

# Summary Response to TPL-008-1 Draft Comments Received

NERC Project 2023-07 Transmission Planning Performance Requirements  
for Extreme Weather | October 2024

## Comments Received Summary

There were 74 sets of responses, including comments from approximately 191 different people from approximately 118 companies representing 10 of the Industry Segments. A summary of comments submitted can be reviewed on the project page.

If you have an interest in joining the distribution list for this project, please reach out to Senior Standards Developer, [Jordan Mallory](#).

If you feel that your comment has been overlooked, please let us know immediately. Our goal is to give every comment serious consideration in this process. If you feel there has been an error or omission, you can contact Manager of Standards [Jamie Calderon](#) (via email) or at (404) 960-0568.

## Consideration of Comments

The NERC Project 2023-07 thanks all of industry for your time and comments. The drafting team (DT) feels that many great points have been provided for the DT to consider during the drafting phase of this project. High level themes received from industry are located below (bolded is the high-level theme followed by the DT's response).

## Benchmark Events

Many commenters expressed concern that they cannot fully approve the Extreme Temperature Assessment definition and TPL-008-1 Standard without having benchmark events information. In addition, some entities expressed concern about having to agree to a requirement that has yet to be fully developed. Based on the technical rationale, there is an expectation that the ERO will determine suitability and make available benchmark events representative of future information. Once the initial library of events has been developed, entities would be in a better position to consider support for this requirement.

## Drafting team response:

NERC is still committed to providing additional information regarding the criteria used in the development of this initial population of the benchmark event library, the process for maintaining the library, the process for entity submitted benchmark events and the criteria for which they will be evaluated for approval, as well as the future state envisioned for ongoing curation of the library with industry involvement and climate data subject matter experts.

To best assist the team when voting “No,” please provide comments specific to the Standard and requirements that is within scope for the team to address. As NERC is directed by FERC to create the benchmark event library, it is unclear what further improvements can be made to the TPL-008-1 Standard by the DT.

## **Definitions**

A commenter recommended that the DT should consider making the definition of Extreme Temperature Assessment align better with the definition of Planning Assessment.

### **Drafting team response:**

The DT originally had the proposed Extreme Temperature Assessment definition aligned with the definition of Planning Assessment. However, to align with the intent of TPL-008-1, the DT included language to specifically focus on extreme heat and extreme cold temperature events. In addition, the DT also removed Corrective Action Plans (CAPs) from the definition because not all CAPs are required for considered Contingencies. Specifically, CAPs are only required when the analysis of a benchmark planning case indicates the responsible entity’s portion of the Bulk Electric System is unable to meet performance requirements for TPL-008-1 Table 1 P0 or P1 Contingencies, while possible actions are required in the benchmark planning cases for Table 1 P7 Contingencies and in the sensitivity cases for Table 1 P0, P1, and P7 Contingencies. Therefore, the definition of Planning Assessment in the NERC Glossary of Terms goes beyond the intent of what is required in TPL-008-1 for Corrective Action Plans.

## **Requirement R1 Maintaining Models**

A commenter recommends that the DT add the term “maintaining models” to the wording for R1 as that is an important joint responsibility for the Planning Coordinator (PC) and Transmission Planner (TP) to do in support of the assessment. The modifications in Draft 2 do not address this concern.

### **Drafting team response:**

Requirement R1 is focused on identifying the zone in which the Planning Coordinator belongs and the individual and joint responsibilities between the Planning Coordinator and its Transmission Planner(s) for completing the Extreme Temperature Assessment. The completion of the Extreme Temperature Assessment includes developing models, having criteria, selecting Contingencies for evaluation, completing steady state and transient stability analyses, developing CAPs in the benchmark planning cases for Table 1 P0 and P1 Contingencies, and documenting possible actions in the benchmark planning cases for Table 1 P7 Contingencies and in the sensitivity cases for Table 1 P0, P1, and P7 Contingencies. Therefore, the DT did not feel it was necessary to explicitly identify a list of what needs to be discussed and agreed upon by the Planning Coordinators and Transmission Planners in Requirement R1, as it is identified throughout the TPL-008-1 Standard.

## **Planning Coordinator or Transmission Planner**

A commenter recommends that the DT choose either the PC or TP to be responsible for Requirement R1. By allowing the responsible party to be either the TP or PC, the two parties may not agree on all terms or there

may result in a reliability gap. Please provide clarification on which responsibilities will belong to the Planning Coordinator and Transmission Planner.

**Drafting team response:**

In accordance with Requirement R1, each Planning Coordinator and its Transmission Planner(s) within the PC’s footprint must coordinate each entity’s individual and joint responsibilities when completing the Extreme Temperature Assessment. The purpose of this requirement is to have the PC and its TP(s) identify their individual and joint responsibilities for the following activities: developing models, having criteria, selecting Contingencies for evaluation, completing steady state and transient stability analyses, developing CAPs in the benchmark planning cases for Table 1 P0 and P1 Contingencies, documenting possible actions in the benchmark planning cases for Table 1 P7 Contingencies and in the sensitivity cases for Table 1 P0, P1, and P7 Contingencies, and providing study results to any functional entity who has a reliability related need. Based on outreach, the DT did not find it appropriate to be overly prescriptive, given regional differences. Therefore, leaving it up to the PC and its TP(s) is appropriate and acceptable by the majority of industry. In general, the Planning Coordinator will lead in its coordination with its Transmission Planner(s) to develop each entity’s individual and joint responsibilities for completing Extreme Temperature Assessment.

