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## *NERC Issues a Gust of Recommendations in Wake of Panhandle Disturbance*

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On August 10, 2022, the North American Electric Reliability Corporation (“NERC”) and Texas Reliability Entity (“Texas RE”) published a joint report (the “Report”)<sup>1</sup> documenting the event, providing analysis, and recommending mitigating actions following the March 22, 2022 disturbance affecting wind resources across the Texas Panhandle (“Panhandle Wind Disturbance”). The Panhandle Wind Disturbance represents yet another widespread reduction of inverter-based resources.<sup>2</sup>

Freezing rain, snowfall, and high winds from late March 21 into the early morning of March 22 resulted in wind turbine icing and high speed cutoffs, culminating in two bulk power system (“BPS”) faults.<sup>3</sup> At the time of the disturbance, wind was producing nearly 21 GW (61%) of the Electric Reliability Council of Texas’s (“ERCOT”) net internal demand.<sup>4</sup> The first fault occurred on a 345 kV generator tie line resulting in a loss of 765 MW of wind resources. The second fault occurred on a 345 kV transmission circuit and resulted in a loss of 457 MW of wind resources. Frequency recovered in approximately 3 minutes for the first fault and 29 seconds for the second fault.<sup>5</sup> The Panhandle Wind Disturbance affected wind resources up to approximately 200 miles away from the initiating fault.<sup>6</sup>

As a result of these findings, NERC and Texas RE recommended (1) improvements to the Federal Energy Regulatory Commission’s (“FERC”) interconnection process; (2) updates to NERC Reliability Standards; and (3) responsive efforts from ERCOT on model quality and model validations.

### **Findings**

The Report identified various causes of the active power reduction for each fault event. The most impactful causes were:

1. Plant controller interactions impeding the ability of the plant to return to pre-disturbance output levels (fault reduction: 282 MW);
2. Consequential (second fault) tripping of wind resources (fault reduction: 273 MW);
3. Dynamic active power reduction (fault reduction: 210 MW); and
4. AC overvoltage tripping (fault reduction: 199 MW).<sup>7</sup>

### **Recommendations and Actions Needed**

From these findings, the Report provided recommendations to the “ERO Enterprise,”<sup>8</sup> FERC, and ERCOT.

**NERC**

NERC and Texas RE first reiterated the need for an enhanced PRC-024 Reliability Standard with a performance-based ride-through standard. The Report noted that multiple wind turbines tripped during the Panhandle Wind Disturbance for causes that were avoidable and that failure to mitigate this issue would pose a significant risk to BPS reliability.<sup>9</sup> NERC submitted a Standard Authorization Request to overhaul the PRC-024 Reliability Standard with a performance-based ride-through standard to mitigate performance issues for inverter-based and synchronous generating resources.<sup>10</sup> The Panhandle Wind Disturbance illustrated how the current PRC-024 Reliability Standard is not serving its intended purpose, as multiple affected resources generally met the minimum PRC-024 requirements regarding voltage and frequency protection, yet nevertheless failed to ride through the disturbance.

The Report also recommends an entirely new performance-based standard<sup>11</sup> that addresses abnormal performance issue identification, analysis, and mitigation for all inverter-based resources.<sup>12</sup> This “performance validation standard”<sup>13</sup> would address abnormal performance issue identification, analysis, and mitigation for all inverter-based resources in a timely manner to prevent cascading outages.<sup>14</sup>

**FERC**

The Report recommends that FERC modify its *pro forma* interconnection agreements to include certain monitoring capabilities for all newly connecting inverter-based resources.<sup>15</sup> Specifically, the Report recommends eight different monitoring capabilities for all newly connecting inverter-based resources:

1. High-resolution oscillography data at the plant point of interconnection (“POI”) and on collector feeders;
2. Plant SCADA data with 1–2 second resolution;
3. Plant-level controller measurements, set points, control settings, and other quantities;
4. Synchrophasor data at the POI;
5. Inverter-level fault codes;
6. Inverter-level oscillography data;
7. Time-synchronized measurements; and
8. Sufficient data retention periods.<sup>16</sup>

The Report’s recommendation would hold interconnecting customers accountable where model or equipment information provided to a Transmission Provider was inaccurate.<sup>17</sup>

**ERCOT**

The Report recommends that ERCOT provide a status update to NERC and Texas RE with the corrections made to the affected facilities and on the dissemination of that information to other ERCOT stakeholders.<sup>18</sup> Additionally, the Report advises ERCOT to conduct model quality and model validation activities<sup>19</sup> to accurately reflect the as-built equipment and identify anomalous behavior between model and actual facilities.<sup>20</sup>

Through the Report's recommendations, the ERO Enterprise looks to strengthen the reliability benefits of inverter-based resources, primarily through enhancements to NERC's Reliability Standards, to close regulatory gaps.<sup>21</sup> Closing these regulatory gaps through enhanced Reliability Standards and changes to FERC's *pro forma* interconnection agreements may promote additional investment in inverter-based resources through more consistent monitoring requirements.

