Do not use this form for submitting comments. Use the electronic form to submit comments on TPL-001-5 – Transmission System Planning Performance Requirements. The electronic form must be submitted by 8 p.m. Eastern, Wednesday, May 24, 2017.

Additional information is available on the project page. If you have questions, contact Standards Developer, Latrice Harkness (via email), or at (404) 446-9728.

Background Information
The SPCS and the SAMS conducted an assessment of protection system single points of failure in response to FERC Order No. 754, including analysis of data from the NERC Section 1600 Request for Data or Information. The assessment confirms the existence of a reliability risk associated with single points of failure in protection systems that warrants further action.

Additionally, the two directives from FERC Order No. 786 (p. 40 and p. 89) and updates to the MOD reference in Requirement R1, Measure M1 and the Violation Severity Levels sections have been added to the scope of the project.
Questions

1. Do you agree with the proposed changes to Requirement 1, Part 1.1.2 that move away from the 6 month duration outage to limited known outages selected by the Planning Coordinator (PC)/Transmission Planner (TP) in consultation with their Reliability Coordinators (RCs) for the time horizon of the operations planning horizon through the near term planning horizon?

☐ Yes
☒ No

Comments:
The new requirement is open ended and may result in Transmission Planners (TP) performing almost a “real time” operations analysis (i.e. what is the impact of this outage / what about that outage) in-lieu of designing the Bulk Electric System (the purpose of TPL-001). NERC IRO-017 Outage Coordination was set up for that purpose, and this proposed change would represent a spillover from IRO-017. The TP would be required to develop a Corrective Action Plan for system outages.

The new requirement does not address a scenario where the TP does not agree with the RC regarding what needs to be studied, or how such a disagreement would be managed from the compliance perspective. The “limited known outages” statement in Question 1 is not part of R1.

We recommend the Requirements 1.1.2 and 2.1.3 be revised as follows to clarify which entity has the sole responsibility to select the outages (additions in RED):

R1.1.2 Known outage(s) (for the time period beyond 12-months into the future) of generation or Transmission Facility(ies) as selected by the Transmission Planner or Planning Coordinator following consultation with the Reliability Coordinator for the Near-Term Transmission Planning Horizon for analyses pursuant to Requirement R2, parts 2.1.3 and 2.4.3.

R2.1.3. P1 events in Table 1, as selected by the Transmission Planner or Planning Coordinator following consultation with the Reliability Coordinator, with known outages modeled as specified in Requirement R1, Part 1.1.2, under those System peak or Off-Peak conditions when known outages are scheduled.

Alternatively, RC should be removed from these Requirements and TP or PC should have the flexibility to select what needs to be studied; as it relates to outages.

In addition, this new requirement would result in Transmission Planners (TP) or Planning Coordinator performing an annual study as the RC could request a study to review upcoming
outages. This could result in a conflict with the existing Requirements that allow the use of past studies to satisfy compliance with TPL-001.

While we agree with the move away from the 6-month minimum duration outage requirement, we feel strongly that the outages selected by the PC/TP in consultation with their RC should be known outages for the time period beyond 12-months from the current date. Required analysis of outages planned in the timeframe of less than 1 year from the current date should be the exclusive responsibility of Operations Planning through reliability standards such as IRO-017 which are intended to cover the Operations Planning time horizon. Our suggested wording of Requirement 1.1.2 is shown below.

2. Do you agree with the proposed changes to Requirement 2, Part 2.4.5 which addresses the Federal Energy Regulatory Commission (FERC) order to add the spare equipment with long lead time to the dynamics analysis?

☐ Yes
☒ No

Comments:
We recommend replacing the word “studied” with “assessed”. Not all major Transmission equipment that may become unavailable due to an entity’s spare equipment strategy may require stability analysis (e.g. the unavailability of a reactor), and thus studies may not be required in all cases.

3. Do you agree with the further clarification of relay to components of a Protection System with the additional footnote to clarify P5 and extreme events?

☐ Yes
☒ No

Comments:
Item #1 states a single relay, not a single protection package. Is our interpretation for item #1 that a package of (electromechanical) component relays (i.e. three relays in the single package) is redundant in accordance with TPL-001-5 correct? Since, within the sensitivity of the devices, a set of 3 phase and 1 ground relay detects any of the classic fault types (3PH, Ph-Ph, DLG, and SLG) with at least two (2) relays. We would like to provide an example with a transmission line that does not have two directional ground relays, but one directional distance relay (KD relay) per phase and one directional distance ground relay (IRD relay) for the SDT’s review. With a single line to ground fault and the directional distance ground relay fails, the instant overcurrent relay will operate, but at a potentially different (e.g., slower) speed (depending on the fault current magnitude). In accordance with footnote 13, should the directional distance ground relay and the overcurrent relay be considered redundant, and hence not constitute a single point of failure per
TPL-001-5? If the relays in the example are considered redundant, could we assume either relay to operate and hence do not need to consider them non-redundant components of a Protection System per footnote 13? Alternatively, if the relays in the example are considered non-redundant, do we need to test for operation of either of the two relays (i.e. both) per footnote 13?

