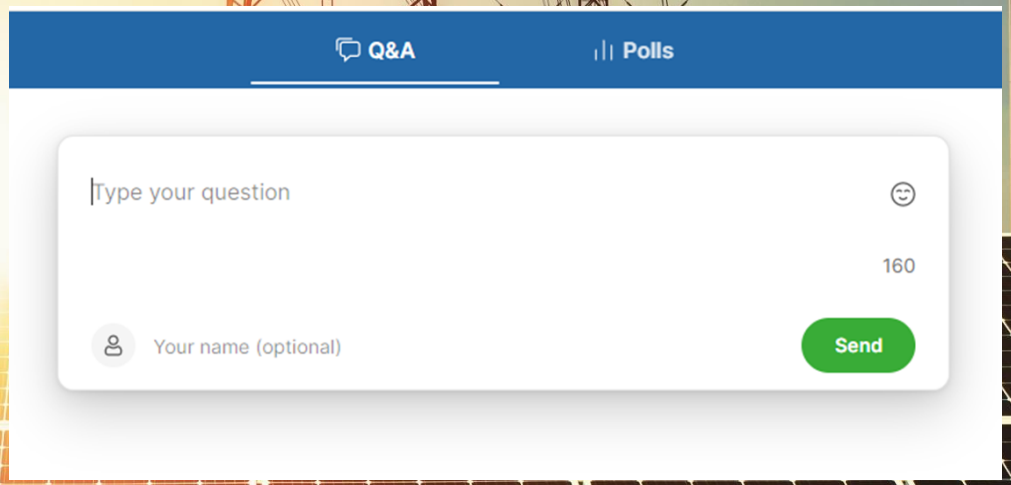
Texas RE
Understanding New Generator Obligations

October 16, 2024

AGENDA

- Welcome & Instructions
- IBR Registration Criteria Changes
- FERC Order No. 901 Update
- Understanding Generator Risk Elements & COPs
- NAGF Overview
- Key Generator Compliance Obligations

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



Welcome & Instructions

Thad Crow
Texas RE
Communications & Training Coordinator

TEXAS RE
Ensuring electric reliability for Texans
TOP WORK PLACES 2023

Antitrust Admonition

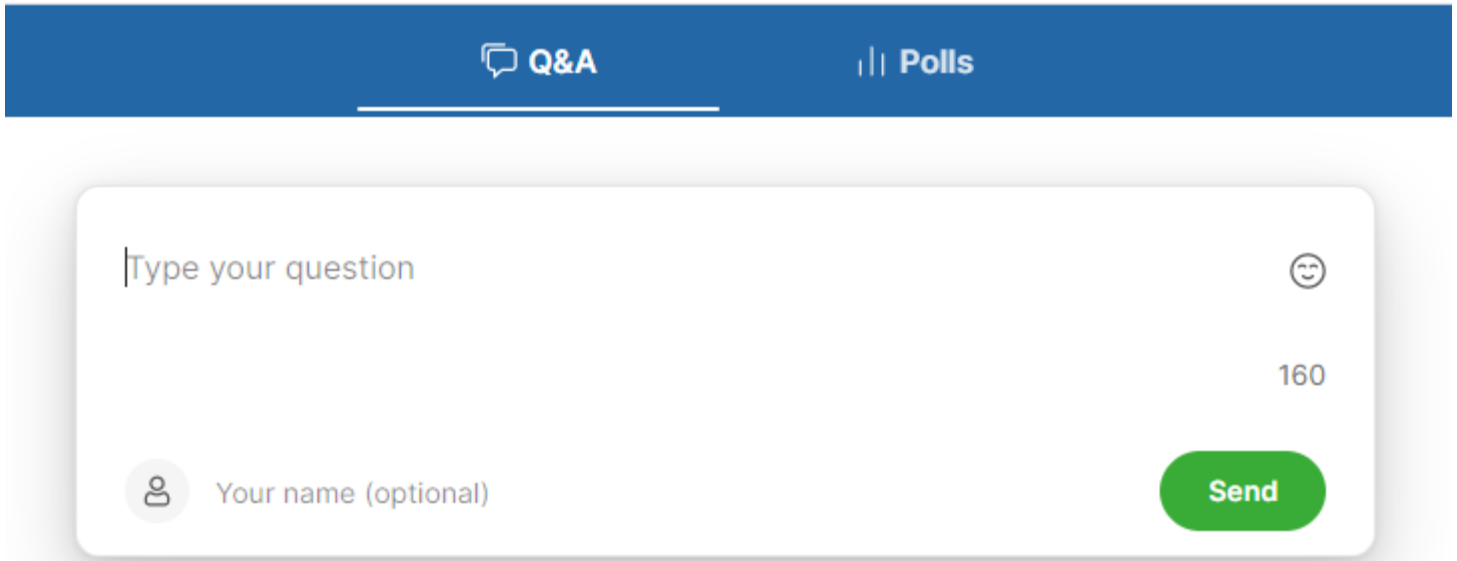
Texas Reliability Entity, Inc. (Texas RE) strictly prohibits persons participating in Texas RE activities from using their participation as a forum for engaging in practices or communications that violate antitrust laws. Texas RE has approved antitrust guidelines available on its website. If you believe that antitrust laws have been violated at a Texas RE meeting, or if you have any questions about the antitrust guidelines, please contact the Texas RE General Counsel.

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.

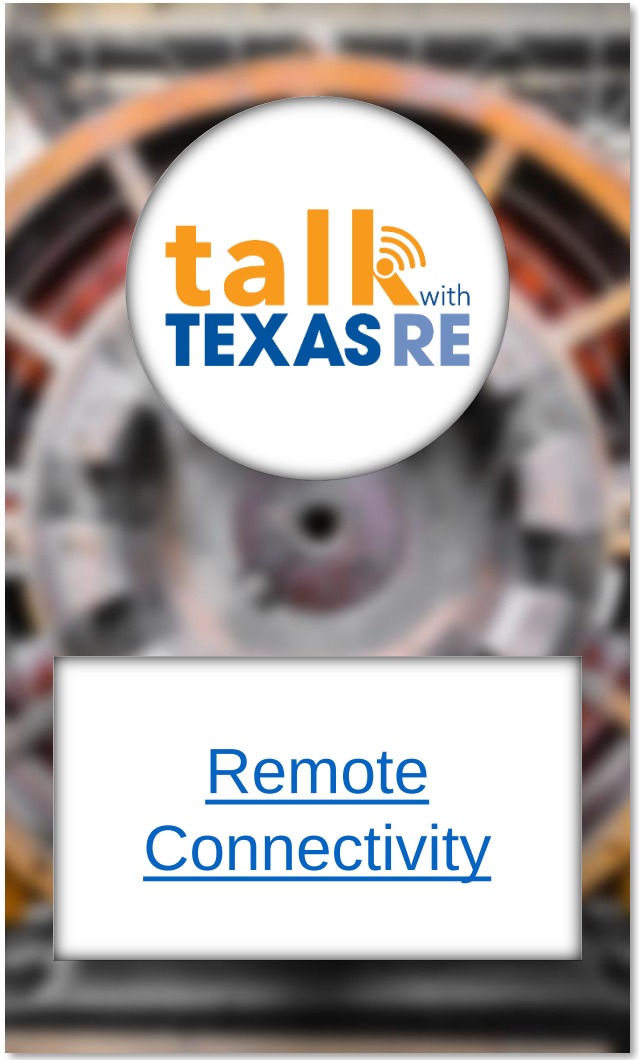
Questions

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

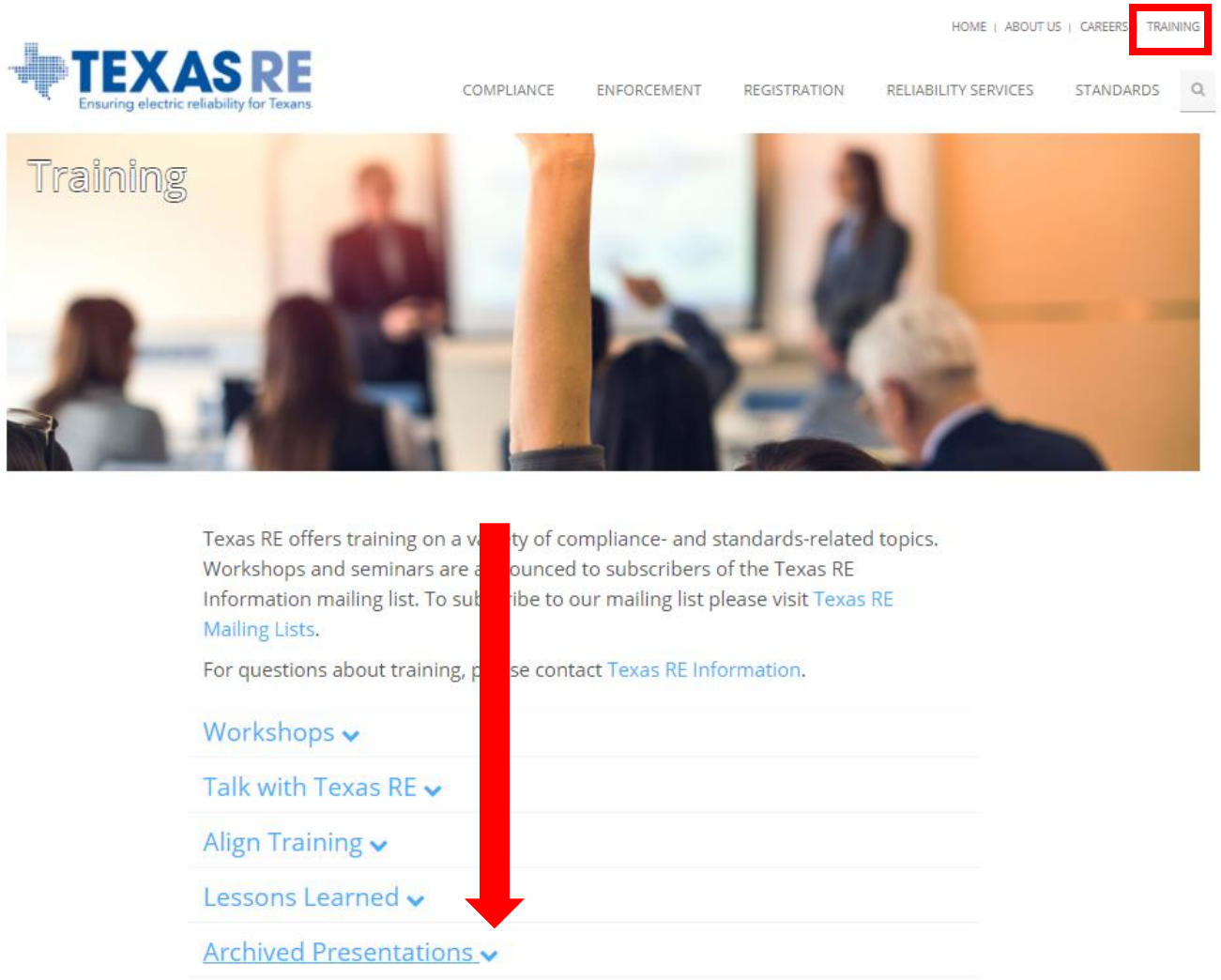
slido



Upcoming Texas RE Events



Training Page



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

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

Women's Leadership in Grid Reliability and Security Conference | Recording

2024 Cyber and Physical Security Workshop | Keynote | Panels: Critical Infrastructure, Threat Assessment, Grid Technologies, Security Posture