## Conclusion

The Report emphasizes the criticality of the ERO Enterprise's focus on inverter-based resources.<sup>22</sup> NERC and Texas RE determined that multiple wind turbines tripped during the Panhandle Wind Disturbance for "causes that were avoidable."<sup>23</sup> Through the proposed recommendations, some of which are already underway, the ERO Enterprise looks to regulate inverter-based resources more consistently for enhanced BPS reliability.

We continue to monitor opportunities to engage with the ERO Enterprise on matters affecting clients' interests and are actively monitoring resulting changes in regulating inverter-based resources following the Report.



*If you have any questions concerning these developing issues, please do not hesitate to contact any of the following Paul Hastings Washington, D.C. lawyers:*

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<sup>1</sup> North American Electric Reliability Corporation, *Panhandle Wind Disturbance, Texas Event: March 22, 2022, Joint NERC and Texas RE Staff Report* (Aug. 2022), <https://www.nerc.com/pa/rrm/ea/Pages/Panhandle-Wind-Disturbance-report.aspx>.

<sup>2</sup> See North American Electric Reliability Corporation, *Quick Reference Guide: Inverter-Based Resource Activities* (Jun. 2022), [https://www.nerc.com/pa/Documents/IBR\\_Quick%20Reference%20Guide.pdf](https://www.nerc.com/pa/Documents/IBR_Quick%20Reference%20Guide.pdf).

<sup>3</sup> The Report at iv.

<sup>4</sup> *Id.* at 1.

<sup>5</sup> *Id.* at iv.

<sup>6</sup> *Id.*

<sup>7</sup> *Id.* at 6.

<sup>8</sup> The ERO Enterprise is comprised of NERC and the six Regional Entities (Midwest Reliability Organization; Northeast Power Coordinating Council, Inc.; ReliabilityFirst Corporation; SERC Reliability Corporation; Texas RE; and Western Electricity Coordinating Council).

<sup>9</sup> The Report at 21.

<sup>10</sup> *Id.* at v; see also North American Electric Reliability Corporation, *Project 2020-02 Modifications to PRC-024 (Generator Ride Through)* (2022), [https://www.nerc.com/pa/Stand/Pages/Project\\_2020-02\\_Transmission-connected-Resources.aspx](https://www.nerc.com/pa/Stand/Pages/Project_2020-02_Transmission-connected-Resources.aspx).

<sup>11</sup> The Report recommends that the performance-based standard "be incorporated into either PRC-004 or (more ideally) in a new standard . . . ." The Report at 21.

<sup>12</sup> *Id.* at v.

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- <sup>13</sup> The Report notes, “Performance validation focuses on comparisons of actual response to expected response based on interconnection requirements and performance expectations.” *Id.*
- <sup>14</sup> *Id.*
- <sup>15</sup> The Report notes that NERC will be submitting comments to FERC’s Notice of Proposed Rulemaking on its improvements to the interconnection process.
- <sup>16</sup> The Report at 15-16.
- <sup>17</sup> *Id.* at 21.
- <sup>18</sup> *Id.* at 22.
- <sup>19</sup> ERCOT was unable to conduct extensive model validation or model quality activities for the Panhandle Wind Disturbance due to high priorities regarding summer operating conditions in Texas. *Id.* at 20.
- <sup>20</sup> *Id.* at 20, 22.
- <sup>21</sup> *Id.* at v.
- <sup>22</sup> See North American Reliability Corporation, *Inverter-Based Resource Performance Identifies Reliability Risk; Joint Report Provides Recommendations* (Aug. 10, 2022), [https://www.nerc.com/news/Headlines%20DL/Panhandle%20Wind%20Disturbance%20Report\\_10AUG22\\_final.pdf](https://www.nerc.com/news/Headlines%20DL/Panhandle%20Wind%20Disturbance%20Report_10AUG22_final.pdf).
- <sup>23</sup> The Report at 21.