

Comment Report

Project Name: 2023-07 Modifications to TPL-001-5.1 Transmission System Planning Performance Requirements for Extreme Weather | SAR

Comment Period Start Date: 8/29/2023

Comment Period End Date: 9/27/2023

Associated Ballots:

There were 31 sets of responses, including comments from approximately 93 different people from approximately 81 companies representing 10 of the Industry Segments as shown in the table on the following pages.

Questions

- 1. What technical considerations should the drafting team consider to assist with the development of benchmark planning cases per the Order?**
- 2. What Contingencies and scenarios should the drafting team consider to represent extreme weather events per the Order?**
- 3. What potential variants for extreme heat and cold weather events should the drafting team consider that are 1) representative of different planning areas, and 2) assure reasonable consistency between planning areas?**
- 4. Provide any additional comments for the SAR drafting team to consider, if desired.**

Organization Name	Name	Segment(s)	Region	Group Name	Group Member Name	Group Member Organization	Group Member Segment(s)	Group Member Region
Midcontinent ISO, Inc.	Bobbi Welch	2	MRO,RF,SERC	ISO/RTO Council Standards Review Committee Project 2023-07 Modifications to TPL-001-5.1	Ali Miremadi	CAISO	2	WECC
					Kennedy Meier	Electric Reliability Council of Texas, Inc.	2	Texas RE
					Helen Lainis	IESO	2	NPCC
					Bobbi Welch	MISO	2	RF
					Gregory Campoli	New York Independent System Operator	2	NPCC
					Elizabeth Davis	PJM	2	RF
					Charles Yeung	SPP	2	MRO
ACES Power Marketing	Jodirah Green	1,3,4,5,6	MRO,RF,SERC,Texas RE,WECC	ACES Collaborators	Bob Soloman	Hoosier Energy Electric Cooperative	1	RF
					Kris Carper	Arizona Electric Power Cooperative, Inc.	1	WECC
					Bill Pezalla	Old Dominion Electric Cooperative	3,4	SERC
MRO	Kendra Buesgens	1,2,3,4,5,6	MRO	MRO NSRF	Bobbi Welch	Midcontinent ISO, Inc.	2	MRO
					Christopher Bills	City of Independence Power & Light	3,5	MRO
					Fred Meyer	Algonquin Power Co.	3	MRO
					Jamie Monette	Allete - Minnesota Power, Inc.	1	MRO
					Larry Heckert	Alliant Energy Corporation Services, Inc.	4	MRO
					Marc Gomez	Southwestern Power Administration	1	MRO

					Matthew Harward	Southwest Power Pool, Inc.	2	MRO
					Bryan Sherrow	Kansas City Board Of Public Utilities	1	MRO
					Terry Harbour	MidAmerican Energy	1,3	MRO
					Jamison Cawley	Nebraska Public Power	1,3,5	MRO
					Seth Shoemaker	Muscatine Power & Water	1,3,5,6	MRO
					Michael Brytowski	Great River Energy	1,3,5,6	MRO
					Shonda McCain	Omaha Public Power District	6	MRO
					George Brown	Acciona Energy North America	5	MRO
					Jaimin Patel	Saskatchewan Power Corporation	1	MRO
					Kimberly Bentley	Western Area Power Administration	1,6	MRO
					Jay Sethi	Manitoba Hydro	1,3,5,6	MRO
					Michael Ayotte	ITC Holdings	1	MRO
FirstEnergy - FirstEnergy Corporation	Mark Garza	1,3,4,5,6		FE Voter	Julie Severino	FirstEnergy - FirstEnergy Corporation	1	RF
					Aaron Ghodooshim	FirstEnergy - FirstEnergy Corporation	3	RF
					Robert Loy	FirstEnergy - FirstEnergy Solutions	5	RF
					Mark Garza	FirstEnergy-FirstEnergy	1,3,4,5,6	RF
					Stacey Sheehan	FirstEnergy - FirstEnergy Corporation	6	RF
Southern Company -	Pamela Hunter	1,3,5,6	SERC	Southern Company	Matt Carden	Southern Company -	1	SERC

Southern Company Services, Inc.						Southern Company Services, Inc.		
					Joel Dembowski	Southern Company - Alabama Power Company	3	SERC
					Ron Carlsen	Southern Company - Southern Company Generation	6	SERC
					Leslie Burke	Southern Company - Southern Company Generation	5	SERC
Northeast Power Coordinating Council	Ruida Shu	1,2,3,4,5,6,7,8,9,10	NPCC	NPCC RSC	Gerry Dunbar	Northeast Power Coordinating Council	10	NPCC
					Alain Mukama	Hydro One Networks, Inc.	1	NPCC
					Deidre Altobell	Con Edison	1	NPCC
					Jeffrey Streifling	NB Power Corporation	1	NPCC
					Michele Tondalo	United Illuminating Co.	1	NPCC
					Stephanie Ullah-Mazzuca	Orange and Rockland	1	NPCC
					Michael Ridolfino	Central Hudson Gas & Electric Corp.	1	NPCC
					Randy Buswell	Vermont Electric Power Company	1	NPCC
					James Grant	NYISO	2	NPCC
					John Pearson	ISO New England, Inc.	2	NPCC
					Harishkumar Subramani Vijay Kumar	Independent Electricity System Operator	2	NPCC

Randy MacDonald	New Brunswick Power Corporation	2	NPCC
Dermot Smyth	Con Ed - Consolidated Edison Co. of New York	1	NPCC
David Burke	Orange and Rockland	3	NPCC
Peter Yost	Con Ed - Consolidated Edison Co. of New York	3	NPCC
Salvatore Spagnolo	New York Power Authority	1	NPCC
Sean Bodkin	Dominion - Dominion Resources, Inc.	6	NPCC
David Kwan	Ontario Power Generation	4	NPCC
Silvia Mitchell	NextEra Energy - Florida Power and Light Co.	1	NPCC
Glen Smith	Entergy Services	4	NPCC
Sean Cavote	PSEG	4	NPCC
Jason Chandler	Con Edison	5	NPCC
Tracy MacNicoll	Utility Services	5	NPCC
Shivaz Chopra	New York Power Authority	6	NPCC
Vijay Puran	New York State Department of Public Service	6	NPCC
ALAN ADAMSON	New York State Reliability Council	10	NPCC
David Kiguel	Independent	7	NPCC

					Joel Charlebois	AESI	7	NPCC
					Joshua London	Eversource Energy	1	NPCC

1. What technical considerations should the drafting team consider to assist with the development of benchmark planning cases per the Order?

Ben Hammer - Western Area Power Administration - 1,6

Answer

Document Name

Comment

Modifying TPL-001-5.1 Table 1 - Steady State & Stability Performance Extreme Events consistent with the FERC directives in Order No. 896 is straightforward. The formulation of benchmark planning cases should remain subject to the cognizance of the Planning Coordinator and Transmission Planner, avoiding one-size-fits-all extreme heat or cold weather conditions.

Likes 0

Dislikes 0

Response

Lenise Kimes - City and County of San Francisco - 1 - WECC

Answer

Document Name

Comment

Comments below for your consideration.

Likes 0

Dislikes 0

Response

Kacie Fischer - Oncor Electric Delivery - 1 - Texas RE

Answer

Document Name

Comment

From Oncor's perspective, Planning Coordinators would be able to provide more accurate insights into the development of benchmark planning cases because they have a broader view of the bulk electric system and would be able to more accurately adjust generation dispatch in the base cases to reflect real-world events.

The drafting team should consider whether it would be more effective in addressing extreme weather conditions in each geographical region if the planning requirements were developed in a manner that allows each Planning Coordinator and corresponding Transmission Planners to determine relevant planning case assumptions.

When developing extreme weather benchmark planning cases, Oncor believes the generation dispatch levels need to be more realistic to aid in anticipating extreme weather conditions. For example, an unrealistic amount of projected load growth may lead to an unrealistic level of generation dispatch, which may not be available during extreme weather conditions. This is true for both peak load and off-peak load planning cases.

Likes 0

Dislikes 0

Response

Srikanth Chennupati - Entergy - 1,3,5,7 - SERC

Answer

Document Name

Comment

None

Likes 0

Dislikes 0

Response

Mark Garza - FirstEnergy - FirstEnergy Corporation - 1,3,4,5,6, Group Name FE Voter

Answer

Document Name

Comment

FirstEnergy asks the Drafting Team to provide guidance of meaning extreme and cold weather events that would also include the duration of the event as well as the frequency of events mentioned in the SAR.

