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DEPARTMENT OF ENERGY
Federal Energy Regulatory Commission
18 CFR Part 141

[Docket Nos. RM22-16-000 and AD21-13-000]

One-Time Informational Reports on Extreme Weather Vulnerability Assessments Climate Change, Extreme Weather, and Electric System Reliability

AGENCY: Federal Energy Regulatory Commission.

ACTION: Notice of proposed rulemaking.

SUMMARY: The Federal Energy Regulatory Commission is initiating this rulemaking to propose to direct transmission providers to submit one-time informational reports describing their current or planned policies and processes for conducting extreme weather vulnerability assessments. The Commission proposes to define extreme weather vulnerability assessments as analyses that identify where and under what conditions jurisdictional transmission assets and operations are at risk from the impacts of extreme weather events, how those risks will manifest themselves, and what the consequences will be for system operations. Specifically, the Commission proposes to require transmission providers to submit a one-time informational report on how they establish a scope for their extreme weather vulnerability assessments, develop inputs, identify vulnerabilities and determine exposure to extreme weather hazards, estimate the costs of impacts, and develop mitigation measures to address extreme weather risks.

DATES: Initial comments are due **[INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

ADDRESSES: Comments, identified by docket number, may be filed in the following ways. Electronic filing through http://www.ferc.gov, is preferred.

- Electronic Filing: Documents must be filed in acceptable native applications and print-to-PDF, but not in scanned or picture format.
- For those unable to file electronically, comments may be filed by USPS mail or by hand (including courier) delivery.
    - Mail via U.S. Postal Service Only: Addressed to: Federal Energy Regulatory Commission, Secretary of the Commission, 888 First Street, N.E., Washington, DC 20426.
    - Hand (including courier) delivery: Deliver to: Federal Energy Regulatory Commission, 12225 Wilkins Avenue, Rockville, MD 20852.

The Comment Procedures Section of this document contains more detailed filing procedures.

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I. Introduction

1. In this Notice of Proposed Rulemaking (NOPR), the Federal Energy Regulatory Commission (Commission) proposes to require each transmission provider[1] to file a one-

[1] In this NOPR, unless otherwise noted, we use the term "transmission provider" to mean any public utility that owns, controls, or operates facilities used for the transmission of electric energy in interstate commerce. *See* 16 U.S.C. 824(e); 18 CFR 35.28. To be clear, this term encompasses public utility transmission owners that are

time informational report pursuant to § 304 of the Federal Power Act (FPA).[2] In the one-time reports, transmission providers would describe their current or planned policies and processes for conducting extreme weather vulnerability assessments. The Commission believes that these reports will assist in its administration of the FPA.

2. The reliability of the electric grid is increasingly threatened by extreme weather events and climate change. While extreme weather has impacted the electric grid throughout its history, the severity and frequency of extreme weather events is

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members of Regional Transmission Organizations (RTO) and Independent System Operators (ISO). Accordingly, the reports we are proposing herein would be filed by the public utility members of RTOs/ISOs, as well as by the RTOs/ISOs themselves and other public utility transmission providers.

[2] 16 U.S.C. 825c. Section 304 of the FPA provides that "every public utility shall file with the Commission such annual and other periodic or special reports as the Commission may by rules and regulations or order prescribe as necessary or appropriate to assist the Commission in the proper administration of" the FPA. *Id.*

increasing.[3] A robust and growing body of scientific evidence attributes this trend to climate change and indicates that the tendency toward more frequent and more severe weather events will persist.[4] In light of this trend, we believe it is increasingly important to understand how the risks of extreme weather to the electric grid are evaluated and mitigated.

3. Reliable electric service is vital to the nation's economy, national security, and public health and safety, and prolonged power outages can have significant humanitarian consequences, as the nation witnessed in Texas and the South-Central United States in February 2021 during Winter Storm Uri. More than four and half million people in Texas alone lost power during the extreme weather event, and in some cases the outages contributed to a tragic loss of life.[5] Additionally, this extreme weather event had a significant impact to consumers as energy prices rose to historic levels in the wholesale markets serving Texas and the South-Central region during the event.[6]

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[3] National Oceanic and Atmospheric Administration, National Centers for Environmental Information "U.S. Billion-Dollar Weather and Climate Disasters" (2022), https://www.ncei.noaa.gov/access/billions/.

[4] INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2022: IMPACTS, ADAPTATION, AND VULNERABILITY (2022); NAT'L ACADEMIES OF SCIENCES, ENGINEERING, AND MEDICINE, ATTRIBUTION OF EXTREME WEATHER EVENTS IN THE CONTEXT OF CLIMATE CHANGE (2016); Herring, S. C., N. Christidis, A. Hoell, M. P. Hoerling, and P. A. Stott, Eds. *Explaining Extreme Events of 2020 from a Climate Perspective*. 103 Bulletin Am. Meteor. Soc'y 3 (2022).

[5] *FERC-NERC-Regional Entity Staff Report*: *The February 2021 Cold Weather Outages in Texas and the South Central United States* 9 (Nov. 16, 2021), https://www.ferc.gov/media/february-2021-cold-weather-outages-texas-and-south-central-united-states-ferc-nerc-and.

[6] *See* Electric Reliability Council of Texas, *Review of February 2021 Extreme Cold Weather Event* 22 (2021), https://www.ercot.com/files/docs/2021/03/03/Texas_Legislature_Hearings_2-25-2021.pdf (average system wide pricing during event greater than $6000/MWh compared to $18-20/MWh in more typical conditions); Southwest Power Pool, Inc, *A*

4. Winter Storm Uri is but one tragic example of the threat extreme weather is posing across the entire country. In the last two years alone,[7] region-wide heat waves, hurricanes, and wildfires have resulted in outages or other significant reliability impacts, often while contributing to substantial consumer costs. In August 2020, California experienced rolling blackouts during a West-wide extreme heat event that impacted nearly a half million customers.[8] Hurricane Ida resulted in outages for more than a million customers across eight states in August 2021,[9] with the most severe impacts in Louisiana due to the collapse of a transmission tower and outage of more than 2,000 miles of transmission lines outside of New Orleans.[10] Some customers continued to lack

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Comprehensive Review of SPP's Response to the February 2021 Winter Storm 72 (2021), https://spp.org/documents/65037/comprehensive%20review%20of%20spp's%20response%20to%20the%20feb.%202021%20winter%20storm%202021%2007%2019.pdf ("SPP experienced historically high market settlements for the impacted operating days"); Midcontinent Independent System Operator, *The February Artic Event: Event Details, Lessons Learned, and Implications for MISO's Reliability Imperative* 45 (2021), https://cdn.misoenergy.org/2021%20Arctic%20Event%20Report554429.pdf (Independent Market Monitor reports average energy prices rose 226 percent in February because of the Artic Event in February).

[7] Indeed, the North American Electric Reliability Corporation (NERC) found that all but one of the days in 2020 with the highest severity risk index, a quantitative measure of the relative severity of risks to the bulk power system, was attributed to some type of weather occurrence. NERC, *2021 State of Reliability Report* 42 (2021).

[8] *See* California Independent System Operator Corporation, *Final Root Cause Analysis: Mid-August 2020 Extreme Heat Wave* 35 (Jan. 13, 2021), http://www.caiso.com/Documents/Final-Root-Cause-Analysis-Mid-August-2020-Extreme-Heat-Wave.pdf.

[9] U.S. Energy Information Administration, *Hurricane Ida Caused At Least 1.2 Million Customers to Lose Power* (accessed June 1, 2022), https://www.eia.gov/todayinenergy/detail.php?id=49556.

[10] *See* S. Van Voorhis, *Transmission Tower Destroyed by Ida Likely to Complicate Power Restoration in New Orleans, Experts Say* (Aug. 31, 2021), https://www.utilitydive.com/news/transmission-tower-destroyed-by-ida-likely-to-complicate-power-restoration/605826/.

electricity nearly a month after Ida's landfall.[11] In July 2021, wildfires in Oregon impacted crucial transmission capacity, limiting the ability to import electricity into California as temperatures soared above 100 degrees, ultimately triggering emergency actions to avoid reliability impacts.[12] At the same time, constrained conditions on the electric grid that result from such extreme weather events can increase electricity prices.[13]

5. Looking forward, the threats of extreme weather and climate change are expected to continue to challenge the reliability of our electric grid. This upcoming summer, NERC expects extreme drought conditions and above-average temperatures across wide areas of North America, resulting in heightened reliability risk.[14] Drought increases reliability risk because it can reduce availability of generation during periods of high peak demand. Drought may impact energy output from hydro generators as well as generators that depend upon once-through cooling as low water levels trigger conservation measures.[15] Above-average temperatures exacerbate reliability risk by

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[11] U.S. Department of Energy, *Hurricanes Ida and Nicholas Update # 20* (Sept. 23, 2021), https://www.energy.gov/sites/default/files/2021-09/TLP-WHITE_DOE%20Situation%20Update_Hurricane%20Ida_20.pdf.

