UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

Climate Change, Extreme Weather, and Electric System Reliability	**)** **)**	**Docket No. AD21-13-000**

COMMENTS OF THE NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

The North American Electric Reliability Corporation ("NERC") hereby provides comments in response to the Supplemental Notice of Technical Conference Inviting Comments issued in this proceeding on March 15, 2021.[1] As the Commission-certified electric reliability organization ("ERO"),[2] NERC is responsible for the development and enforcement of mandatory Reliability Standards for the reliable operation of the bulk-power system[3] and for performing periodic assessments of the reliability and adequacy of the bulk-power system in North America.

The North American bulk-power system is undergoing major transformation that must be understood and planned for to preserve reliability. A rapidly changing generation resource mix is driving this transformation. Traditional baseload generation plants are retiring, while significant amounts of new natural gas and variable energy generating resources are being developed. During

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[1] Supplemental Notice of Technical Conference Inviting Comments, *Climate Change, Extreme Weather, and Electric System Reliability*, Docket No. AD21-13-000 (March 15, 2021) [hereinafter Supplemental Notice].

[2] The Federal Energy Regulatory Commission ("Commission") certified NERC as the ERO in 2006. *N. Am. Elec. Reliability Corp.*, 116 FERC ¶ 61,062 (2006), *order on reh'g and compliance*, 117 FERC ¶ 61,126 (2006), *order on compliance*, 118 FERC ¶ 61,030 (2007), *order on clarification and reh'g*, 119 FERC ¶ 61,046 (2007), *aff'd sub nom. Alcoa Inc. v. FERC*, 564 F.3d 1342 (D.C. Cir. 2009).

[3] Section 215 of the Federal Power Act (16 U.S.C. § 824o(a)(1)) defines the term "bulk-power system" as:

> (A) facilities and control systems necessary for operating an interconnected electric energy transmission network (or any portion thereof); and
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> (B) electric energy from generation facilities needed to maintain transmission system reliability.
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> The term does not include facilities used in the local distribution of electric energy.

this transition, natural gas-fired generation is becoming more critical to provide both "bulk energy" and "balancing energy" to support the integration of variable energy resources. Extreme weather exacerbates the challenges of the transforming grid while also stressing the system in unique ways. Further, stresses on other critical infrastructures, such as the natural gas system that the electric system depends upon, can impact the reliable operation of the bulk-power system. This transition requires the electric industry to reconsider how the system is planned and operated.

With a highly reliable and secure bulk-power system at the core of NERC's mission, NERC is focused on proactively addressing the reliability risks of the transforming grid. These comments reflect NERC's long time focus on bulk-power system reliability through numerous assessments, which have identified areas of risk as well as key observations and steps for consideration to further assure reliability and resilience during this transformation. These comments also address current standard development activities to address the risks posed by extreme cold weather specifically, and other enhancements that are being considered to address fuel concerns during extreme weather conditions more generally. To the extent the FERC/NERC staff inquiry on the February 2021 cold weather event[4] recommends further standards modifications to help assure reliability during extreme cold weather conditions, NERC is prepared to act promptly on any such recommendations.

NERC thanks the Commission and its staff for the opportunity to provide comments in this proceeding.

[4] *See* FERC, Press Release, *FERC, NERC to Open Joint Inquiry into 2021 Cold Weather Grid Operations*, https://www.ferc.gov/news-events/news/ferc-nerc-open-joint-inquiry-2021-cold-weather-grid-operations.

I. NOTICES AND COMMUNICATIONS

Notices and communications with respect to this filing may be addressed to the following:[5]

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II. NERC COMMENTS

In these comments, NERC addresses the following topics from the Supplemental Notice:

- Question 1: Significant challenges posed to electric system reliability due to climate change and extreme weather events;
- Question 2 – Impacts of extreme weather events on the electric system;
- Question 4 -Electric system reliability challenges associated with "common mode failures" and climate change or extreme weather events;
- Question 5 – Potential improvements to coordinated operations and planning between energy systems (e.g., the natural gas and electric power systems) that would help reduce risk factors related to common mode failures;
- Question 6 - How NERC, as the ERO, is evaluating and addressing challenges posed to electric system reliability due to climate change and extreme weather events;
- Questions 7 and 10 – How NERC is considering extreme weather issues in its assessments;

[5] Persons to be included on the Commission's service list are identified by an asterisk. NERC and NPCC respectfully request a waiver of Rule 203 of the Commission's regulations, 18 C.F.R. § 385.203, to allow the inclusion of more than two persons on the service list in this proceeding.