Understanding New Generator Obligations

Fall Standards, Security, and Reliability Workshop

Social Media

LinkedIn /texas-reliability-entity-inc

@Texas_RE_Inc

/TexasReliabilityEntity

TEXAS RE

IBR Registration Criteria Changes

Erin Quigley
Manager, Registration & Certification Program

October 16, 2024

Agenda

- Registration Criteria
- Inverter-Based Resource (IBR) Initiative
- CORES & Logistics
- Resources

Defining Registration

Identifies and Registers Bulk Power System (BPS) Owners, Operators, and Users

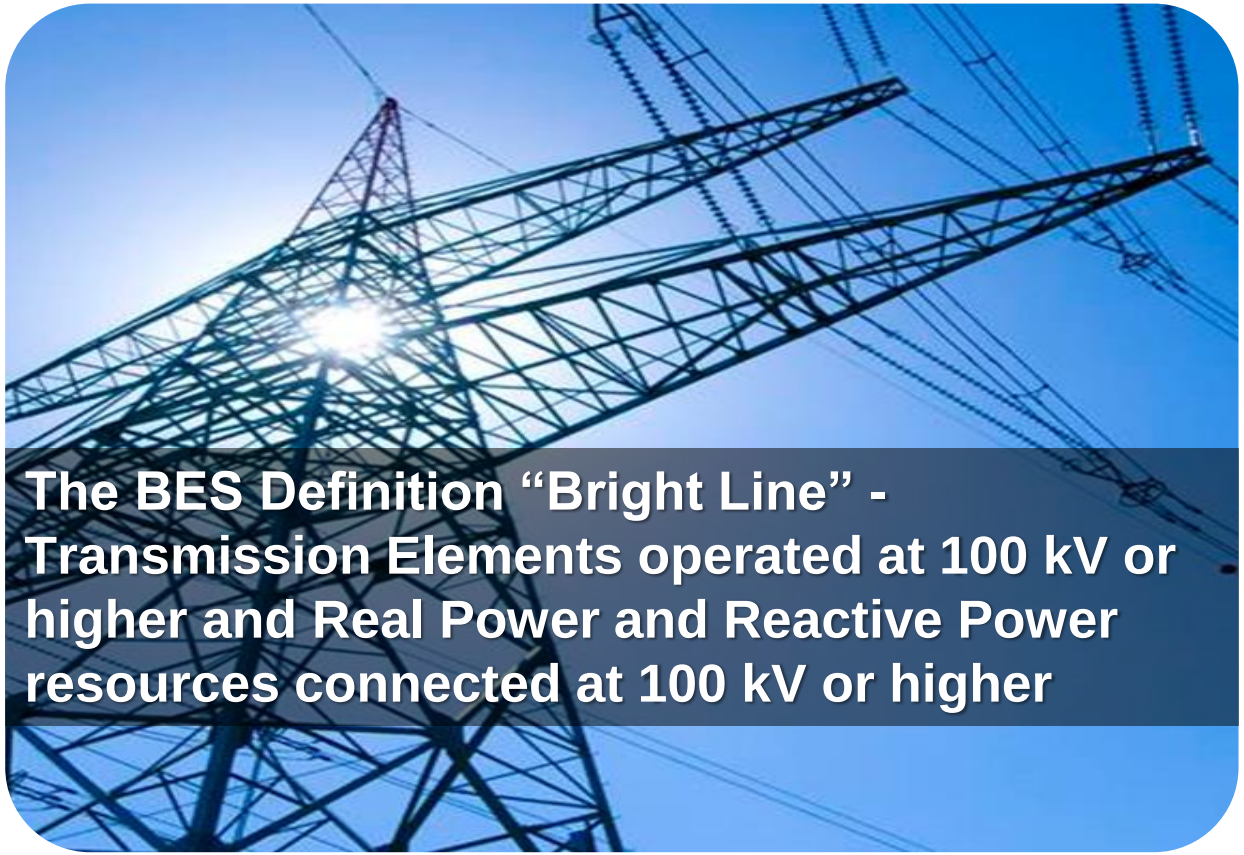
Responsibilities to Perform Specific Function(s)

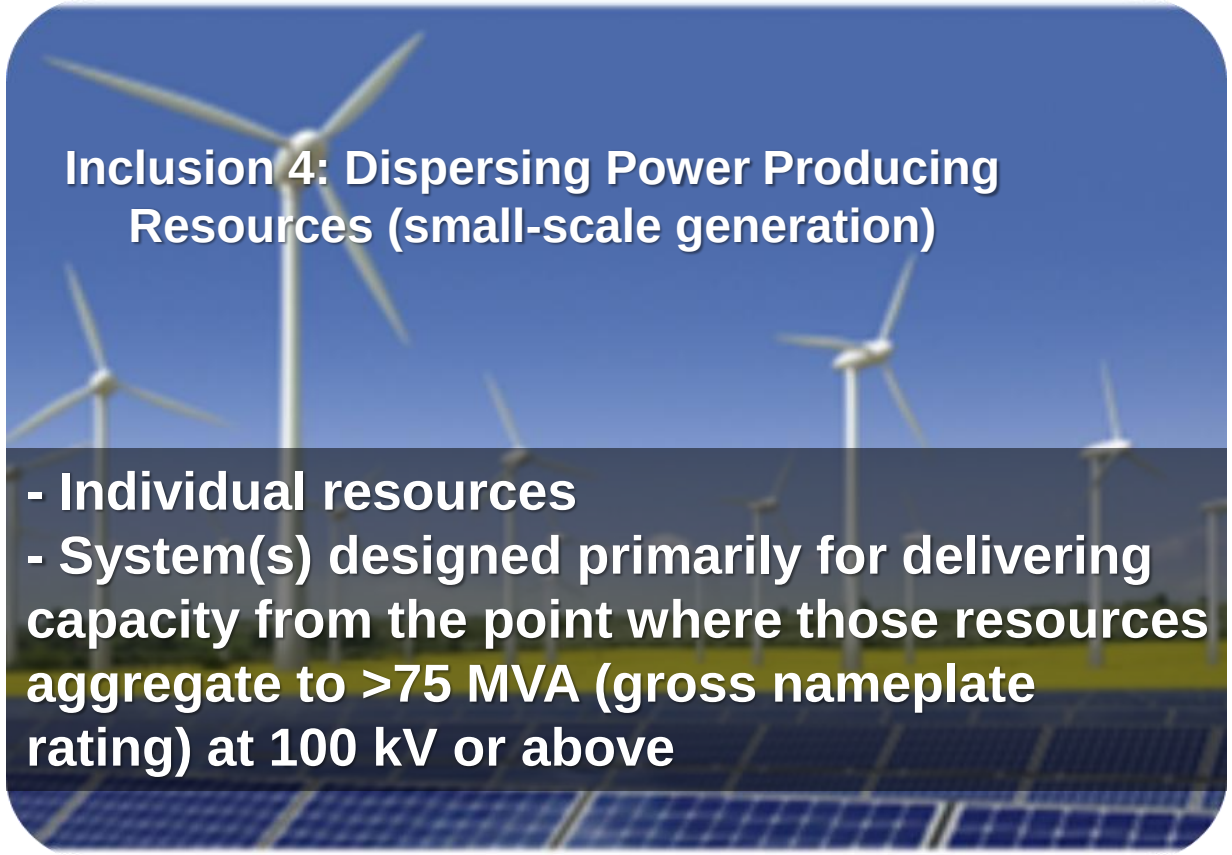
Accountability for Compliance with NERC Reliability Standards

- Registered entities can face penalties or sanctions for noncompliance

Who is Required to Register?

Appendix 2 – Definitions Used in the ROP





Which IBRs are Required to Register?

Generator Owners & Operators

Owns and maintains (Generator Owners) or operates (Generator Operators) generating Facility(ies) and performs the functions of supplying energy and Interconnected Operations Services (Category 1 GO/GOP)

Or

Owns and maintains or operates non-Bulk Electric System (BES) inverter-based generating resources that either have or contribute to an aggregate nameplate capacity of greater than or equal to 20 MVA, connected through a system designed primarily for delivering such capacity to a common point of connection at a voltage greater than or equal to 60 kV (Category 2 GO/GOP)

Category 1 vs. Category 2

Category 1 GO/GOP

- >75 MVA connected at >100 kV
- BES IBRs

Category 2 GO/GOP

- >20 MVA connected at >60 kV
- Non-BES IBRs

Slido.com (#TXRE)

Slido Question

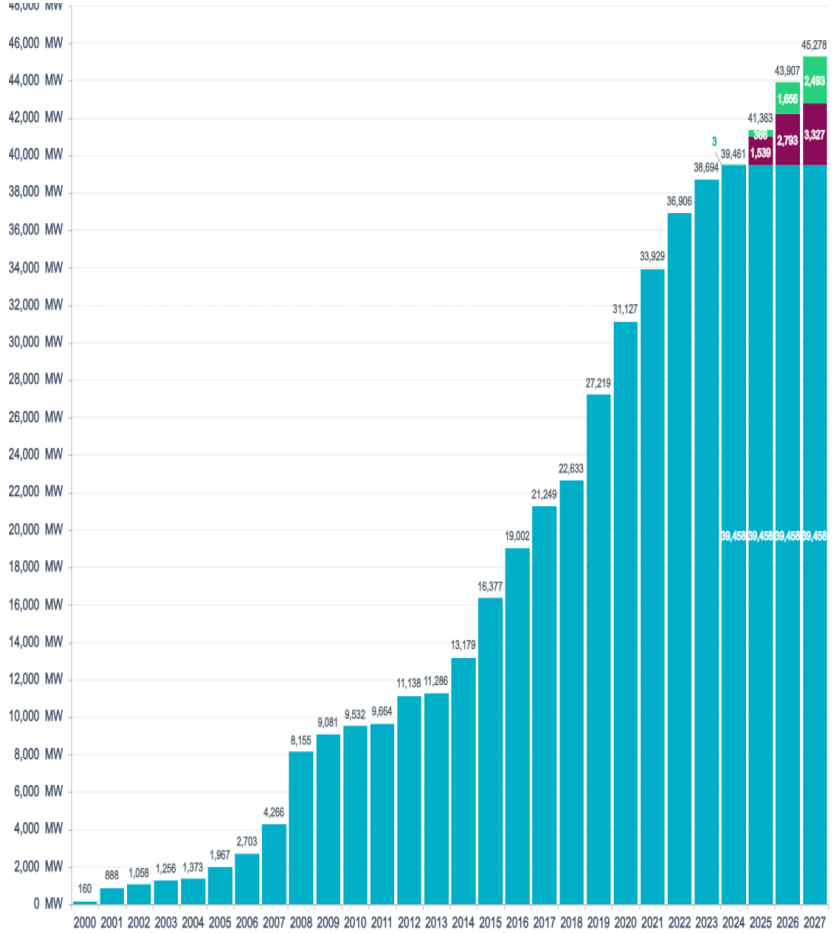
What type of facility does your entity have or expect to have as part of its fleet?

