

Women's Leadership in Grid Reliability & Security Conference



March 5, 2024

Welcome and Instructions

Executive Welcome

Keynote

Women of the ERO Enterprise

Changes in the Resource Mix

CIP 101: NERC Compliance and Cloud Services

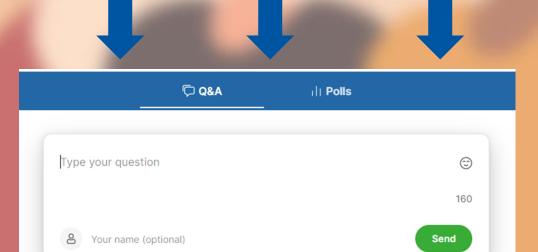
Welcome to Enforcement

Recruitment & Retention

Harnessing Women in the Workplace Roundtable

Mentorship & Career Development

To submit questions during the workshop, please visit **slido.com** and enter today's participant code: **TXRE**



Welcome and Instructions Kaitlin Van Zee Texas RE

Antitrust Admonition

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Notice of this meeting was posted on the Texas RE website and this meeting is being held in public. Participants should keep in mind that the listening audience may include members of the press, representatives from various governmental authorities, and industry stakeholders.





Questions

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Type your question			©
			160
8 Your name (option	nal)		Send







Training Page

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COMPLIANCE

ENFORCEMENT

RELIABILITY SERVICES

STANDARDS





Texas RE offers training on a very of compliance- and standards-related topics. Workshops and seminars are a counced to subscribers of the Texas RE ibe to our mailing list please visit Texas RE Mailing Lists.

For questions about training, pages e contact Texas RE Information.

Workshops 🗸

Talk with Texas RE 🗸

Align Training V

Lessons Learned V

Archived Presentations v



Archived Presentations •

All of Texas RE's outreach activities are free and open to the public. Past presentations delivered by Texas RE staff are available here. Please be aware that presentations will not be available indefinitely, and may be removed to comply with Texas RE's document retention policy.



Align Release 1 Training | Recording

Align Release 2 Periodic Data Submittal Training | Recording

Align Release 2 TFE and Self-Certification Training | Recording

Align Release 3 Training | Recording

Align Release 4 & 4.5 Training | Recording

Workshops

2021 GO/GOP Outreach | Recording

2021 CIP Workshop | Recording | CIP Workshop Q&A

2022 Extreme Events Resiliency Workshop - Day 1 Materials | Recordings

2022 Extreme Events Resiliency Workshop - Day 2 Materials | Recordings

2022 Energy Industry Vandor Summit I. Pacarding

Women's Leadership in Grid Reliability and Security Conference



Fall Standards, Security, and Reliability Workshop

2023 Fall Standards, Security, and Reliability Workshop | Recording





Upcoming Texas RE Events



April 24, 2024

Spring Standards, Security, & Reliability Workshop



June 3-24, 2024

Reliability 101 & 201
Webinar Series



August 28, 2023

Cyber and Physical Security Workshop











@Texas_RE_Inc



/TexasReliabilityEntity





Executive Welcome

Jim Albright
Texas RE President & CEO



Keynote Address

Suzanne Keenan NERC Board of Trustees

Our World

Speed of change is OUTRAGEOUS and only speeding up

Difficult to know who/what to trust – so much info & misinformation

 Niels Bohr: A great truth is a truth whose opposite is also a great truth. We are all agreed that your theory is crazy. The question which divides us is whether it is crazy enough to have a chance of being correct.

Unlimited "access" (skills & smartphone)







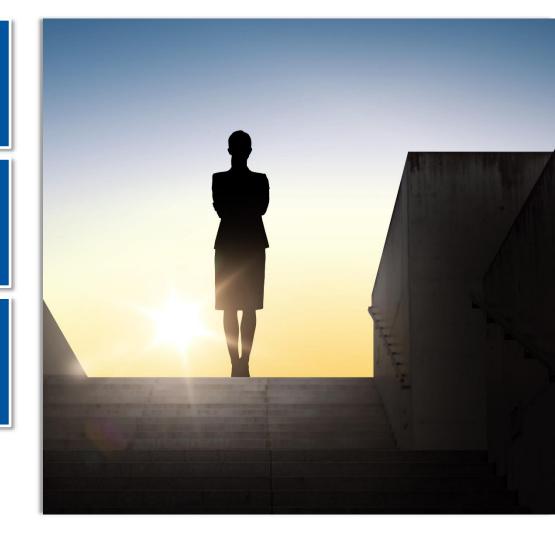
What I Look for in Talent/Leadership

Learning Mindset (Curiosity)

Clarity of Purpose & Vision

Establishing Personal &/or Organizational Resilience

 Creating & Sustaining an Environment of Trust







Personal Resilience Attributes

Hold yourself accountable and tackle problems head on

No "poor me"

Don't complain and keep positive

Occasional venting is healthy

Self-awareness

- Accept your limits
- Ask for help
- Take care of yourself
- Find humor in the absurd (you've got to be able to laugh at yourself)

Don't get locked into one plan; you can't plan everything

Cultivate a support system; have a trusted network you can rely on that will be honest with you







Organizational Resilience Attributes

Encourage and reward innovation and creative problem solving

- Even when trying something different doesn't work out
- Make sure there is a diversity of opinions and space to disagree

Maintain an external focus

Don't be afraid to be vulnerable

Invest in employee well-being

Communications is key

- Share stories
- Draw on your own and other's stories of resilience

Teach the skill of letting go

- How to recover from a difficult situation or conversation quickly
- Normalize making mistakes and learning from them

Takeaways: Questions to ask Yourself



Do you have a trusted network that will tell you the truth/push you?



Have you prioritized what is truly important?

Are you taking care of "yourself"?



Do you have strong communication skills (including listening)?