- Question 8 – Measures being considered by NERC to harden facilities against extreme weather events;

- Question 16 – Opportunities to improve Reliability Standards in order to address vulnerabilities to the bulk power system due to climate change or extreme weather events.

NERC's comments are organized as follows. Section II.A. discusses NERC's work, through its reliability assessments, to assess electric system risks due to extreme weather thorough the lens of the rapidly changing resource mix, addressing in whole or in part Questions 1, 2, 4, 5, 6, 7, and 10 from the Supplemental Notice. Section II.B discusses considerations specific to the increasing reliance on natural gas as a fuel source, addressing in part Questions 4 and 5. Section II.C discusses current efforts underway at NERC to revise the Reliability Standards to address the risks posed by cold weather specifically, and consider other Reliability Standards enhancements to address extreme weather more generally. This discussion addresses in whole or in part Questions 6, 8 and 16 from the Supplemental Notice.

A. Assessing Electric System Risk Due to Extreme Weather Conditions and Impacts of Recent Extreme Weather Events (Questions 1, 2, 4, 5, 6, 7, 10)

Section 215(g) of the Federal Power Act requires NERC, as the Commission-certified ERO, to assess the reliability and adequacy of the North American bulk-power system.[6] Through its reliability assessments, NERC evaluates the performance of the bulk-power system, identifies reliability trends, anticipates challenges, and provides a technical platform for important policy discussions. The breadth and fidelity of NERC assessments evolve with the understanding of risk and improved tools. As the resource mix has shifted to be increasingly reliant on variable energy resources such as wind and solar, and "just in time" natural gas deliveries, NERC began introducing fuel risks into its seasonal assessments and developed more probabilistic analysis of

[6] 16 U.S.C. §824o(g).

reliability. By identifying and quantifying emerging reliability and resilience issues, NERC provides risk-informed recommendations and supports a learning environment for industry to pursue improved reliability performance. These recommendations, along with the associated technical analysis, provide the basis for actionable enhancements to NERC Reliability Standards, as well as resource and transmission planning methods, planning and operating guidelines, and security considerations. In short, NERC's independent assessments provide critical insights necessary for assuring reliability and security of a rapidly changing electricity sector while managing the near-, medium-, and long-term challenges posed to reliability by extreme weather that are the subject of this proceeding.

Extreme weather events are having greater impacts on the reliability of the bulk-power system, and these impacts are largely attributable to the rapid transformation of the grid in recent years. Applying peak demand scenarios, the *2020/2021 Winter Reliability Assessment* includes the below map depicting regions in North America where there is heightened reliability risk due to potential extreme weather or fuel supply disruptions. In this assessment, NERC warns of the potential for extreme generation resource outages due to severe weather in winter and summer, and the potential need for grid operators to employ operating mitigations or Energy Emergency Alerts ("EEAs") to meet peak demand.[7] The assessment highlights that during extreme and prolonged winter conditions, vital natural-gas fuel supplies for electricity generation can be at risk in New England, California and the southwestern United States. Namely, though sufficient capacity is available, the ability to provide energy during these extreme and prolonged winter conditions is challenging. High reliance on natural gas-fired generation and limited natural gas infrastructure elevates reliability risk in some of these areas. In others, the dependence on plant

[7] NERC, *2020-2021 Winter Reliability Assessment* (Nov. 2020), at 6, 27, https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_WRA_2020_2021.pdf.

winterizations and electric loads used to winterizing natural gas facilities elevates the risk. For this assessment, NERC analyzed severe weather scenarios that incorporated generation outages under peak load conditions. NERC noted particular reliability risk in areas within the Midcontinent Independent System Operator ("MISO"), the Canadian Maritimes, Texas, the Rocky Mountain Reserve Group and the Northwest Power Pool.

Over the years, NERC's assessments have continued to identify three areas of primary concern: New England, Texas, and California. While recent events in the central-south and western parts of the country have attracted national attention, New England is another assessment area that NERC has identified as particularly vulnerable to extreme cold weather. With proper planning, including consideration not only of historic temperature averages but also consideration of conditions during extreme weather events and the linkage between critical infrastructures, the risks associated with extreme weather and the changing resource mix can be mitigated.

