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April 6, 2021

Public Utility Commission of Texas
Chairman Arthur C. D'Andrea
1701 N. Congress Ave.
Austin, Texas 78711

Re: PUC Project No. 51878, Reports of the Electric Reliability Council of Texas for
Calendar Year 2021

Preliminary Report on Causes of Generator Outages and Derates For Operating
Days February 14 – 19, 2021 Extreme Cold Weather Event

Dear Chairman D'Andrea:

Electric Reliability Council of Texas, Inc. (ERCOT) submits the attached preliminary report on the causes of generator outages and derates during the February 14-19, 2021 extreme cold weather event. The report provides information on the causes of the outages and derates throughout the weather event based on ERCOT's review of information submitted by Qualified Scheduling Entities (QSEs) in response to ERCOT's first requests for information (RFIs). The QSEs representing generators attributed their outages and derates to several different causes, and this aggregated presentation provides a view of why the generators believe their units experienced outages or derates. ERCOT plans to concurrently provide the attached preliminary report to members of the Texas Legislature, and to post it on the ERCOT website, at the February 2021 Extreme Weather Event webpage.

ERCOT has submitted additional RFIs to QSEs to gather outage cause information for Operating Days February 10 – 13, 2021. When that additional information is available, ERCOT will supplement the attached information, further summarizing the stated causes of the outages and derates. The final event analysis report for the February 2021 extreme cold weather event will provide an even more comprehensive set of information on generator outages and their causes. ERCOT continues to compile the data needed to complete the final analysis, and ERCOT anticipates completing the event analysis report by no later than end of August 2021. In the meantime, however, ERCOT believes the preliminary data available from the first round of RFIs answered by power generator representatives is responsive to questions regarding the causes of the February generator outages and derates.

After ERCOT has received data for the entire period (February 10 – 19, 2021), ERCOT will ask QSEs to waive confidentiality of the specific reported causes of generator outages. This underlying data for the February 14 – 19 period forms the foundation for the aggregated report submitted today. At this time, ERCOT is not able to disclose the QSE-specific answers to the RFIs, which were answered as confidential requests. Additionally, in many cases, the information

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about generator-specific outage causes were designated by QSEs as Resource-specific design or engineering data, which further limits ERCOT's authority to disclose the generators' information.¹

Please do not hesitate to contact me if you have any questions about this preliminary report or require additional information.

Respectfully,

/s/ Woody Rickerson

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¹ See ERCOT Protocol Section 1.3.1.1(1)(m) stating "Protected Information" is information containing or revealing any "Resource-specific costs, design and engineering data, including such data submitted in connection with a verifiable cost appeal." The Protected Information status of this information does not expire after a certain period of time. This information and category of Protected Information is different than the information addressed in the Commission's March 12, 2021 Order which instructed ERCOT to publicly post on its website outage data under Section 1.3.1.1(1)(c).



**February 2021 Extreme Cold Weather Event:
Preliminary Report on Causes of Generator
Outages and Derates**

ERCOT Public
April 6, 2021

Overview

This report provides aggregated information about the causes of generator outages and derates during the February winter storm event based on information provided in response to ERCOT Requests for Information.