Likes 0

Dislikes 0

Response

Harishkumar Subramani Vijay Kumar - Independent Electricity System Operator - 2

Answer

Document Name

Comment

To satisfy the requirement for a wide area view the drafting team should propose specific criteria as to what constitutes extreme weather demand, for example, demand expected at a 90-10 weather scenario, or a once in 31-year weather, or a 3 standard deviation weather temperature. This is not to advocate for any one scenario, but the standard should be specific so that wide areas can be modelled in a consistent manner.

Likes 0

Dislikes 0

Response

Thomas Foltz - AEP - 3,5,6

Answer

Document Name

Comment

Historic events can be used as examples and references, however forward-looking planning cases should not be limited only to specific recent events. If history alone were sufficient, these assumptions would not need to be revisited. AEP recommends that the drafting team focus on analyzing the assumptions used in current planning practices, in contrast to observed extremes, to develop scenarios that capture a broader range of potential conditions. While these cases will appropriately differ by region, the drafting team should focus on establishing a framework that will ensure a consistent methodology across all regions.

Historic events may be beneficial in helping to define “wide area”, as has been observed by industry in reviewing recent events affecting multiple regions. It will be important however for neighboring regions to share assumptions and run studies that consider concurrent events. It may also be appropriate to review historical events to determine the potential impacts of extreme weather on demand, load, and generation types. For example, residential demand may be affected differently than industrial or commercial.

Likes 0

Dislikes 0

Response

Andy Thomas - Duke Energy - 1,3,5,6 - SERC,RF

Answer

Document Name

Comment

NERC’s should not seek to address these issues through their wholesale inclusion in the TPL-001 standard. There may be some aspects that may be appropriate for inclusion in TPL-001 but overall the scope of additions is too large. TPL-001 is presently the baseline standard for design of the transmission system that is sufficiently robust enough to be operated reliably most of the time, including consideration of the impact of more extreme events.

The extreme weather scenarios NERC is now seeking to address go beyond TPL-001 and involve very abnormal conditions that mostly involve wide areas of the interconnections. Separate standards, industry studies or guidance would be a better means to address these scenarios and should be performed by entities with a wide area perspective.

Scenario development requires cooperation of neighboring area/regions and requires input and cooperation from other subject matters experts both internal and external to the electric industry. NERC standards cannot guarantee such cooperation.

Extreme Weather Events require extensive analysis and should not be performed annually.

Evaluation of benchmark extreme weather events are not unlike previous efforts to prepare models for Y2k or to evaluate wide scale events on the interconnection. NERC's efforts to evaluate Minimum Interregional Transfer Capability may serve as a template for how NERC can approach studies of extreme weather scenarios on an ongoing basis. These efforts require collaborative efforts of multiple PC's in order to develop the models. Similarly, it will require collaborative efforts to establish assumptions on expected reduction in generation or increased load levels, as well as any sensitivities that may be desirable to study.

Consider establishment of a NERC committee/working group to develop the plan and scenarios for regions' study of extreme events in each interconnection. Collaboration and cooperation on these studies will lead to greater likelihood of corrective actions being accepted and sharing of cost/benefits is appropriate.

Likes 0

Dislikes 0

Response

Jodirah Green - ACES Power Marketing - 1,3,4,5,6 - MRO,WECC,Texas RE,SERC,RF, Group Name ACES Collaborators

Answer

Document Name

Comment

We do not currently have any additional technical considerations for the drafting team to consider.

Likes 0

Dislikes 0

Response

Israel Perez - Salt River Project - 1,3,5,6 - WECC

Answer

Document Name

Comment

Technical considerations should include but not be limited to: Consideration of regional differences for benchmarked planning cases, coordination of studies among interconnected TPs in similar geographical location and biomes and the availability of regionally coordinated cases for extreme weather scenarios.

Likes 0

Dislikes 0

Response

Randall Buswell - VELCO -Vermont Electric Power Company, Inc. - 1

Answer

Document Name

Comment

Define extreme heat and extreme cold by region. Considerations are temperature levels, wet bulb, wind speed, humidity, and hourly data over a certain number of days. The definition has to be detailed enough to allow a load forecaster to produce load values to be modeled. Our engineering team will need to produce transmission equipment ratings for the conditions under study. The reliability regions will need to figure out how various types of generators will be affected by the weather events. We are assuming that NERC will need to analyze historical data to capture events in the tails of the probabilistic distribution. However, historical events may not be a sufficient dataset to define events that have not yet occurred.

Likes 0

Dislikes 0

Response

Daniela Atanasovski - APS - Arizona Public Service Co. - 1,3,5,6

Answer

Document Name

Comment

No Comment

Likes 0

Dislikes 0

Response

Kendra Buesgens - MRO - 1,2,3,4,5,6 - MRO, Group Name MRO NSRF

Answer

Document Name

Comment

The NSRF would request that the drafting team review and include realistic natural gas assumptions within the planning requirements.

Likes 0

Dislikes 0

Response**Daniel Gacek - Exelon - 1,3****Answer****Document Name****Comment**

Exelon suggests the drafting team review the methods, terminology, and timeframes in the new EOP-012 standard and consider alignment between generation and transmission were appropriate.

Likes 0

Dislikes 0

Response**LaTroy Brumfield - American Transmission Company, LLC - 1****Answer****Document Name****Comment**

ATC believes the SAR and SDT should ensure the feasibility of assumptions made in the benchmark cases and scenarios. For example, how can we ensure assumed natural gas needs can be served with existing natural gas infrastructure under extreme cold-weather conditions (and particularly if solar and/ or wind resources generation is affected/ reduced)?

o ATC does not believe the Transmission Planner has the wide-area view to coordinate with natural gas providers.

Probabilistic analysis of the likelihood of these events is not in the SAR, especially to justify projects/costs to mitigate. Probability distribution was mentioned in the development of benchmark cases.

Likes 0

Dislikes 0

Response

Allie Gavin - International Transmission Company Holdings Corporation - 1 - MRO,RF

Answer

Document Name

Comment

ITC believes that the model used for this study should encompass a large geographic area typically that analyzed by an RTO/ISO. See concerns about the need for the study in question 4 below.

Likes 0

Dislikes 0

Response

David Jendras Sr - Ameren - Ameren Services - 1,3,6

Answer

Document Name

Comment

We recommend the drafting team consider a 1 in 10 load scenario.

Likes 0

Dislikes 0

Response

Rachel Coyne - Texas Reliability Entity, Inc. - 10

Answer

Document Name

Comment

Texas RE appreciates the drafting team's efforts to be responsive to FERC Order No. 896 to make the transmission system more reliable in extreme heat and cold events. Texas RE recommends creating a new standard to address extreme weather events.

While the current version of the standard, TPL-001-5.1, requires assessment of peak load conditions and sensitivity analysis based on system variations, the new standard should consider the TPs and PCs for study extreme cold and hot weather peak load conditions regardless of the entity's historical peak load seasons as the system issues encountered during extreme hot and cold weather conditions can vary greatly. In the extreme heat conditions, the TP/PC should consider wide area wildfire, low wind conditions, extreme drought conditions, facility rating reductions due to high temperatures (if the ambient temperatures are higher the value assumed in the design parameters). In the extreme cold conditions, the TP/PC should consider wide area icing conditions, higher heat pump loads, resource capacity reductions due to ice builds, gas curtailments to resources, etc.

The benchmark cases should consider at minimum, the worst system conditions experienced in the last 25 years and extrapolate those conditions to update the current model (load, resource mix, etc.)

Likes 0

Dislikes 0

Response

Bobbi Welch - Midcontinent ISO, Inc. - 2, Group Name ISO/RTO Council Standards Review Committee Project 2023-07 Modifications to TPL-001-5.1

Answer

Document Name

Comment

To satisfy wide-area view requirement, the **ISO/RTO Council Standards Review Committee (SRC)** [\[1\]](#) suggests the Standard Drafting Team (SDT) consider the following parameters to assist the Planning Coordinators in working with their respective Transmission Planners in the development of region-specific, extreme weather benchmark planning cases per the Order:

Define what attributes are needed to represent extreme weather events:

- **Attributes should be specific for different regions** (i.e., the Northeast, Northwest, West, Southwest, the South, Midwest, etc.) but **common for entities within that region**.
- To **ensure the wide-area view is modeled in a consistent manner**, the standard should provide a framework that must be **applied consistently across a region**. For example, demand expected in a 90-10 weather scenario, once in 31-year weather, or a 3-standard deviation in weather temperature. This is not to advocate for any one scenario; however, it is **important for entities within a region to use a consistent approach**.

Note that while the FERC Order described a “benchmark event,” as noted in the SAR, “Benchmark events will form the basis for a planner's benchmark planning case— i.e., the base case representing system conditions under the relevant benchmark event”. Describing these as the base case planning case in the SAR and from here on would be beneficial in clarifying this term then a footnote could be used to tie the new term back to the wording in the FERC Order.