1. New England

New England's exposure to extreme weather is exacerbated by its limited pipeline capacity to import gas and its dependence on a handful of critical fuel assets. NERC has continually identified fuel supply risk in New England, noting, "A standing concern is whether there will be sufficient electrical energy available to satisfy electricity demand while satisfying operating reserves during an extended cold spell given the existing resource mix and seasonally-constrained, fuel delivery infrastructure." [8] New England attempts to mitigate fuel security concerns through dual-fuel capability in its natural gas fleet, and steam boiler generators that are predominately fifty or more years-old. A cold snap in December 2017/January 2018 led to limited natural gas availability to electric generation due to pipeline constraints. Fuel oil was burned to preserve

[8] *2020-2021 Winter Reliability Assessment* at 18.

reliability. If the cold weather had not dissipated after Monday, January 8, and extended further into the work week, the remaining fuel oil in inventory would have been exhausted and ISO New England would have been forced into load shedding to preserve reliability. It was a near-miss event.

2. Electric Reliability Council of Texas ("ERCOT")/Texas

NERC's assessments have consistently highlighted reliability risk in Texas. As far back as nine years ago, the *2012 Long-Term Reliability Assessment* expressed this warning about ERCOT:

> Starting as early as next year, the [ERCOT] Planning Reserve Margin is projected to be below the NERC Reference Margin Level. Specifically, for 2013 the Anticipated Reserve Margin of 13.4 percent is below the ERCOT planning target (NERC Reference Margin Level) of 13.75 percent. At these levels, the risk of insufficient generation resources to meet peak demand increases beyond the accepted target. Throughout the 10-year assessment period, the Planning Reserve Margin continues to degrade and is projected to fall below five percent by 2017 and approximately zero by 2020 if more resources are not acquired.[9]

ERCOT's tight reserve margins have been a standing concern in NERC's assessments. In the most recent *2020/2021 Winter Reliability Assessment*, NERC warns of the potential for extreme generation resource outages in ERCOT due to severe weather in winter and summer, and the potential need for grid operators to employ operating mitigations or energy emergency alerts to meet peak demand.[10] NERC's *2020 State of Reliability* report finds that Texas continues to have insufficient resources to meet the reference margin level but still successfully met demand throughout the 2019 summer season.[11] NERC's *2020 Long-Term Reliability Assessment* points to

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[9] NERC, *2012 Long-Term Reliability Assessment* (Nov. 2012) at 11, https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/2012_LTRA.pdf.

[10] *2020-2021 Winter Reliability Assessment* at 6, 27.

[11] NERC, *2020 State of Reliability: an Assessment of 2019 Bulk Power System Performance* at ix (Jul. 2020), https://www.nerc.com/pa/RAPA/PA/Performance%20Analysis%20DL/NERC_SOR_2020.pdf.

low operating reserves during the summer and during the months of March and October of the study years (2022 and 2024).[12]

Extreme, record-breaking arctic weather descended upon the central part of the nation during the second week of February 2021, forcing power outages throughout the region. States in the middle south were especially hard hit, particularly Texas where the extreme cold forced generators offline, resulting in a massive deficit of energy to serve customers during record winter demand conditions. The system operator for the majority of Texas –ERCOT – was forced to order unprecedented load shedding as a last resort measure to restore frequency and protect system stability. At its peak, 51,173 MW of generation across *all* fuel types within ERCOT were unavailable, approximately 48% of total installed capacity.[13] ERCOT's preliminary analysis found that approximately 54% of those outages were related to weather, with another 12% of the outages attributable to fuel limitations.[14] (FERC, NERC, and the Regional Entities are currently conducting a separate, independent joint inquiry.) The crisis lasted more than a week, ultimately subjecting more than 4 million Texans to localized blackouts and millions more to a range of compounding impacts. Many municipal water systems failed with 14 million under boil-water notices. Natural gas deliveries were curtailed due to frozen infrastructure exacerbated by the loss of electricity that was to be used to winterize the natural gas wellheads, processing plants and

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12 NERC, *2020 Long-Term Reliability Assessment* (Dec. 2020) at 6, https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_LTRA_2020.pdf.

13 ERCOT, *Review of February 2021 Extreme Cold Weather Event,* Presentation to ERCOT Board of Directors (Feb. 24, 2021), http://www.ercot.com/content/wcm/key_documents_lists/225373/2.2_REVISED_ERCOT_Presentation.pdf; *see also* ERCOT, *February 2021 Extreme Cold Weather Event: Preliminary Report on Causes of Generator Outages and Derates*, Public Utility Commission of Texas Project No. 51878 (filed Apr. 6, 2021), http://www.ercot.com/content/wcm/lists/226521/51878_ERCOT_Letter_re_Preliminary_Report_on_Outage_Causes.pdf (revising estimated generator outages during the event and providing preliminary analysis of the causes).