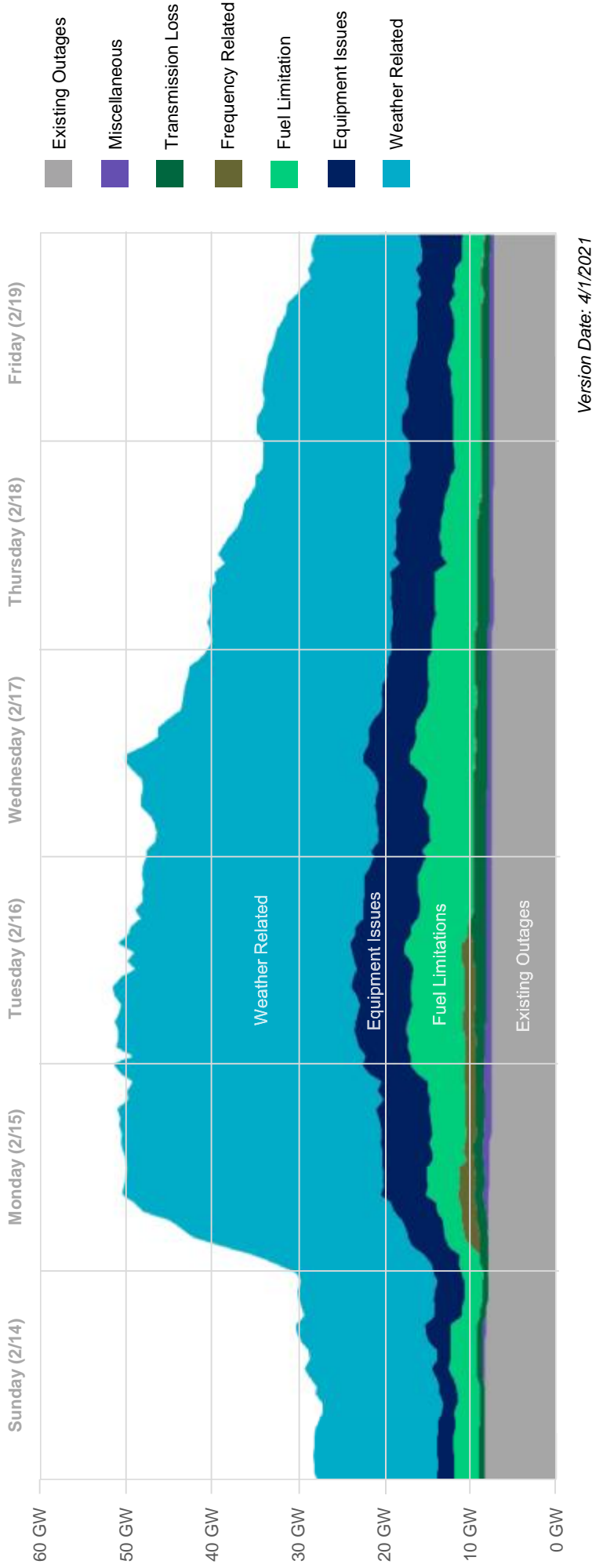
- On February 24, 2021, ERCOT sent Requests for Information (RFIs) to all Qualified Scheduling Entities (QSEs) that represent Generation Resources or Energy Storage Resources.
- The RFIs included questions about the causes of any generator outages and derates that occurred during the period of February 14-19, 2021, which were the days when the Energy Emergency Alert (EEA) was in effect.
- Using the RFI response information, ERCOT assigned each outage and derate to one of seven cause categories (see slides 9-10 for a description of these categories).
- The data in this report includes information about outages and derates entered by each QSE or Resource Entity into ERCOT's Outage Scheduler for the period February 14-19, 2021 as of 4 p.m. on March 4, 2021 (Note: previously posted outage and derate data was based on entries as of February 20, 2021).

Important Notes

- The information in this document is preliminary and subject to change.
- For the purposes of this document, an “outage” is the complete unavailability of a generator’s capacity, and a “derate” is the partial unavailability of that capacity.
- All generator outage and derate values reflected in the graphs are based on generator nameplate capacity—i.e., the maximum possible MW output specified by the generator manufacturer. Because wind and solar output is typically much lower than the specified nameplate capacity, the outage and derate MW values used for those units to develop this report are generally much higher than the actual amount of power that would have been available in the absence of the outage or derate.
- ERCOT cannot disclose the unit-specific outage causes because they are Protected Information.