It would be beneficial for the National Laboratories (or other recognized research entity) to research historical events that occurred and **recommend** (not dictate) key attributes for each region (or Planning Coordinator) to consider in developing their benchmark planning cases. These attributes could also be included in the guidelines for NERC planning standards.

- If the above recommendation is adopted, the attributes should be updated by the National Laboratories on a periodic basis (i.e., once every 5 or 10 years) depending on the frequency of the extreme events that are anticipated in the future.

[\[1\]](#) For purposes of these comments, the IRC SRC includes the following entities: CAISO, ERCOT (with the exception of our response to question 1), IESO, MISO, NYISO, PJM and SPP.

Likes 0

Dislikes 0

Response

Andrea Jessup - Bonneville Power Administration - 1,3,5,6 - WECC

Answer

Document Name

Comment

BPA recommends that the scope of the extreme weather events should be confined to the area that would be experiencing the extreme weather. For example, extreme heat or cold weather events tend to move across a broader geographic area rather than impacting the entire widespread area simultaneously. So, the weather events in the benchmark cases should be confined to a reasonable area of impact – i.e. Pacific Northwest heat wave or cold snap rather than simultaneous WECC-wide impact.

Also, BPA recommends that extreme heat/cold weather should be referred to as extreme **conditions** rather than extreme **events**, which implies extreme *contingencies* in the context of the TPL-001-5 Standard.

Likes 0

Dislikes 0

Response

Darcy O'Connell - California ISO - 2

Answer

Document Name

Comment

The California ISO supports comments submitted by the ISO/RTO Council Standards Review Committee (SRC).

Likes 0

Dislikes 0

Response

John Pearson - ISO New England, Inc. - 2

Answer

Document Name

Comment

To satisfy wide-area view requirement, ISO New England suggests that the Standard Drafting Team (SDT) consider the following parameters to assist the Planning Coordinators and Transmission Planners with the development of benchmark planning cases per the Order:

Define what attributes are needed to represent extreme weather events

Attributes should be **specific for different regions** (i.e., the Northeast, Northwest, West, Southwest, the South, Midwest, etc.) but common for entities within that region.

To **ensure the wide-area view is modeled in a consistent manner**, the standard should provide a framework that must be **applied consistently across a region**. For example, demand expected in a 90-10 weather scenario, once in 31-year weather, or a 3-standard deviation in weather temperature. This is not to advocate for any one scenario; however, it is **important for entities within a region to use a consistent approach**.

It would be helpful if the National Laboratories (or other recognized research entity) would research historical events and recommend (not dictate) specific attributes for each Region's entities to consider and implement in the development of benchmark planning cases. These attributes should be included in the NERC planning standards or technical rationale as guidelines for the PCs and TPs to follow.

If the above recommendation is adopted, the attributes should be updated by the National Laboratories on a periodic basis (i.e., once every 5 or 10 years) depending on the frequency of the extreme events that are anticipated in the future.

Note that while the FERC Order described a "benchmark event", as noted in the SAR, "Benchmark events will form the basis for a planner's benchmark planning case— i.e., the base case representing system conditions under the relevant benchmark event". Describing these as the base planning case in the SAR and from here on would be beneficial in clarifying this term along with a footnote to tie the new term back to the language in the FERC Order.

Likes 0

Dislikes 0

Response

Kennedy Meier - Electric Reliability Council of Texas, Inc. - 2

Answer

Document Name

Comment

When addressing the wide-area view requirement of the FERC order, ERCOT recommends that the Standard Drafting Team define what attributes are needed to represent extreme weather events. This will assist Planning Coordinators in working with their respective Transmission Planners in the development of region-specific, extreme weather benchmark planning cases.

- Different regions (i.e., the Northeast, Northwest, West, Southwest, the South, Midwest, etc.) should have different attributes, but attributes should be common for entities within a given region.
- To ensure the wide-area view is modeled in a consistent manner, the standard should provide a framework that must be applied consistently across a region. For example, demand expected during a 90-10 weather scenario, or during once in 31-year weather, or during weather that exceeds 3 standard deviations in temperature. ERCOT is not advocating for any particular scenario; ERCOT merely seeks to emphasize that it is important for entities within a region to use a consistent approach.

Additionally, ERCOT notes that the SAR (e.g., in footnote 9) uses the term "benchmark event," which is described in the FERC Order. Defining a benchmark event as the base case planning case in the SAR would be beneficial in clarifying this term; a footnote could be used to establish the link back to the wording in the FERC Order.

Likes 0

Dislikes 0

Response

2. What Contingencies and scenarios should the drafting team consider to represent extreme weather events per the Order?

Kennedy Meier - Electric Reliability Council of Texas, Inc. - 2

Answer

Document Name

Comment

ERCOT joins the comments submitted by the ISO/RTO Council (IRC) Standards Review Committee (SRC) for this question and adopts them as its own.

Likes 0

Dislikes 0

Response

John Pearson - ISO New England, Inc. - 2

Answer

Document Name

Comment

ISO New England recommends the Standard Drafting Team (SDT) consider scenarios on a regional basis, including:

Ratings - generation (e.g., output derates) and transmission (e.g., ambient adjusted ratings) related to extreme events

Potential concurrent events - e.g., such as fires and corresponding Public Safety Power Shutoffs, impact of weather on fuel availability (unavailability, wellhead production freeze-offs, lack of wind, too much wind that requires turbine shutdown, etc.) and loss of a supply source (e.g., pipeline, railroad service, etc.)

Scenarios should consider the maximum transfers that can reasonably be expected from an external area that is experiencing similar weather.

Finally, the SDT must consider the risk of piling on too many coincident improbable contingencies in an extreme weather event scenario as it will not provide useful planning results.

Likes 0

Dislikes 0

Response

Darcy O'Connell - California ISO - 2

Answer

Document Name	
Comment	
The California ISO supports comments submitted by the ISO/RTO Council Standards Review Committee (SRC).	
Likes 0	
Dislikes 0	
Response	
Andrea Jessup - Bonneville Power Administration - 1,3,5,6 - WECC	
Answer	
Document Name	
Comment	
BPA recommends that a limited set of contingencies should be included for extreme heat and cold weather events. Since the additional scenarios of extreme heat and cold already significantly expand the scope of required studies compared with the present TPL-001-5 Standard, the contingency list should be limited to the most impactful. BPA recommends that an entity should only consider single contingency (P1 events) for the EHV (300 kV and greater) system, or loss of a single transmission element in combination with loss of a single generator. Transmission Planners may elect to run additional contingencies, if needed, based upon their Planning experience.	
Likes 0	
Dislikes 0	
Response	
Bobbi Welch - Midcontinent ISO, Inc. - 2, Group Name ISO/RTO Council Standards Review Committee Project 2023-07 Modifications to TPL-001-5.1	
Answer	
Document Name	
Comment	
The SRC recommends the Standard Drafting Team (SDT) consider contingencies and scenarios on a regional basis, including:	
<ul style="list-style-type: none"> • Outages - for generation and transmission correlated to extreme events • Ratings - generation (e.g., output derates) and transmission (e.g., ambient adjusted ratings) related to extreme events • Potential concurrent events - e.g., such as fires and corresponding Public Safety Power Shutoffs, impact of weather on fuel scarcity (lack of availability, wellhead production freeze-offs, lack of wind, too much wind, etc.) and loss of a supply source (e.g., pipeline, railroad service, etc.) • Extreme (Hot & Cold) weather impacts - in applicable regions, consider generation outages due to unavailability of gas or extreme high winds impacting wind generation resources • In each region, PCs and TPs should gather input from transmission and generator owners and operators to identify additional types of contingencies, beyond normal planning contingencies, that have an increased probability of occurring due to extreme temperatures, particularly as they affect fuel supplies, hydroelectric capability, and wind turbine operation as they are in the best position to provide this information. 	

- Scenarios should consider the maximum transfers that can reasonably be expected from an external area that is experiencing similar weather.

Finally, the SDT must consider the risk of piling on too many coincident improbable contingencies in an extreme weather event scenario as it will not provide useful planning results. In each region, Planning Coordinators in conjunction with their Transmission Planners, should assess the risk of possible contingencies and apply those that are most probable under suitable scenarios.

Likes 0

Dislikes 0

Response

Rachel Coyne - Texas Reliability Entity, Inc. - 10

Answer

Document Name

Comment

Texas RE recommends the standard specify the model scenarios with generation dispatch conditions and facility ratings (if applicable) that represent the extreme weather conditions that need to be studied. In addition to the existing contingencies listed under the current TPL-001-5.1 standard, Texas RE recommends the drafting team consider contingencies due to a wide area wildfire that could impact multiple PC/TP areas, extreme load levels (which should also include capacities of the distribution connected resources that are embedded in the current load forecast, higher heat pump loads or cooling loads), wide area gas curtailment conditions, sudden loss of wind, and solar resources due to atmospheric variations, etc.