**Category P0**

A couple of commenters asked if the use of “category P0” to describe normal system condition in R1 appropriate, given that it includes both benchmark and extreme events, which are not typically considered normal operating conditions.

**Drafting team response:**

Yes, the use of “Category P0” in the TPL-008-1 Standard specifically refers to benchmark planning cases that are developed from benchmark events. The developed benchmark planning cases establish Category P0 as the normal System condition in TPL-008-1 Table 1 before further Contingencies are applied as part of the assessment.

**Requirement R2**

Many commenters continued to express concern with the lack of knowing what the benchmark events are, and what data entities will have to work from when selecting benchmark events.

**Regional Entities to Complete Assessments**

Some commenters stated that Regional Entities should be the entity to develop the benchmark events.

**Drafting team response:**

Benchmark events are developed based on historical events, which focus on events that may cover a larger area than the Regional Entity oversees. The ERO Enterprise, as an entirety, has the bigger picture and is the appropriate entity to develop benchmark events that could result in reliability issues affecting multiple regions.

**Planning Coordinator Maintain Benchmark Events**

Some commenters expressed that the Planning Coordinator should be able to develop benchmark events that do not exist within the ERO Benchmark Event library and that entities should be able to maintain the benchmark event data.

**Drafting team response:**

FERC Order 896 recognizes that historical events may span across regions and therefore, the ERO is in the best position to develop benchmark events. However, based on recent conversations, the DT has updated the TPL-008-1 Standard to allow Planning Coordinators, in coordination with other Planning Coordinators, to develop benchmark events should the events provided by the ERO not be adequate for Planning Coordinators to consider. In addition, Requirement R2 has been updated to reflect what is being provided by the ERO, which addresses the subparts and what would be required from entities should they choose to develop their own benchmark events in coordination with other PCs. The important note here is that one common extreme heat benchmark temperature event and one common extreme cold benchmark temperature event is selected and studied among the PCs within the zone identified in Attachment 1 of the TPL-008-1 Standard.

**Requirement for NERC to Coordinate with PCs**

Some commenters expressed that a requirement should be added to the TPL-008-1 standard requiring NERC to coordinate with Planning Coordinators when developing benchmark events.

**Drafting team response:**

A NERC Process<sup>1</sup> has been developed and posted to the NERC Project 2023-07 page laying out the process for the 5-year iteration of benchmark events being developed during the second 38-day comment and ballot period. Per the process, the ERO will engage with industry subject matter experts during year one of developing the next round of benchmark events.

**Develop an Attachment 1 Like TPL-007**

Some commenters expressed that Attachment 1 in TPL-008-1 should reflect TPL-007.

**Drafting team response:**

TPL-008-1 is different compared to TPL-007. Industry must take into account the FERC directives assigned to this project. FERC states in FERC Order 896 P58 to “[d]irect NERC to develop benchmark events for extreme heat and cold weather events through the Reliability Standards development process. We agree with Indicated Trade Associations that the development of adequate benchmark events is critical and should be committed to the subject matter experts on the DT. We also agree with Entergy that NERC will be able to tailor benchmark events to capture regional differences and the different risks that each region faces during extreme heat and cold weather events. While Regional Entities and reliability coordinators are encouraged to participate in the NERC Reliability Standards development process to develop the benchmark events, we disagree with AEP and other commenters who recommend that entities other than NERC take the lead in the development of benchmark events.” An update made to the TPL-008-1 Standard shows a map of the zones in which PCs are located and has been added as Attachment 1. A

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<sup>1</sup> Link to NERC Process document: [NERC Standards Development Process Document](#)

process regarding the development and update of benchmark events has been drafted and posted to the NERC Project 2023-07 project page.

## **Coordination through MMWG and ERAG**

Some commenters believe it is not appropriate to assign the Electric Reliability Organization (ERO) responsibility within the standard requirement that directly impacts the compliance to the standard requirement. There is a compliance risk to the directly assigned entity if the ERO fails to uphold its responsibility to maintain the database. We suggest coordinating this the way MMWG is coordinated through ERAG in the Eastern Interconnection.

### **Drafting team response:**

A process has been developed for entities to follow regarding the development of the benchmark events over the 5-year iterations. In year one, the ERO will engage with industry subject matter experts to develop the next round of benchmark events and so forth. This will allow groups such as the MMWG or ERAG to provide comments. In addition, the TPL-008-1 Standard has been updated to allow each PC in coordination with other PCs to develop their own benchmark event should the events provided by the ERO not be adequate for Planning Coordinators to consider.

