TEXAS RE

Cold Weather Risk

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Antitrust Admonition

Because this event brings together market participants who may be viewed as actual or potential competitors, we must be mindful to conduct it in a manner that is consistent with the antitrust and competition laws. Participants should not disclose non-public, proprietary, or competitively sensitive information.

Attendees should exercise independent judgment and avoid even the appearance of discussions of agreements or concerted actions that may be viewed as restraining competition. Any questions on Texas RE's Antitrust Compliance Corporate Policy may be directed to Texas RE's General Counsel.

Upcoming Events at Texas RE

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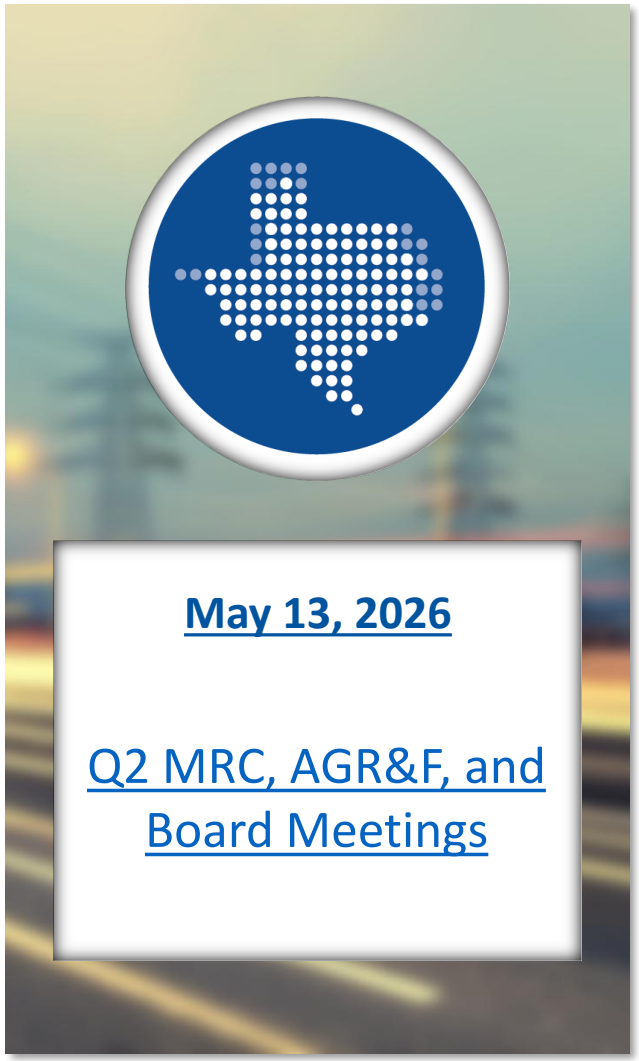