Item #2 does not specifically state anything about the speed of protection, although the associated rationale statement states that the evaluation shall address all Protection Systems affected by the failed component and the increases (if any) of the total fault clearing time. Is our interpretation for item #2 that one high speed and one step distance will provide a correct operation, so it doesn’t need to be tested under footnote 13? Is our interpretation for item #2 that while a single communication system applied over a single communication medium which is not monitored or not reported constitutes a non-redundant component of a Protection System, a monitored pilot channels, such as FSK, is to be considered a redundant communication system in accordance with footnote 13? Further, is our interpretation for item #2 that this extends to on-off carrier channels with check-back testing so that only those without check-back reporting are considered non-redundant in accordance with footnote 13?

It appears that the addition of “A single communications system, necessary for the correct operation of protective functions, which is not monitored or not reported” is beyond the scope of the SAR and the SPCS and SAMS recommendations in response to FERC Order No. 754. Please consider if this addition to footnote 13 is necessary.

Is our interpretation for item #3 that it is sufficient to monitor the battery and alarm if it is getting low correct in accordance with footnote 13? In other words, are we required to evaluate the failure of the battery, or is it sufficient to monitor for low battery voltage, while not knowing when it actually fails?

Could the SDT please provide further guidance in form of clarifying language or application guidance as related to item #4 in footnote 13? Is our interpretation related to item #4 that redundant relays tripping through a single wire to a single trip coil would constitute a non-redundant component of a Protection System? While item #4 does not seem to require dual trip coils, it seems to require dual wires. Does the last sentence provide a correct interpretation of a single control circuitry associated with protective functions through the trip coils of the circuit breakers or other interrupting devices per footnote 13?

Reference footnote 13, bullet 4: We recommend to replace the word “through” with “up to” to make the requirement clearer and less prone to different interpretations.

If the drafting team decided that the listed four items in Footnote 13 define single points of failure of Protection Systems, NPCC suggests revised language in order to provide clarity for both the Planners as well as the P&C SMEs who will be called upon to evaluate the Protection Systems. We suggest the wording in the standard be clarified either directly or through appropriate descriptions in the rationale boxes. We also note that the 4 items in the footnote seem to be a mix of truly
redundant components or singular components whose health is monitored. True Protection System redundancy to avoid single point of failure does not depend solely on health monitoring to meet redundancy requirements. We note and reference a previous work by the NERC SPCS concerning protection system redundancy entitled Protection System Reliability – Redundancy of Protection System Elements” (November 2008) where much of the wording in Footnote 13 and the corresponding rationale was derived from.

Please consider the following comments and suggestions:
1. Table 1 Footnote 13.2 – (Also, reference Section 5.4 of NERC SPCS report) – Please clarify if the intent that a single monitored communication system necessary for correct operation of protection functions means that a single communication channel which is monitored meets the redundancy requirement. Quoting from the NERC SPCS report identifying redundant tele protection schemes:

Some acceptable communication schemes are:
- Two power line carrier systems coupled to multiple phases of the line.
- Two microwave systems and paths with multiple antennas on a common tower.
- Two fiber paths between terminals (two fibers in the same cable are not acceptable)
- Two separate communication systems of different technologies and equipment (e.g., fiber optic and digital microwave).

It would appear from the draft wording for this footnote that any singular communication channel, as long as it is monitored, does not need to be considered in the planning assessment. Please provide clarity on this through revised wording or in the rationale box. We believe that a communication channel is a component of the communication system. Unless this is clear, it may lead to confusion during the necessary Protection System assessments.

2. Table 1 Footnote 13.3 – (Also, reference Section 5.8 of the NERC SPCS report) – NPCC has two concerns with this footnote where a single DC system which “is not monitored or not reported for low voltage and open circuit is considered non-redundant.” Firstly, it should be noted that in a single DC battery system, the RTU will likely also lose DC supply meaning a loss of DC supply alarm could not annunciate that specific condition to a control center directly. Secondly, the use of the term “open circuit” is too broad. An open circuit in the battery system can be caused by many things, such as loose connections at the battery or any downstream DC breaker/fuse opening. We believe the intent of this footnote is to capture only the opening of the main protective device (breaker/fuse) after the DC system. In light of these 2 issues, we would like to suggest the following wording change to address these concerns:

“13.3 A single DC supply associated with protection functions, and that single station DC supply is not monitored or not reported, either directly or indirectly, for both low voltage and for interruption of the station DC supply by the main protective device.” We believe this wording along with appropriate rationale would help clarify this footnote.
3. Table 1 Footnote 13.4 - (Also, reference Section 5.5, Section 5.6, and Section 5.7 of the NERC SPCS report) - If the drafting team considers monitoring for communication system and DC supply to satisfy redundant requirements, then why can’t trip coil monitoring be considered as well?