Women of the ERO Enterprise

Crystal Ashby (Texas RE Board of Directors)
Bluma Sussman (E-ISAC)
Courtney Fasca (ReliabilityFirst)
Emily Stuetzle (NPCC)
Jennifer Golynski (SERC)



Women's Leadership in Grid Reliability & Security Conference



Return: 11:30 a.m.

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Changes in the Resource Mix

CIP 101: NERC Compliance and Cloud Services

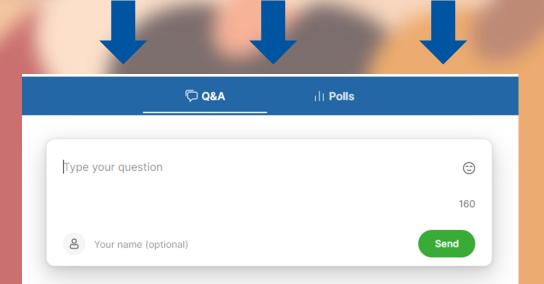
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Changes in the Resource Mix

Rashida Caraway Manager, Risk Assessment

What Does Grid Transformation Mean?

The electric grid is undergoing dramatic changes

- Changing of the power system from one dominated by large machines to variable resources operated by power electronics
- Increasing addition of intermittent renewable energy sources such as wind, solar, storage, etc.
- Dependance on natural gas resources for system balancing
- Balance resource uncertainties, ability to manage demand flexibilities
- Addition of distribution connected resources





Different Types of Resources



Traditional Resources

Nuclear Plants
Coal Plants
Gas Plants
Hydro



Other Generation Resources

Renewable – wind, solar, hybrid generation storage

Battery Energy Storage (BESS)

Emerging resources – Electric Vehicles (EV), Distributed Energy Resources (DER)

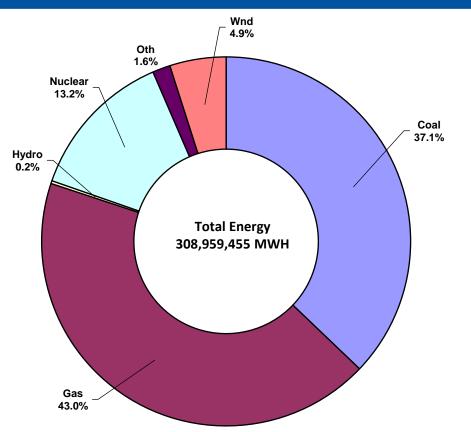
Other





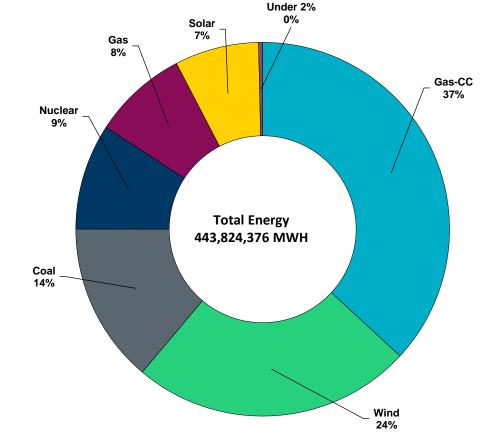
Comparing Energy Use Past 15 Years (ERCOT)

2008



Generation Fuel Mix for 2008 Energy (Total for Year)

2023



Generation Fuel Mix for 2023 (Total for Year)

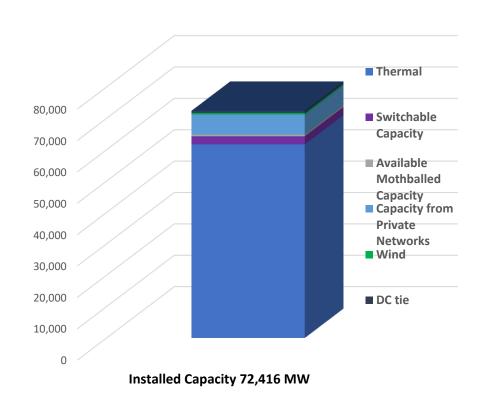


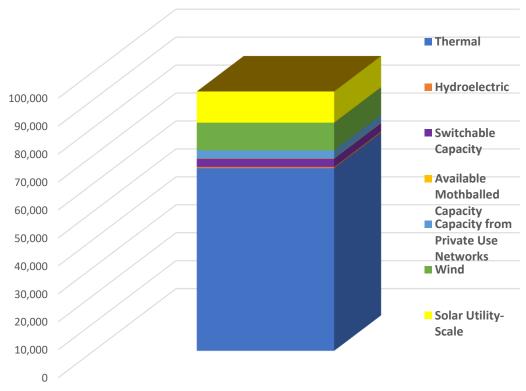


Capacity and Demand (ERCOT)



2023





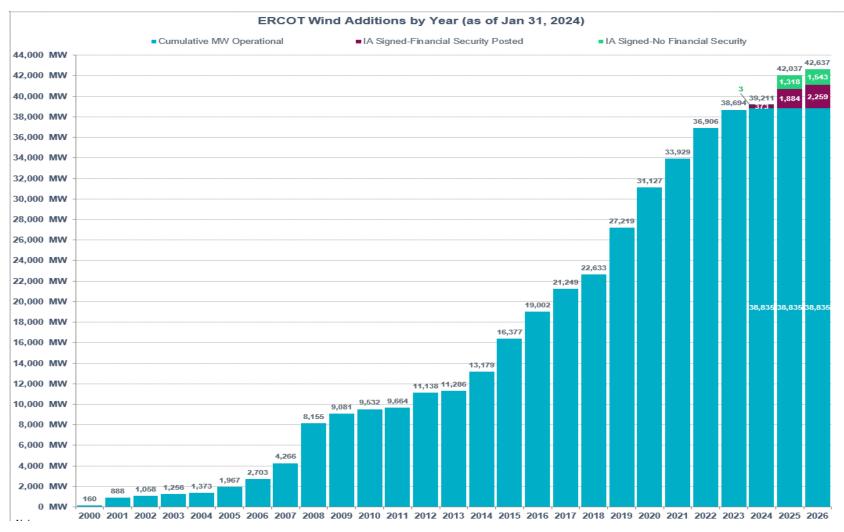
Installed Capacity 92792 MW



System demand increased by 37.5 %



Wind Generation Trend (2000-2026)