A. Category 1
B. Category 2
C. Both Category 1 and Category 2

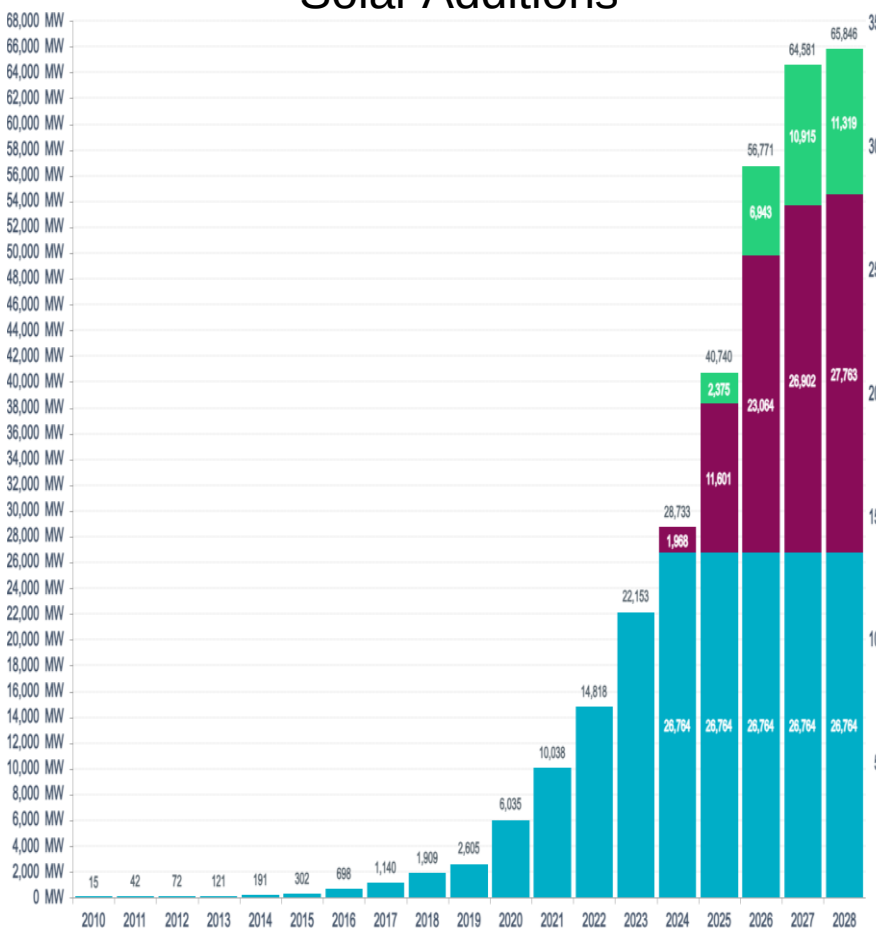
IBR Growth in Texas

Cumulative MW Operational | IA Signed-Financial Security Posted | IA Signed-No Financial Security | Small Generator

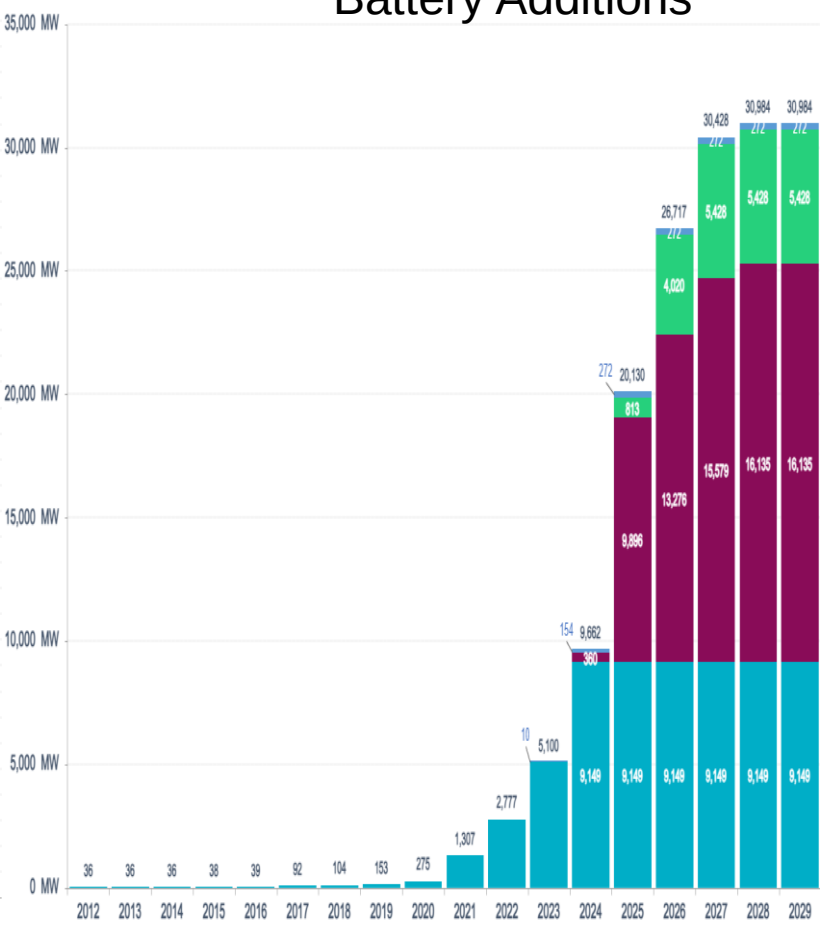
Wind Additions



Solar Additions



Battery Additions



Source: [ERCOT Resource Adequacy Page]

IBR Registration Timeline

You are Here

May 2023 – May 2024

Complete Rules of Procedure (ROP) revisions

May 2024 – May 2025

Identify candidates for registration

May 2025 – May 2026

Register candidates

Next Steps—Identification

- NERC sent RFI on July 9, 2024
- Coordinated effort across Regions
- If identified, you will be contacted

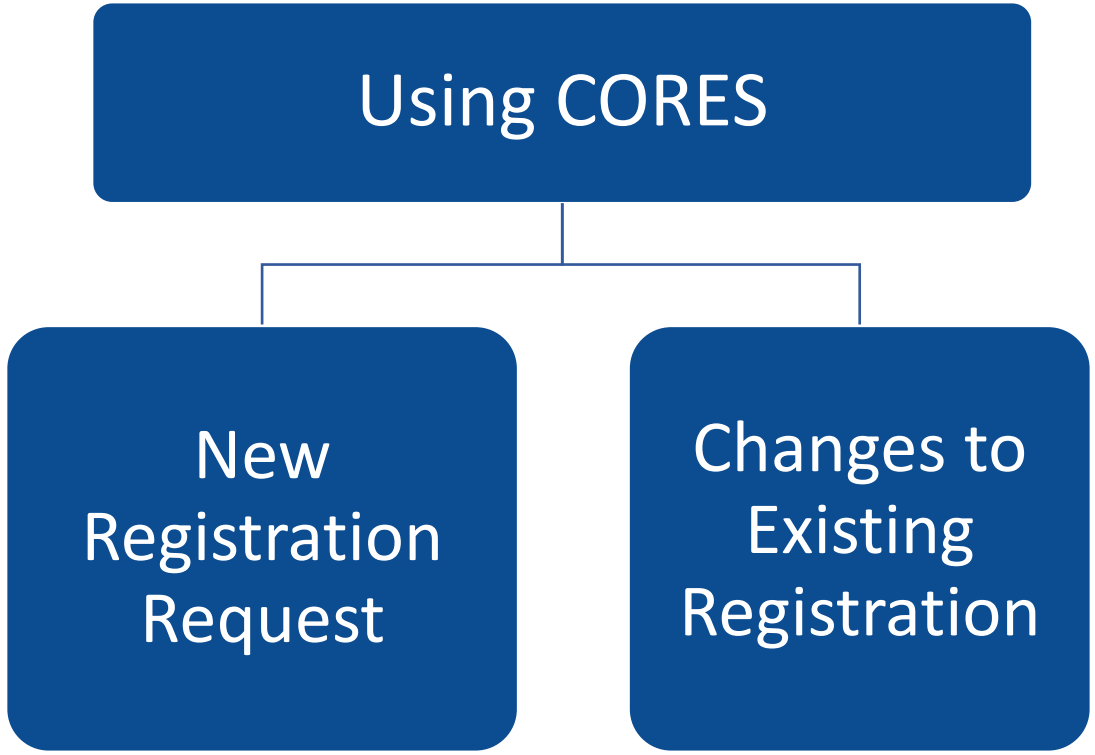
Centralized Organization Registration ERO System (CORES)

CORES Overview

The Centralized Organization Registration ERO System (CORES) launched on July 15, 2019, to provide consistency and alignment across the ERO for registration activities

The CORES platform enables entities to manage their registration information, contact information, and functional relationships from one application

The application is accessed through the ERO Portal (https://eroportal.nerc.net/)