14 ERCOT, February 2021 Extreme Cold Weather Event at 8. ERCOT reported that the remaining unavailable capacity was due to existing outages (15%), equipment issues (14%), transmission loss (2%), miscellaneous causes (1%), or frequency related causes (2%).

compressor stations, and little to no dual-fuel capability was available in Texas. Although not unexpected, resources such as solar and wind were only able to provide a fraction of their nameplate capacities. Solar resources are always subject to limited output due to cloud or snow cover, and extreme cold conditions (low wind, ice accumulation, or low temperatures) can affect wind generation. During this event, nuclear generation was also affected. This event demonstrates that no form of generation is immune to extreme cold conditions, and it serves as a sobering reminder of the essentiality of electric service to support all other critical infrastructures. And, most tragically, lives were lost in the crisis.

While the scale in Texas was especially dramatic, extreme winter weather also caused significant forced outages and load shedding in states throughout the central part of the country from North Dakota to Louisiana. To maintain system stability, MISO ordered 1,430 MW of load shedding on February 16, affecting citizens from southern Louisiana, Arkansas, Mississippi, east Texas, and Illinois. MISO reported a peak of 59,322 MW of generation was unavailable throughout the entire balancing authority area on February 14. This includes 8,081 MW that was weather related. The Southwest Power Pool service area experienced 3,443 MW of load shedding and the loss of 25,000 MW of generation across a range of resources. Outages occurred in Arkansas, Louisiana, Texas, Oklahoma, Kansas, Missouri, Nebraska, North Dakota and South Dakota. This crisis shows the increased vulnerability of the electric supply system to an extreme common condition that spans electric systems.

3. California

NERC assessments have also identified energy sufficiency issues in California. The *2019 Long-Term Reliability Assessment* discusses a need for flexible resources to meet increasing ramping and variability requirements, noting, "as solar generation increases in California and various parts of North America, system planners will need to ensure that sufficient flexibility is

available to operators to offset variability and fuel uncertainty."[15] In discussing the California region, NERC's *2019 Summer Reliability Assessment* concludes, "Extreme outages may result in insufficient resources at peak load."[16] The high-risk scenario in the *2020 Summer Reliability Assessment* predicted, "Operating mitigations and EEAs may be needed under extreme demand and extreme resource derated conditions."[17]

During the middle of August 2020, a massive heat wave developed across the West, forcing high temperatures 15 to 30 degrees above normal, breaking many daily highs. The California Independent System Operator ("CAISO") reported that the August extreme heat was a 1-in-30 year weather event. On August 18, the Western Interconnection hit a new peak demand of 162,000 MW.[18] CAISO implemented numerous operational actions to balance resources with customer demand. In terms of energy supply, the extreme heat reduced electricity output from thermal resources, which typically operate less efficiently during temperature extremes. In addition to below normal hydro conditions, utility-scale and behind-the-meter solar generation output was reduced due to wildfire smoke and cloud cover.[19] High electricity demand across the West limited CAISO's ability to import energy from neighboring areas. During the early evening hours of August 14-15 when solar energy production naturally declines, CAISO was forced to resort to controlled load shedding of approximately 1,800 MW to maintain system stability. Power outages

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[15] NERC, *2019 Long-Term Reliability Assessment* at 8, https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_LTRA_2019.pdf.

[16] NERC, *2019 Summer Reliability Assessment* (June 2019) at 29, https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_SRA_2019.pdf.

[17] NERC, *2020 Summer Reliability Assessment* (June 2020) at 33, https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_SRA_2020.pdf.

[18] Western Electricity Coordinating Council Staff, Presentation, *Western Interconnection August Heat Wave Event: 2020* at 8*,* (October 20, 2020), https://www.wecc.org/Administrative/Western%20Heatwave-WEB.pdf.

[19] California Independent System Operator, California Public Utilities Commission, and California Energy Commission, *Root Cause Analysis: Mid-August 2020 Extreme Heat Wave* (Jan. 13, 2021) at 21-22, http://www.caiso.com/Documents/Final-Root-Cause-Analysis-Mid-August-2020-Extreme-Heat-Wave.pdf.

lasting between 8 to 150 minutes, impacted approximately 800,000 customers served by utilities regulated by the California Public Utilities Commission.[20]

This heatwave event occurred across the entire Western Interconnection. The widespread nature of this heatwave reduced options to mitigate impacts as exports to California dried up due to the need for organizations to serve their native loads. Though not as dramatic as the recent cold weather event, it is another example of an extreme common condition that overwhelmed the electric system. It demonstrates that these conditions can occur in summer or winter and for which industry needs to plan.