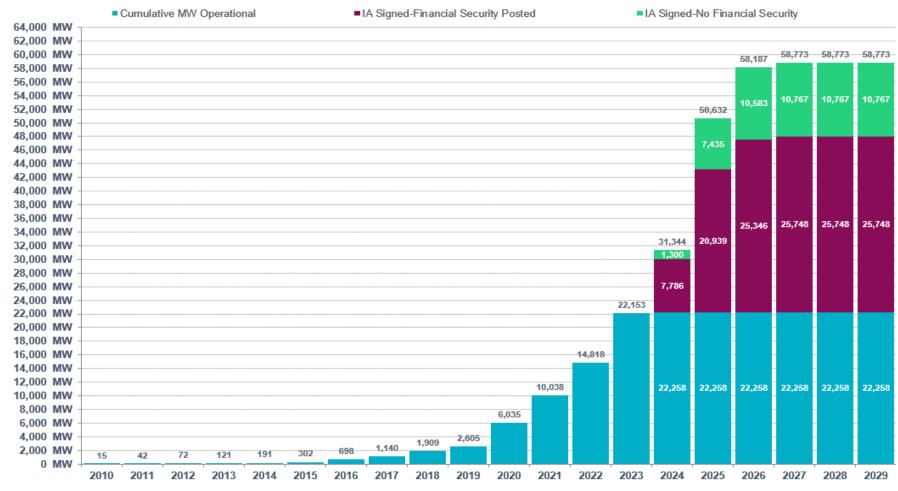






Solar Generation Trend (2010-2029)

ERCOT Solar Additions by Year (as of Jan 31, 2024)









Battery Generation Trend (2012-2026)

Source Data: ERCOT Website

ERCOT Battery Additions by Year (as of Jan 31, 2024)







Challenges and Opportunities

Changing Resource Mix

- Traditional based generation to interment renewable generation
- Unpredictable generation capacity levels due to intermittency

Distributed Energy Resources

 Distribution connected (rooftop solar, small diesel generators, etc.)

Load Forecasting Challenges

- Distributed Energy Resources
- Typically load forecast is based on historical data, getting harder and harder to predict due to weather changes
- Electric vehicles, energy efficiency

Batteries

Charging/discharging cycles

Other Emerging Technologies

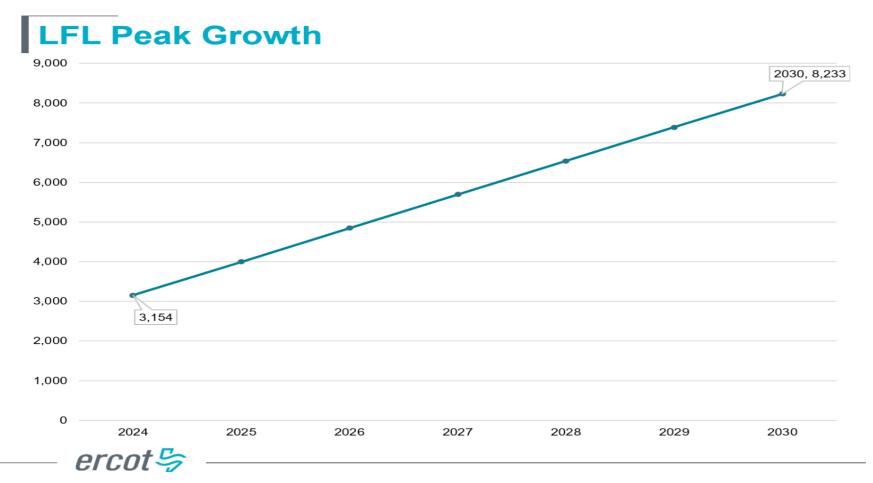
- Virtual power cells
- Electric vehicles charging and discharging (batteries can be turned into generation – power the house)





Generation and Load

Flexible Load:



Demand Response

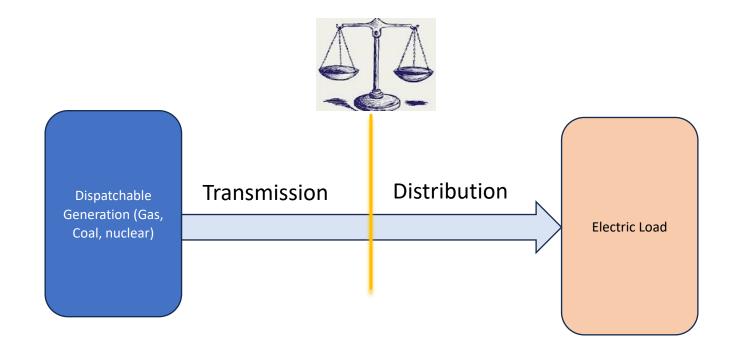
Lowering electric load when grid conditions are tight (Emergency Response Services – ERS, voluntary reduction, etc.)



