



NERC supports the Commission’s proposal to approve proposed Reliability Standard TPL-001-5 and its associated elements. For the reasons discussed in these comments, NERC does not support the Commission’s proposal to direct further modifications to the standard at this time. NERC respectfully requests that the Commission approve the proposed standard as filed by NERC.

## **I. BACKGROUND**

On December 7, 2018, NERC submitted a petition for approval of proposed Reliability Standard TPL-001-5 – Transmission System Planning Performance Requirements.<sup>3</sup> As explained in NERC’s Petition, proposed Reliability Standard TPL-001-5 reflects two sets of revisions intended to enhance the quality and rigor of Planning Assessments, thereby contributing to a more reliable Bulk Power System (“BPS”).

The first set of revisions is intended to address two Commission directives from Order No. 786 approving Reliability Standard TPL-001-4.<sup>4</sup> These directives relate to: (i) the study of known outages of less than six months duration; and (ii) the study, as part of Stability analysis, of the possible unavailability of long lead-time equipment, consistent with the entity’s spare equipment strategy.<sup>5</sup>

The second set of revisions is intended to enhance requirements for the study of Protection System single points of failure.<sup>6</sup> NERC identified Protection System single points of failure as a reliability risk to be addressed based on an analysis of data collected pursuant to NERC’s authority

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<sup>3</sup> *Petition of NERC for Approval of Proposed Reliability Standard TPL-001-5*, Docket No. RM19-10-000 (Dec. 7, 2018) (the “Petition”).

<sup>4</sup> *Transmission Planning Reliability Standards*, Order No. 786, 145 FERC ¶ 61,051 (2013) (“Order No. 786”).

<sup>5</sup> *Id.* at PP 40, 89.

<sup>6</sup> In this context a Protection System “single point of failure” refers to a non-redundant component of a Protection System that, if it failed, would affect Normal Clearing of Faults.

under Section 1600 of the NERC Rules of Procedure.<sup>7</sup> To address the identified reliability risk, the proposed standard contains revisions to two existing TPL-001 planning scenarios and the associated footnote 13. These revised planning scenarios are: (i) the Table 1, Category P5 planning event, which would require the planning entity to study the impacts of Delayed Fault Clearing due to a Protection System single point of failure with a single line-to-ground fault; and (ii) Table 1, Stability extreme events 2.a-h,<sup>8</sup> which would require the planning entity to study the impacts of a three-phase fault with a Protection System single point of failure resulting in Delayed Fault Clearing. The revised footnote 13 includes a more comprehensive list of potentially problematic Protection System components to be studied for both the planning and extreme events.

On June 20, 2019, the Commission issued the NOPR proposing to approve Reliability Standard TPL-001-5. In the NOPR, the Commission proposes to approve TPL-001-5 as just, reasonable, not unduly discriminatory or preferential, and in the public interest.<sup>9</sup> Further, the Commission states that proposed Reliability Standard TPL-001-5 satisfies the Commission's Order No. 786 directives.<sup>10</sup> The Commission, however, expressed concern that the proposed standard may leave a reliability gap because it would not require entities to develop Corrective Action Plans for the revised Table 1, Stability 2.e-h (three-phase fault) extreme event scenario if

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<sup>7</sup> See Petition at 9-10, citing NERC System Protection and Control Subcommittee and System Analysis and Modeling Subcommittee, *Order No. 754: Assessment of Protection System Single Points of Failure Based on the Section 1600 Data Request* (Sep. 2015) ("SPCS/SAMS Report"), <https://www.nerc.com/comm/PC/System%20Protection%20and%20Control%20Subcommittee%20SPCS%2020/FE%20RC%20Order%20754%20Final%20Report%20-%20SPCS-SAMS.pdf>.

<sup>8</sup> As explained in NERC's Petition, Items 2.a through 2.d are revised to strike the term "relay failure" and the associated footnote 13. The study of a "non-redundant component of a Protection System" (and the associated footnote 13) now appear separately in Items 2.e through 2.h. Petition at 22-23.

<sup>9</sup> NOPR at P 15.

