AMERICA'S POWER
Reliable • Secure • Resilient • Affordable

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 AMERICA'S POWER

April 15, 2021

OVERVIEW

America's Power welcomes the opportunity to submit comments on this docket. Basically, the Commission has solicited comment on how to avoid future power outages caused by extreme weather and climate change. Our comments reinforce other comments that we have submitted to the Commission over the course of the past three years urging the Commission to focus on the resilience, not just reliability, of the bulk power system. Major electricity outages have become more frequent and more consequential, affecting the livelihoods and safety of millions of people.[i] These outages are striking evidence that the electricity grid in certain parts of the country is not resilient.

The Commission should expect similar, if not even more severe, consequences if it does not take steps to ensure the bulk power system is resilient. Unfortunately, the Commission took the wrong step when it terminated its three-year-old resilience docket without taking any meaningful action to improve the resilience of the grid. This lack of action allowed CAISO and ERCOT to assert to the Commission that their grids were resilient, despite experiencing rolling blackouts and other unfortunate consequences that clearly demonstrated their grids were not resilient.[ii] ERCOT provided the most ironic comments to FERC three years ago: "ERCOT has robust processes in place to ensure the ERCOT system will be operated in a way that can resist and recover from a variety of foreseeable disturbances."[iii] The assertion that ERCOT's grid was resilient proved to be disastrously wrong three years later. FERC should act to ensure this does not happen to other regions.

Recently, Chairman Glick stated in letters to Members of Congress that both reliability and resilience are among the Commission's paramount responsibilities and concerns.[iv] The Chairman's use of both terms implies that reliability and resilience do

not have the same meaning.[v] We wholeheartedly agree with him on this point. Reliability refers to keeping the lights on when the grid is faced with typical disturbances. On the other hand, resilience means keeping the lights on during extreme but infrequent events that can have disastrous consequences. Although FERC has not defined resilience, recent extreme hot and cold weather events fit squarely within the concept of resilience.

Because of the importance of resilience, especially as it relates to this docket, America's Power urges the Commission to consider these questions:

1. How does FERC define and explain what resilience means?
2. Doesn't the bulk power system need to be resilient to extreme weather caused by climate change?
3. How will the Commission ensure the bulk power system is resilient if it does not define and explain what resilience means?

The Commission previously concluded that, given the lack of a uniform definition for resilience, it should agree on a definition as a starting point to determine if the grid is resilient.[vi] Therefore, the Commission proposed a definition of resilience: "The ability to withstand and reduce the magnitude and/or duration of disruptive events, which includes the capability to anticipate, absorb, adapt to, and/or rapidly recover from such an event."

Despite proposing a definition and receiving many suggested definitions that were not markedly different from FERC's proposal, the Commission never finalized a definition. Nor did it take any other steps to assess the resilience of the regional power grids in order to address resilience deficiencies. However, it is impossible to mitigate the effects of climate change and extreme weather on the grid without assessing the resilience of the grid.

AMERICA'S POWER

America's Power is the only national trade organization whose sole mission is to advocate at the federal and state levels on behalf of coal-fired electricity and the nation's fleet of coal-fired power plants. Our membership is comprised of major industries — electricity generators, coal producers, railroads, barge operators, and equipment manufacturers — involved in generating electricity from coal.[vii] The coal fleet is a critical part of the nation's electricity supply because it is a reliable, resilient, and fuel-secure source of power; it contributes to fuel diversity; it produces affordable electricity; and it serves as an insurance policy when other fuels are either too expensive or not available. The coal fleet was responsible for supplying roughly 20 percent of U.S. electricity needs last year.

America's Power is particularly concerned about the threat to grid reliability and resilience and the impacts on the coal supply chain caused by the premature retirement of coal-fired generating capacity because more than half the U.S. coal fleet — some 173,000 megawatts (MW) — has retired or announced plans to retire.[viii]

FERC QUESTIONS

America's Power provides the following responses to Commission questions 1, 6, 15, and 16:

Question 1: "What are the most significant near-, medium-, and long-term challenges posed to electric system reliability due to climate change and extreme weather events?"

One of the most significant challenges to grid reliability and *resilience* (a term the Commission seems to be avoiding) is the premature retirement of coal-fired generation and the resulting decline in fuel diversity and grid resilience in many regions of the country. The result of these coal retirements is a greater reliance on non-dispatchable and fuel-insecure electricity resources. This threat will increase as coal continues to retire and is not replaced by resources that are dispatchable and fuel secure.