Source Data: ERCOT Website



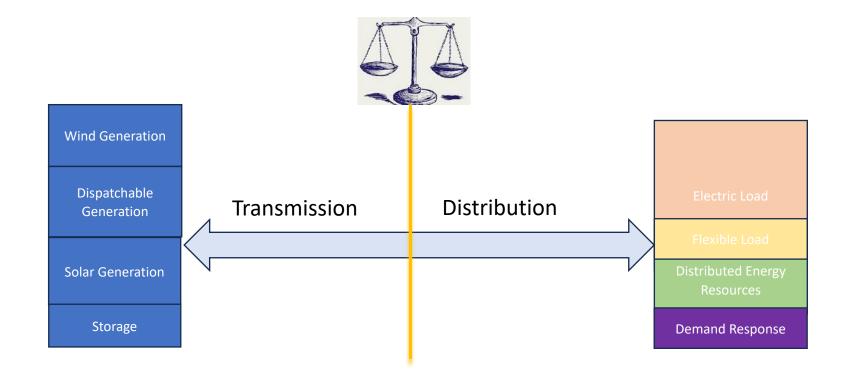
Generation and Load Balancing: 2008







Generation & Load Balancing: Current Conditions



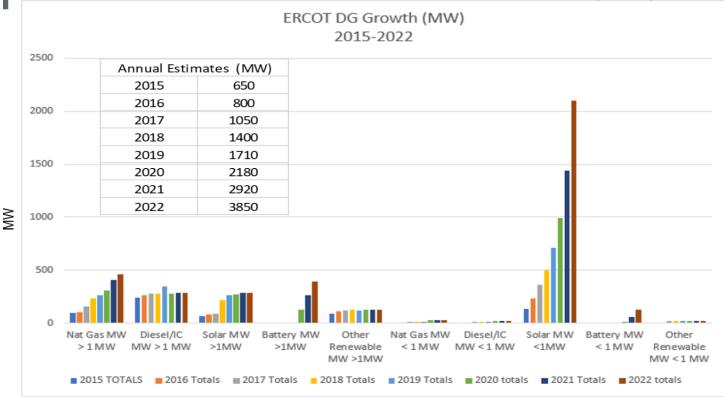




Distributed Energy Resources: Challenges

Roof top solar, settlement only distributed generators (SODG), Distributed Generation resources (DGR – dispatched by ERCOT)



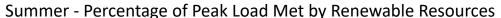


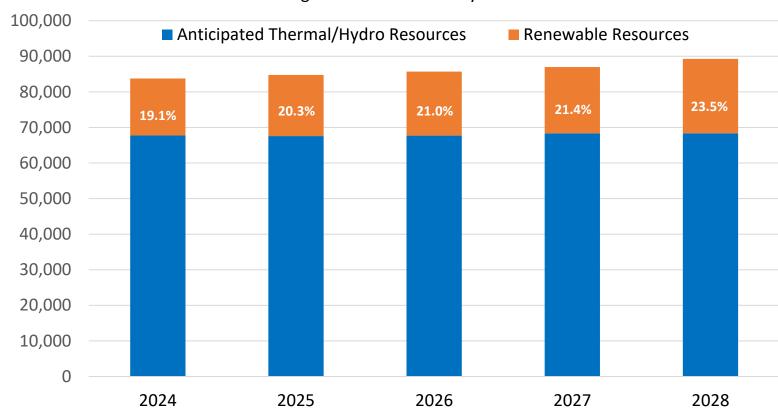




Challenges

2024-2028 ERCOT System Load and Generation Outlook









Modeling/Planning Assessments

Predictive performance models are necessary

- Intermittent Resource Models
- Distribution Connected Resource models
- Load Models
- Flexible Load connection behaviors
- Storage charging vs discharging

Technical resources needed to study different technology needs





Opportunities

Planning Engineers

Plant/Facility Engineers

Distribution Engineers

- Utility Company
- Manufacturing Company

Market Analysts

Meteorologists









Proven Compliance Solutions Inc.

CIP 101:

NERC Compliance and Cloud Services

Alice Ireland, Sr. Reliability Compliance Manager





Personal Background/Experience:

- Utility Industry Regulatory Compliance Experience:
 - 5 years: Market Monitoring and FERC Standards of Conduct program management
 - 15 years: NERC Reliability Standards compliance program development and oversight
 - > 6 years at Xcel Energy
 - > 8 years at Tri-State Generation and Transmission
 - > 1 ½ years (and counting!) at Proven Compliance Solutions
- Certified Compliance and Ethics Professional since 2015
- Current member of NERC Compliance and Certification Committee
- Current member of NERC Security Working Group; subteam lead for BCSI in the cloud
- Former member of: NATF RCC Steering Committee, NERC Standards Committee, NERC Critical Infrastructure Protection Committee, Western Interconnection Compliance Forum Steering Committee



- BES Cyber System Information (BCSI): Information about the BES Cyber System that could be used to gain unauthorized access or pose a security threat to the BES Cyber System.
- Cloud: Off-premises servers that are accessed over the Internet, and the software and databases that run on those servers¹.
- Cloud Service Provider (CSP): Third-party or parties involved in hosting the Responsible Entity's BCSI service in an off-premises cloud. This can be the application/software provider, the cloud platform provider, the underlying infrastructure host and/or third-party services. In some cloud implementations, there is more than one CSP involved.



Public

¹ For more detail, please refer to this Cloudflare, Inc. article: https://www.cloudflare.com/learning/cloud/what-is-the-cloud/

Common Cloud Services (1 of 3):

Software as a Service (SaaS) – The capability provided to the consumer is to use the provider's applications running on a cloud infrastructure. The applications are accessible from various client devices through either a thin client interface, such as a web browser (e.g., web-based email), or a program interface. The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, storage, or even individual application capabilities, with the possible exception of limited user-specific application configuration settings.