<sup>10</sup> *Id.* at P 16.

their studies indicate potential Cascading.<sup>11</sup> As proposed, the standard would require planning entities to conduct “an evaluation of possible actions designed to reduce the likelihood or mitigate the consequence of the event(s)” when potential Cascading is identified, consistent with the requirement for all other TPL-001 extreme events.<sup>12</sup>

Based on its concern, the Commission proposes to direct “that NERC develop modifications to the Reliability Standards to require corrective action plans for protection system single points of failure in combination with three-phase faults if planning studies indicate potential cascading.”<sup>13</sup> The Commission seeks comments on its proposals. The Commission also seeks specific comments on the cost and implementation issues associated with its proposed standard modification directive.<sup>14</sup>

## II. COMMENTS

NERC supports the Commission’s proposal to approve Reliability Standard TPL-001-5. Proposed Reliability Standard TPL-001-5 addresses the Commission’s directives from Order No. 786 and would require entities to perform a risk-based assessment of the potential impacts of Protection System single points of failure that could pose a risk to reliability. NERC maintains that the record developed to date supports the continued treatment of the revised Protection System single point of failure with three-phase fault scenario as a TPL-001 Table 1 extreme event, subject to the same evaluation requirements that are applicable to all extreme event studies that indicate

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<sup>11</sup> See *id.* at PP 18-26. The Commission cites NERC’s Petition, a 2009 NERC Industry Advisory, a 2012 NERC informational filing, and draft materials prepared by the TPL-001-5 standard drafting team as providing support for its concern.

<sup>12</sup> See Proposed Reliability Standard TPL-001-5 Requirement R4.2, Ex. A to the Petition.

<sup>13</sup> NOPR at P 17.

<sup>14</sup> *Id.* at P 29 (“While we are aware of the potential for increased cost under this proposal, we understand that there are likely cost-effective actions that could be taken to mitigate a protection system single point of failure in combination with a three-phase fault. . . . To better understand the potential for increased costs and other implementation issues, the Commission seeks comment on how many corrective action plans are expected for protection system single points of failure in combination with a three-phase fault if study results indicate potential cascading.”).

potential Cascading. For these reasons, which are explained more fully below, NERC does not support the Commission's proposal to direct further revisions to the standard.

**A. The Proposed Standard is Technically Justified, Supported by the Record, and Should be Approved as Proposed.**

As NERC explained in detail in its Petition, proposed Reliability Standard TPL-001-5 carries forward the risk-based mitigation framework of the TPL-001 standard for the revised Protection System single point of failure planning studies. Consistent with other planning events in the standard, proposed Reliability Standard TPL-001-5 would continue to require the entity to develop a Corrective Action Plan if the entity's system is unable to meet the standard's performance requirements as a result of the revised Table 1, Category P5 (single line-to-ground fault) planning event. Consistent with other extreme events in the standard, the proposed standard would continue to require the entity to study the potential impacts on its system and potential mitigation measures if Cascading would occur as a result of the revised Table 1, Stability 2.e-h (three-phase fault) extreme event.<sup>15</sup>

The proposed standard's approach to the study of Protection System single points of failure is consistent with the recommendations of the SPCS/SAMS report. In this report, the SPCS and SAMS conducted an in-depth analysis of data on Protection System single points of failure collected through a mandatory data request issued by NERC and concluded that a reliability risk existed that needed to be addressed. Based on its analysis of the collected data, this report concluded as follows:

Analysis of the data demonstrates the existence of a reliability risk associated with single points of failure in protection systems that warrants further action. The analysis shows that the risk from single point of failure is not an endemic problem and instances of single point of failure exposure are lower on higher voltage systems. However, the risk is sufficient to warrant further action. Risk-based

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<sup>15</sup> See Petition at 24-27.

assessment should be used to identify protection systems of concern (i.e., locations on the BES where there is a susceptibility to cascading if a protection system single point of failure exists). Not all failures adversely affect reliable operation of the bulk power system. The reliability risk varies based on which component of a protection system fails.<sup>16</sup>