The performance of MISO and SPP during the type of extreme weather that has prompted this docket shows the benefits of having significant coal-fired generation as part of a diverse resource mix. (Our response to question 6 also explains the benefits of coal and a diverse resource mix during extreme weather.) Having substantial amounts of coal-fired generation (a combined 81,000 MW) was one of the major reasons that both MISO and SPP instituted limited load shedding during the winter storm, compared to CAISO's significant load shedding in August and ERCOT's disastrous load shedding in mid-February.

MISO's coal fleet *doubled* its output during the winter storm. Wind *declined* by more than half.

The MISO region has approximately 194,000 MW of installed electric generating capacity comprised of natural gas (79,000 MW or 41 percent), coal (57,000 MW or 29 percent), wind (25,000 MW or 13 percent), nuclear (13,000 MW or 7 percent), and various other sources (20,000 MW or 10 percent).[ix] Last year, the MISO coal fleet generated 33 percent of MISO's electricity, second to natural gas at 34 percent.[x] However, almost 23,000 MW of MISO's coal-fired generating capacity are scheduled to retire during this decade.

The MISO coal fleet demonstrated its resilience during the winter storm by almost doubling its output (an increase of 92 percent) compared to last year's average

output and by increasing its capacity factor from 43 percent to 84 percent during the winter storm.[xi] This resilience enabled the coal fleet to generate almost half (49 percent) of MISO's electricity during the extremely cold weather.[xii]

Natural gas also increased its output relative to both 2020 and the previous month. However, due to gas supply disruptions and increased demand for heating, the capacity factor for natural gas was 40 percent, compared to 84 percent for coal. Wind's capacity factor dropped to 17 percent, half that of the previous month (36 percent in January 2021) and 2020 (34 percent). Nuclear performed well, with a capacity factor of almost 90 percent during the extreme weather, similar to both the previous month and 2020. The output of other resources also increased, primarily due to the increased use of backup diesel and fuel oil generators that were necessary during the extreme weather.

The takeaway is that MISO was fortunate to have substantial coal-fired generation and a diverse fuel mix to rely on during extreme weather.

SPP's coal fleet *increased* its electricity output by almost 70 percent during the winter storm. Wind's output *declined* by two-thirds.

SPP has approximately 91,000 MW of installed electric generating capacity comprised of natural gas (34,000 MW or 37 percent), coal (24,000 MW or 26 percent), wind (23,000 MW or 25 percent), nuclear (2,000 MW or 2 percent), and other resources (8,000 MW or 9 percent).[xiii] Some 8,800 MW of coal-fired generation have retired or have plans to retire. Last year, coal was the second largest producer of electricity (29 percent) in SPP behind wind (31 percent).[xiv] During the winter storm, however, coal increased its output to provide 47 percent of SPP's electricity, 68 percent more than 2020 and 48 percent above its January output.[xv] The capacity factor of the coal fleet increased to 73 percent, a considerable increase above its capacity factor last year of 44 percent and its January capacity factor of 49 percent.

The average capacity factor for wind dropped to 13 percent, down two-thirds from the previous month and from last year. Wind's electricity output also declined by two-thirds.

Natural gas increased its output by 15 percent above 2020 and 60 percent above the previous month. However, increased gas demand for heating as well as supply disruptions limited the capacity factor of natural gas to 33 percent during the winter storm. Nuclear's capacity factor was 98 percent, similar to January and to 2020, which also limited nuclear's ability to increase its electricity output any more in response to the increased demand for electricity.

The takeaway here is that SPP was also fortunate to have substantial coal-fired generation and a diverse fuel mix to rely on during extreme weather.

The bottom line is that coal was able to provide almost *half* the electricity in 21 states during extreme weather.

Coal was able to increase its output and provide close to half of the electricity in all or parts of the 21 states that comprise the MISO and SPP regions. This fact shows the importance of the coal fleet when the electricity grid is faced with extreme weather. The performance of the gas-fired generating fleets in both regions was limited for reasons that typically affect gas in cold weather, and wind's performance declined when electricity was needed the most. The resilience of coal compared to gas and wind shows the importance of maintaining substantial coal-fired generation for the foreseeable future. In addition to its own coal fleet, MISO also benefited from roughly 4,000 MW of imported coal-fired generation from PJM during two days of the winter storm.[xvi]

Our response to the question below further underscores the importance of having a diverse resource mix that includes coal. However, further coal retirements will diminish the ability of the grid to withstand future resilience and reliability challenges.