## **Benchmark Event Framework**

Some commenters expressed that the ERO was directed to set a framework with this Reliability Standard that included specific bounds by which the industry could conduct their extreme weather assessments. Yet, TPL-008-1 still does not contain any specific boundary limits that could guide responsible entities in their Extreme Weather Assessments or otherwise limit what might be contained or added to the Extreme Weather Event Library, now or in the future. For these reasons we ask that the DT set clear bounds that guide these Extreme Weather Assessments and set boundaries for any future changes to the Extreme Weather Event Library.

### **Drafting team response:**

A process has been developed to provide entities with the iterative process on how benchmark events will be updated every five years. The process is a separate document from the TPL-008-1 Standard as some of the specifics are not appropriate nor requirements of the TPL-008-1 Standard. For PCs who wish to work with other PCs to develop their own benchmark events should follow the additional requirement language added to Requirement R2. This provides the boundaries entities must follow should the events provided by the ERO not be adequate for Planning Coordinators to consider.

## **Requirement R3/R4 Benchmark Event Framework**

Some commenters requested the DT to clarify “other designated entities.”

### **Drafting team response:**

The DT removed “other designated entities” from the TPL-008-1 Standard.

## **Number of Studies Required**

Some commenters expressed concern regarding the number of studies which must be performed, particularly when a Planning Coordinator (PC) selects a benchmark temperature event that is different from that of its adjacent PC(s). In that situation, each benchmark temperature event may necessitate a significant coordination effort. It was recommended that a governing body identify the scenarios. Extreme temperature events will typically extend beyond the footprint of a single Planning Coordinator. To avoid putting the PCs in a position where they are required to agree on a scenario, a year and the sensitivity to be studied, NERC or other (e.g. ERAG) should identify the extreme heat and extreme cold temperature events to be studied. This is necessary for consistent modeling results across adjacent planning entities. Also, as a benchmark temperature event may extend across several planning areas, the governing body must take this into consideration when determining which extreme heat and extreme cold temperature events are to be studied so that no planning entity is assigned more than one of each.

### **Drafting team response:**

The DT updated the TPL-008-1 Standard to identify that one common extreme heat and one common extreme cold benchmark planning case must be developed, as well as at least one common extreme heat and one common extreme cold sensitivity case. This does not preclude entities from developing more cases, but requires a minimum of one each. Per the FERC Order 896, it is important that entities are studying common historical events in preparation for future events. The ERO will provide entities with one common extreme heat benchmark temperature event and one common extreme cold benchmark temperature event for PCs to study within their zones. In addition, the TPL-008-1 Standard has been updated to allow PCs to coordinate with other PCs to develop their own benchmark event should the events provided by the ERO not be adequate for Planning Coordinators to consider.

## **Extreme Weather is a Sensitivity**

Some commenters expressed that Extreme Temperature Events are already a “sensitivity” to normal long-term planning cases and are built with Gen/Load/Transfer based on the extreme weather conditions of an entity’s territory. Additionally, mandatory “sensitivity cases” seem redundant in nature. In addition, another commenter asked if sensitivity cases could be baked in with the benchmark temperature event.

### **Drafting team response:**

TPL-008-1 is different than TPL-001-5.1. The TPL-008-1 Standard focuses on extreme heat and extreme cold temperature events. Entities are to select an extreme heat and cold benchmark event, develop planning cases, and then develop sensitivity cases from that, which may indicate a different approach on how to handle certain scenarios.

Additionally, FERC Order 896 P124 states that “we adopt the NOPR proposal and direct NERC to require the use of sensitivity cases to demonstrate the impact of changes to the assumptions used in the benchmark planning case. Sensitivity analyses help a transmission planner to determine if the results of the base case are sensitive to changes in the inputs. The use of sensitivity analyses is particularly necessary when studying extreme heat and cold events because some of the assumptions made when developing a base case may change if temperatures change – for example, during extreme cold events, load may increase as

temperatures decrease, while a decrease in temperature may result in a decrease in generation. We agree with AEP, and we direct NERC to define during the Reliability Standard development process a baseline set of sensitivities for the new or modified Reliability Standard. While we do not require the inclusion of any specific sensitivity in this final rule, NERC should consider including conditions that vary with temperature such as load, generation, and system transfers.” P126 continues to explain that “[w]e disagree with NYISO and LCRA that extreme heat and cold weather impacts are already studied as sensitivities under Reliability Standard TPL-001-5.1. Although TPL-001-5.1 mandates sensitivity analysis by varying one or more conditions specified in the standard such as load, generation, and transfers, this analysis alone cannot capture the complexities of extreme heat and cold weather conditions. Sensitivity analyses consider the impact on a base case of the variability of discrete variables. Extreme heat and cold weather impacts, on the other hand, may include numerous concurrent outages and derates which cannot be studied as part of a single-variable sensitivity analysis.”