[12] *See* California Independent System Operator Corporation, *California ISO Issues Flex Alert for Monday, July 12 Due to Wildfires, Heat* (July 11, 2021), https://www.caiso.com/Documents/California-ISO-Issues-Flex-Alert-for-Monday-July-12-due-to-Wildfires-Heat.pdf.

[13] *See e.g.*, Dale et al., *Assessing the Impact of Wildfires on the California Electricity Grid: A report for California's Fourth Climate Assessment* 16-18 (Aug. 2018), https://www.energy.ca.gov/sites/default/files/2019-12/Forests_CCCA4-CEC-2018-002_ada.pdf (estimating multi-million dollar costs increases per event due to disruption of transmission paths caused by wildfires).

[14] NERC, *2022 Summer Reliability Assessment* at 4, 7 (May 2022), https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_SRA_2022.pdf.

[15] *Id*. at 4.

contributing to prolonged periods of high electricity demand and to higher forced outage rates for generation and other elements of the bulk power system. NERC also projects above-normal fire risk across U.S. South Central states, Northern California, Oregon, and Canada this summer, which poses the risk of impacts to the transmission system, potentially reducing output of solar PV generation due to smoke.[16]

6. NERC also evaluated these risks over the long-term in its December 2021 Long Term Reliability Assessment and identified extreme weather among the top risks that

[16] *Id*. at 6, 8.

stakeholders and policymakers need to focus on over the next ten years.[17] NERC concluded in particular that wide-area and long duration extreme weather events driven by climate change threaten reliability over the long-term. NERC identified a combination of factors that make such extreme weather events a threat to reliability. Changes in climatology and the electrical system can increase the volatility and uncertainty of electricity demand and thus the risk that grid operators are unprepared for the peak demands that accompany extreme weather. Further, when extreme temperatures extend over a wide area for a long duration, resources can be strained across multiple regions simultaneously, increasing the risk of shortfalls. At the same time, transmission networks can become stressed by wide-area events such as storms, wildfires, or heat waves, limiting imports of electricity that could relieve shortfalls. Both weather-dependent variable energy resources and thermal generation face risks of reduced output or increased outages due to extreme weather events (e.g., frozen equipment, poor hydrological conditions).[18] While the nature of extreme weather and the extent of transmission impairments will vary across different regions of the United States, no region will be unaffected.

7. The Government Accountability Office (GAO) issued a report in May 2021 stating that climate change is expected to have far-reaching effects on the electricity grid that could cost billions and could affect the ability of grid operators to transmit electricity.[19] GAO identified potential impacts of climate change-driven extreme weather

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[17] NERC, *2021 Long-term Reliability Assessment* at 5-6 (Dec. 2021), https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_LTRA_2021.pdf.

[18] *Id*. at 23-26.

[19] GAO, *Electricity Grid Resilience: Climate Change Is Expected to Have Far-*

to the grid in every region of the United States, and discussed the risk that, absent measures to increase resilience, more frequent and severe weather associated with climate change may increase outages, imposing billions of dollars in additional costs to utility customers. GAO recommended that the Commission take steps to identify or assess climate change risks to the grid in order to ensure it is well-positioned to determine the actions needed to enhance resilience to those risks.[20]

8. In light of recent extreme weather events which demonstrate their potential to substantially impact the reliability of the bulk power system and jurisdictional rates, as well as the series of assessments[21] concluding that climate change and extreme weather are expected to pose an ongoing and increasing threat to the electricity grid, we believe that a greater understanding of actions to assess the vulnerabilities of jurisdictional transmission assets and operations to extreme weather events is necessary to carry out our responsibilities under the FPA.[22] Therefore, we propose to direct transmission providers to submit one-time informational reports describing their current or planned policies and processes for conducting extreme weather vulnerability assessments and developing solutions for mitigating identified extreme weather risks.

9. Requiring transmission providers to submit a one-time informational report on their current or planned efforts to assess the vulnerabilities of their jurisdictional transmission assets and operations to extreme weather events is necessary for ensuring

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Reaching Effects and DOE and FERC Should Take Actions (Mar. 2021), https://www.gao.gov/products/gao-21-423t (GAO Report).

[20] *Id*. at 18-19, 47.

[21] *See supra* notes 14, 17 & 19.

[22] 16 U.S.C. 824d, 824o.

just and reasonable rates. Requiring one-time reports on this information will also enhance transparency as well as provide opportunities for sharing best practices among transmission providers. Therefore, we propose to direct transmission providers to submit one-time informational reports describing their current or planned policies and processes for conducting extreme weather vulnerability assessments.

10. For the purposes of this rulemaking, we propose to define an extreme weather vulnerability assessment as any analysis that identifies where and under what conditions jurisdictional transmission assets and operations are at risk from the impacts of extreme weather events, how those risks will manifest themselves, and what the consequences will be for transmission system operations.[23] We propose to require that these one-time informational reports be filed 90 days after the publication of any final rule in this proceeding in the *Federal Register*. We also propose to seek public comment on the reports 30 days after they are filed.

II. Background

A. Procedural History

11. On March 5, 2021, the Commission issued an initial Notice of Technical Conference stating that Commission staff would convene a technical conference to discuss issues surrounding the threat to electric system reliability posed by climate change and extreme weather events.[24] On March 15, 2021, the Commission issued a Supplemental Notice inviting pre-technical conference comments.[25]

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[23] *See infra* P 20.

[24] March 5, 2021 Notice of Technical Conference, Docket No. AD21-13-000.

[25] March 15, 2021 Supplemental Notice of Technical Conference Inviting Comments, Docket No. AD21-13-000.

12. During the technical conference, held on June 1 and 2, 2021, the Commission heard from utility executives, RTOs/ISOs and market monitor executives, state regulators and energy officials, and energy policy and reliability experts, as well as climatologists. Subsequently, a Notice Inviting Post-Technical Conference Comments was issued on August 11, 2021.[26] Panelists and commenters agreed that electric system planning processes need adjustment to adequately address the threat posed by climate change and extreme weather. Although individual utilities and states facing these threats can and do adjust their planning, operations, and restoration practices in response to climate change, there was widespread agreement that regular and ongoing information sharing and coordination across jurisdictions will be critical.[27] Panelists also recommended that such sharing not be limited to lessons learned, insofar as ongoing information sharing could also benefit entities developing climate models (e.g., the National Oceanic and Atmospheric Administration (NOAA)) that may not always know what information is relevant to electric system planners and their stakeholders. Finally, there was agreement that the Commission should play a role in facilitating information sharing among industry stakeholders and government agencies.[28]

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[26] August 11, 2021 Notice Inviting Post-Technical Conference Comments, Docket No. AD21-13-000.

[27] *See, e.g.*, June 2, 2021 Tr. 127 (Wayland), 129-130 (Howard); Columbia/EDF Pre-Conference Comments at 2; PJM Pre-Conference Comments at 6-9; East Kentucky Power Cooperative, Inc. Pre-Conference Comments at 6-8; CPUC Pre-Conference Comments at 19; Tabors Caramanis Rudkevich Pre-Conference Comments at 11-12, 20; Exelon Pre-Conference Comments at 23-24.

[28] *See, e.g.*, June 2, 2021 Tr. 127 (Wayland), 127-128 (Scripps), 129-130 (Howard), 132 (Terry); Exelon Pre-Conference Comments at 34; NARUC Pre-Conference Comments at 5-6.

B. Need for Reports

13. Extreme weather events place the reliability of electric service at risk. As discussed above, the United States has witnessed several instances over just the past few years of how extreme weather has severely impacted several regions of the nation. The consequences to the electric system have included rolling blackouts, more extensive service disruptions, limited transmission capacity, and damaged electric infrastructure. These types of impacts not only harm system reliability and strain the grid, but they also affect Commission-jurisdictional rates. Moreover, the frequency and severity of extreme weather has been increasing—and is likely to continue to increase—and we are concerned that system reliability could be further jeopardized and that jurisdictional rates could be further affected.[29] Accordingly, we believe that, to assist in our administration of the FPA, it is critically important for the Commission to understand how transmission providers assess their vulnerabilities to extreme weather events. As we explain below, requiring transmission providers to submit a one-time report providing the information sought in this NOPR will enhance the Commission's ability to fulfill its obligations under the FPA.