Question 6: "How are relevant regulatory authorities (e.g., federal, state, and local regulators), individual utilities (including federal power marketing agencies), and regional planning authorities (e.g., RTOs/ISOs) evaluating and addressing challenges posed to electric system reliability due to climate change and extreme weather events and what potential future actions are they considering? What additional steps should be considered to ensure electric system reliability?"

An important step to ensure reliability and resilience is to maintain a balanced portfolio. Associated Electric Cooperative, Inc. (AECI) is a member of America's Power. Its exceptional performance during mid-February's winter storm shows the value of having a balanced portfolio that includes coal. (See AECI's comments to FERC.[xvii]) AECI's performance is a case study to help answer the Commission's question as to what utilities and others are doing and should be doing to address challenges related to extreme weather events.

AECI is a generation and transmission cooperative serving members in Missouri, Oklahoma, and Iowa. Like other electricity generators in the region, it experienced an all-time peak demand during the week of February 15-19, 2021. Unlike MISO and SPP, however, AECI was not forced to impose rolling blackouts during the winter storm.

AECI's reliance on coal (almost 2,000 MW), natural gas (more than 1,400 MW), imported power (almost 1,500 MW), and hydropower (almost 500 MW) to meet its all-time peak enabled it to avoid the load shedding experienced in neighboring RTOs,

even though its more than 1,200 MW of wind output from eight wind farms was less than 200 MW on February 15 and dropped to nearly zero the following day. According to AECI, solar installations across its system were not generating much, if any, electricity during these demand peaks.

AECI has stated that "Government policies that forced the early retirement of many coal plants have significantly decreased the reliability of the generation and transmission system designed to serve … consumers throughout the Midwest. Retirement by other utilities of these coal plants resulted in reliance on natural gas power plants and renewable wind and solar farms. Natural gas power plants rely on a network of gathering systems, processing plants, compression facilities, and pipelines to deliver fuel as needed to the gas-fired plants, while coal plants maintain a two-month supply of fuel on-site. Wind, Solar and other intermittent sources may not be producing energy at significant levels, or at all, during extreme weather events."

FERC, RTOs, and NERC should take note of AECI's exceptional performance that resulted from having a balanced portfolio.

FERC Question 15: "What actions should the Commission consider to help achieve an electric system that can better withstand, respond to, and recover from climate change and extreme weather events? In particular, are there changes to ratemaking practices or market design that the Commission should consider?"

It is important that FERC take timely action with respect to this docket. The Commission, NERC, RTOs, and ISOs must stop admiring the risks to the grid posed by extreme disturbances and adopt measures to mitigate those risks. Accordingly, we respectfully urge the Commission to undertake the following to ensure the grid is resilient in the face of extreme weather and climate change:

Explain resilience. As we mentioned earlier in our comments, FERC should establish a uniform definition of resilience and explain what the term means, perhaps by issuing a white paper on the subject. Among other things, the definition and explanation should clarify the relationship between resilience and reliability.

Identify resilience criteria. The definition/explanation of resilience should lead to the identification of specific criteria that are necessary to ensure grid resilience.

Establish resilience standards. The Commission should direct NERC to establish standards for resilience, just as NERC has standards for reliability. NERC's reliability standards do not consider resilience attributes, nor do they account for fuel security risk.[xviii]

Value fuel security and other resilience attributes. NERC determined that fuel security — a power plant's immediate access to fuel when needed — is important

enough to develop guidelines to help regional planners assess their exposure to fuel risk.[xix]

PJM indicates that fuel security has value, having issued a paper entitled "Valuing Fuel Security," in which it explains that fuel security refers to the "vulnerability of fuel supply and delivery to generators" and recognizes the risks in overdependence on any fuel.[xx] PJM defines fuel security as "The ability of the system's supply portfolio, given its fuel supply dependencies, to continue serving electricity demand through credible disturbance events, such as coordinated physical or cyber-attacks or extreme weather that could lead to disruptions in fuel delivery systems, which would impact the availability of generation over extended periods of time."[xxi]

Wholesale electricity markets should value resilience attributes. For example, fuel security can be valued in much the same manner as wholesale markets value other attributes such as essential reliability services. There are market-based approaches that can be developed to accomplish this.