### **TPL-008-1 Cases Used for TPL-001-5.1**

One commenter asked whether language can be added to ensure that entities can take credit for studies that are run as part of the Sensitivity analysis, rather than running those studies again as part of the assessment to be conducted under TPL-001. For example, the Extreme Temperature Assessment could take the place of the sensitivity analysis required within the TPL-001 assessment for both the steady state and stability analyses. Moreover, if the Extreme Temperature Assessment is essentially a type of sensitivity analysis already, the commenter advised removing R4.2 because this would create a sensitivity case based on a sensitivity case.

#### **Drafting team response:**

A Planning Assessment must be completed annually in accordance with TPL-001-5.1, while an Extreme Temperature Assessment must be completed at least once every five calendar years in accordance with the TPL-008-1 Standard. Time will be required to coordinate and develop the common cases and therefore, may not meet what is required in TPL-001. TPL-008-1 does not speak to TPL-001; however, both standards have different expectations. The DT does not encourage this, but if an entity decided to go this route, it would be up to that entity to explain and demonstrate compliance with the TPL-008-1 Standard.

### **Concurrent/Correlated Outage Language**

Some commenters expressed that in Order 896 paragraph 88, FERC directs “NERC to require under the new or revised Reliability Standard the study of concurrent/correlated generator and transmission outages due to extreme heat and cold events in benchmark events,” explaining in paragraph 89 that “it is necessary that responsible entities evaluate the risk of correlated or concurrent outages and derates of all types of generation resources and transmission facilities as a result of extreme heat and cold events.” Commenters suggested modifying “Benchmark planning cases that include seasonal and temperature dependent adjustments for Load, generation, Transmission, and transfers” to include “concurrent/correlated generator and transmission outages.”

**Drafting team response:**

Concurrent/correlated outages are addressed through the standard. The DT did not use language verbatim, but the standard is laid out on adjustment of temperature data that is provided by the event selection. Aligning with the directives set forth in FERC Order 896, which emphasizes the importance of incorporating derated generation, transmission capacity, and the availability of generation and transmission in the development of benchmark planning cases, it becomes imperative for responsible entities to consider potential concurrent or correlated generation and transmission outages and/or derates within relevant benchmark planning cases. This ensures that the benchmark planning case accurately reflects System conditions under extreme temperatures, with generation and transmission derates and/or outages already factored.

**MOD-032 Data**

Some commenters asked if the DT feels it would be necessary to add any additional data to the table in MOD-032 to complete this work. In addition, some sought clarification on how MOD-032 will allow for the collection of additional information related to extreme heat and cold events.

**Drafting team response:**

MOD-032 ensures an adequate means of data collection for transmission planning and requires applicable registered entities to provide steady-state, dynamic, and short circuit modeling data to their Transmission Planner(s) and Planning Coordinator(s). As outlined in R1 and Attachment 1 of MOD-032, MOD-032 allows various data collection such as in-service status and capability associated with demand, generation, and transmission associated with various case types, scenarios, system operating states, or conditions for the long-term planning horizon. MOD-032 also requires applicable registered entities to provide “other information requested by the Planning Coordinator or Transmission Planner necessary for modeling purposes” for each of the three types of data required. Because the DT determined the responsible entities that will be developing benchmark planning cases are limited to Planning Coordinators and Transmission Planners, they will be able to request and receive needed data pursuant to MOD-032. Thus, the DT believes that there is no need to update MOD-032 because it allows Planning Coordinators and Transmission Planners to request any specific data needed for developing benchmark planning cases and sensitivity cases required in R4 of TPL-008-1.

**“Supplemented by other sources” Clarity**

Some commenters requested the DT clarify what is meant by “supplemented by other sources” with the TPL-008-1 Standard.

**Drafting team response:**

Requirement R4 requires the responsible entity to use data consistent with Reliability Standard MOD-032, supplemented by other sources as needed, for developing benchmark planning cases that represent System conditions based on selected benchmark temperature events. This aligns with directives in FERC Order 896, paragraph 30, emphasizing the requirement of developing both benchmark planning cases and sensitivity study cases. Requirement R4 is consistent with Reliability Standard TPL-001-5.1 in cross-referencing Reliability Standard MOD-032, which establishes consistent modeling data requirements and reporting



procedures for the development of planning horizon cases necessary to support analysis of the reliability of the interconnected System. It is also consistent with Reliability Standard TPL-001-5.1 in acknowledging that data from other sources may be required to supplement the data collected through Reliability Standard MOD-032 procedures.

## **Requirement R5**

### **Use of “System Voltage Limits”**

Some comments suggested using the recently adopted NERC Glossary term “System Voltage Limits.”

#### **Drafting team response:**

The DT determined “System Voltage Limits” focuses on operations and planning information and differs from what is used in the standard. The DT concluded to maintain the proposed language consistent with Reliability Standard TPL-001-5.1.

## **Violation Risk Factor**

The risk factor should be Medium to match TPL 001-5.1. Concern that level of coordination needed to affect the standard will be significant, particularly for “smaller” entities.