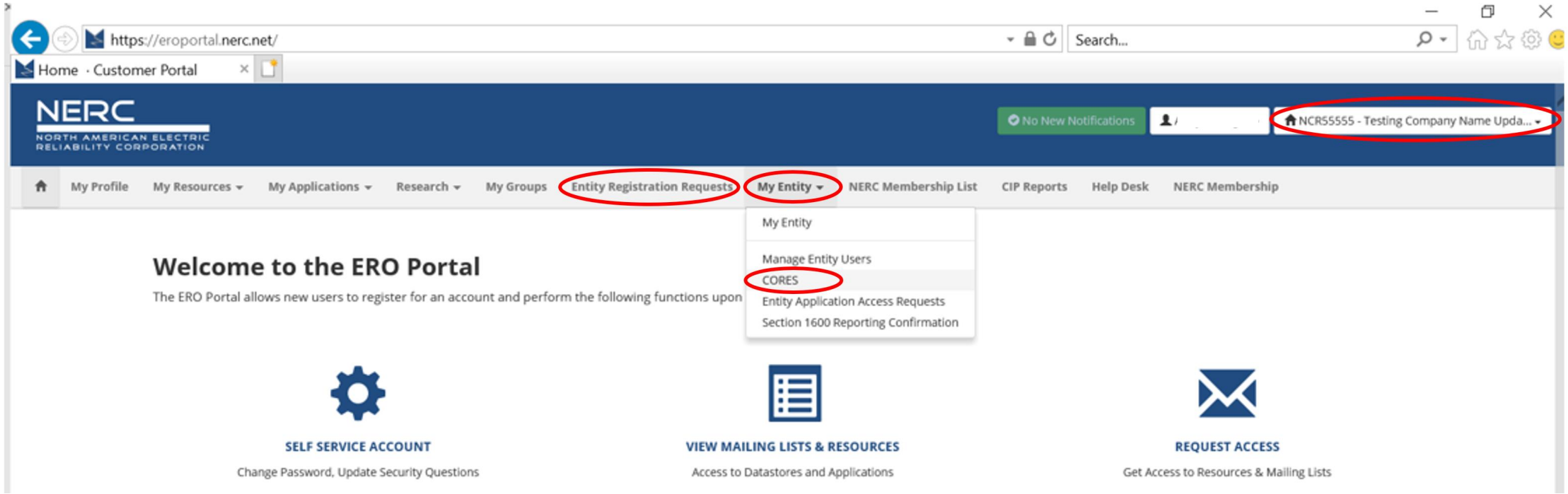


CORES Training Videos

Accessing CORES

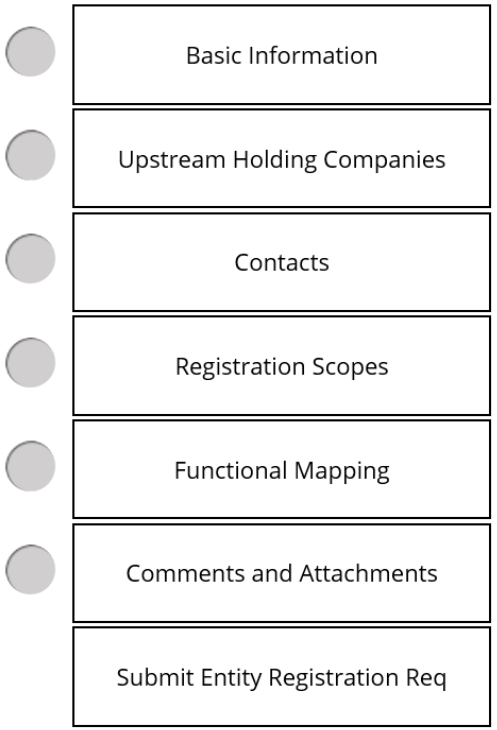
Sign up for an ERO Portal account and complete multifactor authentication (MFA) steps

- **Entity Registration Request** – Any individual with an active ERO Portal account can submit a new registration application within CORES
- **My Entity** – NERC and Entity Admins must initially grant access rights to applicable entities

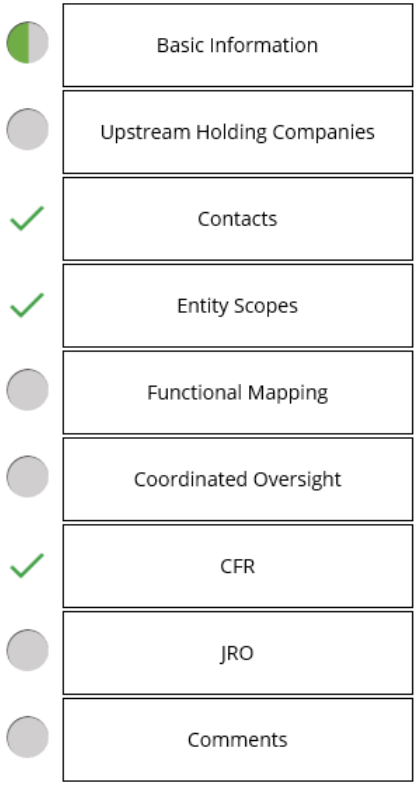


CORES: Navigation Bar Information

New Entity Registration Navigation Bar



My Entity Navigation Bar



The right navigation bar reflects the completion status of each element of the entity registration requests.

Navigation Status	Navigation Symbol
Incomplete	Gray Circle
In Progress	Green and Gray Split Circle
Complete	Green Check Mark

New Registration Request

Submit an application within CORES one month prior to expected registration date

Documentation needed may include:

- Resource Asset Registration Form (RARF) or
  Resource Information and Ongoing Operations (RIOO) Information
- One-line Diagram(s)
- Interconnect Agreement(s)
- GO and GOP Asset Verification Form

CORES
CENTRALIZED ORGANIZATION REGISTRATION ERO SYSTEM

❑Once approved, NERC sends a Notice of Listing on the NERC Compliance Registry

❑Texas RE sends a Welcome Packet including reporting requirements

Submitting a New Registration Request in CORES

Registration Date for New BES Generation Resources

Effective Registration Date

- Defined under Inclusions I2, I3, and I4
- Registration effective upon Commercial Operation Date (COD)
  - All initial testing and commissioning has been completed
  - Initiation date on which the Generator Owner can start producing electricity for sale (excludes sale of test power during initial testing)

- If initiated in stages/phases, registration will occur when Generation Resource achieves COD for an aggregate amount of generating resource(s) (gross nameplate rating) that is greater than the applicable threshold
- 100% compliance with all applicable Reliability Standards once registered

Report Registration Changes to Texas RE

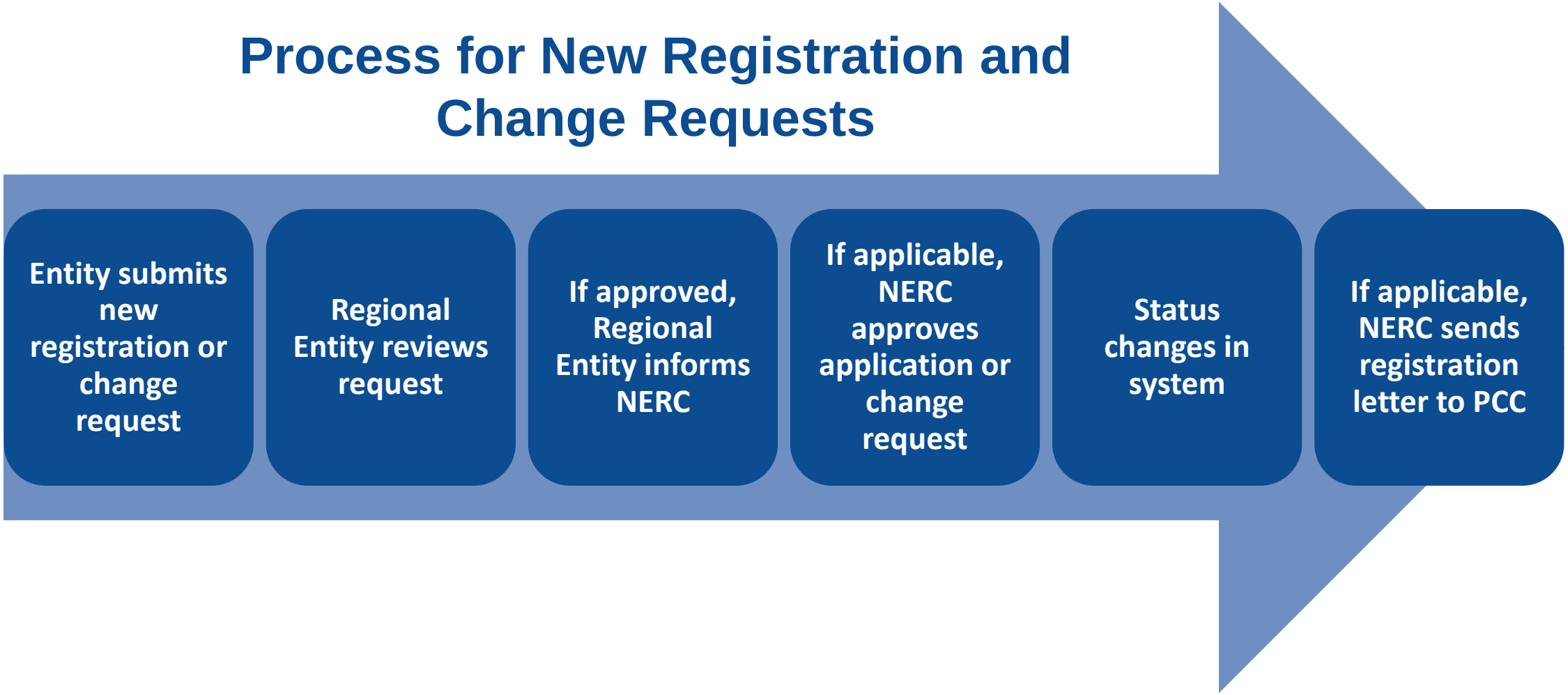
At least 30 days prior to the effective date of any of the registration changes listed below, please contact Texas RE Registration at 512-583-4926 or email registration@texasre.org

- Add/Remove a Function
- Deactivation/ Deregistration
- Entity Function Transfer
- Entity Assets Transfer/Merger/ Sale
- Entity Name Change
- Consolidate NCR Numbers
- Change in JRO/CFR

Documentation may be required via CORES

Process Flow in CORES

Process for New Registration and Change Requests



Changing Contact Roles and Permission Rights in the ERO Portal

When to change contact roles and permission rights

- **Compliance management or entity ownership changes**
- **Role and responsibility changes within organization**
- **User/contact leaves the company**

Actions to perform

- **Request access or change permission rights in the ERO Portal | Pages 9 - 15**
- **Change contact roles in CORES | Pages 17 - 21**
- **Open a Help Desk ticket to "deactivate" the ERO Portal account**

Note: Contact role changes will migrate over from CORES to Align within a day or so

What Happens After Registration?