Conduct analysis. FERC should direct RTOs and ISOs to conduct analysis designed specifically to determine whether their grids are resilient to extreme weather and climate change. PJM asked the Commission "to provide … metrics … to apply to resilience vulnerability and threat analysis."[xxii] PJM further asked the Commission to confirm that RTOs have "an obligation to assess resilience."[xxiii] PJM noted that work needed to be done to analyze the resilience risks beyond relying on existing reliability standards, noting that the markets were not designed originally with resilience in mind.[xxiv]

This analysis could include stress testing of RTO and ISO projections. Banks undergo stress tests, so why not grid operators? Had the assumptions of ERCOT and CAISO been subject to stress testing, the consequences of extreme weather might have been different.

Question 16. "Are there opportunities to improve the Commission-approved NERC Reliability Standards in order to address vulnerabilities to the bulk power system due to climate change or extreme weather events in areas including but not limited to the following: transmission planning, bulk power system operations, bulk power system maintenance, emergency operations, and black start restoration? For example, should the Reliability Standards require transmission owners, operators, or others to take additional steps to maintain reliability of the bulk power system in high wildfire or storm surge risk areas? Should the Reliability Standards require the application of new technologies to address vulnerabilities related to extreme weather events, such as to use new technologies to inspect the bulk power system?"

We respectfully reiterate our recommendations above.

CONCLUSION

While the Commission's questions focus explicitly and solely on "reliability," the grid must also be resilient in the face of extreme weather and climate change. We hope the Commission will consider our five recommendations that start with defining and explaining what resilience means. That simple step should enable FERC, NERC, RTOs, and ISOs to undertake additional measures, if necessary, to avoid disastrous consequences from extreme weather and climate change in the future.

Respectfully submitted,

Michelle Bloodworth
President and CEO
America's Power
4601 N. Fairfax Drive, Suite 1050
Arlington, VA 22203
Phone: 202.595.4663
Email:
mbloodworth@americaspower.org

[i] During mid-February 2021, unusually cold weather interrupted the supply of electricity to customers in regions served by ERCOT, MISO, and SPP. ERCOT was the most severely affected of the three regions. SPP and MISO were forced to adopt less drastic emergency measures but still instituted rolling blackouts. *See e.g.,* https://www.misoenergy.org/about/media-center/miso-load-demand-reaches-an-all-time-high-in-western-south-region/ (last visited April 5, 2021). In the summer of 2020, California experienced a drop in solar power that contributed to rolling blackouts and required emergency measures to avoid a collapse of the CAISO grid. *See* the Preliminary Observations on the August 2020 California Heat Storm (December 17, 2020), Docket No. AD21-3-000.

[ii] *See*, for example, page 6 of CAISO's March 9, 2018 comments to FERC: "Although it is not possible or practical to guard against every possible combination and magnitude of future events or conditions, planning, procurement, coordination, reliability, market enhancements, and other efforts in the CAISO balancing authority area have produced a robust and diverse infrastructure and 'set of tools' that have helped the CAISO to remain reliable and resilient in the face of significant threats such as … severe droughts and fires, and the recent solar eclipse." Also, *see* "JOINT COMMENTS OF THE ELECTRIC RELIABILITY COUNCIL OF TEXAS, INC. AND THE PUBLIC UTILITY COMMISSION OF TEXAS," March 9, 2018: "ERCOT's scarcity pricing mechanisms are designed to alleviate the need for many resilience-based regulatory controls … Apart from market design, ERCOT and the PUCT routinely

undertake a number of measures to ensure resilience of the ERCOT system as part of their broader reliability obligations."

[iii] See page 20 of "JOINT COMMENTS OF THE ELECTRIC RELIABILITY COUNCIL OF TEXAS, INC. AND THE PUBLIC UTILITY COMMISSION OF TEXAS," March 9, 2018. Comments submitted regarding "Grid Resilience in Regional Transmission Organizations and Independent System Operators, Docket No. AD18-7-000."

[iv] In these letters, Chairman Glick stated: "Notwithstanding the termination of [the Commission's docket on grid reliability and resilience], the resilience and reliability of the bulk power system is — and will remain — one of the Commission's paramount responsibilities and concerns. Going forward, we will be focusing on addressing resiliency and reliability on a case-by-case and region-by-region basis." *See* Chairman's Response to Congressman Andy Barr's 11/18/2020 letter requesting an update on *Grid Reliability and Resilience Pricing and Grid Resilience* in *Regional Transmission Organizations and Independent System Operators* under AD18-7 (issued March 31, 2021). Letters containing the same statements also were sent to five Senators and seven other Members of Congress.