Likes 0

Dislikes 0

Response

Pamela Hunter - Southern Company - Southern Company Services, Inc. - 1,3,5,6 - SERC, Group Name Southern Company

Answer

Document Name

Comment

The drafting team should define the benchmark case conditions before determining what contingencies are required. The more severe the benchmark case is, the less severe the contingencies should be. Additionally, requiring CAP items for severe system conditions and contingencies that are less likely (by suggestion of the SAR a 1 in 50-year event), will likely result in CAP items that are not needed which would represent a burden to ratepayers.

Likes 0

Dislikes 0

Response

David Jendras Sr - Ameren - Ameren Services - 1,3,6

Answer	
Document Name	
Comment	
Contingencies: Loss of an entire windfarm or gas pipeline, all wind or solar at 100%. Scenarios: Extreme winter cases, modeling transfers across the system.	
Likes 0	
Dislikes 0	
Response	
Allie Gavin - International Transmission Company Holdings Corporation - 1 - MRO,RF	
Answer	
Document Name	
Comment	
ITC believes that a review of work being proposed within other current NERC SDT should be performed to identify what gaps might exist post the completion of those projects. The scope of this project should be revised following that review.	
Likes 0	
Dislikes 0	
Response	
Kendra Buesgens - MRO - 1,2,3,4,5,6 - MRO, Group Name MRO NSRF	
Answer	
Document Name	
Comment	
No comments.	
Likes 0	
Dislikes 0	
Response	
Daniela Atanasovski - APS - Arizona Public Service Co. - 1,3,5,6	
Answer	

Document Name

Comment

No comment

Likes 0

Dislikes 0

Response

Randall Buswell - VELCO -Vermont Electric Power Company, Inc. - 1

Answer

Document Name

Comment

All contingencies except for extreme contingencies, such as loss of ROW or loss of substations. Known generator limitations would not be contingencies, and would be part of the initial conditions.

For scenarios, the standard may want to consider extreme weather events in the context of extended weather events, as opposed to a single day of extreme weather. For example, long periods of heat tend to increase load more than a single day of heat. Long periods of cold may stress natural gas reserves in some areas more than a single very cold day.

Likes 0

Dislikes 0

Response

Israel Perez - Salt River Project - 1,3,5,6 - WECC

Answer

Document Name

Comment

P0- P7 contingencies should be sufficient
Scenarios should include limitations on import or export capabilities within subregional areas.

Likes 0

Dislikes 0

Response

Jodirah Green - ACES Power Marketing - 1,3,4,5,6 - MRO,WECC,Texas RE,SERC,RF, Group Name ACES Collaborators

Answer	
Document Name	
Comment	
We do not have any additiional specific Contingencies or scenarios that the drafting team should consider at this time.	
Likes 0	
Dislikes 0	
Response	
Andy Thomas - Duke Energy - 1,3,5,6 - SERC,RF	
Answer	
Document Name	
Comment	
Establishing the contingencies and scenarios in the standard would reduce the flexibility to study future postulated events as experience is gained through both performance of studies and operating experience under future extreme weather conditions.	
Likes 0	
Dislikes 0	
Response	
Thomas Foltz - AEP - 3,5,6	
Answer	
Document Name	
Comment	
<p>The future drafting team will need to consider the potential impact of extreme weather on both demand (i.e. load) and generation, as well as impacts to transmission. For example, high demand can be anticipated in high heat scenarios, but high heat may also be associated with lower wind output or higher solar output. There are many potential scenarios and while the team may not need to define them all, they can use appropriate agencies (perhaps National Laboratories) to assist in defining the most likely scenarios that might occur. In addition, transmission ratings may be higher or lower depending on the ambient temperature assumptions, and the team may need to consider how the weather assumptions impact *all* of the variables in a planning case and if the impact is determined to be severe enough to warrant consideration.</p> <p>From a contingency perspective, outages or de-rates of similar generation types across a region (as opposed to a unit-by-unit outage) will need to be incorporated into the analysis. Transmission outages could continue to be deterministic as currently prescribed in the current TPL standard, however additional analyses should be performed to determine if transmission performance has been significantly different during recent periods of extreme weather.</p>	

Likes 0

Dislikes 0

Response

Harishkumar Subramani Vijay Kumar - Independent Electricity System Operator - 2

Answer

Document Name

Comment

The drafting team should get significant input from transmission and generation owners and operators to identify those types of contingencies, beyond the normal planning contingencies, that have an increased probability of occurring due to extreme temperatures, particularly as they affect fuel supplies, hydroelectric capability, and wind turbine operation. They should address the maximum transfers that can reasonably be expected from an external area that is experiencing similar weather.

They must also be aware of the risk of piling on too many coincident improbable contingencies will not provide useful planning results.

Likes 0

Dislikes 0

Response

Mark Garza - FirstEnergy - FirstEnergy Corporation - 1,3,4,5,6, Group Name FE Voter

Answer

Document Name

Comment

FE feels the current TPL-001 standard captures the intent of extreme weather events.

Likes 0

Dislikes 0

Response

Srikanth Chennupati - Entergy - 1,3,5,7 - SERC

Answer

Document Name

Comment

None

Likes 0

Dislikes 0

Response

Kacie Fischer - Oncor Electric Delivery - 1 - Texas RE

Answer

Document Name

Comment

Oncor would like to echo our previous comment that the Planning Coordinator would have the best insight into region-specific issues. If the planning requirements were developed to allow each Planning Coordinator and corresponding Transmission Planners to determine relevant planning contingencies and scenarios, it may be more effective in addressing extreme weather conditions that are unique to each geographical region.

Based on the extreme weather events Oncor has experienced in our portion of the system, we would recommend the drafting team consider the following contingencies/ scenarios when planning for extreme weather:

- Generation dispatch scenarios that are more aligned with real-time operations conditions.
 - This summer we still had 100-degree days well into September, but since the days were shorter, there was less solar generation assistance. Compound that with low wind, and we quickly had low reserve issues.
 - Shorter days towards Fall or days with cloud cover, combined with low wind and an extended heatwave.
 - During severe winter storms, we saw the outage of gas units (due to low pressure) and freezing wind turbines.
- Extreme weather events, such as tornados and hurricanes, should include the outage of a double circuit, other circuits in the same right of way, and multiple autos because those scenarios would be reflective of real-world events. Extreme events should also include consideration of extended outages due to limited or no access to utility facilities without extraordinary construction efforts. We have also seen congestion issues arise due to multiple clustered outages.
- During a few heatwaves, Oncor noticed that some approved transmission outages were not canceled during the onset of the inclement weather. Thus, the drafting committee should consider the potential impact of scheduled outages.

Likes 0

Dislikes 0

Response

Lenise Kimes - City and County of San Francisco - 1 - WECC

Answer

Document Name

Comment

At the cost of being repetitive, scenarios where the weather has been proven to cause a problem such as fire in SW California or tornados in Midwest should be considered.

Likes 0

Dislikes 0

Response

Ben Hammer - Western Area Power Administration - 1,6

Answer

Document Name

Comment

The framework of the existing TPL-001-5.1 Table 1 - Steady State & Stability Performance Extreme Events should define the Contingencies assessed under extreme weather events. Similar to the case representations selected, the event causality and scenarios should be solely the cognizance of the Planning Coordinator and Transmission Planner.

Likes 0

Dislikes 0

Response

Michael Goggin - Grid Strategies - 6 - NA - Not Applicable

Answer

Document Name

[contingencies.docx](#)

Comment

Likes 0

Dislikes 0

Response

3. What potential variants for extreme heat and cold weather events should the drafting team consider that are 1) representative of different planning areas, and 2) assure reasonable consistency between planning areas?

Ben Hammer - Western Area Power Administration - 1,6

Answer

Document Name

Comment

Attempting to craft “variants”, “conditions”, or “scenarios” during the drafting of the TPL-001 modifications will be very difficult and is likely to fail. Instead, the well-understood principle of specifying that the Planning Coordinator and Transmission Planner formulate appropriate System condition representative cases and assess extreme weather Contingency events subject to clear, deterministic System performance criteria will succeed in meeting the FERC directive.

Likes 0

Dislikes 0

Response

Lenise Kimes - City and County of San Francisco - 1 - WECC

Answer

Document Name

Comment

Some type of variants built in, like TPL-007 when considering latitude/longitude, where physical locations are affected more by that extreme event should be considered. For instance, in the WECC area, the NW gets colder than mid CA and the SW gets hotter than mid CA.

