R1, determine whether its load-responsive protective relay(s) applied to that BES Element meets the criteria in PRC-026-1 – Attachment B where an evaluation of that Element’s load-responsive protective relay(s) based on PRC-026-1 – Attachment B criteria has not been performed in the last five calendar years.

2.2 Within 12 full calendar months of becoming aware³ of a generator, transformer, or transmission line BES Element that tripped in response to a stable or unstable⁴ power swing due to the operation of its protective relay(s), determine whether its load-responsive protective relay(s) applied to that BES Element meets the criteria in PRC-026-1 – Attachment B.

R3. Each Generator Owner and Transmission Owner shall, within six full calendar months of determining a load-responsive protective relay does not meet the PRC-026-1 – Attachment B criteria pursuant to Requirement R2, develop a Corrective Action Plan (CAP) to meet one of the following: [*Violation Risk Factor: Medium*] [*Time Horizon: Operations Planning*]

- The Protection System meets the PRC-026-1 – Attachment B criteria, while maintaining dependable fault detection and dependable out-of-step tripping (if out-of-step tripping is applied at the terminal of the BES Element); or
- The Protection System is excluded under the PRC-026-1 – Attachment A criteria (e.g., modifying the Protection System so that relay functions are supervised by power swing blocking or using relay systems that are immune to power swings), while maintaining dependable fault detection and dependable out-of-step tripping (if out-of-step tripping is applied at the terminal of the BES Element).