[v] *See, e.g., Grid Resilience in Regional Transmission Organizations and Independent System Operators*, Docket No. AD18-7-000, Comments and Response of PJM Interconnection, L.L.C. at pp.4, 19 (filed March 9, 2018).

[vi] January 2018 Order at p. 22.

[vii] America's Power's members include Alliance Resource Partners, L.P.; American Consolidated Natural Resources, Inc.; Associated Electric Cooperative Inc.; Berwind Corporation; Big Rivers Electric Corporation; Buckeye Power, Inc.; Caterpillar Inc.; CONSOL Energy Inc.; Crounse Corporation; CSX Transportation; Carbon Utilization Research Council; Drummond Company, Inc.; East Kentucky Power Cooperative; Foresight Energy; Hallador Energy Company; JENNMAR; JTB; Kentucky Coal Association; Kentucky River Properties LLC; Komatsu Limited; Lignite Energy Council; Longview Power; Natural Resource Partners; Norfolk Southern Corporation; Peabody Energy; PowerSouth Energy Cooperative; Prairie State Energy Campus, LLC; Rosebud Mining Company; and Western Fuels Association.

[viii] America's Power has been tracking announced coal retirements since 2011. As of December 2020, 790 coal-fired electric generating units in 42 states—totaling 173,102 MW—have retired or announced plans to retire. Retirements now exceed 54 percent of the coal fleet that was operating in 2010. Through the end of 2020, 110,382 MW of coal-fired generating capacity will have already retired. Between 2021 and 2030, an additional 54,209 MW are expected to retire.

[ix] Installed capacity in MISO balancing authority from monthly EIA 860 data https://www.eia.gov/electricity/data/eia860/

[x] Historical fuel mix for 2020 from https://www.misoenergy.com

[xi] Analysis of hourly generation data for MISO from EIA Hourly Electric Grid Monitor https://www.eia.gov/beta/electricity/gridmonitor/dashboard/electric_overview/US48/US48

[xii] *Ibid.*

[xiii] Installed capacity in MISO balancing authority from monthly EIA 860 data https://www.eia.gov/electricity/data/eia860/

[xiv] Analysis of hourly generation data for MISO from EIA Hourly Electric Grid Monitor https://www.eia.gov/beta/electricity/gridmonitor/dashboard/electric_overview/US48/US48

[xv] Analysis of hourly generation data for MISO from EIA Hourly Electric Grid Monitor https://www.eia.gov/beta/electricity/gridmonitor/dashboard/electric_overview/US48/US48

[xvi] During February 15 and 16, PJM exported more than 18,000 MW of power, with 68 percent going to MISO. Coal's share of PJM's fuel mix was 32 percent at the time. Therefore, PJM exported roughly 4,000 MW of coal to MISO: (0.68)(18,000 MW)(0.32) = 3,917 MW. "Winter Operations of the PJM Grid: December 1, 2020 – February 28, 2021," PJM Operating Committee, April 8, 2021. https://www.pjm.com/-/media/committees-groups/committees/oc/2021/20210408/20210408-item-14-winter-operations-review.ashx

[xvii] Letter from David J. Tudor, CEO and General Manager, Associated Electric Cooperative, Inc., to The Honorable Richard Glick, Chairman, Federal Energy Regulatory Commission, RE: Docket No. AD21-13-000, April 15, 2021. https://elibrary.ferc.gov/eLibrary/filelist?accession_num=20210415-5037

[xviii] *See, e.g.,* PJM Grid Resilience Comments at p.4.

[xix] *See Reliability Guideline: Fuel Assurance and Fuel-Related Reliability Risk Analysis for the Bulk Power System,* March 2020 (March 12, 2020, *available at*

https://www.nerc.com/comm/PC_Reliability_Guidelines_DL/Fuel_Assurance_and_Fuel-Related_Reliability_Risk_Analysis_for_the_Bulk_Power_System.pdf).

[xx] Valuing Fuel Security at p.1 (April 30, 2018), *available at* https://www.pjm.com/-/media/library/reports-notices/special-reports/2018/20180430-valuing-fuel-security.ashx.

[xxi] *Id.*

[xxii] PJM Grid Resilience Comments at p.5.

[xxiii] *Id.*

[xxiv] *Id.* at pp. 19, 66.