Likes 0

Dislikes 0

Response

Kacie Fischer - Oncor Electric Delivery - 1 - Texas RE

Answer

Document Name

Comment

Oncor would like to echo our previous comments that the Planning Coordinator would have the best insight into region-specific issues. Oncor would recommend that generation dispatch levels within the model be consistent with real-world generation levels during extreme summer and winter events.

Likes 0

Dislikes 0

Response

Srikanth Chennupati - Entergy - 1,3,5,7 - SERC

Answer

Document Name

Comment

None

Likes 0

Dislikes 0

Response

Mark Garza - FirstEnergy - FirstEnergy Corporation - 1,3,4,5,6, Group Name FE Voter

Answer

Document Name

Comment

FirstEnergy asks the Drafting Team to provide guidance for response and coordination between planning areas.

Likes 0

Dislikes 0

Response

Harishkumar Subramani Vijay Kumar - Independent Electricity System Operator - 2

Answer

Document Name

Comment

The drafting team should recognize the likely combinations of high heat and humidity, and low temperatures and high wind on increasing demand, while also recognizing their effects on generation.

Likes 0

Dislikes 0

Response

Thomas Foltz - AEP - 3,5,6

Answer

Document Name

Comment

The potential variants will appropriately differ by region, but a common framework will help establish consistency in methodology. Reliability entities should not make differing assumptions, for example on *how* weather events affect the same type of resource, however the scenarios developed may be much different depending on the geography, weather, and resource mix of the region in question.

Likes 0

Dislikes 0

Response

Andy Thomas - Duke Energy - 1,3,5,6 - SERC,RF

Answer

Document Name

Comment

None.

Likes 0

Dislikes 0

Response

Jodirah Green - ACES Power Marketing - 1,3,4,5,6 - MRO,WECC,Texas RE,SERC,RF, Group Name ACES Collaborators

Answer

Document Name

Comment

We suggest that the drafting team consider regional impacts of extreme heat and cold weather events by taking into account local climate information and historical data. To accomplish this task, we recommend considering the climate/weather zones identified by various governmental agencies. For example, the USDA identifies a "Plant Hardiness Zone" for each location in the country. While this data only identifies the average annual minimum winter temperature divided into 10 degF zones, it serves as a good indicator of areas that have similar climates and weather events. Another example of such data is the IECC 2021 Climate zone data provided by the US Department of Energy. This data is intended to be utilized for identify Energy

Efficiency gains in buildings; however, like the aforementioned example from the USDA, we believe it serves as a good indicator of areas with similar weather patterns and climates.

We believe this type of approach will allow each planning area authority to plan for realistic impacts to the BES in its specific planning area while also providing for a consistent approach across planning areas.

Likes 0

Dislikes 0

Response

Israel Perez - Salt River Project - 1,3,5,6 - WECC

Answer

Document Name

Comment

Variants should include the loss of resources dependent on favorable environmental conditions.

Likes 0

Dislikes 0

Response

Randall Buswell - VELCO -Vermont Electric Power Company, Inc. - 1

Answer

Document Name

Comment

This is one area where regional differences are necessary. The ranges of possible weather will be different. Consistency is desirable. To the extent consistency is critical, perhaps we can express weather severity in terms of percent over normal. For example, extreme temperature is defined as 10% over the five-year average of high temperatures.

Likes 0

Dislikes 0

Response

Daniela Atanasovski - APS - Arizona Public Service Co. - 1,3,5,6

Answer

Document Name

Comment

AZPS suggests that the drafting team ensure there is flexibility for regional variance as different regions will have unique weather conditions.

Likes 0

Dislikes 0

Response

Kendra Buesgens - MRO - 1,2,3,4,5,6 - MRO, Group Name MRO NSRF

Answer

Document Name

Comment

No comments.

Likes 0

Dislikes 0

Response

LaTroy Brumfield - American Transmission Company, LLC - 1

Answer

Document Name

Comment

ATC believes that extreme weather coordination and model benchmarking should be handled at the Planning Coordinator level, similar to the approach for TPL-007 (as indicated in page 6 of the SAR)

Likes 0

Dislikes 0

Response

Allie Gavin - International Transmission Company Holdings Corporation - 1 - MRO,RF

Answer

Document Name

Comment

ITC believes that a review of work being proposed within other current NERC SDT should be performed to identify what gaps might exist post the completion of those projects. The scope of this project should be revised following that review. The size of the planning areas should encompass a large geographic area similar to the large geographic areas within an RTO/ISO.

Likes 0

Dislikes 0

Response

David Jendras Sr - Ameren - Ameren Services - 1,3,6

Answer

Document Name

Comment

We ask that the drafting team allow the regions to develop additional criteria after a definition for extreme weather is final.

Likes 0

Dislikes 0

Response

Bobbi Welch - Midcontinent ISO, Inc. - 2, Group Name ISO/RTO Council Standards Review Committee Project 2023-07 Modifications to TPL-001-5.1

Answer

Document Name

Comment

The SDT should recognize the likely combinations of high heat and humidity, and low temperatures and high/low renewable output on increasing demand, while also recognizing their effects on generation in addition to those items mentioned in our response to Questions #1 and 2 above.

Likes 0

Dislikes 0

Response

Andrea Jessup - Bonneville Power Administration - 1,3,5,6 - WECC

Answer

Document Name

Comment

BPA interprets 'variants' to mean sensitivities. BPA recommends only including sensitivities for the most limiting seasonal conditions for specific load areas. For example, most load areas in the BPA footprint have higher-peaking loads in either the winter or summer season which creates the most severe impacts for the load area. The season which is most impactful for that area is the one that should be selected for additional sensitivities to the extreme weather scenario. Potential variants or sensitivities could include: change in generation patterns, change in path flows, variation in the degree of "extreme" weather (i.e., 1 in 10 year expected probability, 1 in 15 year, 1 in 20 year, etc.)

Likes 0

Dislikes 0

Response

Darcy O'Connell - California ISO - 2

Answer

Document Name

Comment

The California ISO supports comments submitted by the ISO/RTO Council Standards Review Committee (SRC).

Likes 0

Dislikes 0

Response

Kennedy Meier - Electric Reliability Council of Texas, Inc. - 2

Answer

Document Name

Comment

ERCOT joins the comments submitted by the IRC SRC for this question and adopts them as its own.

Likes 0

Dislikes 0

Response

Michael Goggin - Grid Strategies - 6 - NA - Not Applicable

Answer

Document Name

Comment

The TPL-001 Standard should be revised to require each Regional Entity to develop the benchmark severe weather events that will be evaluated by all Transmission Planners and Planning Coordinators in that region. The Regional Entities cover large regions but are often subject to the sale type of extreme weather events, so they are well positioned to determine the benchmark for their regions. We recognize that some weather events cross multiple Regional Entities – such as Winter Storms Uri and Elliott that traversed the seams among TRE, MRO, RFC, and SERC. To account for this, the Regional Entities should be required to use the same event when the worst event (after accounting for loss of imports from the other Regional Entities) across the Regional Entities is the same. For those extreme weather events that occur wholly within a sub-region of a Regional Entity, the revised Reliability Standard can allow a Regional Entity to specify different events for parts of their footprint if they can demonstrate events typically affect subregions differently. For example, SERC may need a benchmark hurricane scenario that affects the coastal areas but does not apply to the rest of its footprint. Another option would be to have NERC approve the benchmarks proposed by each Regional Entity for those events that affect either only part of the Regional Entity or cross multiple Regional Entities.

These benchmark events should be based on the best available data concerning the recent historical severe heat, cold, and drought events during which generating supply was most at risk of falling short of demand in that region. For example, FERC could specify that Regional Entities select the events during which operating reserves for the Balancing Authorities (BAs) in that region fell to their lowest levels, or in which spot electricity prices were at a high level for multiple hours. However, simply using historical data, even recent historical data, is not sufficient. As FERC explained in Order 896, extreme weather events “are occurring with greater frequency, and are projected to occur with even greater frequency in the future.” Thus, FERC must also specify that TPL-001 should require the reliability analyses of these benchmark events account for how climate change is increasing their frequency and magnitude.

The use of a common set of events will ensure consistent and comparable results among transmission planning conducted by neighboring BAs, which is essential for evaluating solutions that affect the entire region, like increases in interregional transfer capacity. As FERC explained in Order 896, “Because the impact of most extreme heat and cold events spans beyond the footprints of individual planning entities, it is important that all responsible entities likely to be impacted by the same extreme weather events use consistent benchmark events.”

Likes	0
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Dislikes	0
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Response

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4. Provide any additional comments for the SAR drafting team to consider, if desired.

Kennedy Meier - Electric Reliability Council of Texas, Inc. - 2

Answer

Document Name

Comment

ERCOT joins the comments submitted by the IRC SRC for this question and adopts them as its own.