Risk Assessment

- Inherent Risk Assessment
- Compliance Oversight Plan
- Engagement Scopes

Compliance Engagements

- Self-Certifications
- Audits
- Spot Checks

Texas RE Welcome Packet Information

Texas RE Welcome Packet

TEXAS RE
Ensuring electric reliability for Texans

Welcome Packet

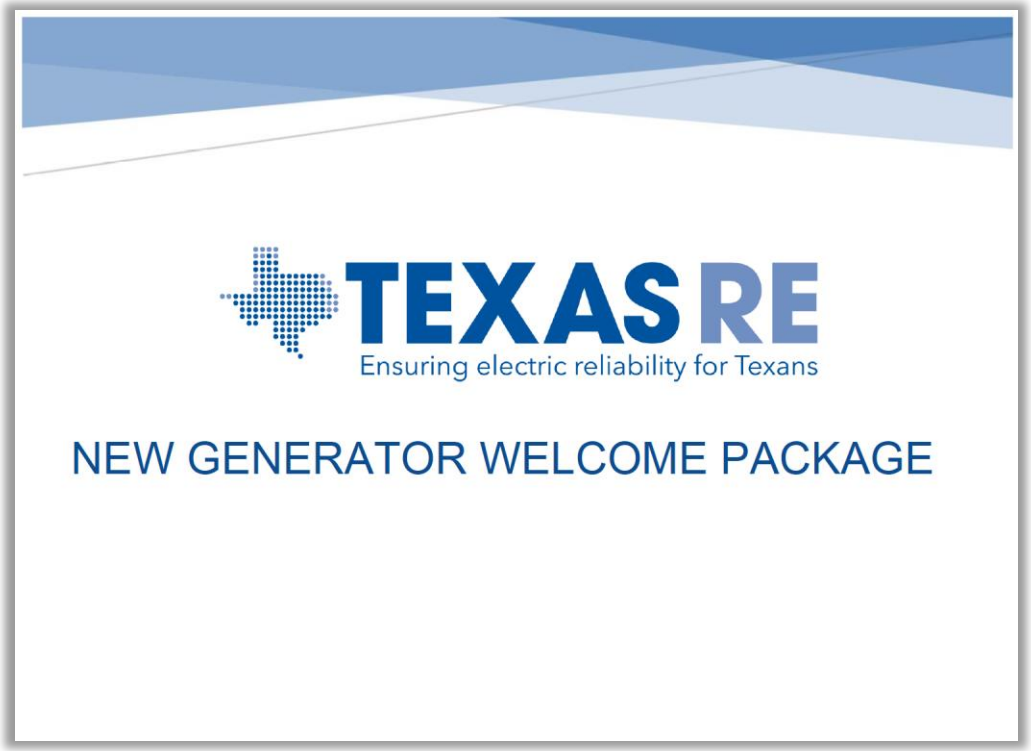
Welcome to the Texas RE Region. We look forward to working with you to maintain the reliability of the bulk power system (BPS) in our interconnection.

Ensuring electric reliability is no small task. To help you get started, we've created a short checklist of action items that will help you get involved and keep you up-to-date on reliability matters!

Recommended Action Items for Registered Entities

- ☐ **Review the Texas RE and NERC websites.**
- ☐ **Join the Texas RE listservs to get Texas RE news in your inbox!**
- ☐ **Become a Texas RE Member if your company is not already. Learn more here!**
- ☐ **Review past announcements and newsletters on the News page.**
  Attend our next free training event. Check the Texas RE calendar to see what's coming up.
- ☐ **Attend Board and MRC meetings.** See our schedule of upcoming meetings.
- ☐ **Participate in a Regional working group.** The NERC Standards Review Forum (NSRF) is a forum for collaboration and discussion on standards development projects. The ERCOT Critical Infrastructure Protection Working Group (CIPWG) is a forum for discussing CIP standards.
- ☐ **Get an ERO Portal account.** The ERO Portal is used to access the Centralized Organization Registration ERO System (CORES), the platform used across the ERO for registration activities. Learn more about CORES here. The ERO Portal is also used to access Align and the ERO Secure Evidence Locker (SEL)
- ☐ **Learn more about ERO Enterprise Registration Guidance.** Review the ERO Enterprise Information Package, the ERO Enterprise Registration Procedure, and the Texas RE Generator Welcome Package.
- ☐ **Email nerc.alert@nerc.net to sign up for NERC Alerts.**

Texas RE Generator Welcome Package



New Generator Welcome Package

- Recommended Reading
- Internal Controls
- GO/GOP Roadmap
- Example Self-Certification Questions

NERC IBR Quick Reference Guide

NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

IBR REGISTRATION INITIATIVE

Quick Reference Guide: IBR Registration Initiative

September 2024

As part of its *Inverter-Based Resource Strategy*, NERC is dedicated to identifying and addressing challenges associated with inverter-based resources (IBR) as the penetration of these resources continues to increase. ERO Enterprise assessments identified a reliability gap associated with the increasing integration of IBRs as part of the grid in which a significant level of bulk power system-connected IBR owners and operators are not yet required to register with NERC or adhere to its Reliability Standards.

In response, FERC issued an order in 2022 directing NERC to identify and register owners and operators of currently unregistered bulk power system-connected IBRs. Working closely with industry and stakeholders, NERC is executing a FERC-approved work plan to achieve the identification and registration directive by 2026. Resources are also posted on the Registration page of the NERC website.

Key Activities

- FERC issued an order approving the Rules of Procedure revisions, subject to submitting a compliance filing, on June 27.
- NERC published its Q2 2024 Quarterly Update on July 11.
- NERC submitted its quarterly work plan update to FERC on August 9.
- NERC submitted a compliance filing in response to FERC's order approving ROP revisions on August 26.

IBR Registration Milestones

Phase 1: May 2023–May 2024

- Complete Rules of Procedure revisions and approvals
- Commence Category 2 GO and GOP candidate outreach and education (e.g., through trade organizations)

Phase 2: May 2024–May 2025

- Complete identification of Category 2 GO and GOP candidates
- Continue Category 2 GO and GOP candidate outreach and education (e.g., quarterly updates, webinars, workshops, etc.)

Phase 3: May 2025–May 2026

- Complete registration of Category 2 GO and GOP candidates thereafter subject to applicable NERC Reliability Standards
- Conduct specific Category 2 GO and GOP outreach and education (e.g., quarterly updates, webinars, workshops, etc.)

Available Resources

- NERC Registration Page
- Standards Under Development Page | FERC Order No. 901 Milestone 2 Summary
- Q1 2024 Update | Q2 2024 Update
- IBR Webinar Series and FAQs
- Quick Reference Guide: Candidate for Registration
- Quick Reference Guide: Inverter-Based Resource Activities
- Learn about NERC and Join the E-ISAC

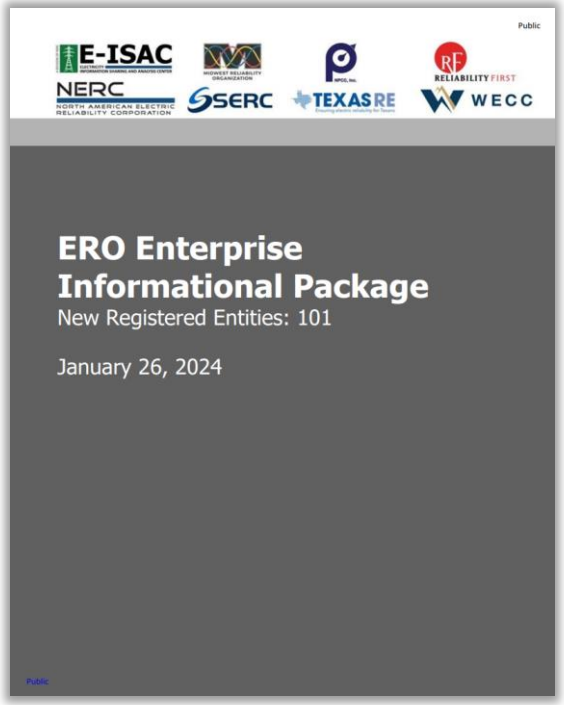
LEARN MORE ABOUT NERC AND THE E-ISAC

NERC NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION | E-ISAC ELECTRICITY INFORMATION SHARING AND ANALYSIS CENTER

RELIABILITY | RESILIENCE | SECURITY

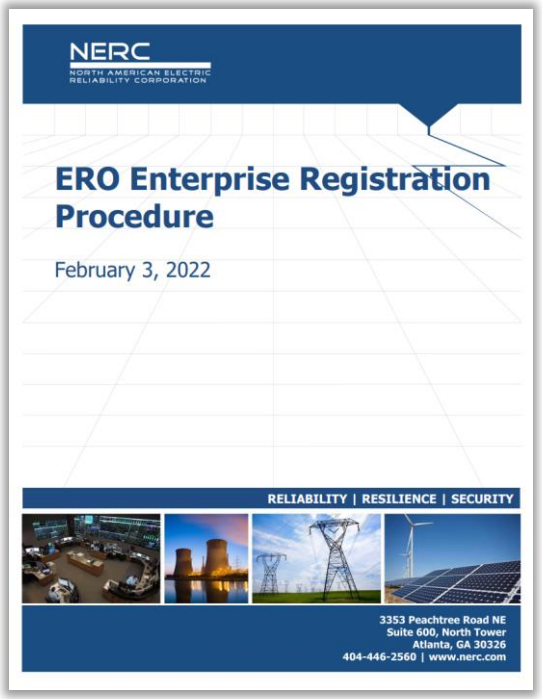
ERO Registration Documents

ERO Enterprise 101 Informational Package



Created to provide guidance on becoming a NERC registered entity and includes steps to complete as a newly registered entity

ERO Registration Procedure



Updated to incorporate a variety of previously issued materials into a single document and to conform to revised Rules of Procedure

Published on NERC's Registration Webpage

Registration Resources

Texas RE's Registration Page

- Registration and Certification Process Information
- Links to Registration and Certification Documentation

NERC's Organization Registration Website

- Registration Process and Guidance Documents
- NERC Compliance Registry Information | CFR and JRO Member Listings

NERC's Organization Certification Website

- Final Certification Reports
- Certification Process Documents

NERC Resources

- ERO Enterprise Registration Procedure
- ERO Enterprise Entity Onboarding Checklist
- ERO Enterprise 101 Informational Package
- ERO Enterprise GO GOP Asset Verification Form
- CORES End User Guide

Staying Informed

Texas RE & NERC Outreach

Texas RE Member Representatives Committee (MRC) Meetings

Texas RE NERC Standards Review Forum (NSRF) Meetings

Contact

Erin Quigley

Manager, Registration and Certification Program

Erin.Quigley@texasre.org | registration@texasre.org

512-583-4926

TEXAS RE
Ensuring electric reliability for Texans

TEXAS RE

FERC Order No. 901 Update

Rachel Coyne
Executive Chief of Staff

October 16, 2024

History—IBR Events

https://www.nerc.com/pa/rrm/ea/Pages/Major-Event-Reports.aspx

FERC Order No. 901 Summary

Federal Energy Regulatory Commission (FERC) Order 901

- Issued October 19, 2023
- Addressing the rapid change in generation resource mix, increase in nonsynchronous resources
- Addresses gaps in four areas
- Four milestones through November 2026
- IBR-related performance issues
- Leverages existing guidance where possible

Order No. 901 Workplan submitted January 17, 2024

FERC Order No. 901—Four Areas to Address Gaps

- IBR Data Sharing
- IBR Model Validation
- IBR Planning and Operational Studies
- IBR Performance Requirements

185 FERC ¶ 61,042
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

18 CFR Part 40

[Docket No. RM22-12-000; Order No. 901]

Reliability Standards to Address Inverter-Based Resources

(Issued October 19, 2023)

AGENCY: Federal Energy Regulatory Commission

ACTION: Final rule

SUMMARY: The Federal Energy Regulatory Commission (Commission) is directing the North American Electric Reliability Corporation (NERC), the Commission-certified Electric Reliability Organization, to develop new or modified Reliability Standards that address reliability gaps related to inverter-based resources in the following areas: data sharing; model validation; planning and operational studies; and performance requirements. The Commission is also directing NERC to submit to the Commission an informational filing within 90 days of the issuance of this final rule that includes a detailed, comprehensive standards development plan providing that all new or modified Reliability Standards necessary to address the inverter-based resource-related reliability gaps identified in this final rule be submitted to the Commission by November 4, 2026.