#### **Drafting team response:**

The DT updated the violation risk factor in Requirement R5 to align with TPL-001-5.1 medium.

## **Criteria**

A commenter mentioned that R5 has criteria for acceptable System steady state voltage limits, post-Contingency voltage deviations, and applicable Facility Ratings, and asked whether entities will also have to have (and document) applicable thermal criteria for completing the Extreme Temperature Assessment (e.g., allowing for the possible use of STE facility ratings post-contingency).

#### **Drafting team response:**

Requirement 5 is drafted to provide flexibility for entities to include thermal criteria depending on the level of risk an entity is willing to take on. This requirement does not mandate which ratings are applicable and leaves that determination up to the entity.

## **Jurisdiction**

A commenter mentioned that in certain jurisdictions, extreme temperature ratings have been established, but that is not necessarily the case in all jurisdictions. Will facility owners be required to establish extreme cold or warm temperature ratings for this standard?

#### **Drafting team response:**

Requirement 5 does not require entities to establish extreme temperature ratings, it only requires entities to identify criteria for whichever ratings are applicable.

## **Requirement R6**

### **Violation Risk Factor**

The risk factor should be Medium to match TPL 001-5.1. Concern that level of coordination needed to affect the standard will be significant, particularly for “smaller” entities.

#### **Drafting team response:**

The DT determined that based on the planning for events such as instability, uncontrolled separation, or Cascading events would consist of a high VRF and therefore, kept the VRF as a high.

### **Updated Wording**

Requirement 6 needs better wording to indicate instability, uncontrolled separation and cascading must all be monitored for. The “or” makes it seem optional.

#### **Drafting team response:**

The DT mirrored language from FERC Order 896 and determined that “or” is appropriate. It is up to the entity to use one, two or all, regarding instability, uncontrolled separation, or Cascading when completing this requirement.

## **Planning Events or Contingencies**

Many commenters questioned if planning events or contingencies was the correct phrasing throughout TPL-008-1 and requested the DT be consistent throughout the standard when using this phrase/term.

#### **Drafting team response:**

The DT determined that Contingencies was the correct phrase as it is Contingencies entities will be completing when addressing TPL-008-1.

## **Requirement R7**

### **Planning Events or Contingencies**

One commenter recommends modifying Table 1 to only include P0 and P1 events in accordance with the FERC Order 896 Paragraph 113 Commission Determination that “NERC may determine whether contingencies P1 through P7 should also apply to the new or modified Reliability Standard, or whether a new set of contingencies should be developed.” Paragraph 113 of the Commission Determination does not require the inclusion of events other than P0. ISO-NE believes P0 and P1 events are acceptable for this Standard, however, P2, P4, and P7 events are not.

#### **Drafting team response:**

The DT removed everything but P0, P1, and P7. The DT finds it important that multiple Contingencies be included; therefore, entities must develop Corrective Action Plans in the benchmark planning cases for Table 1 P0 and P1 Contingencies, and document possible actions in the benchmark planning cases for Table 1 P7 Contingencies and in the sensitivity cases for Table 1 P0, P1, and P7 Contingencies.

## **Violation Risk Factor**

The risk factor should be Medium to match TPL 001-5.1. Concern that level of coordination needed to affect the standard will be significant, particularly for “smaller” entities.

### **Drafting team response:**

The DT updated the violation risk factor in Requirement R7 to align with TPL-001-5.1 medium.

## **Requirement R8**

### **Performance of Steady State and/or Stability Analysis**

The standard does not clearly and specifically state whether steady-state and/or stability analysis is to be performed for the identified events as TPL-001 does, for instance. The DT should consider modifying R7 to allow the responsible entity to develop a methodology or rationale in the performance of a benchmark event to appropriately assess it for that entity’s planning area, otherwise, additional clarity in the analysis expectations is needed. Different weather events would require a different consideration of applicable contingencies and analysis approaches.

### **Drafting team response:**

Requirement 4 has been updated to state one common extreme heat and one common extreme cold. In addition, R8 has been updated to clarify that steady state and transient stability analyses are to be performed.

## **Transient Confusion**

Adding “transient” to qualify stability may result in more confusion in interpretation between planning entities, auditors, and the referenced ERO. There is a requirement to document stability criteria so this should be clear based on that documentation. Adding “transient” therefore is more detrimental than helpful to this standard.

### **Drafting team response:**

Transient is an understood term among industry; therefore, the DT does not feel it will cause confusion.

## **Additional Sensitivity Cases**

Additional sensitivity studies required in R8.2 would add a significant administrative burden without more clarification to how it benefits the long-term planning horizon.