Net Generator Outages and Derates by Cause (MW)

February 14 – 19, 2021



Version Date: 4/1/2021

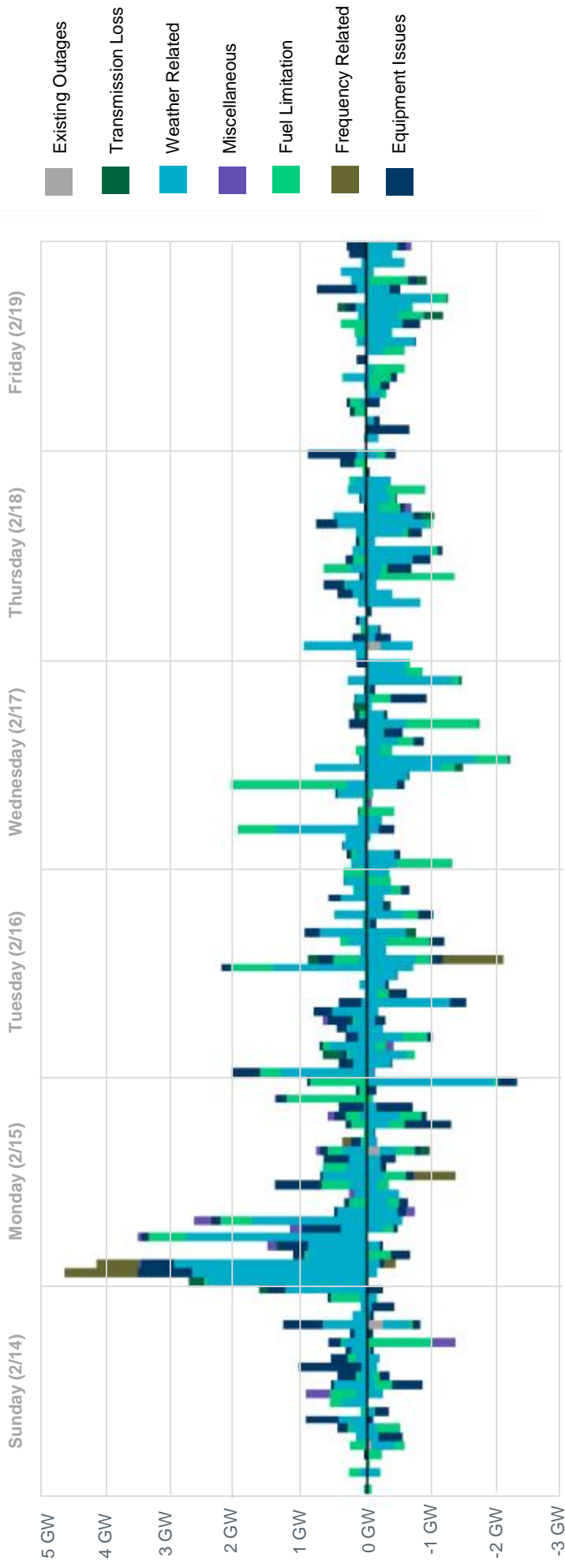
Net generator outages at the beginning of each hour on February 14-19, 2021, by cause category.



Continued Volatility of Generation Supply During the Event

- The amount of outaged capacity shown on the previous slide (slide 4) increased sharply as the storm arrived on Sunday and stayed fairly constant from late morning on Monday to mid-day on Wednesday.
- However, as shown on the next slide (slide 6), the net level of outages masks the volatility in generation availability that continued throughout the week, with generators continuing to go out of service and come into service throughout the duration of the event.
- This volatility made it difficult to accurately forecast an end to emergency conditions.

Incremental Generator Outage and Derates by Hour starting 00:00 on 2.14.21



Outages and derates continued through the week at a high rate.