14. Although the technical conference and technical conference comments underscored the importance of planning appropriately for extreme weather, the record to date does not provide the Commission with a clear understanding of whether and to what extent transmission providers are currently conducting, or planning to conduct, extreme weather vulnerability assessments, the method(s) used to conduct those assessments, and

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[29] NERC's reports on both short-term and long-term weather issues discussed above highlight our concern regarding the impact of extreme weather on system reliability, as well as our concern that such events are likely to increase in severity of frequency.

what is done with the information from those assessments.[30] Moreover, it is unclear the extent to which transmission providers regularly assess their vulnerabilities to extreme weather events.[31] But given the severe impacts resulting from extreme weather, as discussed above, we believe the Commission needs a better understanding of what transmission providers are doing—or not doing—with respect to assessing and mitigating extreme weather risks.

15. We are issuing this NOPR under § 304 of the FPA, which allows the Commission to order reports as the Commission may prescribe as "necessary or appropriate to assist the Commission in the proper administration of" the FPA.[32] We believe that our proposal here does precisely that because it will help ensure that the Commission fulfills its statutory obligations with respect to system reliability and just and reasonable rates. Under the FPA, the Commission is responsible for overseeing the development and enforcement of reliability standards for the Bulk-power System.[33] The Commission must also ensure that the rates, terms, and conditions of Commission-jurisdictional services are

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[30] Based on the record developed during the technical conference, this practice does not appear to be widespread among transmission providers. For example, of the six jurisdictional RTOs/ISOs, only New York Independent System Operator, Inc. appears to have conducted such an assessment. Therefore, we believe that the proposed one-time informational reporting requirement will provide the necessary information for the Commission to understand the extent to which transmission providers are performing these assessments.

[31] We recognize that transmission providers may be undertaking such vulnerability assessments. *See, e.g.*, Entergy Corporation (Entergy) Post-Conference Reply Comments at 1. But we nonetheless do not have much visibility into whether and how each transmission provider undertakes such assessments, and we propose to remedy that concern here.

[32] 16 U.S.C. 825c.

[33] *Id.* 824o.

just and reasonable and not unduly discriminatory or preferential.[34] The reports we propose to require will enhance the Commission's understanding of whether, and if so, how transmission providers are assessing risks to transmission assets and operations as a result of extreme weather events. As noted above, we believe it is important for the Commission to understand whether and to what extent such assessments are being conducted to assist the Commission in the proper administration of the FPA.

16. For example, the failure to assess and mitigate the risks of extreme weather could increase the frequency of loss of load events and also impact consumers who could not only experience increased frequency of power outages but would also ultimately bear the financial burden to regularly rebuild damaged infrastructure or to pay for solutions that may be more costly than solutions that could have been identified through a more proactive, forward-looking process. Extreme weather events can also lead to extreme prices for wholesale electricity.[35] Notwithstanding these potentially severe impacts, the record in this proceeding does not indicate that most transmission providers have robust policies and processes for assessing and mitigating extreme weather vulnerabilities.

17. Additionally, transmission providers may face adverse impacts to their credit ratings and increased insurance costs, which could ultimately flow through into transmission rates. For example, credit rating agencies like Standard & Poor's and Moody's have added "resiliency" as a component of their rating criteria, indicating the

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[34] *Id.* 824d, 824e.

[35] During Winter Storm Uri, both the Midcontinent Independent System Operator and the Southwest Power Pool experienced prices exceeding the $2,000/MWh cap on incremental energy offers. FERC Staff, *2021 State of the Markets Report*, p. 30 (issued Apr. 21, 2022).

relevance of extreme weather risk for creditworthiness.[36] Similarly, transmission providers could increasingly seek access to a higher level of insurance to cope with potential damage from more frequent and destructive weather-related events.[37] Finally, we believe that the one-time informational reports proposed in this NOPR will facilitate the sharing of best practices among transmission providers and their stakeholders for conducting extreme weather vulnerability assessments. At the technical conference, several commenters and panelists noted the importance of coordination and information sharing between entities in order to better assess and plan for extreme weather risks.[38] The information in these reports could serve as the basis for further information sharing and coordination, which could lead to improved or more robust assessments and thereby better avoid the adverse rate impacts discussed above.

18. Extreme weather events are occurring more frequently than ever before, and those events bring increased threats to system reliability and impacts on jurisdictional rates. Consistent with the GAO's recommendation noted above, the Commission needs to be well-positioned to take appropriate action consistent with its FPA obligations, if necessary. We believe that the reports we are proposing to require in this NOPR will help provide us with information necessary to assist us in administering the FPA.

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[36] F. Shafroth, *Climate Change and Credit Ratings* (Dec. 10, 2015), https://www.governing.com/archive/gov-climate-change-credit-ratings.html.

[37] *See, e.g.*, Oregon Public Utility Commission Pre-Conference Comments at 6-7, National Association of Mutual Insurance Companies Pre-Conference Comments at 1-3.

[38] *See* June 2, 2021 Tr. 102-103 (Moskowitz); Columbia/EDF Pre-Conference Comments at 2; PJM Pre-Conference Comments at 6-9.

III. Discussion

19. We propose to require transmission providers to submit one-time informational reports describing their current or planned policies and processes for conducting extreme weather vulnerability assessments and mitigating identified extreme weather risks within 90 days of the publication of any final rule in this proceeding in the *Federal Register*. We propose to seek public comment on the reports 30 days after they are filed.

20. For the purposes of this proposed rulemaking, we propose to define an extreme weather vulnerability assessment as any analysis that identifies where and under what conditions jurisdictional transmission assets and operations are at risk from the impacts of extreme weather events, how those risks will manifest themselves, and what the consequences will be for transmission system operations. Such assessments can take different forms: they may be qualitative or quantitative; they may be performed on a periodic or ad hoc basis; and they may cover a narrower or broader range of extreme weather threats. The extreme weather threats analyzed by these reports may include those extreme weather events exacerbated by climate change (e.g., extended heat waves or storm surge due to sea level rise).

21. Transmission providers may then use such extreme weather vulnerability assessments to develop mitigation in the form of extreme weather resilience plans, which outline measures to reduce the risk to vulnerable assets and operations. Extreme weather resilience efforts can take many forms, but generally involve both measures to prevent or minimize damage to vulnerable assets (e.g., investments in asset hardening or relocation) and to manage the consequences of such damage when it occurs (e.g., investments in system recoverability).[39]

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[39] R.M. Webb, M. Panfil, and S. Ladin, *Climate Risk in the Electric Sector: Legal*

22. To be clear, we do not intend in this NOPR to require transmission providers to conduct extreme weather vulnerability assessments where they do not do so already, or to require transmission providers to change how they conduct or plan to do such assessments.[40] Instead, the goal of this proceeding is to gather information, not to establish new requirements. In addition, we do not propose that transmission providers submit the results of their extreme weather vulnerability assessments or include lists of affected assets and operations, specific vulnerabilities, or asset- or operation-specific mitigations in the informational reports proposed by this NOPR. Rather, we propose that the one-time informational reports focus on describing the current or planned policies and processes that respondents have in place, or plan to implement, to assess and mitigate extreme weather risks. We believe that this focus of the proposed one-time informational reports should avoid the need for respondents to file Critical Energy/Electric Infrastructure Information. However, to the extent transmission providers believe that information they will submit warrants protections, they may make a request for such treatment pursuant to §§ 388.112 and 388.113 of the Commission's regulations.[41]

Obligations to Advance Climate Resilience Planning by Electric Utilities 10 (Dec. 2020), https://perma.cc/V25A-KBNP.

[40] Similarly, while we propose that transmission providers may describe what they "plan" to do with respect to various issues, this is meant only to capture plans that have been made, but not yet been implemented; transmission providers are not required to speculate on how they would conduct extreme weather vulnerability analysis where they have no plans to do so.

[41] 18 CFR 388.112-113. Section 388.112 of the Commission's regulations specifies that any person submitting a document to the Commission may request privileged treatment for some or all of the information contained in a particular document that it claims is exempt from the mandatory public disclosure requirements of the Freedom of Information Act, and that should be withheld from public disclosure. *See* 5 U.S.C. 552. Section 388.113 of the Commission's regulations governs the procedures for submitting, designating, handling, sharing, and disseminating Critical Energy/Electric

23. Although commenters in Docket No. AD21-13-000 have referenced previously published guidance on conducting vulnerability assessments,[42] insufficient data exists to establish best practices. Therefore, we seek comments on our approach in directing such one-time informational reports, the proposed topics and questions discussed below, and the burden associated with submitting these reports. As further described below, we propose the one-time reports to address: (1) Scope; (2) Inputs; (3) Vulnerabilities and Exposure to Extreme Weather Hazards; (4) Costs of Impacts; and (5) Risk Mitigation.

