Background Information
The North American Generator Forum (NAGF) received feedback from members indicating that there was confusion regarding the applicability of protective functions inside synchronous generator excitation systems to PRC-005. The primary cause of confusion is the use of the term (from the NERC Glossary of Terms) “Protection System,” which specifies ‘relays’ but not the protective functions that are typically (but not always) associated with relays. Excitation systems may measure and utilize similar quantities as protective relays and may perform similar functions as protective relays applicable to PRC-005. For this reason, the SAR drafting team agrees that the aforementioned protective functions within excitation systems and other control systems need to be clearly and explicitly applicable to PRC-005.

PRC-005 should be modified to provide clarity on the inclusion of BES protective functions enabled within excitation systems (analog/digital AVRs), and BES protective functions enabled within other control systems, that respond to electrical quantities and/or trip BES elements either directly or via lockout or auxiliary tripping relays. The clarifying changes would apply to BES Protection Systems and BES protective functions applied on generators, dispersed power producing resources from the point of aggregation (greater than 75 MVA) to the point of Interconnection, static and synchronous condensers and other BES elements as defined.

The SAR drafting team recommends considering the specification of American National Standards Institute (ANSI) Standard Device Numbers for the applicability to PRC-005 as outlined in the Applicability Section 4.2. Other considerations to provide clarity include: developing standard-specific definitions, developing or revising existing terms in the NERC Glossary of Terms, or making other modifications to the Applicability Section.

The maintenance tables should be updated to include the aforementioned BES protective functions enabled within other control systems, and the associated maintenance activities and intervals.

Additionally, the maintenance tables should be updated to include new DC supply technologies for Protection System(s) not currently captured.

Entities registered as ULFS-Only Distribution Providers (DPs) have PRC-005 applicable Protection Systems, but are not expressly listed as Applicable Entities in Section 4.1. UFLS-Only DPs should be added to the
Applicability Section to avoid any confusion and to be consistent with the FERC-approved Risk-Based Registration (RBR) changes.

Questions

1. The NERC Glossary of Terms defines Protection System as: “Protection System –
   
   • Protective relays which respond to electrical quantities,
   
   • Communications systems necessary for correct operation of protective functions,
   
   • Voltage and current sensing devices providing inputs to protective relays,
   
   • Station dc supply associated with protective functions (including station batteries, battery chargers, and non-battery-based dc supply), and
   
   • Control circuitry associated with protective functions through the trip coil(s) of the circuit breakers or other interrupting devices.”

   This definition omits protective functions in the excitation and other control systems that respond to electrical quantities and voltage/current sensing devices providing inputs to protective functions. In addition, the SAR drafting team found that the lack of a definition for protective function creates confusion and potential reliability gaps. These protective functions often measure the same quantities and respond similarly to protective relays. Do you agree that this definition creates confusion with regards to protective functions that behave similarly to protective relays but are embedded in control systems? If you do not agree, or if you agree but have comments or suggestions, please provide your recommendation or proposed modification in the comments section.

   [ ] Yes
   [ ] No

   Comments:
   Protective relay functionally equivalent devices or systems should be added to the definition.

   NPCC Regional Standards Committee (RSC) recommends modifying the NERC Glossary of Term, 'Protection System Maintenance Program ' instead of the term 'Protection System.' Adding in Excitation systems to that the definition would be consistent with NERC including ‘Automatic Reclosing, and Sudden Pressure Relaying Components’ to that definition.

2. The SAR drafting team determined that BES protective functions that respond to electrical quantities inside excitation systems (including analog/digital AVRs) should be clarified as included in PRC-005, in addition to BES protective functions inside other control systems for BES elements. Do you agree that BES protective functions that respond to electrical quantities inside excitation systems and BES protective functions for other BES element control systems should be included in
PRC-005? If you do not agree, or if you agree but have comments or suggestions, please provide your recommendation or proposed modification in the comments section.

☐ Yes
☒ No

Comments:
Please provide clarification regarding the reference to, “other control systems.”

While NPCC RSC agrees, this should be limited to only excitation systems.

3. The SAR drafting team determined that there are Protection System Station DC supply technologies that do not currently have maintenance activities in Reliability Standard PRC-005. Do you agree the standard should provide for the use of alternative Protection System Station DC supply technologies (battery-based and non-battery-based), and ensure that they are subject to maintenance requirements? If you do not agree, or if you agree but have comments or suggestions, please provide your recommendation or proposed modification in the comments section.

☒ Yes
☐ No

Comments:

4. Entities registered as ULFS-only DPs have PRC-005-applicable Protection Systems, but are not expressly listed as Applicable Entities in Section 4.1. ULFS-only DPs should be added to the Applicability Section to avoid any confusion and to be consistent with the FERC-approved RBR registration changes. Project 2017-07 Standards Alignment with Registration. Do you agree with adding ULFS-only DPs as a Functional Entity applicable to PRC-005 to align with registration? If you do not agree, or if you agree but have comments or suggestions, please provide your recommendation or proposed modification below.

☒ Yes
☐ No

Comments:

5. Are there any logistical or cost considerations that would add significant burden to equipment owners trying to confirm BES protective functions in an exciter, inverter, or other control system?
If so, do you have a more cost-effective suggestion to accomplish the objective of the SAR that the drafting team should consider?

☐ Yes  ☑ No

Comments:

6. Please provide any additional comments for the SAR drafting team to consider, if desired.

Comments:

The project scope should be modified to clearly identify the intent as it relates to generation with is determined to be BES under Inclusion I2 of the BES definition and those that are considered to be captured under I4 of the BES definition. Specifically, the following section should be modified:

“The clarifying changes would apply to BES Protection Systems and BES protective functions applied on generators, dispersed power-producing resources from the point of aggregation (greater than 75 MVA) to the Point of Interconnection, static and synchronous condensers and other BES elements as defined.”

The section “BES protective functions applied to generators” could be interpreted to capture the individual generation resources of a dispersed power facility as these resources are technically captured under the I4 inclusions of the BES Definition. Clarification can be provided as follows:

“The clarifying changes would apply to BES Protection Systems and BES protective functions applied on generators identified as applicable to Inclusion I2 of the BES Definition, dispersed power-producing resources from the point of aggregation (greater than 75 MVA) to the Point of Interconnection, static and synchronous condensers and other BES elements as defined.”