May 13, 2026

Q2 MRC, AGR&F, and Board Meetings

August 19, 2026

Winter Weatherization Workshop

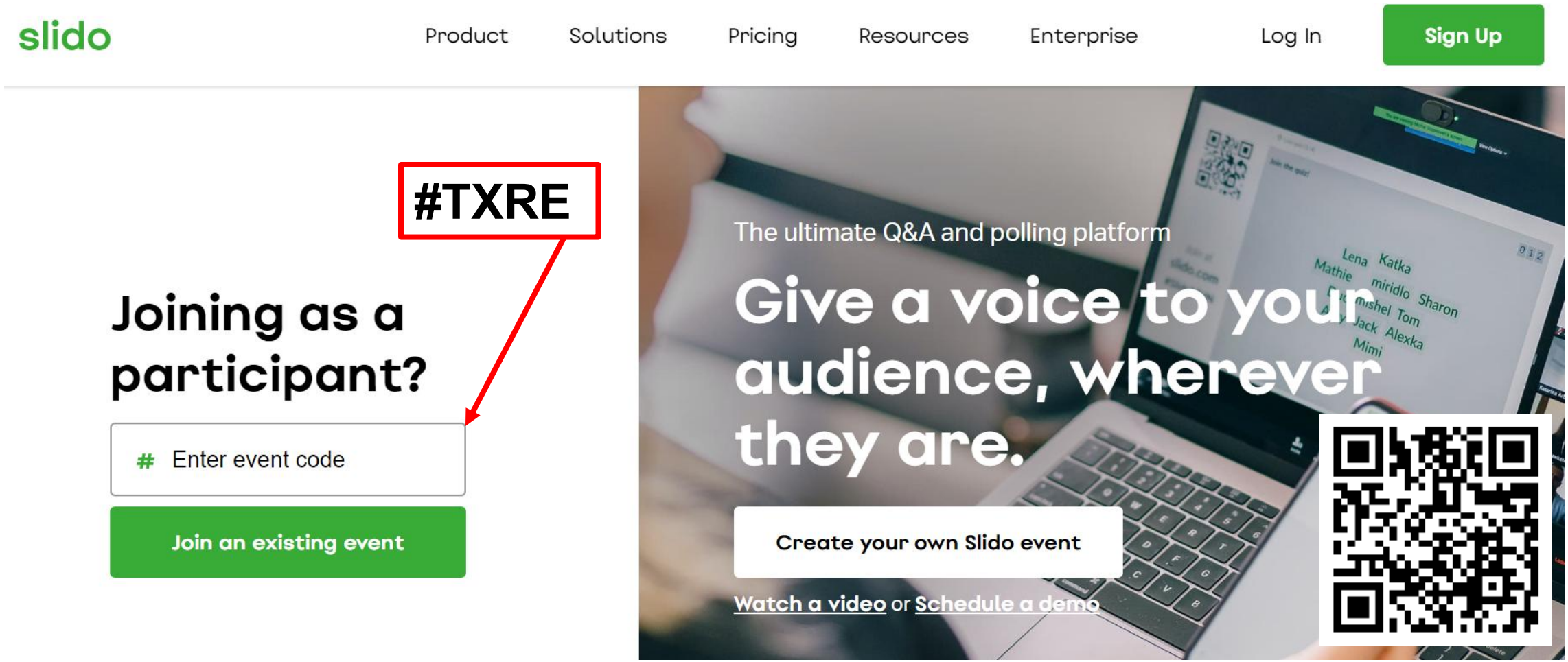
November 4, 2026

Fall Standards, Security, & Reliability Workshop

Upcoming ERO Enterprise Events

Date	Event
April 20, 2026	Technical Talk with RF
May 12-13, 2026	2026 MRO Reliability, Security, and CMEP Summit
May 12-14, 2026	SERC System Operator Technical Conference #2

Slido.com



Agenda

CMEP IP Extreme Weather Risk Element

Cold Weather Risk

- Inherent Risk
- Performance Risk

Registered Entity Impact

Best Practices

References

Questions

Compliance Monitoring and Enforcement Program Implementation Plan (CMEP IP)

The ERO Enterprise uses a risk-based compliance monitoring approach to identify both ERO Enterprise-wide risks to Bulk Power System (BPS) reliability and mitigating factors that may reduce or eliminate the impacts from a given reliability risk.

Extreme natural events, such as Hurricane Helene, underscore the challenges posed by their location, intensity, duration, and frequency. Weather conditions (e.g., cloud cover impacting solar) can challenge operations and complicate outage management.

Thirteen past NERC assessments identified the impact severity on the BPS due to extreme natural events (e.g., extreme temperatures, storms). Extreme natural events continue to impact BPS resilience in several ways including:

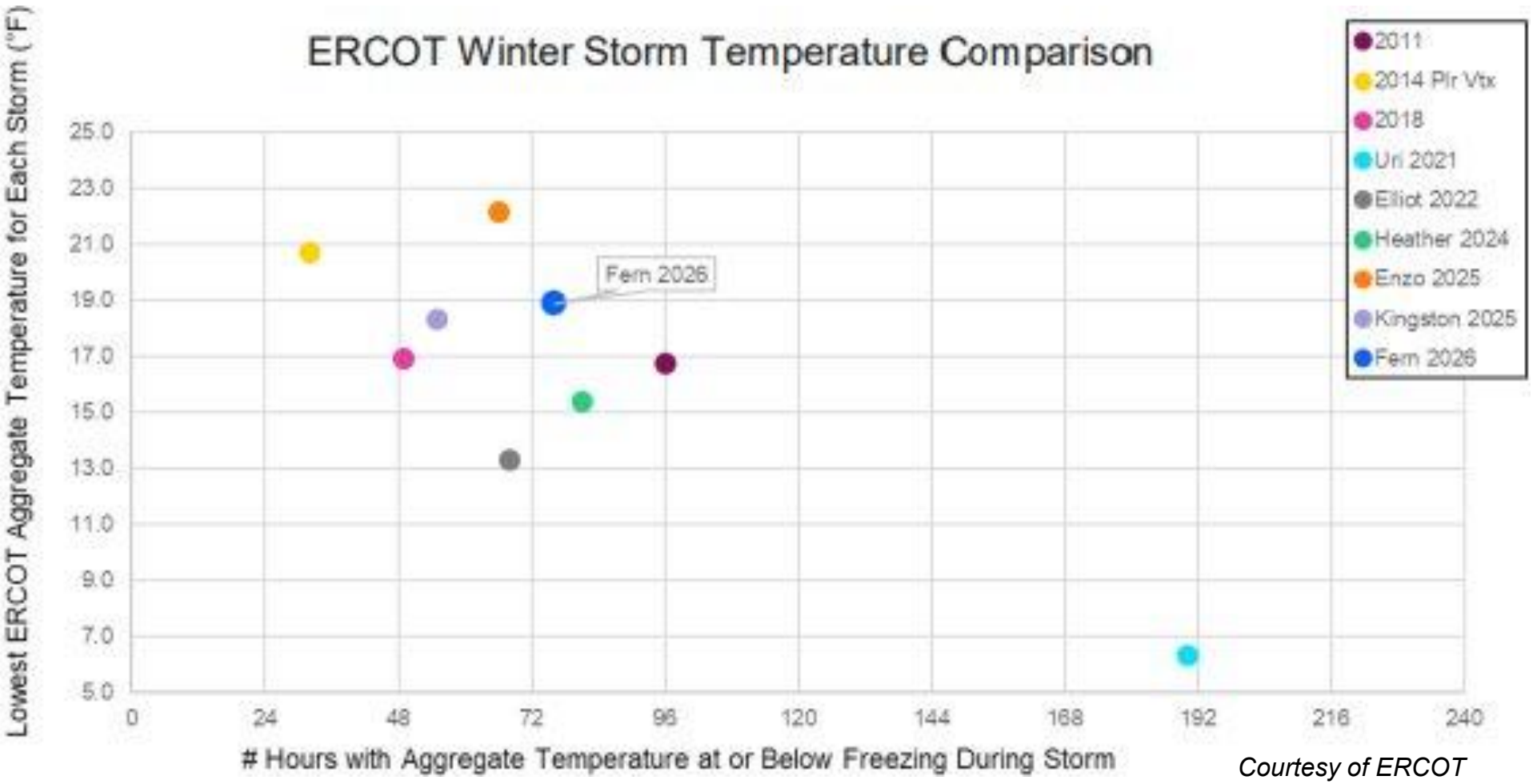
- Increased intensity, duration, or frequency of events
- Instances of historically atypical events, either to a given geographic area and/or new circumstances
- Longer-term trends
- Impacts on supply chain and workforce due to geographically larger events

Cold Weather Risk

Texas RE 2024 Reliability Performance and Regional Risk Assessment

Multiple extreme events in recent years have tested the BPS's ability to maintain the reliability levels expected by Texans. These include Hurricane Harvey in August 2017, the cold weather event of January 2018, the panhandle ice storm of October 2020, Winter Storm Uri in February 2021, Winter Storm Elliott in December 2022, and Winter Storm Heather in January 2024. Generation system outage performance on extreme days in 2018, 2021, 2022, and 2024 have been related to cold weather events.