24. While not all extreme weather vulnerability assessments must follow the same processes or include the same analyses, we understand the aforementioned topics to reflect typical practices and considerations in the development of extreme weather vulnerability assessments. Therefore, should respondents' processes and policies for developing their own extreme weather vulnerability assessments differ from those we describe below, we propose to require that transmission providers still describe in their one-time reports the processes and policies which most closely align with the intent or aim of the topics discussed below.

Infrastructure Information submitted to or generated by the Commission.

[42] Department of Energy, Office of Energy Policy and Systems Analysis, *Climate Change and the Electricity Sector: Guide for Climate Resilience Planning* (Sept. 2016), https://toolkit.climate.gov/sites/default/files/Climate%20Change%20and%20the%20Electricity%20Sector%20Guide%20for%20Climate%20Change%20Resilience%20Planning%20September%202016_0.pdf (DOE Guide); CPUC, *Climate Adaptation in the Electric Sector: Vulnerability Assessments & Resiliency Plans* (Jan 2016), https://perma.cc/R6NW-F6GV (CPUC Guide); J. Gundlach and R. Webb, *Climate Change Impacts on the Bulk Power System: Assessing Vulnerabilities and Planning for Resilience* (Feb 2018), http://columbiaclimatelaw.com/files/2018/02/Gundlach-Webb-2018-02-CC-Bulk-Power-System.pdf.

A. Scope

1. Background

25. Determining the scope of an extreme weather vulnerability assessment depends on the breadth of assets, operations, and extreme weather hazards that a transmission provider faces in its specific area. A narrower scope (i.e., examining a subset of assets and operations, extreme weather hazards, or geographic regions in greater depth) can produce important insights related to specific facilities, systems, or regions, whereas a broader scope is more likely to identify system- and company-wide risks. For example, although Hurricane Sandy in 2012 initially motivated Consolidated Edison, Inc. (ConEd) to conduct its 2019 climate change vulnerability assessment, ConEd sought in its study to understand the broader impact of a changing climate on its service area and identified additional climate vulnerabilities including sea level rise, inland flooding due to increased precipitation, and extreme heat events.[43]

26. As part of scoping the extreme weather vulnerability assessment, transmission providers have the flexibility to choose the assets and operations to examine for their assessment. For example, some transmission providers focus their analyses on assets and operations related to critical electric infrastructure and/or assets and operations that meet or exceed some MW or other threshold.[44] Furthermore, transmission providers may use

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[43] ConEd, *Climate Change Vulnerability Study* 4 (Dec. 2019), https://www.coned.com/-/media/files/coned/documents/our-energy-future/our-energy-projects/climate-change-resiliency-plan/climate-change-vulnerability-study.pdf.

[44] National Grid and Dominion Energy Virginia, for example, have focused specifically on substation flooding risk resulting from sea level rise and severe storms because of the relatively higher impact of substation loss compared to other assets like individual distribution lines. DOE Office of Energy Policy and Systems Analysis, *A Review of Climate Change Vulnerability Assessment: Current Practices and Lessons Learned from DOE's Partnership for Energy Sector Climate Resilience* 8 (May 2016), https://toolkit.climate.gov/sites/default/files/A%20Review%20of%20Climate%20Change

discretion to determine what extreme weather hazards and geographic scope to consider in their vulnerability assessment. Transmission providers could also consider external vulnerabilities in their assessment, such as those related to consumers, interconnected utilities, and supply chains. For example, with respect to external vulnerabilities, PG&E examined not only its own assets, but upstream interdependencies, including regional bulk electric and natural gas systems, water availability, telecommunication utilities, and supply chains, as well as downstream interdependencies like community- and customer-level resiliency.[45] With respect to geographic scope, although Entergy's service territory and assets extend across multiple states, its assessment, conducted with partners, focused exclusively on the 77 counties bordering the Gulf of Mexico. This specific geographic scope allowed Entergy and its partners to study the hazards unique to the Gulf region, driven by sea level rise, land subsidence, and increasing hurricane intensity.[46] A wider geographic scope may consider wide-area and long duration extreme weather events, such as the August 2020 West-wide extreme heat event described above.

27. Finally, a transmission provider may engage a broad set of stakeholders early in the scoping process to identify particularly susceptible regions in their footprint and increase support for any resilience actions that result from the extreme weather

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%20Vulnerability%20Assessments%20Current%20Practices%20and%20Lessons%20Learned%20from%20DOEs%20Partnership%20for%20Energy%20Sector%20Climate%20Resilience.pdf (DOE Vulnerability Assessment Review).

[45] PG&E, *Climate Change Vulnerability Assessment and Resilience Strategies* 18 (Nov. 2016), https://www.pgecurrents.com/wp-content/uploads/2016/12/PGE_climate_resilience_report.pdf.

[46] Entergy, *Building a Resilient Gulf Coast: Executive Report* (2010), https://www.entergy.com/userfiles/content/our_community/environment/GulfCoastAdaptation/Building_a_Resilient_Gulf_Coast.pdf.

vulnerability assessment.[47] The Oregon Department of Energy, for example, engaged stakeholders from vulnerable and underserved communities in its climate vulnerability assessment in order to incorporate equity concerns and examine the extent to which underserved and vulnerable groups are disproportionately impacted by these risks.[48]

2. Proposal

28. As a threshold matter, we propose that each transmission provider state whether it conducts extreme weather vulnerability analyses. Further, we propose to require each transmission provider to provide the following information on the policies and processes they employ, or plan to employ, for determining the scope of extreme weather vulnerability assessments:

Q1) A description of the types of extreme weather events for which the transmission provider conducts, or plans to conduct, extreme weather vulnerability assessments, if any. For transmission providers that conduct, or plan to conduct, such assessments, a description of how the transmission provider determined which extreme weather hazards to include in the assessment (e.g., extreme storms such as hurricanes and the associated flooding and high winds, wildfires, extreme prolonged heat or cold, or drought conditions);

Q2) A description of how the transmission provider selects, or plans to select, the set of assets and operations that will be examined;

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[47] DOE Guide at 8-15.

[48] Oregon Department of Energy, *2020 Biennial Energy Report* 28 (Nov. 2020), https://www.oregon.gov/energy/Data-and-Reports/Documents/2020-Biennial-Energy-Report.pdf.

Q3) A description of how the transmission provider determines, or plans to determine, the geographic or regional scope of the analysis;

Q4) A description of whether and to what extent the transmission provider considers, or plans to consider, external interdependencies, such as interconnected utilities, other critical infrastructure sectors (e.g., water, telecommunications) and supply chain-related vulnerabilities, in the assessment;

Q5) A description of whether and to what extent the transmission provider coordinates, or plans to coordinate, with neighboring utilities and/or entities in other sectors that could potentially be relevant to the assessment;

Q6) A description of whether and to what extent the transmission provider engages, or plans to engage, with stakeholders in the scoping phase of the assessment, including the processes used to identify and engage relevant stakeholder groups and incorporate stakeholder feedback into the extreme weather vulnerability assessment, especially with regard to disadvantaged or vulnerable communities.

B. Inputs

1. Background

29. As noted above, the processes for conducting extreme weather vulnerability assessments may vary; however, there are several types of key inputs that are likely to be part of such assessments. First, most assessments require meteorological data that support and describe how the extreme weather hazards selected for study during the scoping phase may specifically manifest in the study region (e.g., local storm surge projections for the next 50 years, historical drought data, projected temperature data). In

some cases, such data may be readily available, or in cases where existing extreme weather projections are inadequate to support a transmission provider's vulnerability assessment, new projections may be generated by consulting a modeling group (typically academic institutions or consulting firms).

30. Second, transmission providers can elect to use scenario analyses to explore how the set of potentially vulnerable assets and operations may vary across a range of assumed extreme weather hazards and other modeling inputs. Transmission providers may opt to study a single scenario or multiple scenarios based on previous modeling efforts; for example, in its internal climate vulnerability assessment, San Diego Gas & Electric Company (SDG&E) compiled multiple projections for temperature, rainfall patterns, drought, and sea level rise in its service territory to explore potential impacts in 2050 and 2100.[49] Alternatively, transmission providers may take a probabilistic approach whereby probability distributions are developed and forecast for each parameter (e.g., precipitation, windspeed). This approach is more computationally advanced but can help produce granular, quantitative risk assessments that capture a wider range of potential variation and outcomes.