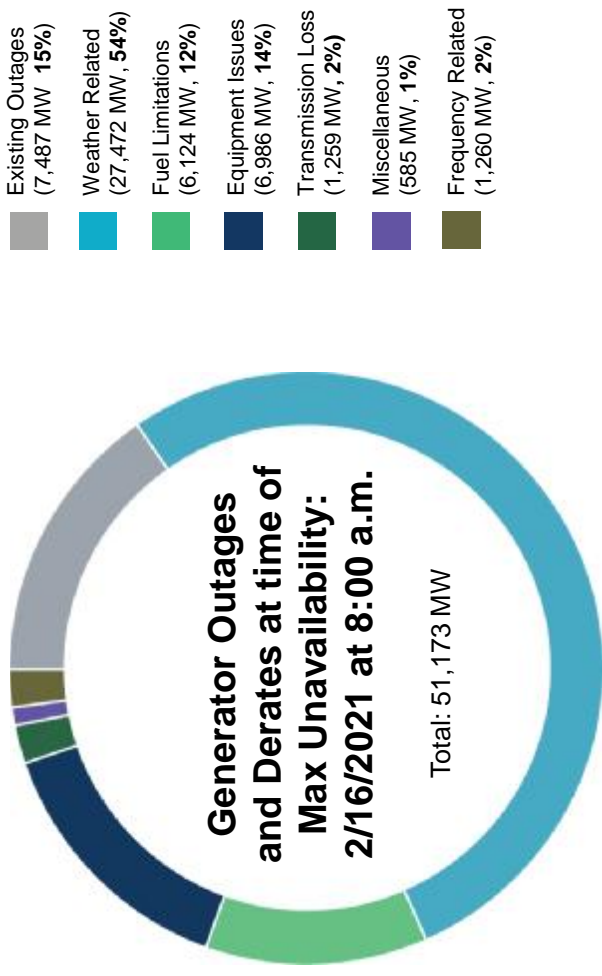


Explanation: Incremental Generator Outage and Derates by Hour

- The graph on the previous slide shows the generator outages and derates that started or ended in each hour on February 14-19, 2021, by cause category. The quantity of outages starting during a given hour are shown as positive values, and the quantity of outages ending during a given hour are shown as negative values.
- For example, if a 100 MW generator started an outage at 2 p.m. on February 14 due to a fuel limitation, and that outage ended at 5 p.m. on February 17, it would show as a positive 100 MW in the fuel limitation category for 2 p.m. on February 14 and a negative 100 MW in the fuel limitation category at 5 p.m. on February 17.
- This graph does not include the start of any outage or derate that occurred before February 14, but it does include the incremental reduction in outaged MW for any of those outages or derates that ended during the February 14-19 window.

Generator Outage and Derates: Maximum Unavailability

- The highest amount of unavailable capacity during the period of February 14-19, 2021 occurred on February 16 at ~8:00 AM and was 51,173 MW.
- This chart shows the MW of the generator outages or derates that were occurring at that point in time by cause category.
- Note that the total outaged and derated capacity at this time is different than what was previously reported (52,277 MW) due to additional information received in response to the RFIs.



Outage Cause Categories

- **Existing Outages:** Generator outages or derates that started before the issuance of the Operating Condition Notice on February 8, 2021; includes ongoing planned and forced outages as well as seasonally mothballed units. Some existing outages ended before or during the event, allowing the unit to return to service.
- **Fuel Limitations:** Generator outages or derates due to lack of fuel, contaminated fuel, fuel supply instability, low gas pressure, or less efficient alternative fuel supply.
- **Weather Related:** Generator outages or derates explicitly attributed to cold weather conditions in the RFI responses. This includes but is not limited to frozen equipment—including frozen sensing lines, frozen water lines, and frozen valves—ice accumulation on wind turbine blades, ice/snow cover on solar panels, exceedances of low temperature limits for wind turbines, and flooded equipment due to ice/snow melt.

Outage Cause Categories *(continued)*

- **Equipment Issues:** Generator outages or derates due to facility equipment failures or malfunctions not explicitly attributed to cold weather in the RFI response. This includes trips and derates related to control system failures, excessive turbine vibrations, or other equipment problems.
- **Transmission Loss:** Generator outage or derates due to forced outages on directly connected transmission facilities.
- **Frequency Related:** Generator outage or derates attributed to frequency deviations from 60Hz; includes automatic tripping due to under-frequency protection relays and any automatic or manual tripping attributed to plant control system issues related to frequency deviation.
- **Miscellaneous:** Other generator outages or derates not linked to one of the above causes, including outages for which a cause is yet unknown.