Examples include:

- Web-based email services such as Outlook and Gmail
- Microsoft 365 (includes apps such as SharePoint Online, Exchange Online, OneDrive, Teams, etc.)
- ServiceNow Enterprise CX



Common Cloud Services (2 of 3):

Platform as a Service (PaaS) – The capability provided to the consumer is to deploy onto the cloud infrastructure consumer-created or acquired applications created using programming languages, libraries, services, and tools supported by the provider. The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, or storage, but has control over the deployed applications and possibly configuration settings for the application-hosting environment.

Examples include:

- Microsoft Azure
- ServiceNow Now Platform
- SAP Cloud
- AWS Elastic Beanstalk
- Google App Engine



Infrastructure as a Service (IaaS) – The capability provided to the consumer is to provision processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications. The consumer does not manage or control the underlying cloud infrastructure but has control over operating systems, storage, and deployed applications; and possibly limited control of select networking components (e.g., host firewalls).

Examples include:

- Amazon Web Services (AWS)
- o IBM Cloud
- Microsoft Azure
- Backup storage such as: Commvault and Faction



Public

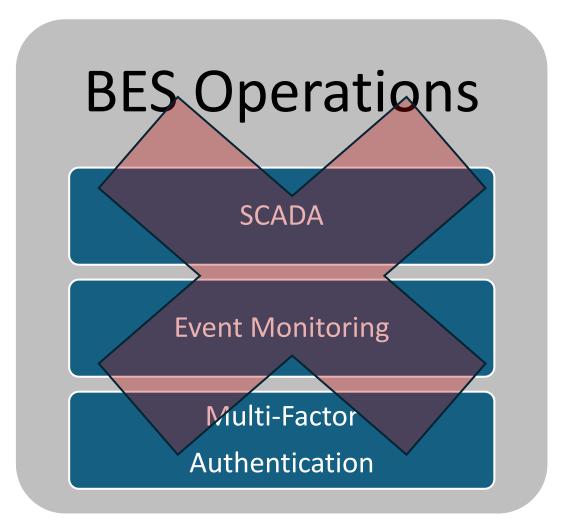
Cloud Services – BCSI versus BES Operations



SharePoint Online

ServiceNow (CMBD/tickets)

Server Backups





Public

Regulatory Journey Towards BCSI in the Cloud



2019 - Submitted SAR to modify CIP-004 and CIP-011

2019 - Published CMEP Practice Guide: BES Cyber System Information (Access)

2019 - Published RSTC Security Guideline: Supply Chain – Cloud Computing (Risks)

2020 - Published RSTC Security Guideline: Primer for Cloud Solutions and Encrypting BCSI

2021 – CIP-004 and CIP-011 were modified to address cloud; effective 1/1/2024

2023 – ERO Endorsed Compliance Implementation Guidance: Usage of Cloud Solutions for BCSI





Relationship between CIP-011 and CIP-004

Figure 1 illustrates the high-level relationship between CIP-011-3 R1 and CIP-004-7 R6, and explains why you will see guidance on CIP-011-3 R1 before CIP-004-7 R6 within this document:

Identify BCSI (CIP-011-3 Part 1.1) Protect confidentiality of BCSI (CIP-011-3 Part 1.2)

Manage provisioned access to BCSI (CIP-004-7 R6)

Figure 1 - Relationship between CIP-011-3 R1 & CIP-004-7 R6



Shared Responsibility Model

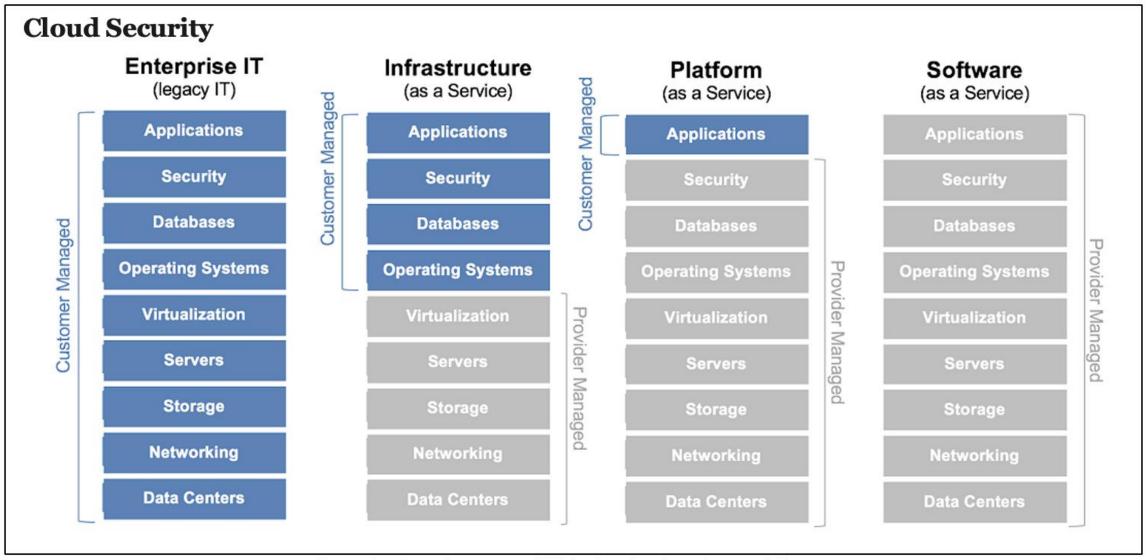


Figure 2 – Security responsibilities by cloud service model



Public

Overlay vs. Underlay

Depending upon a Responsible Entity's implementation and specific services, its BCSI may reside within the Overlay (as is more common with SaaS) or may reside in the Underlay (as is more common in a PaaS or laaS implementation).

Figure 3 is a generalized diagram of a cloud environment depicting the division between the Overlay and Underlay.