31. Third, the relevant attributes of the assets and operations that will be studied are additional key inputs into an extreme weather vulnerability assessment that may affect whether, and to what extent, these assets and operations exhibit vulnerabilities under the conditions being studied. For example, the potential vulnerability of a transmission tower to extreme wind may vary based on its height, age, and other known or foreseeable parameters. Example asset attributes could include, among others, age, design lifetime,

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[49] DOE Vulnerability Assessment Review at 14.

location, elevation, and replacement costs, while example operations attributes could include type and number of staff, locations of critical staff and facilities, and maintenance schedules.

32. Fourth, transmission providers have the flexibility to decide the timeframe(s) to be considered by the vulnerability assessment (e.g., the next 10 years, or a sampling of specific one-year periods).[50] The selected timeframe(s) may affect or be affected by the transmission provider's choices with other study inputs (e.g., relevant datasets may not be available for a study of potential vulnerabilities 100 years into the future).

33. Lastly, if transmission providers analyze the potential financial implications of extreme weather impacts, they could use a discount rate that will convert the costs of potential impacts on identified vulnerable assets and operations at different points in time into equivalent values in a base year (i.e., present dollars).[51] Discount rates could also inform transmission provider efforts to compare the costs of extreme weather events to the benefits of mitigation actions over time.

2. Proposal

34. We propose to direct each transmission provider to provide the following information about the inputs it uses, or plans to use, for any extreme weather vulnerability assessments.

Q9) A description of methods and processes the transmission provider uses, or plans to use, to determine the meteorological data needed for its

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[50] For example, in their internal climate vulnerability assessments, Entergy studied the following 45 years while Seattle City Light studied years 2030 and 2050. *Id.* at 6.

[51] William Pizer and Richard Newell, *Discounting the Benefits of Climate Change Mitigation: How Much Do Uncertain Rates Increase Valuations?* 2 (Dec. 2001), https://www.c2es.org/wp-content/uploads/2001/12/econ_discounting.pdf.

assessment. In particular, how the transmission provider determines whether it can rely on existing extreme weather projections, and if so, whether such projections are adequately robust;

Q10) A description of how the transmission provider determines whether to use scenario analysis, and if so, whether to do so with multiple scenarios;

Q11) The extent to which it reviews neighboring transmission providers' extreme weather vulnerability assessments, if available, to evaluate the consistency of extreme weather projections between transmission providers;

Q12) The timeframe(s) and discount rate(s) selected for the extreme weather vulnerability assessment;

Q13) A description of the methods and processes the transmission provider uses, or plans to use, to create an inventory of potentially vulnerable assets and operations.

C. Vulnerabilities and Exposure to Extreme Weather Hazards

1. Background

35. Extreme weather vulnerability assessments can include an analysis of the assets or operations exposed to the types of extreme weather hazards established in the assessment's scope (e.g., hurricanes and associated flooding, and high winds, wildfires, extreme prolonged heat or cold, drought conditions), the sensitivities of transmission assets and operations to extreme weather events, and the magnitude of any impacts to the transmission system caused by extreme weather events. In assessing the exposure to extreme weather events, transmission providers may estimate the likelihood and extent of damage or disruption to their transmission assets and operations if various extreme weather events occur.

36. In extreme weather vulnerability assessments, transmission providers generally use probability distributions or other quantitative estimates to examine how a particular asset or operation would be affected under a specific extreme weather event or combination of events.[52] The sensitivity of an asset or operation to a specific extreme weather event depends on both the type and severity of the event (e.g., the force of a wave during a hurricane or temperature during a heat wave) and the type, configuration, or attributes of the asset or operation itself (e.g., the physical resilience of a transmission tower to increased wind speeds or wave force).[53] In cases where it is difficult to estimate the likelihood or severity of damage or disruption given the occurrence of an extreme weather impact, transmission providers may provide a best estimate.

37. Rather than attempting to analyze the likelihood of damage, disruption or failure for all transmission assets and operations, transmission providers may instead use a screening analysis to identify critical thresholds at which extreme weather hazard(s) would likely render an asset or operation vulnerable based on the relevant attributes determined in the sensitivity analysis. If a screening analysis identifies potential vulnerabilities among assets and operations considered especially significant or critical, transmission providers conducting vulnerability assessments could supplement their analysis with a more detailed review of the specific assets and operations.

38. Once these vulnerabilities are identified, transmission providers may estimate the magnitude of the impacts that would cause damage or disruption to assets or operations triggered by various extreme weather hazards. For example, NERC acknowledges that

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[52] CPUC Guide at 15.

[53] DOE Guide at 39.

various conditions could lead to loss of resources, including extreme cold temperatures and wind that can cause wellhead, processing plant, or compressor station freezing or ambient temperature conditions that are outside the operating temperatures for the asset.[54]

2. Proposal

39. We propose to direct each transmission provider to provide the following information about the methods or processes it uses, or plans to use, in its extreme weather vulnerability assessment to assess the vulnerability of its transmission assets and operations to extreme weather events.

Q14) A description of how the transmission provider identifies the transmission assets or operations vulnerable to the extreme weather events for which it conducts assessments;

Q15) A description of how the transmission provider uses, or plans to use, screening analyses to test for potential vulnerabilities, as well as how the transmission provider examines, or plans to examine, the sensitivities of the transmission assets and operations being studied to types and magnitudes of extreme weather events.

D. Costs of Impacts

1. Background

40. The aggregate economic effects of climate change and extreme weather on energy infrastructure could be trillions of dollars over the next few decades, including the costs of power outages to utility customers and costs to rebuild from storm damage, among others.[55] These costs are a function of the estimated exposure of the impacted assets,

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[54] NERC Post-Conference Comments at 6.

[55] GAO Report at 19; Deloitte, *The Turning Point: A New Economic Climate in*

their geographical locations, the severity of associated extreme weather impacts, other potential location-specific factors, and the study's timeframe and assumed discount rate (used for converting costs to net present value). These costs may be further broken up into direct and indirect costs.

41. In this proceeding, we define direct costs as the economic losses borne by the transmission provider. Direct costs may include expenditures and administrative and labor costs associated with responding to and resolving extreme weather impacts, such as the costs of repairing, replacing, or relocating an asset. Direct costs may also include the transmission provider's opportunity costs of lost sales during an outage.[56] Transmission providers may arrive at a rough estimate of direct costs by assuming that impacted vulnerable assets would be damaged beyond repair and calculating their associated replacement costs. Alternatively, a more detailed analysis could examine how costs vary as a function of impact severity for specific assets and operations.[57]

42. Depending on the scope of the extreme weather vulnerability assessment, transmission providers may also consider indirect costs, which we define in this proceeding as costs associated with loss of service to utility customers.[58] For example,

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the United States 15 (Jan. 2022), https://www2.deloitte.com/content/dam/Deloitte/us/Documents/about-deloitte/us-the-turning-point-a-new-economic-climate-in-the-united-states-january-2022.pdf.

[56] DOE Guide at 43.

[57] *Id.* at 44.

[58] Relatedly, transmission providers may also consider induced costs that do not directly affect their ratepayers, such as increased prices for consumer goods and effects on interdependent sectors like water and transportation. However, we assume that induced costs would likely be beyond the scope of most transmission providers' extreme weather vulnerability assessments because they do not directly affect ratepayers or the prudence of transmission provider investments. *Id.* at 45.

relevant indirect costs may include equipment damage, spoilage, and health and safety effects.[59] Value of lost load calculations, which estimate the value that customers place on reliable electricity service, are a common method for quantitatively estimating indirect costs.[60]

2. Proposal

43. We propose to direct each transmission provider to provide the following information on how it estimates, or plans to estimate, the costs associated with extreme weather impacts in its extreme weather vulnerability assessments:

Q16) A description of the methodology or process, if any, the transmission provider uses, or plans to use, to estimate the potential costs of extreme weather impacts on identified vulnerable assets and operations;

Q17) If the transmission provider estimates such potential costs, a description of the types of: (a) direct costs, such as replacements or repair costs, restoration costs, associated labor costs, or opportunity costs of lost sales, and (b) indirect costs, such as costs associated with loss of service to electric customers and other utilities that purchase power from the transmission provider, including equipment damage, spoilage, and health and safety effects,[61] in calculating the costs of extreme weather impacts.

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[59] *Id.* at 45-46.

[60] *See, e.g.*, *Wholesale Competition in Regions with Organized Electric Markets*, Order No. 719, 73 FR 64100 (Oct. 28, 2008), 125 FERC ¶ 61,071, at P 208 (2008) (describing the Commission's contemplated reforms "to ensure that the market price for energy accurately reflects the value of such energy during an operating reserve shortage").

