NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

INTERPRETATION REQUEST FORM

When completed, email this form to:
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For questions about this form or for assistance in completing the form, call Laura Hussey at 404-446-2579.

Note: A valid interpretation request is one that requests additional clarity about one or more requirements in approved NERC reliability standards, but does not request approval as to how to comply with one or more requirements.

Request for an Interpretation of a Reliability Standard			
Date submitted:			
Contact information for person requesting the interpretation.			
Name:			
Organization:			
Telephone:		**E-mail:**	
Identify the Standard (include version number, e.g. PRC-001-1) that needs clarification and its associated title.			
Standard	Title		
TPL-003-0a	System Performance Following Loss of Two or More Bulk Electric System Elements (Category C)		
TPL-004-0	System Performance Following Extreme Events Resulting in the Loss of Two or More Bulk Electric System Elements (Category D)		
Identify specifically what Requirement needs clarification.			
Standard	Requirement (and text)		
TPL-003-0a	**R1.3.1** Be performed and evaluated only for those Category C contingencies that would produce the more severe system results or impacts. The rationale for the contingencies selected for evaluation shall be available as supporting information. An explanation of why the remaining simulations would produce less severe system		

	results shall be available as supporting information.
TPL-003-0a	**R1.3.10.** Include the effects of existing and planned protection systems, including any backup or redundant systems.
TPL-003-0a	**R1.5.** Consider all contingencies applicable to Category C.
TPL-004-0	**R1.3.1.** Be performed and evaluated only for those Category D contingencies that would produce the more severe system results or impacts. The rationale for the contingencies selected for evaluation shall be available as supporting information. An explanation of why the remaining simulations would produce less severe system results shall be available as supporting information.
TPL-004-0	**R1.3.7.** Include the effects of existing and planned protection systems, including any backup or redundant systems.
TPL-004-0	**R1.4.** Consider all contingencies applicable to Category D.

Identify the nature of clarification that is requested (Check as many as applicable).

- ☒ Clarify the required performance
- ☐ Clarify the conditions under which the performance is required
- ☐ Clarify which functional entity is responsible for performing an action in a requirement
- ☐ Clarify the reliability outcome the requirement is intended to produce

Please explain the clarification needed.

This interpretation requests clarification of the following questions about the performance required for the listed standards, requirements and terms. More specifically clarification is needed about the comprehensive study of system performance relating to Table 1's, Category C and D contingency of a "protection system failure." It is not entirely clear whether a valid assessment of a protection system failure includes evaluation of common protection system components. For example, a common system protection component evaluation would include the evaluation of any protection system component that is integral to the operation of the protection system being evaluated and shares a common component that is essential to the operation of another protection system that could result in the

inability to meet system performance.

On March 30, 2009, NERC issued an Industry Advisory — Protection System Single Point of Failure[1] (i.e. NERC Alert) for three significant events. For example, the Westwing outage (June 14, 2004) was caused by failure of the primary protection single auxiliary relay that initiated both breaker tripping and the breaker failure protection. The failure of this auxiliary relay is known as a "single point of failure." It is not clear whether this situation is comprehensively addressed by the applicable entities when making a valid assessment of system performance for both Category C and D contingencies.

Question 1: For the parenthetical "(stuck breaker or protection system failure)" in TPL-003-0a (Category C contingencies 6-9) and TPL-004-0 (Category D contingencies 1-4), does an applicable entity have the option of evaluating the effects[2] of either the "stuck breaker" or "protection system failure" contingency[3], or does an applicable entity have to evaluate the contingency that produces the more severe system results or impacts as identified in R1.3.1 of both standards?

We believe that R1.3.1[4] requires an applicable entity to assess which contingency will cause the most severe system results or impacts (R1.3.1) and must perform and evaluate simulation of the contingency. That is, whether simulation of a stuck breaker or protection system failure will produce the worst result depends on the protection system design. For example, when a protection system is fully redundant the failure of a protection system will not affect fault clearing and a stuck breaker would result in more severe system performance. However, when a single point of failure in a protection system affects fault clearing the fault clearing time may be longer than the breaker failure protection clearing time for a stuck breaker contingency and may result in tripping of additional system elements, resulting in a more severe system response.