NERC and the Western Electricity Coordinating Council, the Regional Entity serving the Western Interconnection, are conducting a review of this heatwave event through NERC's Event Analysis program. This review is nearing completion. A separate joint analysis by CAISO and California energy regulators was published on January 13, 2021. The report finds that issues with calculating resource planning targets and market practices contributed to the supply deficits during the extreme heat conditions.[21]

B. Natural Gas Considerations (Questions 4, 5)

As noted previously in these comments, the bulk-power system is becoming increasingly reliant on natural gas. Traditional baseload generation plants are retiring, while significant amounts of new natural gas and variable generation resources are being developed. As variable resources continue to replace other generation sources, natural gas will remain essential to reliability. In many areas, natural gas fueled generation is needed to meet energy demand during shoulder periods between times of high and low renewable energy availability. And on a daily basis in areas

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20 *Id.* at 35.

21 *Id.* at 38 *et seq*.

with significant solar generation, the mismatch between the solar generation peak and the electric load peak necessitates a very flexible generation resource to fill the gap. Natural gas generation is best positioned to play that role. The criticality of natural gas as the "fuel that keeps the lights on" will remain unless or until very large-scale battery deployments are feasible or an alternative flexible fuel such as hydrogen can be developed.

Growing reliance on natural gas for electric generation is driving a variety of actions within the industry and across interdependent infrastructure sectors to manage risks to natural gas fuel supply. Most areas are reliant on natural gas to meet on-peak electricity demand. Unlike generation with on-site fuel storage, natural-gas-fired generators depend on the natural gas pipeline system to deliver just-in-time fuel for electricity production. Unless they are dual-fuel units with onsite fuel oil, they can be particularly sensitive to extreme cold temperature, and should be winterized to reduce the risk to their ability to operate. Further, growth in the use of natural gas as a fuel for electric generation and other applications can stress the natural gas supply infrastructure when necessary expansions (i.e. additional pipelines and storage) do not keep pace. While natural gas disruptions could cause reliability impacts at any time of the year, the problem is particularly acute during extreme weather conditions. These impacts can be further exacerbated by the loss of electricity, as natural gas wellheads, processing plants and compressors may be winterized and powered by electricity.

Consistent with NERC's role as the ERO under Section 215 of the Federal Power Act, NERC regularly assesses the potential reliability issues associated with the increasing reliance on natural gas as a fuel source. The preceding sections of these comments have provided specific examples of how natural gas issues have contributed to reliability impacts during extreme weather

conditions. In its *2020 Long-Term Reliability Assessment*, NERC describes planning considerations to help mitigate these risks.[22]

Nevertheless, while natural gas is key to supporting a reliable transformation of the grid, the natural gas system was not built nor regulated or operated to serve the needs of an electric power sector that is increasingly dependent upon reliable natural gas service. When it comes to bulk-power system reliability, the current framework for regulation and oversight of natural gas supply for electric generation needs to be rethought. Clear regulatory authority is needed over natural gas when used for electric generation to help support bulk-power system reliability.

C. NERC Efforts to Improve the Reliability Standards to Address Cold Weather Specifically, and Extreme Weather Events Generally (Questions 6, 8, 16)

Before the most recent cold weather event in Texas and the south central United States in February 2021, extreme cold weather events caused substantial reliability impacts in 2011, 2014, and 2018. The fact that four such events occurred over the past decade demonstrates that these events can no longer be treated as rare. Further, in the past decade, the generation fleet has transformed to one that is more sensitive to weather with extreme temperatures. Accordingly, to address the risks to reliability posed by extreme cold weather, NERC concluded that mandatory standards addressing cold weather risks specifically were warranted.

In September 2019, NERC initiated Project 2019-06 Cold Weather to develop new cold weather requirements.[23] This project is developing revisions to currently effective Reliability Standards EOP-011-1, IRO-010-3, and TOP-003-4 to address cold weather preparedness and situational awareness. In March 2021, the NERC Board of Trustees, recognizing that "the

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[22] *See* NERC, *2020 Long-Term Reliability Assessment* at 34.