DATES: This rule is effective **[INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**

E-1-RM22-12-000 | Federal Energy Regulatory Commission (ferc.gov)

FERC Order No. 901—Four Milestones

1 COMPLETED JANUARY 2024

Order No. 901 Work Plan submission

2 DUE NOVEMBER 4, 2024

Standards development and filing to address performance requirements and post-performance validations for Registered IBRs

3 DUE NOVEMBER 4, 2025

Development and filing of Reliability Standards to address data sharing and model validation for all IBRs

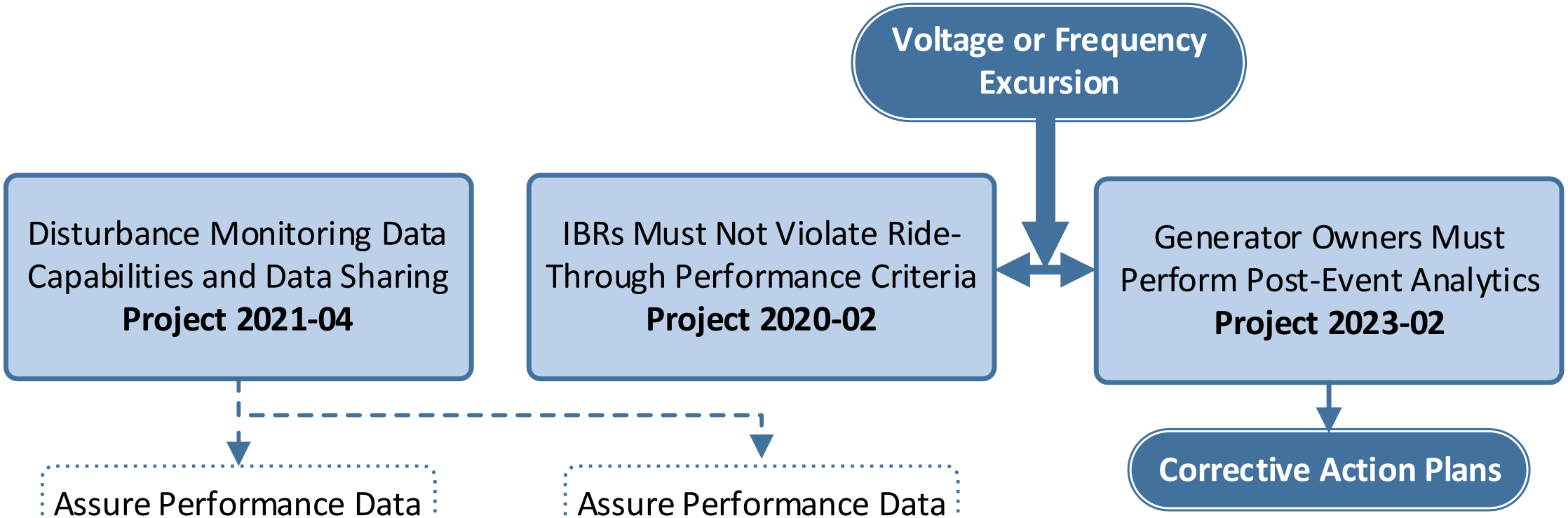
4 DUE NOVEMBER 4, 2026

Development and filing of Reliability Standards to address use of performance data in Operational and Planning studies

Milestone 2 Projects

Project	Standard(s)	Filing Due Date
2020-06	IBR Definition	N/A
2020-02 Modifications to PRC-024 (Generator Ride-Through)	PRC-024-4 PRC-029-1	11/4/2024
2021-04 Modifications to PRC-002	PRC-002-5 PRC-028-1	11/4/2024
2023-02 Analysis and Mitigation of BES IBR Performance Issues	PRC-030-1	11/4/2024

Milestone 2 Projects



Project 2020-06: Definition of Inverter-Based Resource (IBR)

A plant/facility consisting of individual devices that are capable of exporting Real Power through a power electronic interface(s) such as an inverter or converter, and that are operated together as a single resource at a common point of interconnection to the electric system. Examples include, but are not limited to, plants/facilities with solar photovoltaic (PV), Type 3 and Type 4 wind, battery energy storage system (BESS), and fuel cell devices.

Project 2021-04 (PRC-002-5, PRC-028-1)

Industry Need

- Have adequate data available to facilitate the analysis of BES disturbances

Separated IBR requirements from existing PRC-002-4, updated PRC-002 language

New Standard: PRC-028-1 Disturbance Monitoring and Reporting Requirements for Inverter-Based Resources

- Data needed by **all** 901 related Standards
- Requires installation of equipment—phased-in through 2030
- Share data on request

Project 2023-02 (PRC-030-1)

Industry Need

- All such events to be analyzed with root causes of undesired performance identified and possible mitigating actions documented and taken as appropriate

New Standard: PRC-030-1 Unexpected Inverter-Based Resource Event Mitigation

- Analysis of Performance during a disturbance
- Triggers what is evaluated for ride-through performance

Project 2020-02 (PRC-024-4 & PRC-029-1)

Industry Need

- Multiple IBRs experience abnormally tripping, ceasing current injection, or reducing power output with control interactions

PRC-024-4: Excluded IBR, added Type 1 and Type 2 Wind and other conforming adjustments

New Standard: PRC-029-1 Frequency and Voltage Ride-Through Requirements for Inverter-Based Resources

- Establish capability-based ride-through criteria
- Establish performance-based ride-through criteria

Ride-Through Definition

PRC-029-1 Technical Conference

ROP Section 321

September 4-5, 2024

Topics

- Ride-through definition
- Newly proposed criteria for frequency ride-through performance
- Allowable hardware-based exemptions

Recent and Current Milestone 2 Postings

Project	Standard(s)	Recent Action
2020-06	IBR Definition	9/12/2024 Final Ballot Passed
2020-02 Modifications to PRC-024 (Generator Ride-Through)	PRC-024-4	9/30/2024 Final Ballot Passed
2020-02 Modifications to PRC-024 (Generator Ride-Through)	PRC-029-1	10/4/2024 Additional Ballot Passed
2021-04 Modifications to PRC-002	PRC-002-5 PRC-028-1	9/18/2024 Final Ballots Passed
2023-02 Analysis and Mitigation of BES IBR Performance Issues	PRC-030-1	9/27/2027 Final Ballot Passed

Implementation

Effective Date = first day of first calendar quarter after FERC approval

All phased-in implementation to be complete no later than January 1, 2030

Dependencies

- PRC-029-1 – Performance-based elements—Entities shall not be required to comply with the portion of Requirements R1, R2, and R3 relating to the operation of IBRs to meet the requirements until the entity has established the required disturbance monitoring equipment capabilities for those IBRs in accordance with the implementation plan for Reliability Standard PRC-028-1
- PRC-030-1 Effective Date = later of first day of first calendar quarter 12 months after FERC approval OR first day OR first calendar quarter 12 months after FERC approval of PRC-029-1

Milestone 3

1 COMPLETED JANUARY 2024

Order No. 901 Work Plan submission

2 DUE NOVEMBER 4, 2024

Standards development and filing to address performance requirements and post-performance validations for Registered IBRs

3 DUE NOVEMBER 4, 2025

Development and filing of Reliability Standards to address data sharing and model validation for all IBRs

4 DUE NOVEMBER 4, 2026

Development and filing of Reliability Standards to address use of performance data in Operational and Planning studies

Milestone 3 Standard Authorization Requests

SAR Title	Date Submitted	Part of Project	Dates/Actions
FERC Order No. 901 Milestone 3, Part 3	4/29/2024	2021-01	5/23/2024 - 6/28/2024 SAR Comment Period
FERC Order No. 901 – Milestone 3, Part 2: IBR Model Validation	4/29/2024	2020-06	5/23/2024 - 6/28/2024 SAR Comment Period
FERC Order No. 901 – Milestone 3, Part 1: Modeling and Data Sharing Requirement	4/29/2024	2022-02	5/17/2024 - 6/24/2024 SAR Comment Period

Other IBR Standards Projects

High Priority

- 2020-06 Verification of Models and Data for Generators
- 2021-01 System Model Validation with IBRs
- 2022-02 Uniform Modeling Framework for IBR
- 2024-01 ROP Definitions Alignment (GO and GOP)

Medium Priority

- 2022-04 EMT Modeling
- 2023-01 EOP-004 Event Reporting

Low Priority

- 2021-02 Modifications to VAR-002
- 2023-05 Modifications to FAC-001 and FAC-002
- 2023-08 Modifications of MOD-031 Demand and Energy Data

Get Involved

NSRF

- Texas RE stakeholder group to discuss upcoming effective standards as well as compliance topics

RSTC

- NERC stakeholder committee to discuss various grid topics

SDT Meetings

- Open meetings to participate in standards develop process

References

- FERC Order No. 901
- FERC Order No. 901 Workplan
- Quick Reference Guide: Inverter-Based Resource Activities
- Reliability Standards Under Development
- **Project Pages**
  - 2020-06
  - 2020-02 Modifications to PRC-024 (Generator Ride-Through)
  - 2021-04 Modifications to PRC-002
  - 2023-02 Analysis and Mitigation of BES IBR Performance Issues