In addition, ERCOT notes that extreme weather events should be treated as extreme events or sensitivity scenarios rather than as TPL-001 base case studies.

Likes 0

Dislikes 0

Response

John Pearson - ISO New England, Inc. - 2

Answer

Document Name

Comment

The SAR should expand its focus to consider the design of BES facilities (including the expansion of IBR registration criteria and definition of BES facilities, particularly for smaller-sized generators and DER if these types of resources will be a significant portion of supply). It is misguided to create mandatory requirements to “plan” a system to withstand extreme supply shortages or equipment outages resulting from extreme weather (Item F in the SAR description) if all elements are not required to meet the same standards.

Planners should be able to expect that transmission facilities and generation resources are designed to be available and function during reasonably expected extreme weather conditions for an area. While there may be some value in performing system studies of extreme weather scenarios to determine their impact on load level, the value is limited if transmission elements and generation resources are not designed to operate under the same extreme weather conditions since there is no benefit in upgrading transmission systems to deliver power during extreme conditions if distribution systems, DER, and other generation (and fuel supply systems) are not designed to deliver under those same conditions.

Consider developing a new standard modeled after TPL-007. If adopted, this option should:

Clearly articulate how the new standard differs from the existing sensitivity scenario analysis requirements in TPL-001-5.1, parts 2.1.3 and 2.4.3.

Specify which future year or years are intended to be the primary focus on the study.

Provide clear criteria to determine when mitigating action should be taken.

The SAR states “The costs associated are anticipated to be comparable to those associated with a responsible entity’s performance of TPL-007-1 – Transmission System Planned Performance for Geomagnetic Disturbance Events”. What is the basis for this statement? We suggest deleting this sentence.

Revise the sentence stating “In determining the responsible entities that will be developing benchmark planning cases and conducting wide-area studies, the drafting team must ensure there is a mechanism in place to ensure the sharing of data and studies.” to “In determining the responsible entities that will be developing benchmark planning cases and conducting wide-area studies, the drafting team must ensure there is a mechanism in place to ensure the sharing of data and studies.”

To the extent Planning Coordinators and/or Transmission Planners require additional data to study the benchmarking cases, the SAR should allow the standard to require the provision of that data from relevant entities to the PC/TP.

Likes 0

Dislikes 0

Response

Darcy O'Connell - California ISO - 2

Answer

Document Name

Comment

The California ISO supports comments submitted by the ISO/RTO Council Standards Review Committee (SRC) and offers the following supplemental suggestions.

- Extreme weather events should be considered as sensitivity scenarios rather than a TPL-001 base case. This would be more of a long-term planning effort, led by the PC, to develop a matrix of extreme weather event scenarios with studies to be performed at a set frequency. CAISO suggests a frequency of every 5 years with more frequent assessment as needed.
- Attention should be given to jurisdictional concerns related to resource planning in regards to state regulatory authority.

Likes 0

Dislikes 0

Response

Andrea Jessup - Bonneville Power Administration - 1,3,5,6 - WECC

Answer

Document Name

Comment

BPA believes the goal of the new or modified Standard should be to maintain reliability of the backbone EHV transmission system (300 kV and above). For the underlying (below 300 kV) network, load serving entities can shift loads between substations or sectionalize their systems during extreme weather events. Investments for corrective actions, such as transmission reinforcements, would provide the best value if they improve the resilience of the EHV system to withstand extreme heat or cold weather events.

Because extreme weather is considered a sensitivity case, BPA believes the new or modified standard should not require a CAP for one specific single contingency for an Extreme weather Event since the likelihood of one specific element outage occurring is low. The focus should be on fixing an issue that can occur during the extreme weather event for several independent single contingency events.

The existing TPL-001-5 Standard does not require corrective action plans for problems flagged in a single sensitivity; therefore it is not reasonable to require corrective actions for a single sensitivity when we are already studying events that are extreme.

There also appears to be inconsistency in the SAR regarding when Corrective Actions would be required. At one point, the SAR suggests corrective actions would only be required if studies indicate there is potential for cascading. However, later in the SAR, there is an example of proposing corrective actions to prevent thermal overloads. With the existing TPL-001-5 Standard, corrective actions for Extreme Events are intended to reduce the potential for cascading. Requiring corrective actions for thermal or voltage issues is not consistent with how the TPL Standard for Extreme Events is structured.

The SAR mentions the need to identify the responsible entities for developing the extreme weather cases and performing the studies. The following statement was copied from the SAR: *“The drafting team is to (1) designate the responsible entities responsible for developing benchmark planning cases, and (2) specify which responsible entities have an obligation to conduct wide-area studies under the new or modified Standard.”*

Given the emphasis on a “wide area approach” to these studies, it is suggested that in the west, WECC may be in a better position to be the responsible entity to develop these cases and perform the studies rather than individual TP’s or PC’s which have more limited geographical areas.

BPA recommends that extreme heat/cold weather should be referred to as extreme **conditions** rather than extreme **events**, which implies extreme contingencies in the context of the TPL-001-5 Standard.

Likes 0

Dislikes 0

Response

Stephen Stafford - Georgia Transmission Corporation - 1 - SERC

Answer

Document Name

Comment

The proposed requirements should not be added to TPL-001; they should instead be added to a new standard with a less frequent periodicity of study than TPL-001.

When considering the requirement of corrective action plans (CAP) to mitigate specified instances where performance requirements during extreme heat and cold weather events are not met, the drafting team should consider the following:

- Performance requirements should be reasonable relative to the extremity and probability of the case/scenario compounded by the extremity and probability of the required contingencies. In short, the set of system performance requirements for the new standard might be less stringent than that of TPL-001.
- The requirement of a CAP should also be reasonable relative to the probability of occurrence of the causal severe system conditions & extreme contingency combination. The requirement should not result in expensive corrective actions to resolve issues with a very low probability of occurrence and/or a moderate consequence.
- In the Southeastern Region of SERC, the impacts of extreme weather events have primarily been related to resource adequacy issues, not transmission issues. This might prove to be the case in other regions as well. Transmission projects may not be the best solution to resource adequacy problems. As such, the CAP requirements should include limited load shedding options.

Likes 0

Dislikes 0

Response

Pamela Hunter - Southern Company - Southern Company Services, Inc. - 1,3,5,6 - SERC, Group Name Southern Company

Answer

Document Name

Comment

The drafting team should consider making this its own TPL standard and not placing it in TPL-001. By doing this, the analysis could be performed on a different frequency (e.g., every five years instead of annually) criteria. This is consistent with how TPL-007 was handled.

Performance requirements should be reasonable relative to the extremity and probability of the case/scenario compounded by the extremity and probability of the required contingencies. In short, the set of system performance requirements for the new standard would be appropriately established.

The drafting team should leverage the Eastern Interconnection Planning Collaborative (EIPC) to assist with the identification and development of any benchmark planning cases that are to be created and assign the EIPC full responsibility for wide-area studies from an Eastern Interconnection perspective under any new or modified standard. The EIPC is comprised of registered Planning Coordinators who represent the majority of transmission planning for the Eastern Interconnection and are uniquely situated to perform such studies.

In the Southeastern Region of SERC, the impacts of extreme weather events have primarily been related to resource adequacy issues, not transmission issues. This might prove to be the case in other regions as well. Transmission projects may not be the best solution to resource adequacy problems. As such, the CAP requirements should include the option of limited load shedding.

Likes 0

Dislikes 0

Response

Bobbi Welch - Midcontinent ISO, Inc. - 2, Group Name ISO/RTO Council Standards Review Committee Project 2023-07 Modifications to TPL-001-5.1

Answer

Document Name [2023-07_Unofficial_Comment_Form_SRC_09-27-23_final.docx](#)

Comment

The SRC makes the following recommendations:

1. The SAR should expand its focus to consider the design of BES facilities (including the expansion of IBR registration criteria and definition of BES facilities, particularly for smaller-sized generators and DER if these types of resources will be a significant portion of supply). It is misguided to create mandatory requirements to “plan” a system to withstand extreme supply shortages or equipment outages resulting from extreme weather (Item F in the SAR description) if all elements are not required to meet the same standards.

Planners should be able to expect that transmission facilities and generation resources are designed to be available and function during reasonably expected extreme weather conditions for an area. While there may be some value in performing system studies of extreme weather scenarios to determine their impact on load level, the value is limited if transmission elements and generation resources are not designed to operate under the same extreme weather conditions since there is no benefit in upgrading transmission systems to deliver power during extreme conditions if distribution systems, DER, and other generation (and fuel supply systems) are not designed to deliver under those same conditions.