### **Drafting team response:**

Table 1 has been updated to require P0, P1, and P7 Contingencies. R4 has also been updated to clarify that it is one common extreme heat and one common extreme cold benchmark planning case, as well as at least one common extreme heat and one common extreme cold sensitivity case. In addition, this is a directive from the FERC Order 896 P124 which states “we adopt the NOPR proposal and direct NERC to

require the use of sensitivity cases to demonstrate the impact of changes to the assumptions used in the benchmark planning case. Sensitivity analyses help a transmission planner to determine if the results of the base case are sensitive to changes in the inputs. The use of sensitivity analyses is particularly necessary when studying extreme heat and cold events because some of the assumptions made when developing a base case may change if temperatures change – for example, during extreme cold events, load may increase as temperatures decrease, while a decrease in temperature may result in a decrease in generation. We agree with AEP, and we direct NERC to define during the Reliability Standard development process a baseline set of sensitivities for the new or modified Reliability Standard. While we do not require the inclusion of any specific sensitivity in this final rule, NERC should consider including conditions that vary with temperature such as load, generation, and system transfers.”

## **Requirement R9 Regulatory Burden**

Many commenters raised concerns about the requirement to submit CAPs to regulatory authorities, suggesting it could delay approval, lacks justification, need clearer definitions, and should be limited or removed.

### **Drafting team response**

The DT reviewed the comments and determined that the requirement is necessary to address the directives of Order 896, specifically the directives mentioned in the paragraphs 152 (i.e., “we direct NERC to develop certain processes to facilitate interaction and coordination with applicable regulatory authorities or governing bodies responsible for retail electric service as appropriate in implementing a corrective action plan”) and 165 (i.e., “we direct NERC to require in the new or modified Reliability Standard that responsible entities share their corrective action plans with, and solicit feedback from, applicable regulatory authorities or governing bodies responsible for retail electric service issues”).

## **Clarity on Sensitivity Analysis**

Various commenters questioned the necessity of a Corrective Action Plan for issues identified in sensitivity analysis, seeking clarity on how sensitivity analysis is handled.

### **Drafting team response**

The DT updated Requirement R9 to clarify that Corrective Action Plans are not required specifically for addressing performance requirements related to sensitivity cases. The responsible entity must develop Corrective Action Plan(s) when the analysis of a benchmark planning case indicates its portion of the Bulk Electric System is unable to meet performance requirements for Table 1 P0 or P1 Contingencies.

## **Facility Overload Concern**

Requirement 9 and Table 1 requires the development of Corrective Action Plans for P1 events where applicable facility ratings are exceeded and steady state voltages are not within limits. This requirement goes beyond the directives in FERC Order 896. The FERC Order is concerned with cascading, instability, and uncontrolled islanding but not with facility overloads.

### **Drafting team response**

Thermal violations are a contributing factor in Cascading events and the DT did not go beyond the intent of FERC Order 896. According to Footnote 2 from FERC Order 896: The FPA defines “Reliable Operation” as “operating the elements of the Bulk-Power System within equipment and electric system thermal, voltage, and stability limits so that instability, uncontrolled separation, or cascading failures of such system will not occur as a result of a sudden disturbance, including a cybersecurity incident, or unanticipated failure of system elements.” 16 U.S.C. 824o(a)(4).

### **CAP Request**

A commenter requested the DT to ‘make their CAP available’ in R9.1 to ‘make available on request.’

### **Drafting team response**

FERC Order 896 P153 states: “We adopt our rationale set forth in the NOPR and conclude that the directive to require the development of corrective action plans is needed for Reliable Operation of the Bulk-Power System. Under the currently effective Reliability Standard TPL-001-5.1, planning coordinators and transmission planners are required to evaluate possible actions to reduce the likelihood or mitigate the consequences of extreme weather events, but are not obligated to develop corrective action plans, even if such events are found to cause cascading outages. Experience over the past decade has demonstrated that the potential severity of extreme heat and cold weather events exacerbates the likelihood to cause system instability, uncontrolled separation, or cascading failures as a result of a sudden disturbance or unanticipated failure of system elements. Thus, we conclude that entities should proactively address known system vulnerabilities by developing corrective action plans that include mitigation for specified instances where performance requirements for extreme heat and cold events are not met.” Therefore, it is the responsibility of the PC or TP developing the CAPs to provide this information to the respective governing bodies and solicit feedback per the FERC Order.

### **CAP Process**

There are already existing processes for interactions with applicable regulatory authorities and governing bodies regarding CAP for many other issues and items. Extreme weather CAPs are not exceptions and do not need a new way to solicit feedback. R9.1 should be removed because it also creates a compliance requirement without any benefit to reliability and would be confusing.

In addition, a commenter requested 9.1 subpart be removed because it creates a compliance requirement without any incremental benefit to reliability and further conflicts with existing planning requirements and processes.

### **Drafting team response**

An entity may use what is already in place to be compliant with this requirement. This requirement is addressing the FERC Order 896 directive in P152 that states “we direct NERC to develop certain processes to facilitate interaction and coordination with applicable regulatory authorities or governing bodies responsible for retail electric service as appropriate in implementing a corrective action plan.” Lastly, the

TPL-008-1 Standard is aligning with what the FERC Order 896 directs. The DT did its best to align with TPL-001 while meeting the FERC Order 896 directives.