[23] More information on Project 2019-06 Cold Weather is available on the NERC web site at https://www.nerc.com/pa/Stand/Pages/Project%202019-06%20Cold%20Weather.aspx.

continued reliability of the Bulk-Power System depends on the prompt development of Reliability Standards to address cold weather preparedness," directed that development of the revised Reliability Standards be completed by June 2021.[24] Assuming the revised standards are approved by the NERC ballot body in accordance with NERC's Commission-approved standard development procedures and subsequently adopted by the NERC Board of Trustees, NERC will submit the revised Reliability Standards to the Commission for approval in summer 2021.

The revised Reliability Standards being developed under Project 2019-06 Cold Weather will support reliability of the bulk-power system by helping to ensure that generator units are prepared for cold weather and enhancing situational awareness in the operational planning and operations timeframes. The second drafts of proposed Reliability Standards EOP-011-2, IRO-010-4, and TOP-003-5 are posted for comment through April 26 and include draft requirements for the following:

- Cold weather preparedness plans developed, maintained, and implemented by generators for each unit, incorporating freeze protection measures based on geographic location and plant configuration;
- Annual maintenance and inspection of generation unit freeze protection measures;
- Identification of cold weather operating parameters, including operating limitations and generating unit design or operating temperature for cold weather;
- Training on the roles and responsibilities of site personnel responsible for implementing cold weather preparedness plans; and
- Communication of specific unit cold weather operating parameters to Reliability Coordinators, Transmission Operators, and Balancing Authorities for use in setting operating processes, determining contingency reserves, and performing operational planning analysis.

[24] NERC Board of Trustees, March 22, 2021 Action without a Meeting Executed Resolution 2019-06 Cold Weather, https://www.nerc.com/gov/bot/Pages/Agenda-Highlights-and-Minutes-.aspx.

Until new requirements for cold weather preparedness are approved and enforceable, staff from NERC and the Regional Entities will pose questions to industry on their seasonal preparations and what modifications have been put in place since the prior year (e.g., increased winterization/insulation installations, increased back-up fuel, or other initiatives that increase energy certainty under extreme conditions). NERC will publish this information in aggregate in its 2021/2022 Winter Reliability Assessment. To the extent the joint FERC/NERC staff inquiry on the February 2021 cold weather event recommends further standards modifications to help assure reliability during extreme cold weather conditions, NERC is prepared to act promptly on any such recommendations.

Additionally, NERC staff will continue to examine the Reliability Standards to determine if other modifications to address fuel concerns during extreme weather conditions are needed. Presently, Reliability Standard TPL-001-4 requires planning entities to study wide area events affecting the transmission system caused by loss of generating stations due to factors such as wildfires and severe weather.[25] NERC's assessments may provide additional considerations for Reliability Standards enhancements. Such enhancements could include:

- Reliability Standard requirements for the Reliability Coordinator, Balancing Authority, or Planning Coordinator to determine the temperature to which plants in their respective areas must weatherize.
- Reliability Standard requirements for the Reliability Coordinator or Balancing Authority to develop seasonal emergency energy management plans, to address conditions such as wildfires, extreme hot and cold temperatures, and severe storms (i.e. hurricanes).
- Reliability Standard requirements for the Reliability Coordinator to develop a rolling three week emergency energy management plan.
- Reliability Standard for the development of a Seasonal Energy Management Plan based on regional extreme weather scenarios, to be assessed as part of NERC's seasonal assessments, and to include weatherization, fuel availability, projected unit maintenance,

[25] Reliability Standard TPL-001-4 – Transmission System Planning Performance Requirements, https://www.nerc.com/pa/Stand/Reliability%20Standards/TPL-001-4.pdf.

electric supply to gas wellheads and compressors, operating procedure, and so on; and a determination of the sources of energy and the degree of certainty with each source.

NERC looks forward to continued discussion in this proceeding regarding Reliability Standards enhancements that may help address the reliability risks posed by extreme weather.

III. CONCLUSION

NERC thanks the Commission and its staff for the opportunity to submit comments in this proceeding and respectfully requests that these comments be accepted for consideration.

Respectfully submitted,

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Date: April 15, 2021

CERTIFICATE OF SERVICE

I hereby certify that I have served a copy of the foregoing document upon all parties listed on the official service list compiled by the Secretary in this proceeding. Dated at Washington, D.C. this 15th day of April, 2021.

/s/ Lauren A. Perotti

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Counsel for the North American Electric Reliability Corporation