We would like to see further clarification under P5 and the new Extreme Events (2e through 2h) as to where the fault and the failure of the components of a Protection System occur. Is the intent of these new faults to have the fault and the failure of the component of the Protection System locally, remotely, or both?

Can this be added (“local failure of a non-redundant component of a Protection System”, or “remote failure of a non-redundant component of a Protection System”, or “local and remote failure (not simultaneously) of a non-redundant component of a Protection System”) to the P5 and Extreme Events?

A fault locally along with a local failure of a component of a Protection System would be similar to NPCC’s Criteria A-10 test, however, a fault locally with a remote failure of a component of a Protection System would be a scenario new to the industry, possibly leading many entities to discover scenarios where they have un-cleared faults, however this may not be apparent to entities to be studied unless it’s clarified in the standard.

4. Do you agree with the proposed Requirement 4, Part 4.6 additions which require a Corrective Action Plan for this subset of Table 1 extreme events (footnote 13, 2e-2h)?

☐ Yes
☒ No

Comments:

Traditionally the intent of “extreme events” or “extreme contingencies” was to create awareness of the impacts of the studied contingencies, but not establish design requirements. Therefore, we recommend moving Table 1 Extreme Events Stability elements 2e through 2h from the Extreme Events table to Table 1 Planning Events, under a new Category P8, with the following attributes:

- Category: P8 Multiple Contingency
- Initial Condition: Normal System
- Event: 2e through 2h
- Fault Type: 3 phase
- BES Level: HV, EHV
- Interruption of Firm Transmission Service Allowed: Yes
- Non-Consequential Load Loss Allowed: Yes

With this change, Requirement R4.6 should be revised as follows: “If the analysis concludes there is Cascading caused by the occurrence of Table 1 planning events P8, a Corrective Action Plan shall be developed....”
5. Do you agree with the drafting team’s approach which doesn’t add additional applicable entities to the applicability of the standard? (e.g. RC, Transmission Operator (TO), Generator Operator (GO), Distribution Provider (DP))

☐ Yes
☒ No

Comments:
If the SDT does not accept our comment to clarify and revise R1.1.2 and R2.1.3, then the applicability of TPL-001 must be expanded to include the RC, to ensure the RC “consults” with the TP. TO and GO that own Protection Systems should be added to applicability, so that those entities are required to provide the necessary Protection System information to the Transmission Planner so the TP can perform the Planning Analysis.

6. Do you agree with the 36 month implementation period to address All Requirements except for Requirement R4, Part 4.6, and Requirement 2, Part 2.7 associated with P5 due to Footnote 13 bullets 2, 3 and 4, as well as the definitions?

☒ Yes
☐ No

Comments:
Agreed.

7. Do you agree with the 60 month implementation plan for Requirement 4, Part 4.6 and Requirement 2, Part 2.7 associated with P5 due to Footnote 13 bullets 2, 3 and 4?

☒ Yes
☐ No

Comments:
Agreed.

8. Are you aware of any other governing documents that could be in conflict with the current proposal for this draft of the standard?

☐ Yes
☒ No

Comments:
Not aware of any.
9. Do you agree with the teams proposed changes to align the VRF/VSLs for Requirement 4, Part 4.6 with the VRF/VSLs for Requirement 2, Part 2.7?

☐ Yes
☒ No

Comments:
Please refer to Question 4 comments.

10. Do you have any other general recommendations/considerations for the drafting team?

☒ Yes
☐ No

Comments:
Requirement 2 – 2.7.1: the reference to Special Protection Systems (SPS) should be replaced by Remedial Action Schemes (RAS).

Requirement 4 – 4.1.1: the reference to Special Protection Systems (SPS) should be replaced by Remedial Action Schemes (RAS).

Order 786 specifically mentions that TPL-001 is intended to analyze the Near-Term Transmission Planning Horizon and requires annual assessments using Year One or year two, and year five. We agree that 1-, 2-, and 5-year forward looking is the appropriate and intended timeframe to be evaluated by the requirements of TPL-001. Therefore, only outages planned for this timeframe (more than 12-months forward) are appropriate to be required to be analyzed as a requirement of a Transmission Planning standard such as TPL-001.

Outages planned to occur within the next 12-months should be analyzed per the Operations Planning requirements of IRO-017 which is intended to cover the Operations Planning time horizon. Using a bright-line of 12-months to determine the applicability of IRO-017 vs TPL-001 gives clarity and certainty of the appropriate requirements to be met.