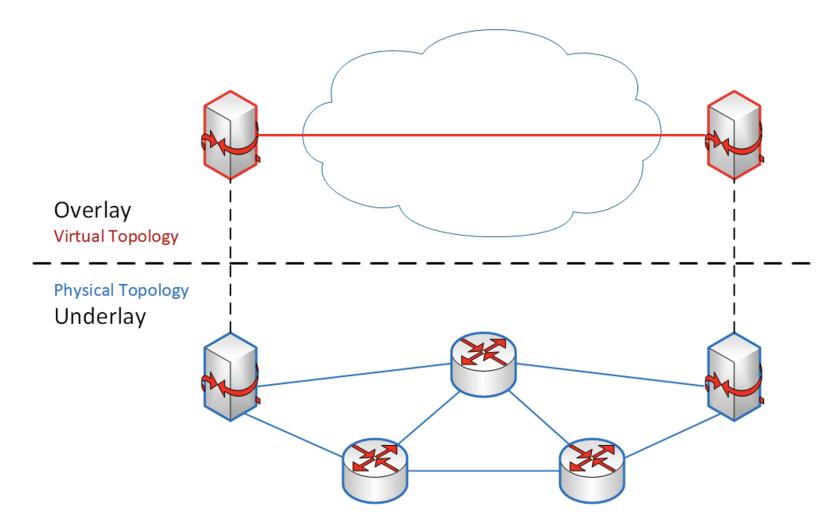
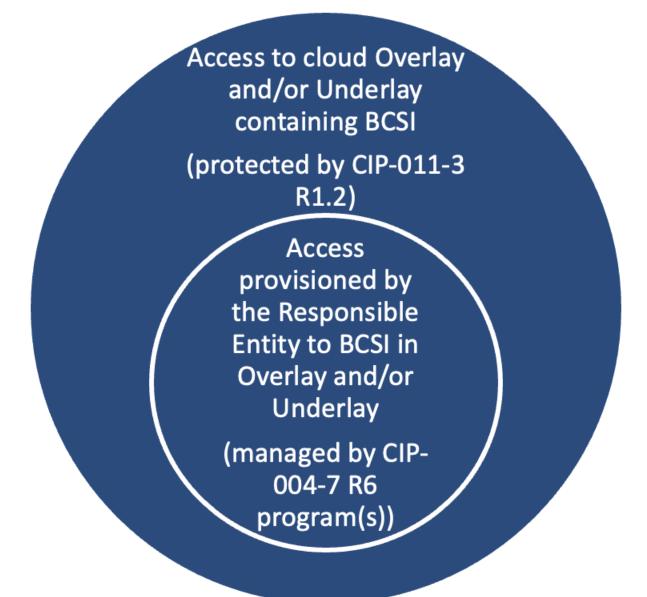


Figure 3 – Example diagram of a cloud environment to depict the division between the Overlay and Underlay







Methods to protect and securely handle BCSI to mitigate risks of compromising confidentiality (in an off-premise/cloud) can be TECHNICAL or ADMINISTRATIVE.

Examples of Technical methods:

- Encryption
- Electronic key management. Depending upon where they keys are stored and who manages the keys, additional controls may be needed such as:
 - Notification when keys are utilized by an unauthorized user
 - Notification when key vault is accessed by an unauthorized user
- Just-In-Time access controls
- Access Control Lists
- Multi-factor authentication
- Data loss prevention controls (e.g. scanning of email attachments, etc.)
- If the BCSI is not encrypted, masked, ciphered, etc., need to address physical protections such as whole disc encryption, distributed storage, etc.



Public

Examples of Administrative methods:

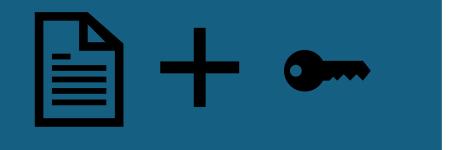
- Vendor service agreements or Vendor risk assessments that specifically address:
 - How confidentiality of the entity's information is maintained by the CSP, or
 - The cloud service provider's access management controls/obligations
- CSP's certification(s) relevant to the entity's environment, including security controls that reduce the risks of compromising the confidentiality of the entity's BCSI + third party audit reports of the relevant security controls (access revocation, training, etc.)
- Electronic banners upon entry to a system, folder, etc. to remind personnel of certain handling requirements



Public

CIP-004-7, R6: What is "provisioned access"?

To be considered access to BCSI in the context of this requirement, an individual has both the ability to obtain and use BCSI.



Provisioned access is to be considered the result of the specific actions taken to provide an individual(s) the means to access BCSI (e.g., may include physical keys or access cards, user accounts and associated rights and privileges, encryption keys).





CIP-004-7, R6: What is "provisioned access"?

Each entity may further define what this means as it pertains to their specific cloud environment(s). For example, an entity may document that "provisioned access" is access to BCSI that only they authorize. They may further clarify that this does <u>not</u> include:

- Access to information in the overlay and/or underlay, including BCSI, that is authorized by the CSP for their personnel.*
- Access to the underlay that may be needed by CSP personnel for maintenance of the infrastructure.*



^{*}This access should be addressed by the entity's CIP-011 program.

Use of 3rd Party Audit Reports as Evidence

- Addressed in the Practice Guide Using the Work of Others
- Listed as potential evidence in the Implementation Guidance Cloud Solutions for BCSI

Caution... the report must contain sufficient detail to demonstrate the security controls that were tested and the results.