[61] DOE Guide at 43-46.

E. Risk Mitigation

1. Background

44. In general, the overall vulnerability of the transmission system is a function of the estimated exposure of vulnerable assets and operations to extreme weather threats and the estimated impact of those threats. For example, the failure of an asset that is highly exposed to a particular extreme weather risk may not materially increase the overall vulnerability of the system if there are other redundant assets that perform similar system functions. Conversely, the failure of a pivotal asset (i.e., not backed by redundant assets) with relatively low exposure to a particular extreme weather risk may nonetheless pose significant operational challenges if such failure were to occur.

45. Some transmission providers consider the potential degradation or failure of key assets and operations due to various extreme weather threats by using likelihood-consequence matrices to categorize vulnerable assets and operations based on: (1) the likelihood that the asset or operation is impacted by an extreme weather event or change in climatic parameter (e.g., severe storms and flooding, ambient heat increase, sea-level rise); and (2) the estimated associated consequences for overall system performance. This approach can reveal the need to replace certain assets, deficiencies in current asset and operational performance standards, or the potential for stranded assets.[62]

46. Under this approach, transmission providers may further define illustrative anchors for these categories to foster a consistent interpretation under this approach. For example, Public Service Electric & Gas Company (PSE&G) chose to map vulnerabilities onto a likelihood-consequence matrix composed of six likelihood categories—with its

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[62] CPUC Guide at 15-16.

highest likelihood category as those events expected to occur more than once per year, and its lowest likelihood category as those which are expected to never occur—and six consequence categories ('inconsequential,' 'minimal,' 'minor,' 'moderate,' 'considerable,' and 'severe').[63] PSE&G then assigned numeric ratings to each likelihood and consequence category and scored each extreme weather vulnerability by multiplying the two ratings together. This approach enabled PSE&G to rank the severity of extreme weather and climate risks to its assets and further prioritize actions to mitigate these risks.[64]

47. After assessing the relative risks to assets and operations, the transmission provider can then determine appropriate mitigation. Example solutions for mitigating risks to vulnerable assets may include hardening or relocating, while example solutions for mitigating risks to vulnerable operations may include improved load management practices that reduce outages and expedite restoration.

2. Proposal

48. We propose to direct each transmission provider to provide the following information on the processes and policies it uses, or plans to use, to determine and implement appropriate measures for mitigating extreme weather risks identified in its extreme weather vulnerability assessment:

Q18) A description of how the transmission provider uses, or plans to use, the results of its assessment to develop measures to mitigate extreme weather risks, including:

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[63] DOE Vulnerability Assessment Review at 16-17.

[64] *Id.*

i. How the transmission provider determines which risks should be mitigated and the appropriate time horizon for mitigation;

ii. How the transmission provider determines appropriate extreme weather risk mitigation measures, including any analyses used to determine the lowest-cost or most impactful portfolio of measures;

Q19) A description of how the transmission provider informs, or plans to inform, relevant stakeholders—such as neighboring transmission providers, RTOs/ISOs of which the transmission provider is a member, electric customers, affected and frontline communities, shareholders and investors, emergency management agencies, local and state administrations, and state utility regulators—of identified extreme weather risks and selected mitigation measures;

Q20) A description of the extent to which the transmission provider incorporates, or plans to incorporate, identified extreme weather risks and mitigation measures into local and regional transmission planning processes;

Q21) A description of how the transmission provider measures, or plans to measure, the progress and success of extreme weather risk mitigation measures (e.g., through reduced outages) and how it incorporates these observations into ongoing and future extreme risk mitigation actions.

IV. Information Collection Statement

49. The information collection requirements contained in this NOPR are subject to review by the Office of Management and Budget (OMB) under section 3507(d) of the

Paperwork Reduction Act of 1995.[65] OMB's regulations require approval of certain information collection requirements imposed by agency rules.[66] Upon approval of a collection of information, OMB will assign an OMB control number and an expiration date. Respondents subject to the filing requirements of a rule will not be penalized for failing to respond to the collection of information unless the collection of information displays a valid OMB control number.

50. This NOPR would, pursuant to § 304 of the FPA, require transmission providers[67] to file one-time reports on their extreme weather vulnerability assessment practices. The Commission believes requiring transmission providers to submit a one-time informational report on their current or planned efforts to assess the vulnerabilities of their jurisdictional transmission assets and operations to extreme weather events will assist in the proper administration of the FPA.

Title: One-Time Informational Reports on Extreme Weather Vulnerability Assessments

Action: Proposed FERC-1004 collection of information in accordance with Docket Nos. RM22-16-000 and AD21-13-000.

OMB Control No.: 1902-TBD

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[65] 44 U.S.C. 3507(d).

[66] 5 CFR 1320.11 (2021).

[67] As noted above, in this NOPR, unless otherwise noted, we use the term "transmission provider" to mean any public utility that owns, controls, or operates facilities used for the transmission of electric energy in interstate commerce. See 16 U.S.C. 824(e); 18 CFR 35.28. To be clear, this term encompasses public utility transmission owners that are members of RTOs/ISOs. Accordingly, the reports we are proposing herein would be filed by the public utility members of RTOs/ISOs, as well as by the RTOs/ISOs themselves and other public utility transmission providers.

Respondents: Transmission providers (including public utility transmission owners that are members of RTOs/ISOs and the RTOs/ISOs themselves).

Frequency of Information Collection: One time.

Necessity of Information: The Commission seeks to address the increasing risks of extreme weather to bulk electric system reliability and jurisdictional rates, and to better understand how transmission providers assess and mitigate those risks. The Commission believes the informational reports directed by this Proposed Rulemaking will allow it to determine whether additional action on extreme weather vulnerability assessments is needed and assist the Commission in the proper administration of the FPA.

Internal Review: The Commission has reviewed the reporting requirement and has determined that such a requirement is necessary. These requirements conform to the Commission's need for efficient information collection, communication, and management within the energy industry. The Commission has specific, objective support for the burden estimates associated with the information collection requirements. Interested persons may obtain information on the reporting requirements by contacting Ellen Brown, Office of the Executive Director, Federal Energy Regulatory Commission, 888 First Street, NE, Washington, DC 20426 via email (DataClearance@ferc.gov) or telephone ((202) 502-8663).

51. The Commission solicits comments on its need for this information; whether the information will have practical utility; the accuracy of the burden estimates; ways to enhance the quality, utility, and clarity of the information to be collected or retained; and any suggested methods for minimizing respondents' burden, including the use of automated information techniques.

52. Please send comments concerning the collection of information and the associated burden estimate to the Office of Information and Regulatory Affairs, Office of Management and Budget, through www.reginfo.gov/public/do/PRAMain, Attention: Federal Energy Regulatory Commission Desk Officer. Please identify FERC-1004 and OMB Control Number 1902-TBD in the subject line of your comments. Comments should be sent within 60 days of publication of this notice in the *Federal Register*.

53. Please submit a copy of your comments on the information collection to the Commission via the eFiling link on the Commission's website at http://www.ferc.gov. Comments on the information collection that are sent to FERC should refer to Docket Nos. RM22-16-000 and AD21-13-000.

54. Public Reporting Burden: Our estimates are based on the NERC Compliance Registry as of May 6, 2022 and each RTO/ISO's list of participating transmission owners per their websites, which indicates that there are 49 transmission providers[68] (including the six RTOs/ISOs) and 83 transmission owners that are registered with NERC within the United States and are subject to this proposed rulemaking.[69]

55. The Commission estimates that the burden[70] and cost of the proposed FERC-1004 are as follows:

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[68] The transmission service provider (TSP) function is a NERC registration function which is similar to the transmission provider that is referenced in the pro forma Open Access Transmission Tariff. The TSP function is being used as a proxy to estimate the number of transmission providers that are impacted by this proposed rulemaking.

[69] The number of entities listed from the NERC Compliance Registry reflects the omission of the Texas RE registered entities.

[70] "Burden" is the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency. For further explanation of what is included in the information collection burden, refer to 5 CFR 1320.3.