2. Consider developing a new standard modeled after TPL-007. Whether or not this option is adopted, **the standard should:**

- Clearly articulate how the new standard differs from the existing sensitivity scenario analysis requirements in TPL-001-5.1, parts 2.1.3 and 2.4.3.
- Be led by the PC, working in conjunction with its TPs, to develop a matrix of extreme weather event scenarios with studies to be performed periodically. (Periodicity to be defined in the standard development process.)
- For outages, suggest identifying a subset of contingencies for extreme weather events such as P0, P1, and P7 rather than the whole set of contingencies outlined in TPL-001 standard.
- Specify the time domains to be addressed. There is no single time snap scenario that works. Most of the events needing study are not just “extreme” in temperature for example, but are also generally long in duration (wildfires, hurricanes, winter storms, heat waves, etc.). This means the scenarios need to cover various time periods within the event – not just during summer or winter peak.
- Specify which future year or years are intended to be the primary focus on the study.
- If an extreme event affects multiple regions, the standard should provide a mechanism to coordinate inter-regional benchmark planning cases.

3. The results of the study need to be actionable. To ensure this, there must be clear criteria to determine when mitigating action is to be taken. Corrective Action Plans that result from the studies should address credible potential problems and scenarios; layering too many extreme situations on top of each other (which is a particular concern here, since extreme weather scenarios already have extreme situations built in to a certain degree) could result in resources being allocated disproportionately towards addressing low probability events.

4. The SAR states “The costs associated are anticipated to be comparable to those associated with a responsible entity’s performance of TPL-007-1 – Transmission System Planned Performance for Geomagnetic Disturbance Events”. What is the basis for this statement? We suggest deleting this sentence.

5. Revise the following sentence:

“In determining the responsible entities that will be developing benchmark planning cases and conducting wide-area studies, the drafting team must ensure there is a mechanism *in* place to ensure the sharing of data and studies.”

6. To the extent probabilistic approaches are incorporated, the implementation plan for the standard should allow for modeling changes.[\[1\]](#)

7. Likewise, to the extent Planning Coordinators and/or Transmission Planners require additional data; e.g. generator availability and operability, to study the benchmarking cases, the SAR should allow the standard to require the provision of that data from relevant entities to the PC/TP.

8. To properly build and dispatch models, we will need clarity on generator availability and operability. Knowing the generators that will be available on extreme conditions will be challenging. The chart provided in the attachment illustrates if you push temperatures to either extreme, eventually generators are not able to operate in those extreme cold or heat due to either environmental, equipment, or fuel supply limitations as observed in the polar vortex and in Winter Storm Elliott. Similarly, time of day matters, we may have plenty of generation on a sunny, extreme heat afternoon that dramatically reduces as the sun goes down; units that generally would be relied on to pick up load as the sun goes down may encounter extreme heat limitations (cooling water discharge limits, GSU max temp limits, etc.). Thus, an extreme summer peak afternoon case may not provide the dispatch of concern for an extreme heat weather scenario. On the other extreme, as extreme freezing temperatures are experienced, units relying on water cooling

will eventually struggle. Add in heavy snow or freezing rain and other operating challenges are introduced. Then consider fuel delivery issues. To properly build and dispatch models, we will need clarity on generation availability issues also in these scenarios and inputs.

[1] We...direct NERC to determine during the standard development process whether probabilistic elements can be incorporated into the new or modified Reliability Standard and implemented presently by responsible entities. If NERC identifies probabilistic elements which responsible entities can feasibly implement and that would improve upon existing planning practices, we expect the inclusion of those methods in the proposed Reliability Standard. (Paragraph 134)

Likes 0

Dislikes 0

Response

David Jendras Sr - Ameren - Ameren Services - 1,3,6

Answer

Document Name

Comment

We recommend that the SDT consider utilizing the IEEE standards for equipment operating temperature. In addition, we believe a definition of what extreme heat and cold weather events are needs to address all the regions separately because they are each vastly different. Finally, we are concerned that to benchmark planning cases would be a burden because they change every year as the resource mix is constantly changing.

Likes 0

Dislikes 0

Response

Allie Gavin - International Transmission Company Holdings Corporation - 1 - MRO,RF

Answer

Document Name

Comment

ITC supports the EEI comments to question 4 with the addition that ITC believes the studies should be performed at the macro level covered by typically RTO/ISOs.

Likes 0

Dislikes 0

Response

LaTroy Brumfield - American Transmission Company, LLC - 1

Answer

Document Name

Comment

ATC believes that extreme weather coordination and model benchmarking should be handled at the Planning Coordinator level, similar to the approach for TPL-007 (as indicated in page 6 of the SAR).

ATC believes that updating the benchmark cases every five years is reasonable, similar to the approach for TPL-007. These studies would be too onerous to conduct annually.

- A five-year timeline would be better supported under a new Reliability Standard.

ATC cautions that scenarios should be reasonable to avoid requiring Corrective Action Plans that could be prohibitively expensive and labor-intensive.

- Concerns on building for low-probably events; what if state does not agree? Events should be actionable and address events that are probable.

- There seems to be a directive of mitigations but not a directive of the review of associated potential projects (mitigations) with a cost-benefit analysis.

If the SDT creates a definition for "wide-area," ATC cautions that this term is used in other NERC Reliability Standards.

Bulk power systems (BPS) should be replaced with Bulk Electric Systems (BES) throughout the SAR and any developed new or modified standard. BPS is not clearly defined in the NERC glossary of terms whereas BES is clearly defined. BPS seems to leave open the potential for NERC over-reach into <100 kV systems.

Probabilistic analysis of the likelihood of these events is not in the SAR, especially to justify projects/costs to mitigate. Probability distribution was mentioned in the development of benchmark cases.

Likes 0

Dislikes 0

Response

Daniel Gacek - Exelon - 1,3

Answer

Document Name

Comment

Exelon supports the comments to Question #4 submitted by the EEI.

Likes 0

Dislikes 0

Response	
Kendra Buesgens - MRO - 1,2,3,4,5,6 - MRO, Group Name MRO NSRF	
Answer	
Document Name	
Comment	
<p>NERC should work with industry to ensure NERC standards do not put industry in a position where federal standards mandate construction for low probability or forecasted events and states could disagree. The NERC SDT must strike an appropriate balance between reliability, affordability and impacts on rate payers. Hardening the system against all potential weather contingencies may not be possible, could be cost prohibitive or deemed not prudently incurred and thus not recoverable. Corrective Actions Plans developed pursuant to this project must be not only be actionable but address those outcomes that are probable.</p> <p>Additionally, there are multiple projects currently that may have cross over with each other. NSRF would recommend that NERC review open projects and coordinate amongst drafting teams and consolidate where appropriate to promote efficiency in managing standard projects (e.g., Project 2022-03).</p>	
Likes	0
Dislikes	0
Response	
Junji Yamaguchi - Hydro-Quebec (HQ) - 1,5	
Answer	
Document Name	
Comment	
<p>While we recognize that the normal and extreme natural events in the Transmission Planning Energy Scenario SAR does not include extreme heat and cold as addressed in the FERC Order 896, consideration should be taken to combine these two SARs.</p>	
Likes	0
Dislikes	0
Response	
Daniela Atanasovski - APS - Arizona Public Service Co. - 1,3,5,6	
Answer	
Document Name	
Comment	
<ul style="list-style-type: none"> Given the large scope of the existing TPL-001 standard, AZPS recommends that a New Reliability Standard be created to address the directed scope as defined by FERC Order 896. 	

- AZPS considers the planning obligations, as defined in this SAR, to be too excessive to be reasonably conducted on an annual basis. For this reason, AZPS recommends that the planning studies described in Order 896, and this SAR, be conducted on a planning cycle of 3 to 5 calendar years.
- AZPS also recommends that mitigations directed by FERC Order 896, be limited to those events that are reasonably likely to happen in order to limit significant financial impacts that do not improve reliability.

Likes 0

Dislikes 0

Response

Nicolas Turcotte - Hydro-Quebec (HQ) - 1,5

Answer

Document Name

Comment

While we recognize that the normal and extreme natural events in the Transmission Planning Energy Scenario SAR do not include extreme heat and cold as addressed in the FERC Order 896, consideration should be taken to combine these two SARs.

Likes 0

Dislikes 0

Response

Randall Buswell - VELCO -Vermont Electric Power Company, Inc. - 1

Answer

Document Name

Comment

TPL-001 focuses on transmission capacity under various system conditions. Resource adequacy should also be part of the discussion, and in some parts of the country energy adequacy may be a concern. (i.e. In the northeast, an extreme weather event could be an extended cold snap that stresses natural gas reserves and therefor resource adequacy.) As see in previous extreme weather events. The availability of the generation resources could be compromised due to extreme temperature conditions. Situations such as the downgrade of available solar PV capacity due to extreme heat or unavailability of gas powered resources due to extreme cold.