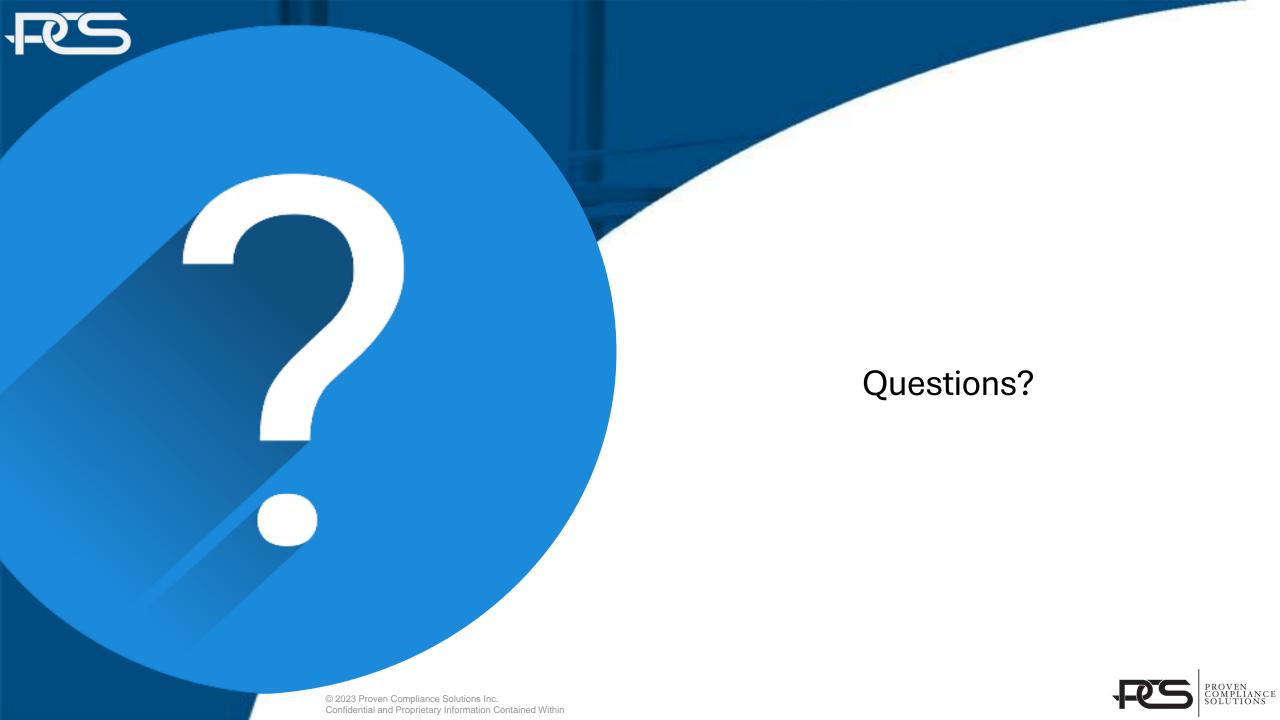


Resources

- Implementation Guidance Cloud Solutions for BCSI (published 12/11/23)
- CMEP Practice Guide Using the Work of Others (published 3/14/23)
- CMEP Practice Guide BES Cyber System Information (published 4/26/19)
- RSTC Security Guideline: Primer for Cloud Solutions and Encrypting BCSI (published 6/10/20)
- RSTC Security Guideline: Cloud Computing (published 12/10/19)



Public





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Send

Return: 12:45 p.m.

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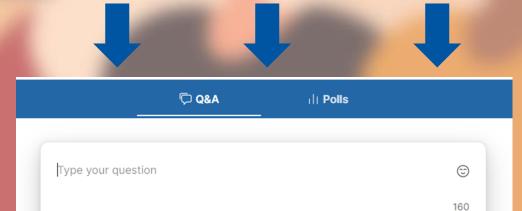
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Your name (optional)



TEXASRE



Why Are We Here Today?

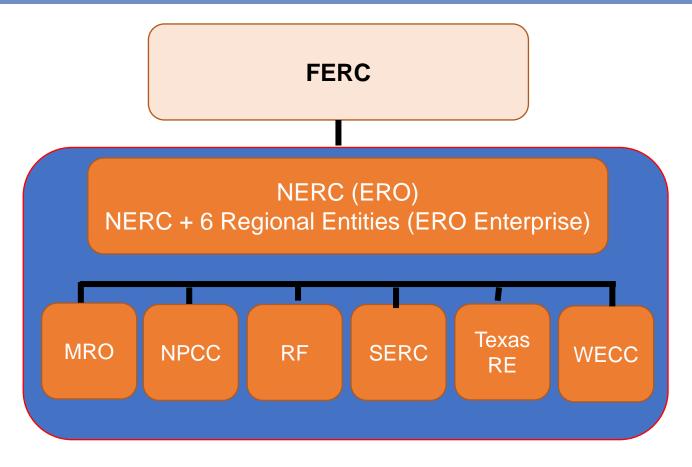
I will be talking about my onboarding process here within the Electric Reliability Organization (ERO) Enterprise and at Texas RE

This presentation is intended to be helpful for those interested in the industry, those new to the industry, and organizations that wish to retain and attract talent





What Does Enforcement Do?



Enforcement resolves issues pertaining to the NERC Reliability Standards by considering the facts and circumstances and the degree of risk, and helps ensure noncompliance issues are mitigated to address risk and prevent reoccurrence.





