

NERC SPCWG

Activities Report to ERCOT SPWG

July 14th, 2026

Uchenna Ndusorouwa

Outline

Meetings

Protection & Control (PRC) Standards – No Update

- PRC-005
- PRC-019

Other Activities

- NERC Standards & IEC 61850 Technical Reference Document
- PRC-023-6 Technical Reference & Implementation Guide Documents
- Protection System Misoperation Analysis Annual Report
- Protection System Impacts to the BPS from Emerging Large Loads
- Use of AI in Protection Systems

NERC SPCWG Meetings

- NERC SPCWG met 2 times since February 205 ERCOT SPWG open meeting
- Next meeting schedule on **August 13 via MS Teams**

Protection & Control (PRC) Standards Update

Project 2019-04 -New Standard Authorization Requests (SARs) proposed to address testing of AVR protective functions in PRC-005-6

- PRC-005: Protection System, Automatic Reclosing, and Sudden Pressure Relaying Maintenance Standard
- **Low Priority**
- SAR accepted October 20,2021
- Nominations for additional drafting team members was sought and closed on December,15, 2021
- 3rd Round of comments ended last Friday (2/26). Provide clarity that the protective functions enabled within analog/Digital AVRs, excitation systems, and other control systems that respond to electrical quantities
- Update the applicability of the standard to include UFLS-only DPs
- Modify requirements to cover Protection System DC supply technologies that are not currently covered in the standard
- Some notable updates to the latest SAR revision:
 - AVR control functions already within scope of PRC-005 but not clarified
 - Fix protection system vs function definition and add to scope
 - Not limiting protection functions just to AVR and generators but to any equipment.
- First draft (**PRC-005-7**) was posted and failed to pass with only 35%.
- Pushed back on calendar to 2025 and beyond (Medium Priority)
- **No Updates**

Protection & Control (PRC) Standards Update

PRC-019-3

- **PRC-019: Coordination of Generating Unit or Plant Capabilities, Voltage Regulating Controls, and Protection Standard**
- PRC-019-2 addresses the reliability issue of miscoordination between generator capability, control systems, and protection functions. However, PRC-019-2 was developed with a bias toward synchronous generation and does not sufficiently outline the requirements for all generation resource types. The proposed Standard Authorization Request (SAR) aims to address a number of issues identified by the SPCS and revise the standard to be inclusive of all types of generation resources.
- First Draft of **PRC-019-3** has been posted for comment and voting that runs through 11/14/2022
 - First Draft failed to pass with only 39% approval
- Second draft was posted and voting took place between 5/30/23-06/08/23
 - Second draft failed to pass with only 44% approval
- Pushed back on calendar to 2025 and beyond (Medium Priority)
- **No Update**

Other Activities

NERC Standards * 61850 Technical Reference Document

- Create a technical reference for 61850 and the impacts on NERC Protection System definition and related standards
- Reference to include clarity in 61850 P&C designs regarding Protections System definition, relay maintenance requirements, and recommended documentation to support design
- Currently working on scope and outline for paper to get approval to add to SPCWG Work Plan.
- Document goal
 - *Explain new technologies utilizing ethernet based protection and how maintenance/design may be handled*
 - *Address issues being raised with ethernet based protection systems*
- **Draft document reviewed at the April NERC SPCWG meeting.**
 - **Significant progress made on draft**
 - **Final draft scheduled to be available by 2026 Q4 for NERC SPCWG internal review**

Other Activities

PRC-023-6 Technical Reference & Implementation Guide Documents

- PRC-023-6: Transmission Relay Loadability Standard
- Technical Reference document approved by RSTC and posted to RSTC document site on 3/12/2025
 - [Determination of Practical Transmission Relaying Loadability Settings](#)
 - Provides example calculations to help entities comply with the standard while maintaining system reliability
- Draft Implementation Guide for requirement R1 of standard currently been reviewed
 - Clarifies the intent and application of the various criteria in the requirement R1, support more consistent and accurate implementation across the industry
- Implementation guidance document submitted to RSTC for approval
 - *RSTC – Reliability and Security Technical Committee*
 - ***RSTC approval of guidance document still pending***

Other Activities

Protection System Misoperation Analysis Annual Report

- Misoperation analysis report to help understand events occurring on the electric grid
- Overall purpose of report is to provide a deep dive on events useful for protection engineers. Not a metric-based report
- Small group established to work on the report – kickoff meeting in 2025 Q1
 - To coordinate misoperation analysis with Regional Protection System Working Groups/Committees
 - Using previous year Q2 to current year Q1 data, start report in mid-July and publish 1st report by **2026 Q4**
- Likely to have a 1600 Data Request for MIDAS form. This will make optional fields required, add more detail in drop-downs for existing fields, and possibly new fields. 1600 Data Request Process likely takes a couple of years.
- **Considering implementation of updated template 2028 Q1**
- **First report to focus on incorrect settings and relay failures**
 - *Detailed analysis of 2025 protection system misoperation, and 2020 -2024 historical data & trends*
 - *Following years report will focus on a different topic*
- **Report outline reviewed during February 2026 meeting**
- **Initial draft expected in August.**

Other Activities

Protection System Impacts to the BPS from Emerging Large Loads

- NERC SPCWG has been asked to assess possible protection system impacts to the Bulk Power System (BPS) from emerging large loads
 - i. Short Analysis of potential risks of large loads to BPS reliability to and from the protection system*
 - ii. UVLS, UFLS, Reclosing, Reclosing/reclosing into a fault, Operator initiated load shedding schemes, protection coordination, transformer in-rush, education of system operations and their impacts on voltages to close in substations, education of large loads so they understand how the protection systems operate, Harmonic injection, Voltage sensitivity, etc.*
- Small group established to work on task and provide report
 - Create a paper that documents areas of awareness between protection systems related to large loads. Highlighting the issues such as: Adaptive Under and Over Load and Frequency Shed Schemes, Fault Values (fault current magnitudes), Compressed Timelines, Education, Power Quality, Sub synchronous Oscillation Events (40MW swing and 23 Hz) and other challenges
 - **Report outline reviewed during February 2026 meeting**
 - **Group also coordinating with NERC Large Load (LL) working group and LL SMEs**

Other Activities

Use of AI in Protection Systems

- Discussion and questions on use of AI (How, where)
- EPRI research/analysis of an AI tool
 - Reading substation one-line
 - Develop relays settings
- Small group established to create a short paper on the topic “Use of AI in Protection Systems”
 - **Brainstorm of “How could AI be used for protection?” at the June NERC SPCWG meeting**

Conclusion

