



Panhandle Wind Disturbance

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System Operations Subcommittee
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- Concerning weather patterns started the evening of March 21, 2022, with severe conditions (freezing rain, snowfall, and high winds) occurring the early morning of March 22, 2022. Generator Operators (GOP) reported wind turbine icing and high wind speed cutoffs during this time period.

Predisturbance Operating Conditions

At the time of the disturbances, ERCOT net internal demand was 34.4 GW with wind producing nearly 21 GW (61%), synchronous generation producing 13.2 GW (38%), and imports at just over 200 MW; due to the early hours of the events, solar PV production was at zero (see [Table I.1](#)).

Table I.1: Predisturbance Resource Mix		
BPS Operating Characteristic	MW	Percent
Internal Net Demand*	34,407	-
Solar PV Output	0	0%
Wind Output	20,977	61%
Synchronous Generation	13,212	38%

*ERCOT was importing 218 MW

Table 1.1: Causes of Reduction for Fault 1 and Fault 2

Cause of Reduction	Fault 1 Reduction [MW]	Fault 2 Reduction [MW]
Consequentially Tripped	273	–
Plant Controller Interactions	138	144
AC Overvoltage Tripping	135	64
Dynamic Active Power Reduction	82	128
Subsynchronous Oscillation Tripping	64	55
Pitch Converter Faults	57	17
Not Analyzed	14	–
Uninterruptible Power Supply Failure	2	–

Table ES.1: Overview of Disturbances

Fault	Initiating Fault Event	Description of Resource Loss
Event 1	A–B Fault on 345 kV Gen Tie Line	Loss of 765 MW of wind resources (10 facilities)
Event 2	B–C Fault on 345 kV Transmission Circuit	Loss of 457 MW of wind resources (8 facilities)

- Reiterated Need for Enhanced Inverter-Based Resource Ride-Through Requirements
- Strengthened Need for Performance Validation and Abnormal Performance Mitigation Requirements for Inverter-Based Resources

- NERC Event Analysis Program
- <https://www.nerc.com/pa/rrm/ea/Pages/Major-Event-Reports.aspx>

Lesson Learned Combustion Turbine Anti-Icing Control Strategy

Primary Interest Groups

Generator Owner (GO)

Generator Operators (GOP)

Problem Statement

- Unexpected icing due to intermittent interference from outside sources may present operating challenges

Details

- After an entity's investigation of an icing-over of a combustion turbine air inlet, it was determined that there were several situations where the original equipment manufacturer's (OEM) anti-icing logic did not detect all potential icing conditions as currently designed.

Corrective Actions

- As a result of these occurrences, the entity instituted a more aggressive combustion turbine anti-icing strategy to prevent a reoccurrence

Lesson Learned

- Ensure that manual corrective actions are proactively taken when unexpected icing may occur due to intermittent interference from outside sources

- <https://www.nerc.com/pa/rrm/ea/Pages/Major-Event-Reports.aspx>
- [LL20230401_CT_Anti-Icing_Control_Strategy.pdf \(nerc.com\)](#)

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