Texas RE Onboarding

The onboarding process was smooth and thoughtful. I have worked at a wide variety of different organizations ranging from government agencies, law firms, and private companies

Clear process for ensuring success after orientation

Frequent check-ins from different levels in the organization

True opportunities to provide feedback and ask questions

Defined metrics and goals





Technical Training Processes

ERO Enterprise Training and Education – Learning Management System (LMS)

Multi-pronged approach to training:

- Training through the LMS to ensure consistency throughout the ERO Enterprise
- Conversations with counterparts in other Regional Entities
- Direct training with Enforcement Department at Texas RE





Texas RE Enforcement Department

Support given by Enforcement Department

- Every team member was involved in the onboarding process
- Monthly 1:1s with Enforcement Manager





Takeaways for Individuals

There are a multitude of skills that would be useful in the industry:

- Engineering, tech, or law background
- Policy development, regulatory background, those skilled with problem-solving

There is constant support and touchpoints with everyone in the organization

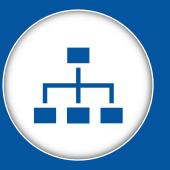




Takeaways for Organizations



More frequent touchpoints for those onboarding – communication is key



Structured approach to getting to know the organization and duties



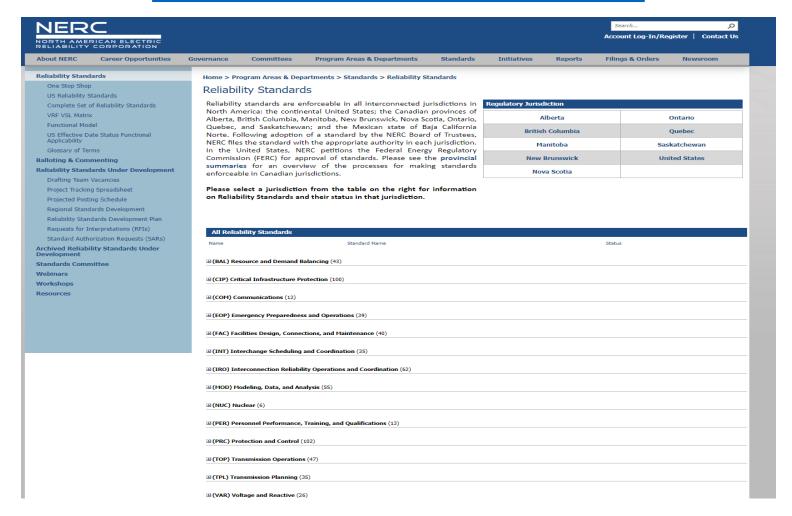
Setting expectations for onboarding process





Helpful Enforcement Information

Reliability Standards (nerc.com)

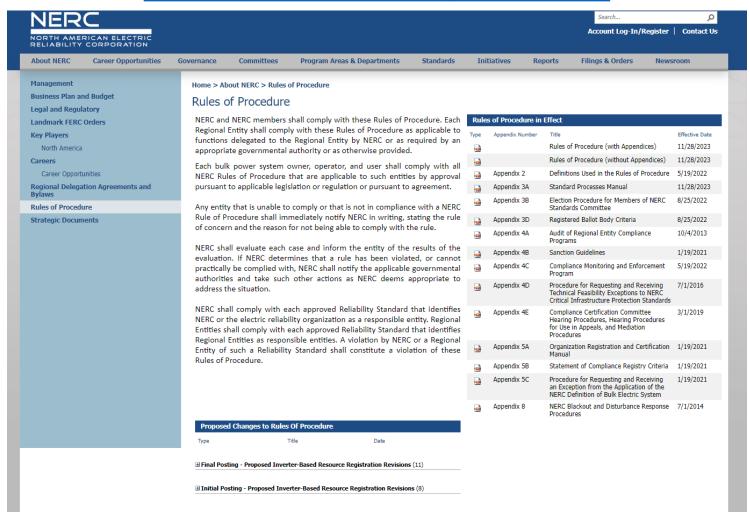






NERC Rules of Procedure (RoP)

Rules of Procedure (nerc.com)

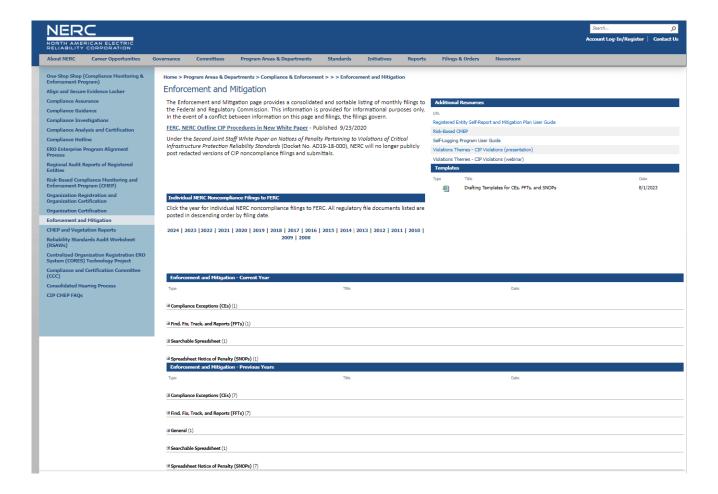






Postings of Dispositions

Enforcement and Mitigation (nerc.com)







Resource Summary

Reliability Standards (nerc.com)

Rules of Procedure (nerc.com)

Enforcement and Mitigation (nerc.com)

Things to know about Enforcement for entities

- Contact the general email for any questions you have: Enforcement@TEXASRE.org
- Align & SEL are new tools contact the general email
- Can always contact Enforcement if unsure whether there is a violation of a Reliability Standard







Recruitment & Retention

Karla Schiller (MRO)
Ally McKenna (WECC)
Christine Byer (SERC)
Filloreta Bicaj (NPCC)
Hue DeLuca (ReliabilityFirst)
Kara Murray (Texas RE)

ERO Enterprise Career Sites















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Return: 2:10 p.m.

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Type your question	©
	160
S Your name (optional)	Send

Harnessing Women in the Workplace Roundtable

Suzanne Spaulding (Texas RE Board of Directors)
Kate Davis (Texas A&M University)
Rhonda Jones (Invenergy)
Tammy Cooper (Austin Energy)
Julie Peterson (MRO)

Mentorship & Career Development

Holly Peterson (NERC)
Holly Hawkins (SERC)
Tammie Henderson (NERC)
Tim Gallagher (ReliabilityFirst)
Kellie Macpherson (Radian Generation)

Wrap Up