Secondly, the revised standard needs to be clear whether the performance requirements are the same under normal and extreme weather conditions. And if different, the expectations need to be clear. For example, the standard could state the amount of load and generation that can trip during extreme events, how much support should be relied upon from neighboring control areas, what operational actions are acceptable, and what corrective actions are appropriate.

Likes 0

Dislikes 0

Response

Mark Gray - Edison Electric Institute - NA - Not Applicable - NA - Not Applicable

Answer

Document Name

Comment

EEI offers the following suggested comments for SDT consideration:

1. Given the intended scope of this SAR and the technical differences with TPL-001-5.1, EEI suggests that a new Reliability Standard be created to address the directed scope as defined within FERC Order No. 896.
2. While EEI does not oppose the proposed scope set forth in this SAR, the planning obligations, as defined in this SAR, are too onerous to be reasonably conducted on an annual basis. For this reason, we ask that the planning studies mandated by Order No. 896, and this SAR, be conducted on a planning cycle of 3 calendar years or greater.
3. EEI is additionally concerned that mitigations directed under FERC Order No. 896, if not limited in scope, could have significant financial impacts on companies. Reliability and affordability must be considered.

Likes 0

Dislikes 0

Response

Ruida Shu - Northeast Power Coordinating Council - 1,2,3,4,5,6,7,8,9,10 - NPCC, Group Name NPCC RSC

Answer

Document Name

Comment

While we recognize that the normal and extreme natural events in the Transmission Planning Energy Scenario SAR do not include extreme heat and cold as addressed in the FERC Order 896, consideration should be taken to combine these two SARs.

Likes 0

Dislikes 0

Response

Israel Perez - Salt River Project - 1,3,5,6 - WECC

Answer

Document Name

Comment

The best outcomes will be derived from regional or sub regional efforts.

Likes 0

Dislikes 0

Response

Jodirah Green - ACES Power Marketing - 1,3,4,5,6 - MRO,WECC,Texas RE,SERC,RF, Group Name ACES Collaborators

Answer

Document Name

Comment

We believe the appropriate approach for developing benchmark events is to use a probability distribution.

Thanks you for the opportunity to comment.

Likes 0

Dislikes 0

Response

Andy Thomas - Duke Energy - 1,3,5,6 - SERC,RF

Answer

Document Name

Comment

The SAR should further elaborate on the “The drafting team should consider the cost impacts to responsible entities.” comment in Section I (Other Extreme Weather-Related Events and Issues). Specifically, what cost impacts are being referred to – the cost of performing the analysis or something else such as cost of corrective actions?

To the extent that extreme weather leads to lost generation resources, it is unclear how corrective action plans in transmission space can address that loss. Although additional resources may seem to be the solution, resource adequacy has typically been a state jurisdictional issue. Project 2022-03 (Energy Assurance with Energy Constrained Resources) will require entities to perform energy reliability assessments to evaluate energy assurance and develop Corrective Action Plan(s) to address identified risks. That project will be looking at both near term and long-term planning. Assessment of Operating Reserves and Planning Margins will most likely be discussed in that project.

Likes 0

Dislikes 0

Response

Thomas Foltz - AEP - 3,5,6

Answer

Document Name

Comment

AEP requests that the drafting team provide clarity regarding the establishment of a minimum performance criteria. While AEP believes that the performance criteria could be the same as in the current TPL standard, the scenarios studied will likely need to consider different load/generation scenarios involving a wider variety of multi-contingency events (e.g., multiple generator outages coupled with transmission outages). The SDT will need to consider both the similarities and differences between the current performance criteria, and the criteria necessary for more extreme scenarios. In addition, the SDT will need to consider the frequency of these studies as well as their impact on the resources required to perform them. While the studies currently in the TPL-001 standard are performed on an annual basis, such periodicity may not be necessary for new studies involving more extreme scenarios.

Responsible entities will need the flexibility to use sound engineering judgement in these plans, rather than be obligated to take prescriptive measures that may not be the best for every situation. As one example, while Corrective Action Plans would be a key component in this proposed SAR, care should be taken so that load shed is not relied upon as a sole mitigating measure.

Likes 0

Dislikes 0

Response

Harishkumar Subramani Vijay Kumar - Independent Electricity System Operator - 2

Answer

Document Name

Comment

The current standard applies to Planning Coordinators and their respective areas. To cover a much wider view as required in the FERC order, the standard should be instructive as to the minimum expectation to accomplish a wide area coverage, for example, a study led by one planning coordinator must include a view of all adjacent (or two adjacent over) planning coordinators.

The drafting team should work to adopt a wide area co-operation and involvement requirement, if at all possible, rather than introducing a new responsible entity.

Likes 0

Dislikes 0

Response

Mark Garza - FirstEnergy - FirstEnergy Corporation - 1,3,4,5,6, Group Name FE Voter

Answer

Document Name**Comment**

FirstEnergy supports EEI's comments which state:

EEI offers the following suggested comments for SDT consideration:

1. Given the intended scope of this SAR and the technical differences with TPL-001-5.1, we suggest that a new Reliability Standard be created to address the directed scope as defined within FERC Order 896.

2. While EEI does not oppose the proposed scope as defined in this SAR, the planning obligations, as defined in this SAR, are too onerous to be reasonable conducted on an annual basis. For this reason, we ask that the planning studies as envisioned in Order 896, and this SAR, be conducted on a planning cycle of 3 calendar years or greater.

3. EEI is additionally concerned that mitigations directed under FERC Order 896, if not limited in scope, could have significant financial impacts on companies. Reliability and affordability must be considered.

Likes 0

Dislikes 0

Response

Srikanth Chennupati - Entergy - 1,3,5,7 - SERC

Answer**Document Name****Comment**

1. Entergy recommends SDT to create a separate new standard and not simply a revision to TPL-001-5.1.
2. The standard should specifically address the Generator Owner (GO) role in study and corrective action plan.
3. Sensitivities should not simply be "worse than base case" instead they should focus on how load and generation availability vary within parts of study region due to variation in temperatures across the study region.

Likes 0

Dislikes 0

Response

Kacie Fischer - Oncor Electric Delivery - 1 - Texas RE

Answer**Document Name****Comment**

Could the SAR committee provide further insight into how corrective action plans from Transmission Providers might significantly mitigate violations that occur during extreme weather events? From our experiences, the lack of dispatchable generation during extreme weather has been the main hindrance to reliability.

Likes 0

Dislikes 0

Response

Lenise Kimes - City and County of San Francisco - 1 - WECC

Answer

Document Name

Comment

1. This is sounding a lot like a whole new TPL standard. As a small entity, it is increasingly harder to add another study. For instance, TPL-001 and TPL-007 had requirements that needed to be adhered to in 2023. TPL-007 had requirements to be implemented in January. TPL-001 had requirements to be implemented a few months later but to be compliant there were 2 options: the first was to have the 2022 planning assessment compliant before December 31 or run a whole other planning assessment mid-year 2023. HHWP chose the first option, so this caused us to have to perform 2 lengthy studies before December 31 of 2022. In a nutshell... consider the little "guys".

2. It is suggested that there be consideration for hydro units (or any generating unit) that may never experience mechanical or design complications due to hot or cold weather. For instance, HHWP hydro units are in a temperature-controlled environment and will likely never experience a weather event that will shut them down. Maybe there can be a question in the standard that determines if a study would even need to be done at all.

3. Additionally, it is suggested that there be a customer load capacity (MW) to determine if a study needs to be performed. HHWP's maximum load is 10MW with loads separated by a large distance. There wouldn't be a huge impact to any NERC entity if any one load were lost due to extreme weather.

Likes 0

Dislikes 0

Response

Alan Kloster - Evergy - 1,3,5,6 - MRO

Answer

Document Name

Comment

Evergy supports and incorporates by reference the comments of the Edison Electric Institute for question #4.

Likes 0

Dislikes 0

Response	
Ben Hammer - Western Area Power Administration - 1,6	
Answer	
Document Name	
Comment	
<p>The Project 2022-02 (Modifications to TPL-001 and MOD-032) drafting team is already underway to modify TPL-001. It would be more consistent with prior TPL-001 modifications practices and better leverage resources to modify the Project 2022-02 SAR with desired parts of the “Modifications to TPL-001-5.1 Transmission System Planning Performance Requirements for Extreme Weather” SAR and allow the existing TPL-001-5.1 SDT guide the draft modifications.</p>	
Likes 0	
Dislikes 0	
Response	
Michael Goggin - Grid Strategies - 6 - NA - Not Applicable	
Answer	
Document Name	GETs.docx
Comment	
Likes 0	
Dislikes 0	
Response	