The SPCS/SAMS considered several alternatives to address the potential risk of a Protection System single point of failure with three-phase fault. It considered recommending modifying the TPL-001 standard to add a new planning event, but concluded that the “[p]robability of three-phase fault with a protection system failure is low enough that it does not warrant a planning event.”<sup>17</sup> The SPCS/SAMS thus concluded:

Additional emphasis in planning studies should be placed on assessment of three-phase faults involving protection system single points of failure. ***This concern (the study of protection system single points of failure) is appropriately addressed as an extreme event in TPL-001-4 Part 4.5.*** From TPL-001-4, Part 4.5: If the analysis concludes there is cascading caused by the occurrence of extreme events, an evaluation of possible actions designed to reduce the likelihood or mitigate the consequences and adverse impacts of the event(s) shall be conducted.<sup>18</sup>

The stakeholder consensus, as developed through NERC’s open and inclusive, American National Standards Institute-accredited standard development process, is that the approach recommended by the SPCS/SAMS is the most appropriate and cost effective way to address this issue in planning studies based on all relevant considerations.<sup>19</sup>

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<sup>16</sup> SPCS/SAMS Report at 11.

<sup>17</sup> *Id.* at 9.

<sup>18</sup> *Id.* at 11 (emphasis added).

<sup>19</sup> For comments indicating support for this approach, *see, e.g.*, Petition, Ex. G (Summary of Development and Complete Record of Development ) at 1601 of pdf:

The purpose of the SAMS/SPCS joint report was to evaluate the available data and make a recommendation as to the level of reliability risk that did, or did not, exist, and recommend paths forward to address those risks. Industry provided the data for the Section 1600 data request dutifully and faithfully entrusting SPCS and SAMS to carefully analyze [sic] that data and make reasonable recommendations to industry, NERC and FERC based on the evidence. This is what SPCS and

NERC has identified no information in the record of development that compels a different result. Further, NERC's data indicates that only 10 potential instances of a Protection System single point of failure with three-phase fault have been reported since 2011.<sup>20</sup> While the Commission suggests that such events may "reasonably be viewed as regular occurrences" based on the average frequency with which these events have been reported across the United States,<sup>21</sup> it does not follow that an individual planning entity may expect to experience such an event on its system at that rate. As discussed below, many stakeholders participating in NERC's standard development process indicated that they believed the probability for such an event was too low, the potential costs of mitigation too high, and the potential benefits too uncertain, to mandate that they develop a Corrective Action Plan to address potential performance concerns.

For these reasons, and as explained more fully in its Petition, NERC submits that the standard is technically justified and supported by the record and respectfully requests that the Commission approve it as proposed.

**B. The Standard Development Record Does Not Provide Sufficient Support for the Commission's Proposed Standard Modification Directive.**

In the NOPR, the Commission states that the record indicates that there is a reliability gap for the Protection System single point of failure with three-phase fault scenario.<sup>22</sup> As the Commission observes, the TPL-001-5 standard drafting team did consider other approaches

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SAMS did. The joint report concluded a Planning level event was not warranted and made recommendations to ensure that Protection system failures with three phase faults were studied as extreme events."

*See also* Petition, Ex. G at pages 568-69, 571, 573-74, 578-79, 582, 586-88, 589-92 (2 comments), 1589, 1595-96, and 1600 of pdf.

<sup>20</sup> Petition at 26-27.

<sup>21</sup> *See* NOPR at P 20 (stating that such events have occurred, on average, once in every eight months according to NERC's data).

<sup>22</sup> *Id.* at PP 18-26.

beyond that recommended by the SPCS/SAMS report in developing the proposed standard.<sup>23</sup> The standard drafting team in fact proposed three alternative approaches. In its first draft, the standard drafting team proposed to require entities to develop a Corrective Action Plan in the event the three-phase fault scenario indicated Cascading.<sup>24</sup> In its second draft, the standard drafting team proposed a provision that, while not called a Corrective Action Plan, would have required entities to develop a list of deficiencies, list actions to prevent Cascading, and provide a timetable for implementation.<sup>25</sup> In its third draft, the standard drafting team proposed to create a new Category P8 planning event for the Protection System single point of failure with three-phase fault scenario.<sup>26</sup> Based on the comments received in response to these proposals during NERC's standard development process, NERC does not believe that the record, as it has been developed to date, provides sufficient support for the Commission's proposed standard modification directive.