FERC-1004, as Proposed in NOPR in Docket Nos. RM22-16-000 and AD21-13				
A. Area of Modification	**B. Annual Number of Respondents**	**C. Annual Estimated Number of Responses (1 per respondent)**	**D. Average Burden Hours & Cost[71] per Response**	**E. Total Estimated Burden Hours & Total Estimated Cost (Column C x Column D)**
Report on Extreme Weather Vulnerability Assessment (one-time)	132 (49 TPs[72] and 83 TOs)	132	Year 1: 99 hours; $8,613.00 Subsequent Years: 0 hours per year; $0	Year 1: 13,068 hours; $1,136,916 Subsequent Years: 0 hours per year; $0

V. Environmental Analysis

56. The Commission is required to prepare an Environmental Assessment or an Environmental Impact Statement for any action that may have a significant adverse effect on the human environment.[73] The actions proposed to be taken here fall within categorical exclusions in the Commission's regulations for rules regarding information gathering, analysis, and dissemination, and for rules regarding sales, exchange, and transportation of natural gas that require no construction of facilities.[74] Therefore, an environmental review is unnecessary and has not been prepared in this rulemaking.

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[71] Commission staff estimates that respondents' hourly wages plus benefits are comparable to those of FERC employees. Therefore, the hourly cost used in this analysis is $87.00 (or $180,703 per year).

[72] The number of entities listed from the NERC Compliance Registry reflects the omission of the Texas RE registered entities.

[73] *Reguls. Implementing the Nat'l Env'tal Pol'y Act*, Order No. 486, 52 FR 47,897 (Dec. 17, 1987), FERC Stats. & Regs. ¶ 30,783 (1987) (cross-referenced at 41 FERC ¶ 61,284).

[74] *See* 18 CFR 380.4(a)(2)(ii), 380.4(a)(5), 380.4(a)(27).

VI. Regulatory Flexibility Act

57. The Regulatory Flexibility Act of 1980 (RFA)[75] generally requires a description and analysis of proposed rules that will have significant economic impact on a substantial number of small entities. The RFA mandates consideration of regulatory alternatives that accomplish the stated objectives of a proposed rule and minimize any significant economic impact on a substantial number of small entities.[76] The Small Business Administration (SBA) sets the threshold for what constitutes a small business. Under SBA's size standards,[77] transmission providers (including RTOs/ISOs) and transmission owners fall under the category of Electric Bulk Power Transmission and Control (NAICS code 221121),[78] with a size threshold of 500 employees (including the entity and its associates).[79]

58. We estimate that there are 132 total transmission providers and owners that (not including the six RTOs/ISOs) are affected by the NOPR.

59. The six RTOs/ISOs (SPP, MISO, PJM, ISO-NE, NYISO, and CAISO) each employ more than 500 employees and are not considered small entities.

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[75] 5 U.S.C. 601-612.

[76] *Id.* 603(c).

[77] 13 CFR 121.201.

[78] The North American Industry Classification System (NAICS) is an industry classification system that Federal statistical agencies use to categorize businesses for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. economy. United States Census Bureau, North American Industry Classification System, https://www.census.gov/eos/www/naics/.

[79] The threshold for the number of employees indicates the maximum allowed for a concern and its affiliates to be considered small. 13 CFR 121.201.

60. Using the list of transmission service providers from the NERC Registry (dated May 6, 2022), we estimate that approximately 30% of those entities are small entities. We estimate an additional average one-time cost of $8,613.00 for each of the 132 entities affected by the NOPR.

61. According to SBA guidance, the determination of significance of impact "should be seen as relative to the size of the business, the size of the competitor's business, and the impact the regulation has on larger competitors."[80] We do not consider the estimated cost to be a significant economic impact. As a result, pursuant to section 605(b) of the RFA,[81] the Commission certifies that the proposals in this NOPR will not have a significant economic impact on a substantial number of small entities.

VII. Comment Procedures

62. The Commission invites interested persons to submit comments on the matters and issues proposed in this notice to be adopted, including any related matters or alternative proposals that commenters may wish to discuss. Comments are due **[INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. Comments must refer to Docket Nos. RM22-16-000 and AD21-13-000, and must include the commenter's name, the organization they represent, if applicable, and their address in their comments. All comments will be placed in the Commission's public files and may be viewed, printed, or downloaded remotely as described in the Document Availability

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[80] U.S. Small Business Administration, *A Guide for Government Agencies How to Comply with the Regulatory Flexibility Act* 18 (August 2017), https://cdn.advocacy.sba.gov/wp-content/uploads/2019/06/21110349/How-to-Comply-with-the-RFA.pdf

[81] 16 U.S.C. 605(b).

section below. Commenters on this proposal are not required to serve copies of their comments on other commenters.

63. The Commission encourages comments to be filed electronically via the eFiling link on the Commission's website at http://www.ferc.gov. The Commission accepts most standard word processing formats. Documents created electronically using word processing software must be filed in native applications or print-to-PDF format and not in a scanned format. Commenters filing electronically do not need to make a paper filing.

64. Commenters that are not able to file comments electronically may file an original of their comment by USPS mail or by courier-or other delivery services. For submission sent via USPS only, filings should be mailed to: Federal Energy Regulatory Commission, Office of the Secretary, 888 First Street, NE, Washington, DC 20426. Submission of filings other than by USPS should be delivered to: Federal Energy Regulatory Commission, 12225 Wilkins Avenue, Rockville, MD 20852.

VIII. Document Availability

65. In addition to publishing the full text of this document in the Federal Register, the Commission provides all interested persons an opportunity to view and/or print the contents of this document via the Internet through the Commission's Home Page (http://www.ferc.gov). At this time, the Commission has suspended access to the Commission's Public Reference Room due to the President's March 13, 2020 proclamation declaring a National Emergency concerning the Novel Coronavirus Disease (COVID-19).

66. From the Commission's Home Page on the Internet, this information is available on eLibrary. The full text of this document is available on eLibrary in PDF and Microsoft Word format for viewing, printing, and/or downloading. To access this

document in eLibrary, type the docket number excluding the last three digits of this document in the docket number field.

67. User assistance is available for eLibrary and the Commission's website during normal business hours from the Commission's Online Support at (202) 502-6652 (toll free at 1-866-208-3676) or email at ferconlinesupport@ferc.gov, or the Public Reference Room at (202) 502-8371, TTY (202) 502-8659. E-mail the Public Reference Room at public.referenceroom@ferc.gov.

By direction of the Commission. Commissioner Danly is concurring with a separate statement attached.

Issued: June 16, 2022.

Debbie-Anne A. Reese,
Deputy Secretary.

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

One-Time Informational Reports on Extreme Weather Vulnerability Assessments	Docket Nos. RM22-16-000
Climate Change, Extreme Weather, and Electric System Reliability	AD21-13-000

(Issued June 16, 2022)

DANLY, Commissioner, *concurring*:

1. I concur in today's notice of proposed rulemaking directing transmission providers to submit one-time informational reports describing their current or planned policies and processes for conducting weather assessments to identify where and under what conditions jurisdictional transmission assets and operations are at risk from weather-related events, how those risks manifest, and their consequences for transmission system operations.[1]

2. It will take over six months, at a minimum, from this NOPR to the filing of the informational reports. These informational reports will be filed long after this summer is over and will not, and indeed cannot, timely address the projected risk of widespread blackouts this summer.[2] It is doubtful they will be filed in time to take action, if gaps are identified, for the winter of 2022-2023 either. Nonetheless, I agree that there is some value in understanding the extent to which, *if any*,[3] transmission providers currently

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[1] *One-Time Informational Reports on Extreme Weather Vulnerability Assessments*, 179 FERC ¶ 61,196 (2022) (NOPR).

[2] Chairman Glick says that I am "prone to hyperbole" when I warn that blackouts are the likely outcome of the majority's misguided policies to prop up renewables at the expense of competitive markets and existing fossil resources. Rich Heidorn Jr., *Summer Forecasts Spark Warnings of 'Reliability Crisis' at FERC*, RTO INSIDER (May 19, 2022), https://www.rtoinsider.com/articles/30170-summer-forecasts-spark-warnings-reliability-crisis-ferc. Chairman Glick appears to be confusing "hyperbole" with "reality." California and Texas have already experienced blackouts. Over two-thirds of the nation faces "elevated [reliability] risk" this summer. Ethan Howland, *FERC commissioners respond to elevated power outage risks across two-thirds of US*, UTILITY DIVE (May 20, 2022), https://www.utilitydive.com/news/ferc-nerc-power-outage-risks-summer-drought/624111/ ("At its monthly meeting Thursday, Federal Energy Regulatory Commission members dissected the North American Electric Reliability Corp.'s warning that roughly two-thirds of the United States faces [sic] heightened risks of power outages this summer.").