Contact

Rachel Coyne

Executive Chief of Staff

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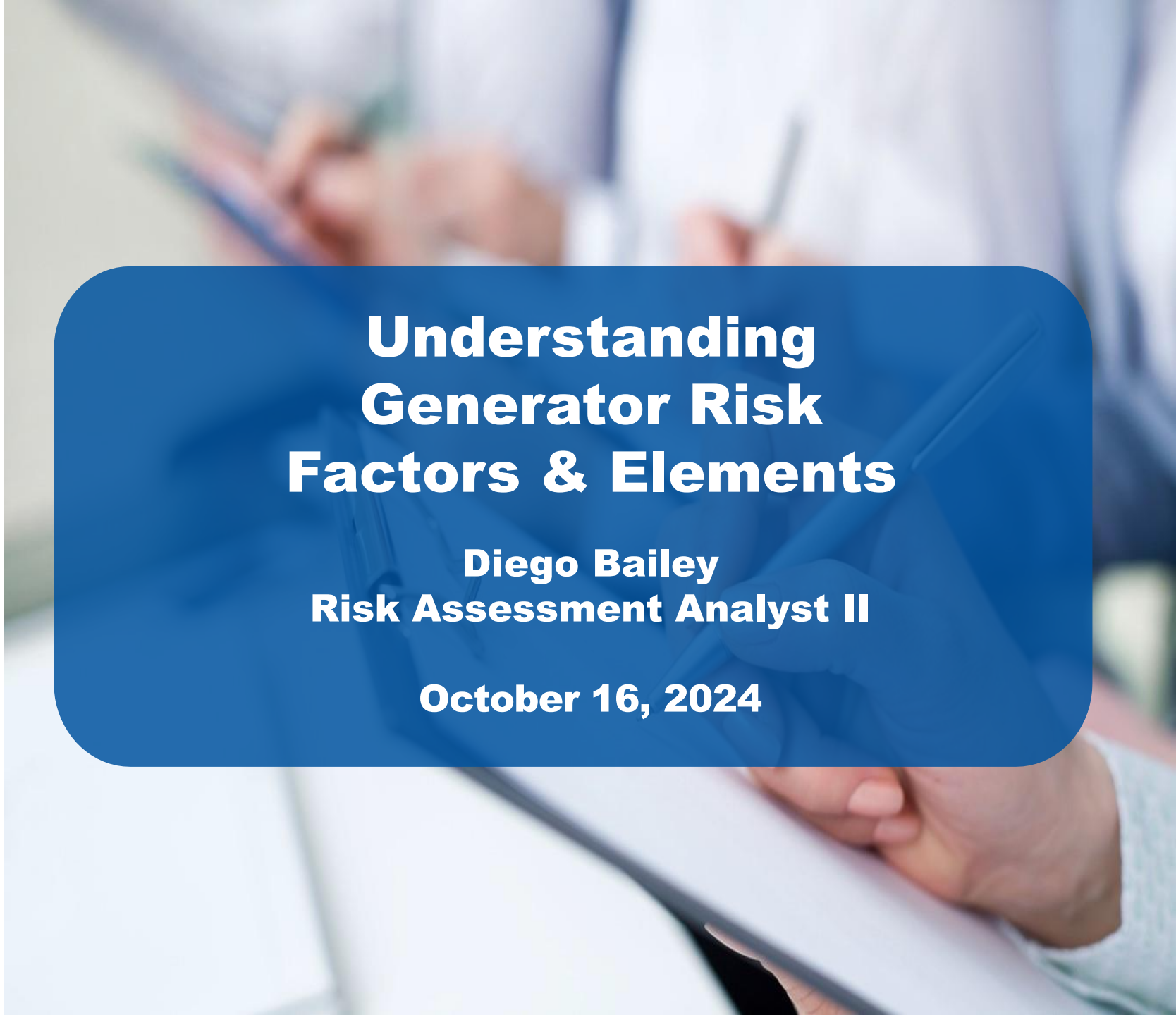
TEXAS RE
Ensuring electric reliability for Texans

TEXAS RE

Understanding Generator Risk Factors & Elements

Diego Bailey
Risk Assessment Analyst II

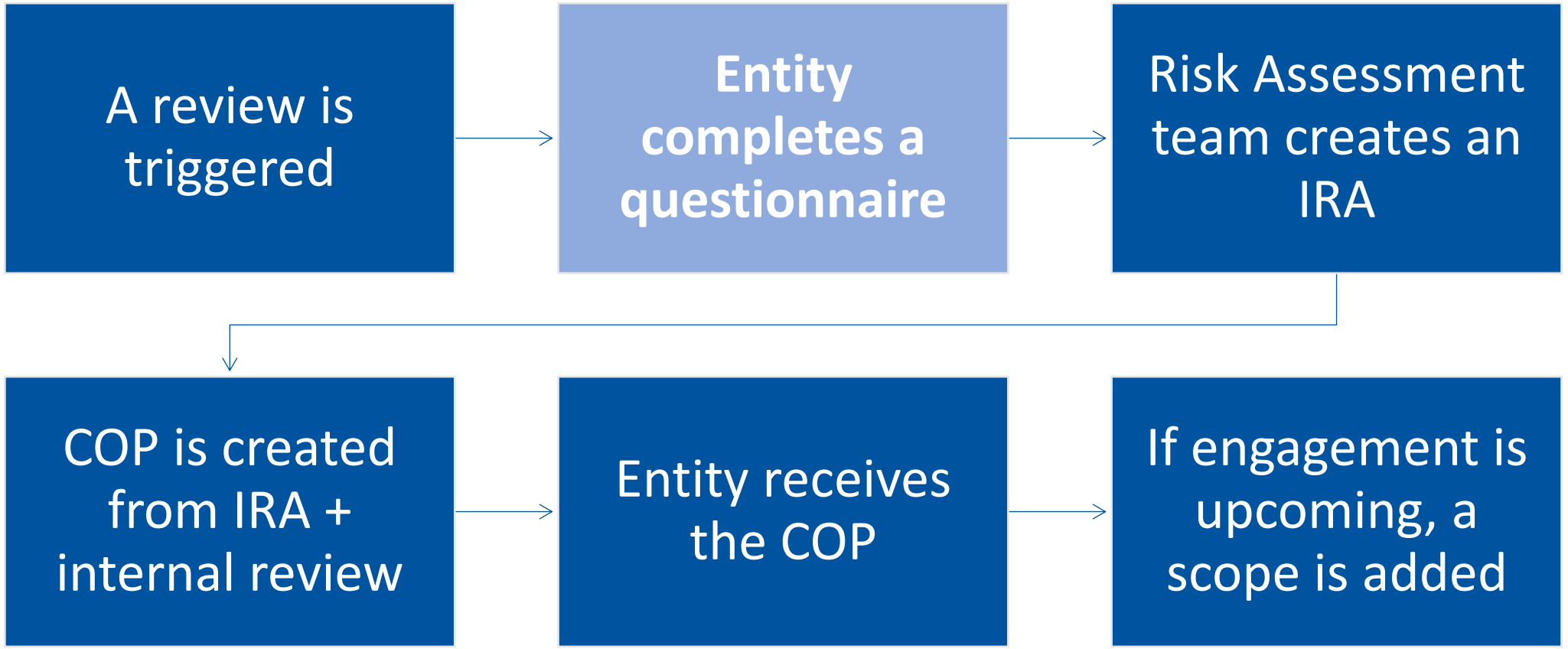
October 16, 2024



Agenda

- **Risk Assessment Process**
- **IRA Risk Factor Criteria Examples**
- **Tips for Filling out Your Questionnaire More Accurately**
  (Five common questions with mistakes in generator questionnaires)
- **Which Risk Elements NERC Has Highlighted for Generators**
  (a look at the 2024 CMEP IP)

The Risk Assessment Process



IRA Risk Factor Criteria Examples

Appendix B – ERO Enterprise Risk Factors

Risk Factors	Criteria for Assessment			
Risk Factor	**N/A**	**Low Risk**	**Medium Risk**	**High Risk**
Voltage Control	Entity does not own or operate any voltage control equipment	----------	Entity owns and/or operates reactive resources to provide voltage control	Entity owns and/or operates reactive resources other than generators to provide voltage control
Largest Generator Facility	Entity does not own any generation facilities	Entity's largest single generation facility is less than 500 MVA	Entity's largest single generation facility is between 500 - 1,000 MVA	Entity's largest single generation facility is greater than 1,000 MVA
Total Generation Capacity	Entity does not own or operate any generation facilities	Entity's total generation nameplate capacity is less than 1,000 MVA	Entity's total generation nameplate capacity is between 1,000 - 5,000 MVA	Entity's total generation nameplate capacity is greater than 5,000 MVA

Appendix B of the ERO Enterprise Guide for Compliance Monitoring (2016)

Tips for Filling Out Your Questionnaire More Accurately

Five common questions with mistakes in generator questionnaires

Voltage Control

Question: Do you use voltage control devices other than generators?

Common Answer: No

Voltage Control

ERCOT language includes: "capacitor switching, reactor switching" (i.e. capacitors and reactors count as voltage control devices!)

The Risk Assessment team checks your answer against GridGeo and one-line diagrams

Make sure to include capacitors and reactors as voltage control devices

Largest Generator Facility

Question: What is the largest generator facility you own?

Common Answer: N/A, we don't own!

Largest Generator Facility

"Own" in this case means own *or* operate

The Risk Assessment team checks your answer against ERCOT documentation and generators mapped to your entity

If you operate a generator, for this question, you "own" it

Generator Ratings

Question: Any question with generator ratings included (largest generator, total generation, etc.)

Common Answer: MW instead of MVA

Generator Ratings

Please use the unit specified in the question!

Check your registration documents, the information you provide ERCOT, previous numbers given to Texas RE

Update your information if there have been any changes

This is commonly a risk consideration for FAC-008

Double check the units you're using when answering generator questions

CIP—External Electronic Communication

Question: Are you sharing information outside of your site?

Common Answer: No

CIP—External Electronic Communication

Are you sharing information outside of your site?

- *Almost always yes (telemetry!)*

Who are you sharing that information with?

- *At the very least with ERCOT via ICCP*

NERC-registered entities have NCRs

- *A majority of QSEs are not NERC-registered entities*

You are most likely communicating with non-NERC-registered entities

CIP—Monitor and Control Capability

Question: Does your entity have or interact with centralized Cyber Assets that have monitor and control capability for generation assets?