Electric Reliability Council of Texas (ERCOT) Winter Storms



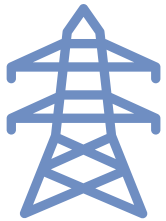
Courtesy of ERCOT

Cold Weather as a Reliability Risk

Cold Weather is a Recurring Driver of System Stress

Events tend to be

- High-impact
- Wide-area
- Operationally complex



Cold weather can simultaneously stress

- Generation
- Transmission
- System operations and maintenance

Challenge assumptions about

- Resource availability
- Equipment performance
- Operational limits

Risk Framing: Inherent vs. Performance Risk

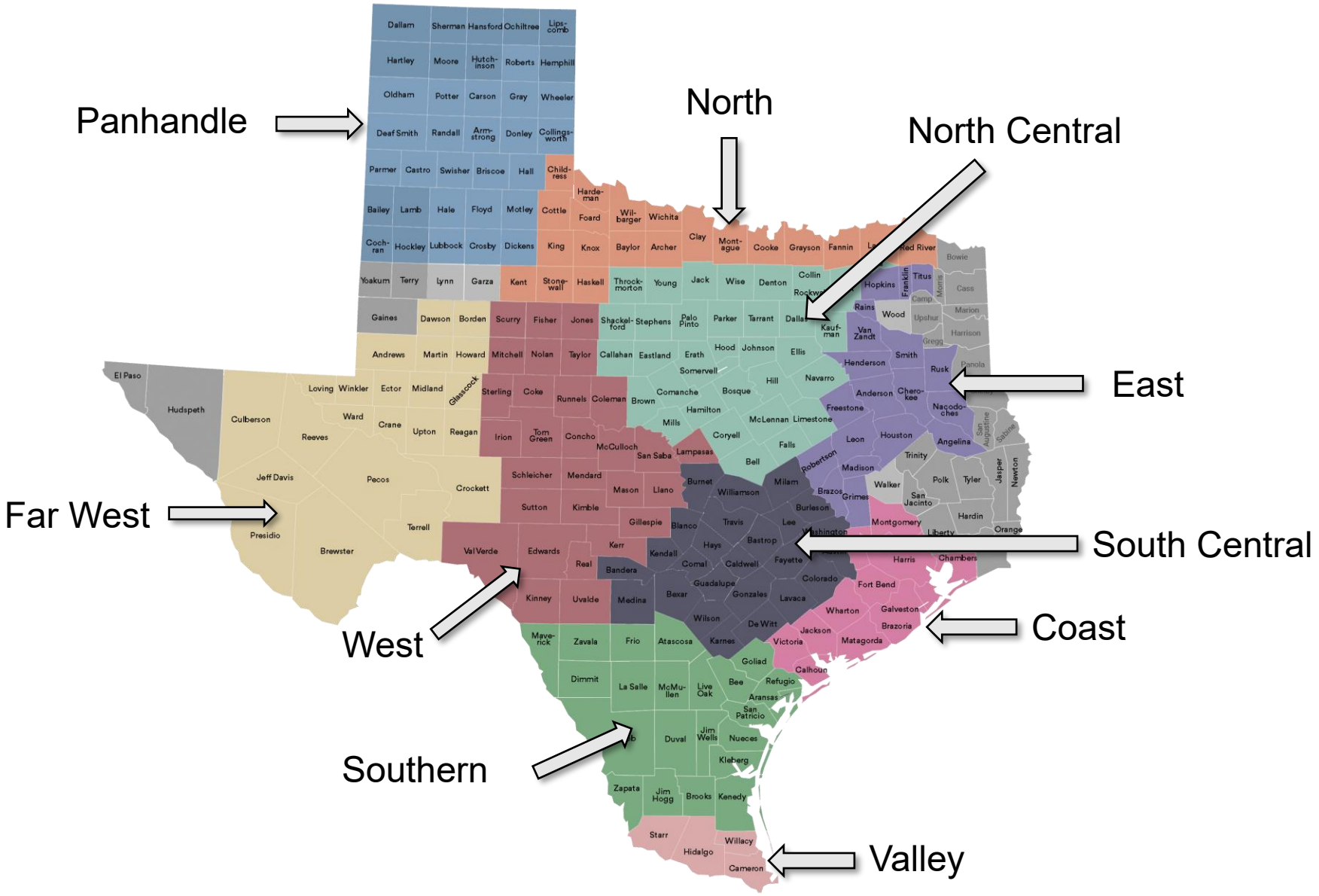
Inherent Risk

- Who you are
- Exposure based on geography, environment, and equipment
- Exists regardless of controls or performance

Performance Risk

- What you do
- How entities perform during cold weather events
- Observable through outages, events, and compliance history

Inherent Risk: ERCOT Weather Zones map



ERCOT Historical Weather Report

In 2022, the Public Utility Commission of Texas (PUCT) released a historical weather report in coordination with ERCOT

- Spans 1899 to 2021
- Next report in late 2026
- Covers temperature, wind speed, snowfall, and rain

Inherent Risk: Historical Weather Data

72 Hour Wind Chill (January 1899 - February 2021)

Weather Zone	95th Percentile Minimum Average Wind Chill
Panhandle	-17.6
North	-5
North Central	-0.5
West	0.3
Far West	1.3
East	4.4
South Central	8.4
Southern	16.3
Coast	18.1
Valley	20

PUCT uses this study for cold weather requirements

Linking Weather Data to Reliability

❑EOP-012-3 R3

- **Purpose:** To address the effects of operating in extreme cold weather by ensuring each Generator Owner has developed and implemented plan(s) to mitigate the reliability impacts of extreme cold weather on its applicable generating units.
- **R3.** Applicable to generating unit(s) in commercial operation prior to October 1, 2027: Each Generator Owner, for each generating unit that has a calculated Extreme Cold Weather Temperature at or below 32 degrees Fahrenheit (zero degrees Celsius) as determined in Requirement R1, and that self-commits or is required to operate at or below a temperature of 32 degrees Fahrenheit (zero degrees Celsius), shall:
  - Implement freeze protection measures to protect Generator Cold Weather Critical Components that provide the capability to operate at the generating unit(s)' Extreme Cold Weather Temperature; or
  - Develop a Corrective Action Plan to add new or modify existing freeze protection measures to provide the capability to operate at the generating unit(s)' Extreme Cold Weather Temperature.