[3] The NOPR is clear that we do not intend in this NOPR to require transmission providers to conduct extreme weather vulnerability assessments where they do not do so

assess and mitigate the risks posed by weather-related events. I also agree that the informational reports may help us identify opportunities to avoid adverse rate impacts stemming from weather events, which is consistent with our obligations under the Federal Power Act.[4]

3. The NOPR makes use of, indeed bases our action upon, an ever-growing narrative: reliability challenges arise primarily from weather-related events.[5] But even if one were to grant that certain parts of the United States were experiencing statistically unusual weather when compared to historical baselines, that has *absolutely nothing* to do with whether the markets and regulated utilities are procuring sufficient generation of the correct type to ensure resource adequacy and system reliability. We cannot blame our problems on the weather. The problem is federal and state policies which, by mandate or subsidy, spur the development of *weather dependent* generation resources at the expense of the dispatchable resources needed for system stability and resource adequacy. This is seen in particularly stark terms in our markets in which subsidies, combined with failed market design, warp price signals. This destroys the incentives required to ensure the orderly entry, exit, and retention of the necessary quantities of the necessary types of generation. The thinner and thinner margins that result render the Bulk-Power System

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already, or to require transmission providers to change how they conduct or plan to do such assessments. *See* NOPR, 179 FERC ¶ 61,196 at P 22; *id.* P 22 n.40 ("Similarly, while we propose that transmission providers may describe what they 'plan' to do with respect to various issues, this is meant only to capture plans that have been made, but not yet been implemented; transmission providers are not required to speculate on how they would conduct extreme weather vulnerability analysis where they have no plans to do so.").

[4] *See* 16 U.S.C. §§ 824d, 824e.

[5] *See* Chairman Glick (@RichGlickFERC), TWITTER (May 19, 2022, 11:13 AM), https://twitter.com/RichGlickFERC/status/1527306459263881223?s=20&t=3a4C-1cac3nmFkjZyvoUDA ("Extreme weather may be the single most important factor impacting #grid #reliability & the impacts of expected heat, drought, wildfires, hurricanes, & other events – all pose a big threat. Keeping eye on West, ERCOT, & parts of MISO this summer."); Benjamin Mullin, *Climate Change is Straining California's Energy System, Officials Say*, N.Y. TIMES (May 6, 2022), https://www.nytimes.com/2022/05/06/business/energy-environment/california-electricity-shortage.html.

more and more susceptible to the caprices of weather. We have been warned by credible sources on the matter: NERC,[6] the RTOs,[7] and Commission staff.[8]

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[6] *See generally* North American Electric Reliability Corp., *2022 Summer Reliability Assessment* (May 2022), https://www.nerc.com/pa/RAPA/ra /Reliability%20Assessments %20DL/NERC_SRA_2022.pdf. In addition, NERC has warned that system operators in areas of significant amounts of solar photovoltaic (PV) resources should be aware of the potential for resource loss events during grid disturbances. *Id.* at 6. NERC has further warned that "[i]ndustry experience with unexpected tripping of [Bulk-Power System]-connected solar PV generation units can be traced back to the 2016 Blue Cut fire in California, and similar events have occurred as recently as Summer 2021. A common thread with these events is the lack of inverter-based resource (IBR) ride-through capability causing a minor system disturbance to become a major disturbance. The latest disturbance report reinforces that improvements to NERC Reliability Standards are needed to address systemic issues with IBRs." *Id.* NERC also explains that "because the electrical output of variable energy resources (e.g., wind, solar) depends on weather conditions, on-peak capacity contributions are less than nameplate capacity." *Id.* at 45.

[7] *See, e.g.*, California Independent System Operator Corp., *2022 Summer Loads and Resources Assessment* (May 18, 2022), http://www.caiso.com/Documents/2022-Summer-Loads-and-Resources-Assessment.pdf; Midcontinent Independent System Operator (MISO), *Lack of Firm generation may necessitate increased reliance on imports and use of emergency procedures to maintain reliability* (Apr. 28, 2022), https://www.misoenergy.org/about/media-center/miso-projects-risk-of-insufficient-firm-generation-resources-to-cover-peak-load-in-summer-months/; PJM Interconnection, L.L.C. (PJM), *Energy Transition in PJM: Frameworks for Analysis* (Dec. 15, 2021), https://pjm.com/-/media/committees-groups/committees/mrc/2021/20211215/20211215-item-09-energy-transition-in-pjm-whitepaper.ashx (addressing renewable integration).

[8] *See FERC Staff Presentation on 2022 Summer Energy Market and Reliability Assessment* (AD06-3-000), FERC, at slide 9 (May 19, 2022), https://www.ferc.gov/news-events/news/presentation-report-2022-summer-energy-market-and-reliability-assessment (identifying the Western U.S., Texas, MISO and Southwest Power Pool as "[p]arts of North America are at **elevated** or **high** risk of energy shortfalls during peak summer conditions") (emphasis in original); *id.* at slide 10 (In MISO, "[g]eneration capacity declined 2.3% since 2021 resulting in [a] lower reserve margin" and the "[n]orth and central areas [are] at risk of reserve shortfall in extreme temperatures, high generation outages, or low wind" with "[s]ome risk of insufficient operating reserves at normal peak demand.").

4. As more nuclear[9] and coal plants[10]—with their high capacity factors and onsite fuel—announce early retirements, the dispatchable resources that remain are predominantly natural gas generators. Backstopping weather-dependent resources with gas generators, largely dependent on just-in-time delivery of gas, raises its own set of reliability concerns, particularly in areas—like New England—with inadequate pipeline infrastructure. On top of this, the Commission has delayed the processing of pipeline certificates and cast a chill over the pipeline industry with its "draft policy statements"[11] and orders throwing the finality of fully litigated certificates into doubt.[12] Under pressure to reduce emissions at all costs, pipelines have moved to electrify compressor stations, furthering an unhealthy co-dependency between the gas and electric systems. And the efforts of politically motivated financial institutions to cut fossil fuel producers' access to capital has added to the current supply crunch.[13] Yet, we are led to believe that extreme weather is supposed to be the culprit for the nation's looming reliability woes. Not so.

5. The question of whether the weather is getting worse is a red herring. The much more relevant question is whether current system operations and tariff and market design

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[9] U.S. Energy Information Administration, *U.S. nuclear electricity generation continues to decline as more reactors retire* (Apr. 8, 2022), https://www.eia.gov/todayinenergy/detail.php?id=51978.

[10] Ethan Howland, *Coal plant owners seek to shut 3.2 GW in PJM in face of economic, regulatory and market pressures*, UTILITY DIVE (Mar. 22, 2022), https://www.utilitydive.com/news/coal-plant-owners-seek-to-retire-power-in-pjm/620781/.

[11] *See Certification of New Interstate Nat. Gas Facilities*, 178 FERC ¶ 61,107 (2022) (Danly and Christie, Comm'rs, dissenting); *Consideration of Greenhouse Gas Emissions in Nat. Gas Infrastructure Project Revs.*, 178 FERC ¶ 61,108 (2022) (Danly and Christie, Comm'rs, dissenting); *see also Certification of New Interstate Nat. Gas Facilities*, 178 FERC ¶ 61,197, at P 2 (2022) (converting the two policy statements to "draft policy statements"). It is worth noting that PJM and MISO filed comments on the draft policy statements. PJM and MISO May 25, 2022 Limited Reply Comments, Docket Nos. PL18-1-001 and PL21-3-001, at 4 ("[A]ny future Commission pipeline policy should consider the importance of ensuring that needed pipeline infrastructure can be timely sited, and ensure that the need for infrastructure to meet electric system reliability is affirmatively considered and not lost in the debate over the scope of environmental reviews to be undertaken by the Commission.").

[12] *See, e.g.*, *Algonquin Gas Transmission, LLC*, 174 FERC ¶ 61,126 (2021) (Danly and Christie, Comm'rs, dissenting).

[13] Matt Egan, *Energy crisis will set off social unrest, private-equity billionaire warns*, CNN BUSINESS (Oct. 26, 2021), https://edition.cnn.com/2021/10/26/business/gas-prices-energy-crisis-schwarzman/index.html ("Part of the problem, [Blackstone CEO Stephen Schwarzman] said, is that it's getting harder and harder for fossil fuel companies to borrow money to fund their expensive production activities, especially in the United States. And without new production, supply won't keep up.").

are adequate to maintain reliability. The present high risk of reliability failures proves that they are not. That the policies of the Commission and other government bodies are undermining reliability is far more obvious than the question of whether, and how, the weather is getting worse and what specific effects that worsening weather might have on the stability of the electric system. That question of the weather's effect on reliability is a subject that doubtless merits study and planning, but misguided government policies are the root cause of the alarming reliability issues facing the nation, not the weather.

For these reasons, I respectfully concur.

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James P. Danly
Commissioner

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