



TEXAS RE

Inverter-Based Resources Challenges

**George Brown
Pattern Energy Group**

July 30, 2024

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Upcoming Texas RE Events



August 6, 2024

IBR Data Collection
and Reports



August 28, 2024

Cyber & Physical Security
Workshop

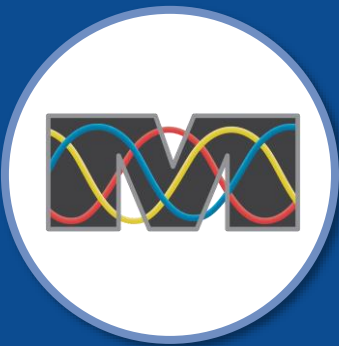


September 10, 2024

Cybersecurity



Upcoming ERO Enterprise Events



August 6-8, 2024

Physical Security Workshop



August 7, 2024

Protection System Workshop



August 13-15, 2024

Power Systems Security
Conference

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Inverter-Based Resource Challenges Talk with Texas RE

July 30, 2024

George Brown

- Pattern Energy Group (2022 – Present)
 - Director, Regulatory Compliance
 - Senior Manager, NERC Regulatory
- Acciona Energy North America Corporation (2008 to 2022)
 - Director, Regulatory Compliance
 - Director, System Operation Center
 - Manager, Regulatory Compliance
 - Regulatory Compliance Analyst
 - Electrical System Operator
- Energy Regulatory Compliance Stakeholder Involvement:
 - Midwest Reliability Organization NERC Standards Review Forum (NSRF), Elected Member (2022 – Current)
 - Texas Reliability Entity Members Representative Committee (MRC), Elected Member (2022 – 2023)
 - Midwest Reliability Organization Standards Committee, Elected Member (2011 – 2019)
 - NERC Project 2014-01 Dispersed Generation Resources Standards Drafting Team Elected Member (2014 – 2015)
 - Lakeshore Technical College Wind Energy Technology Program Advisory Committee Member (2013 – 2015)

For the purposes of today's discussion inverter-based resources will refer to:

- Wind Generation Facilities
- Photovoltaic Facilities
- Battery Energy Storage Systems (BESS)



- FERC Order No. 888 §1.14:

Good Utility Practice means any of the practices, methods and acts engaged in or approved by a significant portion of the electric utility industry during the relevant time period, or any of the practices, methods and acts which, in the exercise of reasonable judgment in light of the facts known at the time the decision was made, could have been expected to accomplish the desired result at a reasonable cost consistent with good business practices, **reliability**, safety and expedition. Good Utility Practice is not intended to be limited to the optimum practice, method, or act to the exclusion of all others, but rather is intended to include acceptable practices, methods, or acts generally accepted in the region.

- 16 TAC §25.5:

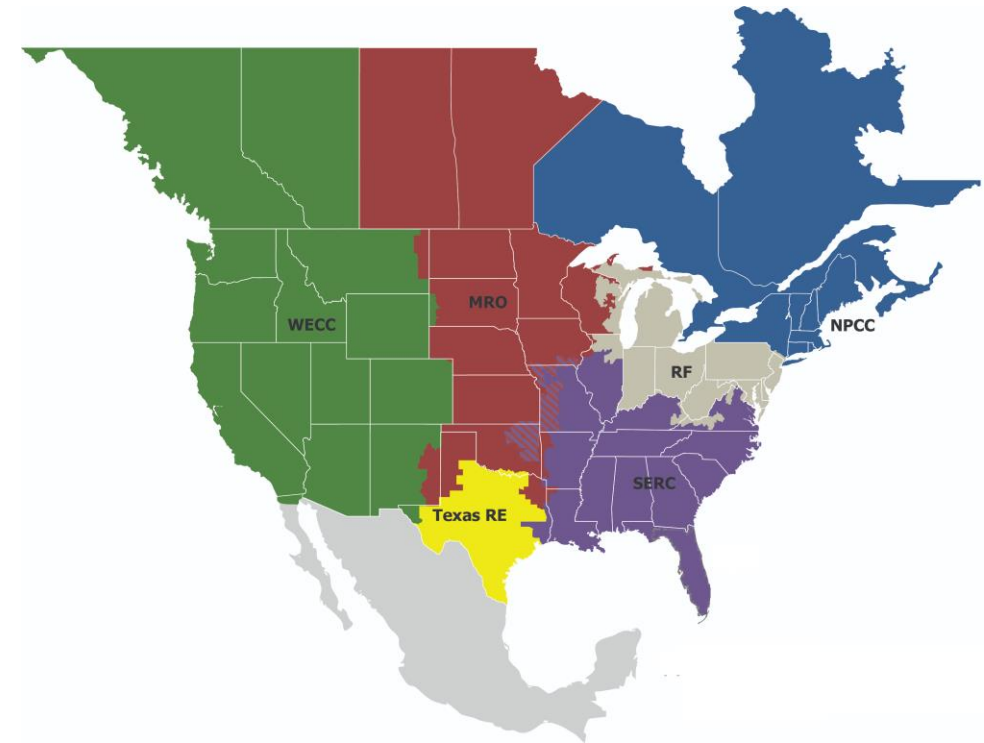
Good utility practice - Any of the practices, methods, or acts engaged in or approved by a significant portion of the electric utility industry during the relevant time period, or any of the practices, methods, or acts that, in the exercise of reasonable judgment in light of the facts known at the time the decision was made, could have been expected to accomplish the desired result at a reasonable cost consistent with good business practices, **reliability**, safety, and expedition. Good utility practice is not intended to be limited to the optimum practice, method, or act, to the exclusion of all others, but rather is intended to include acceptable practices, methods, and acts generally accepted in the region.

- Federal Power Act §215(a)(4):

The term “**reliable operation**” means operating the elements of the bulk-power system within equipment and electric system thermal, voltage, and stability limits so that instability, uncontrolled separation, or cascading failures of such system will not occur as a result of a sudden disturbance, including a cybersecurity incident, or unanticipated failure of system elements.

Cornerstones of a robust compliance program:

1. Intent versus Interpretation
2. Developed policies, procedures and instructions
3. Trained personnel
4. Maintain a “pulse” on compliance



1. Intent versus Interpretation

■ Intent

- What is the reason for the requirement or regulation?
- How does the requirement/regulation aid reliability? Good Utility Practice?

■ Interpretation

- What do the words of the regulation require?
- Defines the minimum base-line for compliance

■ How to determine intent:

- FERC Orders
- RSAWS
- Standard Drafting Team White Papers
- Event Analysis

Compliance Programs should be based on the intent of the requirement/regulation.

2. Developed policies, procedures and instructions

- Are not a regurgitation of requirement/regulation
- Are written based on how the organization operates and does business
- Set clear expectations for actions and documentation
- Clearly assigns obligations to individuals responsible for completing the task
- Accounts for all the requirements/regulations of a similar nature
 - NERC Reliability Standards
 - RTO/ISO protocols, business practice manuals, guides, standard operating procedures, et cetera
 - Executed interconnection agreements
 - Power purchase agreements
- Determine the most limiting requirement/regulation, apply it across the fleet, Good Utility Practice

Policies, Procedures & Instructions should be based on reliability not compliance.

3. Trained personnel

- What good are policies, procedures and instructions if no one knows about it?
- Training should not replace the policies, procedures and instructions, only supplement them
- Training should provide the following context to the trainee:
 - Why does this exist?
 - Describes the intention of the requirement/regulation and focuses on good utility practice
 - Provides insight into developer's thought process when writing the document
 - Describes how to use the policy, procedure and standard
- Training should be routine, based on risk, severity and the company's compliance history
- Training should not only be formal; it should also take the form of indirect training, e.g. compliance moments

Knowledgeable personnel increases the probability of reliability.

4. Maintain a “pulse” on compliance

- Do you know what happened yesterday?
- Do you know what is happening tomorrow?
- Be proactive, be involved in operations and ‘bake’ compliance into operations
- Be a partner to operations
- Always know the state of compliance of the organization

Never let compliance get in the way of good utility practice.

Questions