Performance Risk: Outages and Derates

Cold weather events expose latent equipment vulnerabilities

Winter Storm Uri (2021)

- Total number of outages or derates entered – 2,599*
- Total MW reduction from outage or derate – 257,311 MW*

Winter Storm Elliot (2022)

- Total number of outages or derates entered – 702*
- Total MW reduction from outage or derate – 59,867 MW*

Winter Storm Fern (2026)

- Total number of outages or derates entered – 1,312*
- Total MW reduction from outage or derate – 87,292 MW*

***Contains multiple outages and derates from the same generator at different times**

Performance Risk: Operational Challenges

Cold weather events coincide with:

- Emergency operating conditions
  - Energy Emergency Alert levels
- Increased coordination demands

Heightened reliance on:

- Accurate data
- Timely communications
- Clear decision-making

Performance Risk: Compliance History

CMEP IP Cold Weather Requirements EOP-011 and EOP-012

- Since 2023 the requirements applicable to cold weather risk in the CMEP IP have been audited **141** times
- Since 2023 there have been **16** violations including current open enforcement actions

Root Causes

- Ineffective managerial oversight
- Insufficient internal controls
- Insufficient procedures for compliance
- Insufficient process for compliance

Registered Entity Impact

2026 CMEP IP Areas of Focus

Table 7: Extreme Weather Response

Rationale	Standard	Req	Entities for Attention
Ensure each Transmission Operator and Balancing Authority has developed plan(s) to mitigate operating Emergencies.	EOP-011-4	R1, R2, R3, R6	Balancing Authority Reliability Coordinator Transmission Operator
Ensure each Generator Owner has developed and implemented plan(s) to mitigate the reliability impacts of extreme cold weather.	EOP-012-3	R1, R3, R4, R5, R6, R7	Generator Owner Generator Operator
Ensure each applicable Transmission Owner and Generator Owner are performing vegetation inspections.	FAC-003-5	R6	Transmission Owner Generator Owner

Implications for Compliance Monitoring

Cold weather risk may influence:

- Engagement scope
- Monitoring period

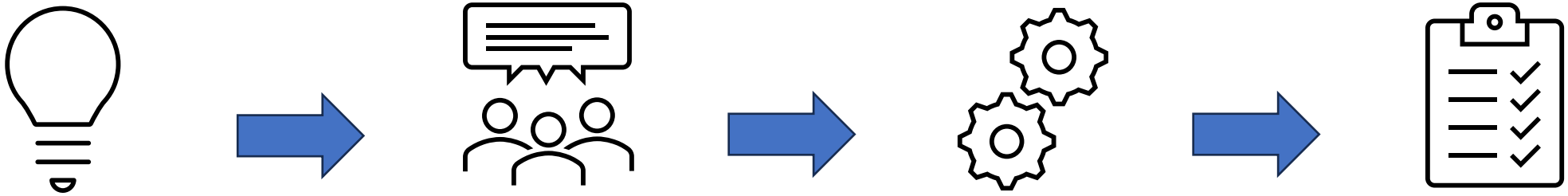
Focus on:

- Procedures
- Training
- Internal controls

A Strong Internal Controls Program

- Forward looking
- Helps maintain compliance
- Anticipates future compliance risks
- Anticipates reliability risks that aren't necessarily tied to compliance

Internal Controls



Identify objectives

Design controls

Implement controls

Verify the objectives are achieved

Cold Weather Risk Internal Controls

Preparedness plans

- Have a process to update, review, and track changes to plans
- Update plans annually, after events, equipment changes, or as necessary

Training

- Have a process to ensure required/scheduled cold weather preparedness plan training is provided to old and new employees
- Have training specific to generation sites where personnel work

Freeze protection measures

- Have a process to track and verify annual inspection and maintenance on cold weather critical components
- Have preventative and detective controls to ensure that annual inspection and maintenance of freeze protection measures is completed

Key Takeaways and Risk Assessment Training

Takeaways

- Cold weather remains a material reliability risk
- Texas has diverse weather zones
- Outages and violation history are key indicators of latent vulnerabilities
- Cold weather risk is likely to have an impact on engagement scope and monitoring timelines

Texas RE Risk webinars

- Risk 101
- Risk 201

References

ERCOT Historical Weather Report

Texas RE 2024 Reliability Performance and Regional Risk Assessment

2026 CMEP IP

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Questions?

TEXAS RE
Ensuring electric reliability for Texans