Question 2: For the phrase "Delayed Clearing" used in Category C[5] contingencies 6-9 and Category D[6] contingencies 1-4, does the description in Table 1, footnote (e)[7], require the applicable entity to evaluate a single point of failure of any protection system component that may prevent correct operation of a protection system(s)[8]; and model the consequences of such a failure, including a common protection system component failure, based on the design of that protection system(s), in simulation of the contingency?

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[1] NERC Website: (http://www.nerc.com/fileUploads/File/Events%20Analysis/A-2009-03-30-01.pdf)

[2] As required by NERC Reliability Standard TPL-003-0a, Requirement R1.3.10. and/or TPL-004-0, Requirement R1.3.7.

[3] As required by NERC Reliability Standard TPL-003-0a, Requirement R1.5. and/or TPL-004-0, Requirement R1.4.

[4] "*Be performed and evaluated only for those Category (TPL-003-0a Category C and TPL-004-0 Category D) contingencies that would produce the more severe system results or impacts*."

[5] As required by NERC Reliability Standard TPL-003-0a, Requirement R1.5.

[6] As required by NERC Reliability Standard TPL-004-0, Requirement R1.4.

[7] "failure of any protection system component such as a relay, circuit breaker, or current transformer, and not because of an intentional design delay,"

[8] As required by NERC Reliability Standard TPL-003-0a, Requirement R1.5. and/or TPL-004-0, Requirement R1.4.

We believe that footnote (e) in Table 1 requires consideration of any protection system component that may prevent correct operation and requires accurate modeling of the protection system(s) consequences for a single point of failure, including a common protection system component failure. For example, failure of a communication system may result in a backup, stepped distance protection scheme tripping the same circuit breakers with a longer time delay that would have been tripped by a high-speed protection system, while failure of an auxiliary relay that initiates both tripping and breaker failure protection may result in operation of backup protection systems on adjacent elements resulting in the fault remaining on the system for a longer time and tripping of more elements than required to clear the fault. A valid assessment should include evaluation of delayed clearing due to failure of the protection system component (i.e. single point of failure) that results in the most severe system response and should include accurate modeling of the fault clearing sequence and protection system(s) operation based on the protection system(s) design.

Identify the material impact to your organization or others, if known, caused by the lack of clarity or an incorrect interpretation of this standard.

Impact 1: We believe there is a material impact to system performance if the applicable entity's valid assessment when studying or simulating TPL-003-0a and TPL-004-0 contingencies does not include evaluation of "stuck breaker" and "protection system failure" to determine which will cause the more severe system response. The specific impact is that without determination of which contingency produces the more severe system impact, system performance is unknown and the unstudied contingency may result in unintended consequences, failure to identify a reliability risk, or failure to achieve an Adequate Level of Reliability[9] (ALR).

Impact 2: We believe there is a material impact to system performance if the applicable entity does not make a comprehensive assessment of system performance in the case of protection system component failure. If the planner does not consult the protection engineer to evaluate and accurately model the consequence of a protection system single component failure, the simulated system performance may not be achieved. The unstudied consequence of the protection system single component failure may result in unintended consequences, failure to identify a reliability risk, or failure to achieve an ALR.

[9] NERC Website: Adequate Level of Reliability http://www.nerc.com/files/Adequate_Level_of_Reliability.pdf

- The system is controlled to stay within acceptable limits during normal conditions.
- The system performs acceptably after credible contingencies.
- The system limits the impact and scope of instability and cascading outages when they occur.
- The system's facilities are protected from unacceptable damage by operating them within facility ratings.
- The system's integrity can be restored promptly if it is lost.

The system has the ability to supply the aggregate electric power and energy requirements of the electricity consumers at all times, taking into account scheduled and reasonably expected unscheduled outages of system components.