During the standard development process, multiple stakeholders expressed disagreement with the standard drafting team's proposals. Stakeholders stated that adding new requirements for Corrective Action Plans would be inconsistent with the existing TPL-001 risk-based framework, which affords planning entities discretion on how best to address extreme event performance issues on their systems.<sup>27</sup> Stakeholders also objected to the re-categorization of the three-phase fault

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<sup>23</sup> See *id.* at P 21 (“[T]he standard drafting team evaluated and initially adopted more robust options to mitigate protection system single points of failure in combination with three-phase faults if studies indicated cascading, including requiring a corrective action plan or some variation of a corrective action plan.”).

<sup>24</sup> See Petition, Ex. G at page 407 of pdf (redline comparison of TPL-001-4 and TPL-001-5 draft 1, Apr. 2017).

<sup>25</sup> See *id.* at page 858 of pdf (redline comparison of TPL-001-4 and TPL-001-5 draft 2, Sept. 2017).

<sup>26</sup> See *id.* at page 1406 of pdf (redline comparison of TPL-001-4 and TPL-001-5 draft 3, Feb. 2018).

<sup>27</sup> For comments on the first draft, see, e.g., Petition, Ex. G at page 580 of pdf (“From our perspective, requiring the development of corrective action plans to include redundant relaying for extreme events is inconsistent compared with the existing TPL-001-4 requirements. Corrective action plans should include upgrades to meet planned events and local transmission planning criteria, but not for extreme events that have a very low probability of occurrence.”). See also *id.* at pages 570, 572, and 596-97 of pdf (stating that such a requirement “goes beyond the basic criteria for the design, planning and operation of the BES.”). See also *id.* at page 582 (“There is no justification given for why

scenario as a planning event, stating that such an approach was not technically justified.<sup>28</sup> Further, stakeholders expressed concern that the costs or other considerations associated with a mandatory Corrective Action Plan or other mitigation requirement for the three-phase fault scenario would be unreasonable in light of the expected reliability benefit, given the lower probability of such an event.<sup>29</sup> Of particular concern, it was suggested that a mandatory mitigation requirement for this

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these particular extreme events should have more stringent requirements than other extreme events.”). *See also id.* at pages 583, 586, 590, and 592 of pdf.

For comments on the second draft, *see, e.g.*, Petition, Ex. G at page 1016 of pdf (“In the past, the decision to mitigate extreme events has been left to the discretion of the Planning Coordinator. The PC is best able to set their risk tolerance or do a cost/benefit analysis to determine whether the Corrective Action Plan should be implemented.”)

<sup>28</sup> *See, e.g.*, Petition, Ex. G at page 1591 of pdf (“In reviewing the Cost Effectiveness document, the Technical Rationale, the SPCS/SAMS Order 754 Report, and the proposed redline to the existing TPL-001 Reliability Standard, [commenter] does not believe that the proposed P8 Planning Event is prudent and the technical rationale is flawed in light of what the SPCS/SAMS documented in their review of the Order 754 Data Request analysis.”)

*See also id.* at page 1601 of pdf:

“Elevating an event to a Planning event when data does not suggest this is warranted creates complexity and confusion and puts other events at risk of the same fate and changes aspects of the planning standard that were working well and did not need to be changed.”

<sup>29</sup> For comments on the first draft, *see, e.g.*, Petition, Ex. G at page 574 of pdf (“The ‘only’ Corrective Action Plan for these kinds of events is a new capital improvement project which will require a significant time and effort for coordination among PCs, TPs and the Facility owners and operators (TO/ TOP/ GO/ GOP). In addition, the installation/implementation of such Corrective Action Plans may cost the industry tens of billions of dollars with significant construction efforts spanning 10-20 years.”). Additional comments included the following:

- “Requiring documentation of a CAP for a specific, limited subset of Extreme Events results in a compliance burden that does not provide commensurate reliability benefits” (*Id.* at page 571 of pdf);
- “Requiring a CAP on an extreme contingency on the amount of BES substations involved will lead to unreasonable mitigation costs” (*Id.* at page 583 of pdf);
- “Requiring implementation of a corrective action plan to fix these extremely rare events would cause a large and unnecessary financial burden with little benefit to our system reliability” (*Id.* at page 593 of pdf);
- “Not economically justifiable to require corrective action plans for low probability extreme events like these” (*Id.* at page 593 of PDF); and
- “There are concerns with requiring the development of Corrective Action Plans (CAPs) for extreme stability 2e-2h events, or any other extreme events. The distinction between developing CAPs for ‘planning events’ and not for ‘extreme events’ is to recognize that the probability of extreme events is too low and the cost to benefit ratio is too high to require the development of CAPs.” (*Id.* at page 595 of pdf).

For comments on the second draft, *see, e.g.*, Petition, Ex. G at page 1019 of pdf (“[I]t is clear that, despite stakeholder input, Parts 4.2.2, 4.2.2.1, and 4.2.2.2 are still requiring a CAP even though the contingencies to be addressed are extreme, unlikely to occur, difficult and expensive to address, and unlikely to significantly improve reliability.”).

For comments on the third draft, *see, e.g., id.* at page 1591 of pdf:

scenario could inadvertently result in worse outcomes for reliability, such as by leading to a rise in Protection System Misoperations while entities redesign their Protection Systems to eliminate single points of failure or by forcing entities to direct resources away from more pressing reliability needs.<sup>30</sup>

In summary, comments submitted during NERC's standard development process have indicated that replacing the existing evaluation requirement with a mandatory Corrective Action Plan requirement for the revised Protection System single point of failure with three-phase fault scenario may not advance prudent system planning, in light of the low probability of such an event, the possibility that mitigation could come with high costs and undesirable impacts on planning and operations, and the uncertain reliability benefits that may be gained.

Based on these concerns, NERC does not believe that the record, as developed to date, provides sufficient support for the Commission's proposed directive to require a Corrective Action Plan for the Protection System single point of failure with three-phase fault scenario. NERC respectfully submits that if the Commission is inclined to adopt its NOPR proposal, it should do so only after it has further studied the issue and developed a complete and comprehensive consideration of all relevant factors, including the probable costs, likely reliability benefits, and other potential impacts on operations and planning. NERC believes that such an evaluation is

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[T]he SDT and the SPCS/SAMS clearly recognize that a three-phase fault is in and of itself an event that has a low probability of occurrence, and adding a low probabilistic single point of failure of a protection system on top and requiring that this be analyzed as a Planning Event is beyond prudent planning and results in diminishing returns from an analysis and cost effectiveness standpoint.

<sup>30</sup> See, e.g., Petition, Ex. G at page 1022 of pdf (second posting):

[T]here is risk with the proposed changes of the single point of failure (SPF) language that will not significantly improve reliability. There is likelihood this change may even reduce reliability by having the CAPs force entities to redirect its limited resources away from other important reliability needs to solve SPF identified issue. Further, implementation of the CAPs may likely cause significant mis-ops while system protection systems are being modified to eliminate SPFs thus reducing reliability and increase risk to the transmission system.

needed to ensure that any directed revisions to the NERC Reliability Standards will continue to advance the prudent, risk-based planning of the BPS.

### **III. CONCLUSION**

NERC respectfully requests that the Commission accept these comments for consideration.

Respectfully submitted,

/s/ Lauren A. Perotti

Lauren A. Perotti  
Senior Counsel  
North American Electric Reliability Corporation  
1325 G Street, N.W., Suite 600  
Washington, D.C. 20005  
(202) 400-3000  
(202) 644-8099 – facsimile  
lauren.perotti@nerc.net

*Counsel for the North American Electric  
Reliability Corporation*

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**CERTIFICATE OF SERVICE**

I hereby certify that I have served a copy of the foregoing document upon all parties listed on the official service list compiled by the Secretary in this proceeding. Dated at Washington, D.C. this 26<sup>th</sup> day of August, 2019.

*/s/ Lauren A. Perotti*

Lauren A. Perotti

*Counsel for the North American Electric  
Reliability Corporation*