## **Include Threshold**

One commenter believes the requirement for the notification to an applicable regulatory entity should also include a threshold. As written, an entity would need to make a notification if a proposal tripped 0.1 MW of non-consequential load. Recommend the DT add a threshold in a similar way as is included in TPL-001 Attachment 1.

## **Drafting team response**

The DT does not feel that a threshold is needed in the TPL-008-1 Standard. An entity only has report obligations if it is a part of a CAP. Depending on the mechanism used, you may not be required to report smaller amounts of load.

## **Jurisdiction**

One commenter expressed that the "applicable regulatory authorities... electric service" needs better clarification and questioned what this looks like for Jurisdictional vs non-Jurisdictional. The commenter asked the DT to provide better guidance and examples, and highly recommended using operation procedures instead of CAPs since operation procedures have more flexibility to respond to a system's needs and adapt proactively.

## **Drafting team response**

Per FERC Order 896 P165, building generation and transmission is outside the jurisdiction and left up to the states. FERC Order 896 provides some examples of various activities that would be appropriate in P155: "As noted by commenters, the NOPR provided examples of various activities that may be appropriate under a corrective action plan, some of which may require state or local authorizations (e.g., generation or transmission development). Other examples mentioned in the NOPR include "implementing new energy efficiency programs to decrease load, . . . transmission switching, or adjusting transmission and generation maintenance outages based on longer-lead forecasts," none of which involve the construction of generation or transmission capacity. In addition, responsible entities have the option to use controlled load shed as a mitigation measure. In sum, while responsible entities would have the obligation to develop and implement a corrective action plan, the Commission is not directing any specific result or content of the corrective action plan. In such circumstances, the Commission's directive does not exceed the jurisdictional limits set forth in section 215(i) of the FPA0." Also, "applicable regulatory authorities or governing bodies responsible for retail electric service issues" is in TPL-001; therefore, the same entities may be used. Finally, this language was added based on FERC Order 896 P165: "We direct NERC to require in the new or modified Reliability Standard that responsible entities share their corrective action plans with, and solicit feedback from, applicable regulatory authorities or governing bodies responsible for retail electric service issues. We agree with commenters that relevant state entities should have the opportunity to provide input during the development of corrective action plans. Just as this final rule seeks to ensure Reliable Operation of the Bulk-Power System during extreme heat and cold weather events, regulatory authorities and governing bodies responsible for retail electric service are

taking actions to ensure reliability for local stakeholders. As such, we believe that requiring responsible entities to seek input from applicable regulatory authorities or governing bodies responsible for retail electric service issues when developing corrective action plans could help ensure that shared opportunities to increase system reliability are not missed. Further, as NESCOE points out, such consultation may allow these entities to better understand “the cost implications of various approaches” and, therefore, provide “better insight into the considerations and tradeoffs inherent in the options available.”

## **Requirement R10**

### **Remove R10**

Some commenters feel that R10 requires a significant amount of work without providing additional system reliability and suggested that this requirement be removed.

### **Drafting team response**

The DT removed everything but P0, P1, and P7 Contingencies. The DT finds it important that multiple Contingencies be included; therefore, entities must develop Corrective Action Plans in the benchmark planning cases for Table 1 P0 and P1 Contingencies, and document possible actions in the benchmark planning cases for Table 1 P7 Contingencies and in the sensitivity cases for Table 1 P0, P1, and P7 Contingencies. In addition, an Extreme Temperature Assessment must be completed once every five calendar years.

## **Reasons for Requiring Possible Actions and Restrictions in Creating CAPs**

Certain commenters questioned why possible actions are required for P2, P4, P5, and P7 contingencies, while others disagreed due to limitations in creating CAPs for these contingencies.

### **Drafting team response**

The DT reviewed the comments and affirmed that the Technical Rationale for R10 adequately clarified the necessity for possible actions. Additionally, it is important to note that the TPL-008-1 Standard sets a baseline to fulfill the directives from Order 896 and does not prohibit responsible entities from exceeding these requirements.

## **Clarity and Communication on Possible Actions**

A commenter questioned what actions the responsible entity intends to take based on the identified “possible actions.” There is uncertainty about how these actions will be executed. In addition, the commenter suggested that these possible actions should be communicated to the operators so they can prepare necessary plans and processes accordingly.

### **Drafting team response**

The DT acknowledges the commenter's concerns regarding implementing possible actions and their communication to operators. The DT asserts that Requirement 11 outlines the expected actions, mandating responsible entities to share Extreme Temperature Assessment results with any functional entities that has a reliability-related need to enhance readiness for extreme temperature events.

## **Exclusion of P2, P4, P5, and P7 Contingencies**

Some commenters proposed removing P5, citing that extreme weather conditions affect outdoor EHV elements but do not impact protective relaying. Additionally, other comments suggested excluding P2, P4, P5, and P7 events from TPL-008-1.

### **Drafting team response**

The DT reviewed the comments and updated Requirement 10 and Table 1 to remove the P5 Contingency from the TPL-008-1 Standard. The rationale for this decision is detailed in the Technical Rationale of R10.

## **TPs Ability to Create CAPs**

A commenter disagrees with R10 because the requirement does not give TPs the ability to create CAPs for the listed contingencies.

### **Drafting team response**

Requirement 10 does not preclude Transmission Planners from developing CAPs; however, possible actions would be required should a Transmission Planner determine that a CAP is not required.

## **Requirement R11**

### **Timeline for Distributing Assessment Results**

Some comments questioned if the 60 calendar days was appropriate.

### **Drafting team response:**

The DT determined to keep the requirement unchanged as this strikes a good balance between allowing enough time for the responsibility entity to distribute the results and the functional entity requesting the information to receive them.

## **Distribution of Assessment Results**

Some comments questioned if the distribution of the Extreme Temperature Assessment results should be limited to selecting registered entities.

### **Drafting team response:**

The DT determined to keep the requirement unchanged as it meets the following FERC directive in FERC Order 896, Paragraph 72: “Further, responsible entities must share the study results with affected transmission operators, transmission owners, generator owners, and other functional entities with a reliability need for the studies.” Therefore, the responsible entity must share with any functional entity that has a reliability related need and submits a written request for the information. Additionally, this is consistent with other approved NERC Reliability Standards (e.g., TPL-001-5.1 and TPL-007-4).

## **Table 1**



Based on the removal of all except P0, P1, and P7 Contingencies, the table has been condensed and cleaned up. Some comments received may no longer be applicable based on the updated Table 1. Please see the updates in the TPL-008-1 Draft 3.

## **Stability Performance**

A commenter asked the DT how to determine stability performance requirements for P0 events. Currently, Table 1 says that the system shall remain stable, and that instability, uncontrolled separation and cascading shall not occur, but the commenters asked how those would occur for a P0 event.

### **Drafting team response:**

Instability can occur during P0 conditions due to various factors like oscillations, renewable generation behavior, and excessive power transfers. For example, poorly damped oscillations between generators in different areas can grow and destabilize the system if not properly controlled. High levels of wind, solar, or energy storage may also cause instability if these resources don't adequately support grid stability. Additionally, excessive power transfers on key transmission lines can lead to voltage instability and potential voltage collapse.

## **Implementation Plan**

### **Benchmark Events**

Some entities requested a date be established as to when the ERO will have the benchmark event library published.

### **Drafting team response:**

An ERO Benchmark Event Process document has been published with the TPL-008-1 Draft 2 posting. The ERO benchmark event library will be published and up and running by December 2024. This library will contain events for the first 5-year iteration of TPL-008-1. Additional time is essentially provided to entities as the benchmark events will be published and TPL-008-1 will be pending approval from the respective applicable governmental authorities. In addition, example benchmark event examples have been provided in a separate document for entities to see what they will be working with to meet the TPL-008-1 Standard. Please reference the process document for additional details on how the ERO plans to address preparing for the next 5-year iteration of benchmark events.

## **Requirement R1**

Many entities disagreed with making Requirement R1 effective on the effective date of TPL-008-1 because this requirement includes the development of processes that currently do not exist.

### **Drafting team response:**

Per FERC Order 896, Paragraph 7, *“we direct NERC to ensure that the proposed new or modified Reliability Standard becomes mandatory and enforceable beginning no later than 12 months from the effective date of Commission approval of the new or modified Reliability Standard.”* To meet this FERC directive,

Requirement R1 is the most reasonable requirement to meet the 12-month implementation directive. 12 months from the approval date of TPL-008-1 is adequate time to identify individual and joint responsibilities for completing the Extreme Temperature Assessment. Requirement R3 is when the process should be developed and implemented, which per the TPL-008-1 Implementation Plan has 36-months. In addition, there is nothing precluding entities from starting discussions with other PCs and TPs once the petition has been submitted for approval with the respective governmental authorities.

## **Requirement R9**

Some entities expressed concern that if R9 is intended to include the construction of capital projects, there should be additional time allowed for construction of those projects after the completion of the first Extreme Temperature Assessment study.

### **Drafting team response:**

The drafting team did not change the implementation plan; however, Requirement R9.3 was added to permit the use of Non-Consequential Load Loss as an interim solution, which normally is not permitted in Table 1, in situations that are beyond the control of the Planning Coordinator or Transmission Planner that prevent the implementation of a Corrective Action Plan in the required timeframe. The use of Non-Consequential Load Loss as an interim solution in this situation is permitted, provided that each responsible entity documents the situation causing the problem, alternatives evaluated, and takes actions to resolve the situation. Additionally, Requirement R9.4 was added to permit having revisions to the CAP in subsequent Extreme Temperature Assessments, provided that the planned BES continues to meet the performance requirements of Table 1.

## **Implementation Plan Diagram**

One commenter pointed out that the diagram does not line up with the Implementation Plan Language and requested the DT update it accordingly.

### **Drafting team response:**

The DT updated the timeframes within the Implementation Plan to line up with the intent of timing.

## **Technical Rationale**

Please see the updated Technical Rationale document, which is located on the 2023-07 project page.