Common Answer: Your NCR's assets

Sometimes

CIP—Monitor and Control Capability

This number should be just the assets you control, unless…

If your NCR owns the Control Center in the Texas RE region, then there are extra considerations:

- Can your site be used as an access point for a location that controls a larger number of MWs?
- Total number of MWs that the Control Center monitors factor into this risk

If you have a Control Center, double-check to see if those assets need to be included in this answer or not

The Risk Assessment Process

A review is triggered → Entity completes a questionnaire → Risk Assessment team creates an IRA

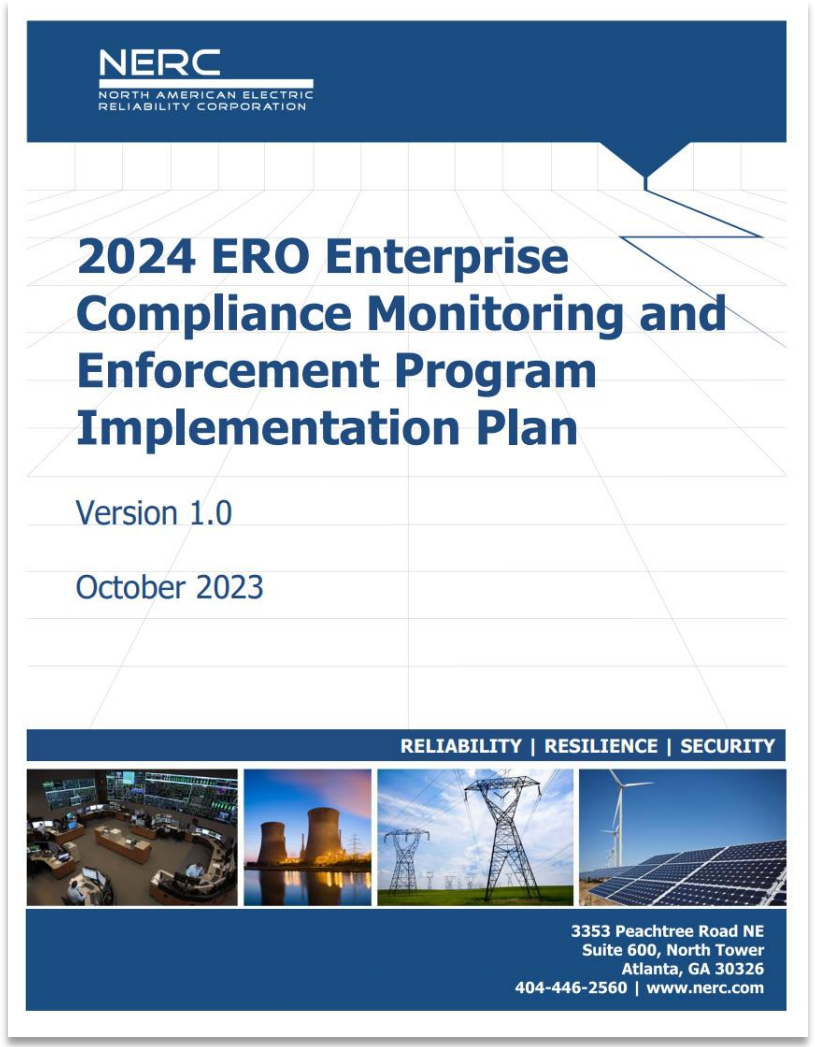
COP is created from IRA + internal review → Entity receives the COP → If engagement is upcoming, a scope is added

Which Risk Elements NERC Has Highlighted for Generators

A look at the 2024 CMEP IP

Risk Elements Related to GO/GOPs

- Remote Connectivity
- Supply Chain
- Incident Response
- Inverter-Based Resources
- Facility Ratings
- Extreme Weather Response



Inverter-Based Resources

With the recent and expected increases of both utility-scale solar resources and distributed generation, the causes of a sudden reduction in power output from utility-scale power inverters need to be widely communicated and addressed by industry

Areas of Focus for Inverter-Based Resources

Standard	Requirements
FAC-001-4	R1, R2
FAC-002-4	R1, R2
MOD-026-1	R2
PRC-024-3	R1, R2

Facility Ratings

- The accuracy of Facility Ratings is a cornerstone of being able to use and protect the BES
- Operators depend on Facility Ratings to provide reliable System Operating Limits (SOLs) and Interconnection Reliability Operating Limits (IROLs) that inform operating decisions

Facility Ratings

Area of Focus

Standard	Requirements
FAC-008-5	R6

Extreme Weather Response

Extreme weather events encompass a wide range of situations that can cause major BPS impacts

- Excessive heat
- Excessive cold
- Hurricanes

Extreme Weather Response

Areas of Focus

Standard	Requirements
EOP-011-2	R1, R2, R3, R6, R7, R8
EOP-012-1 (Effective 10/1/24)	R1, R2, R3, R4, R5, R6, R7

References

- ERO Enterprise Guide for Compliance Monitoring
- ERCOT Nodal Operating Guide 2.7.2 (1) (f) (iii)
- ERO CMEP Implementation Plan v1.0 - 2024 (nerc.com)

Contact

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TEXAS RE
Ensuring electric reliability for Texans

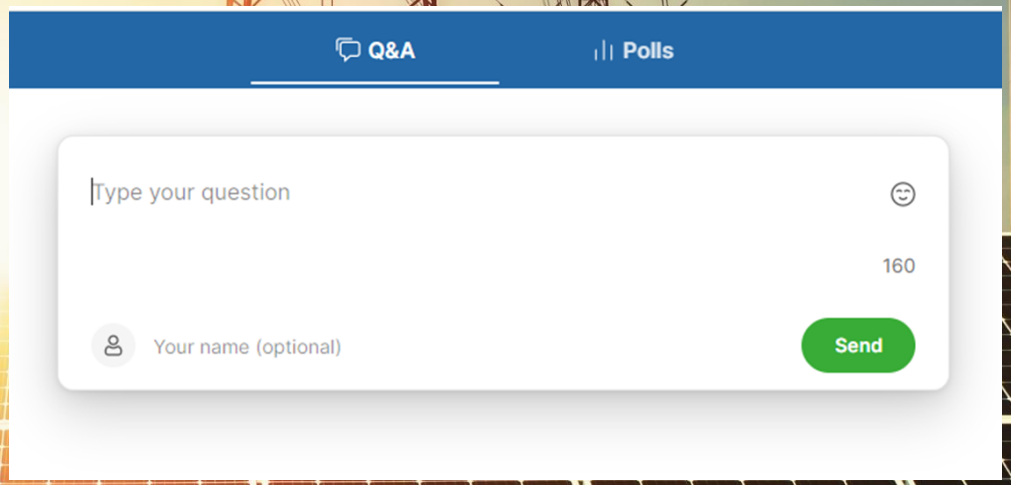
Texas RE
Understanding New Generator Obligations

AGENDA

- Welcome & Instructions
- IBR Registration Criteria Changes
- FERC Order No. 901 Update
- Understanding Generator Risk Elements & COPs
- NAGF Overview
- Key Generator Compliance Obligations

Return: 10:25 a.m.

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



North American Generator Forum

Venona Greaff
Secretary
venona_greaff@oxy.com
October 16, 2024

What is the NAGF?

The NAGF is an independent, member-driven, non-profit organization of generator owners and operators, focused on NERC and other grid reliability issues.

NAGF Mission

The NAGF mission is to promote the safe, reliable operation of the generator segment of the bulk power system through generator owner and operator collaboration with grid operators and regulators.

What We Do

We provide a unified voice for the generator segment to NERC and the Regional Entities.

We do this through open-source collaboration and information exchange among our members and with other industry professionals.

NAGF's Dual Focus

- Compliance with existing Standards
  - "The here and the now"
  - Collaborative efforts
  - Best Practice sharing
  - Discussion boards, file cabinet, etc. on Groupsite

- Shaping policy
  - Helping paint the futurescape
  - Ensuring the unique perspective of the generation segment is understood and accounted for
  - Improve "first time success" of new regulations

Current Areas of Focus

- **FERC Order No. 901, IBR Registration and Standards**
- **IBR Performance and Modeling Requirements**
- **Extreme Cold Weather Reliability including Blackstart availability and Gas-Electric Coordination**
- **The NAGF and RSTC leadership collaboration**
- **NAGF-NERC Quarterly Collaboration Meeting**

NAGF Participation

- NERC Outreach regarding FERC Order 901 Milestone 2 IBR Projects Under Development (PRC-028, 029, and 030)
- NERC Preparation for Cold Weather Webinar, September 5, 2024
- NERC Project 2023-07 Extreme Heat and Extreme Cold Weather Industry Webinar, Tuesday, September 10, 2024
- NERC Ride-through Technical Conference on September 4 and 5, 2024
- NAGF working with NERC to develop FERC 901 New Entity Registration and Compliance Guidance for NAGF members

Current Activities

- NAGF Annual Meeting & Compliance Conference
  - Mark Lauby – Keynote Speaker
  - November 6-7 at Texas RE's offices in Austin
    - In Person and Virtual Option
    - Registration Link
      - https://generatorforum.org/event/2024-compliance-conference-and-annual-meeting/

NAGF Working Groups

- Security Practices / CIP
- Physical Security
- Cold Weather Preparedness
- Standards Review Team
- Policy & Market
- Variable Resources

Collaboration: Website

NERC Standard Projects

Through its Working Groups, the NAGF actively engages in the standards development process

- Cold Weather Working Group
  - 2024-03: Modifications to EOP-012-2
  - Continuing work to share best practices for ensure cold weather preparations

- CIP Working Group
  - 2023-01: CIP-002
  - 2023-04: Modifications to CIP-003
  - 2023-09: Risk Management for 3rd Party Cloud Services

NERC Standard Projects

Through its Working Groups, the NAGF actively engages in the standards development process (continued)

- Physical Security Working Group
  - 2023-01: EOP-004 IBR Event Reporting
  - 2023-06: CIP-014 Risk Assessment Refinement

- Standards Review Team
  - Project 2021-01: Modifications to MOD-025 & PRC-019
  - Project 2022-02: Modifications to TPL-001 and MOD-032
  - Project 2022-03: Energy Assurance w Energy-Constrained Resources
  - Project 2023-02: Analysis and Mitigation of BES Inverter-Based Resource Performance Issues

NERC Standard Projects

Through its Working Groups, the NAGF actively engages in the standards development process (continued)

- Variable Resources Working Group
  - 2020-02: Modifications to PRC-024 (new PRC-029)
  - 2020-06: IBR Glossary Terms
  - 2021-04: Modifications to PRC-002 Phase II – new PRC-028
  - 2023-02: Performance of IBRs (new PRC-030)
  - 2024-01: Rules of Procedure Definitions Alignment (Generator Owner and Generator Operator)

Thank you!

www.GeneratorForum.org

TEXAS RE

Key Generator Compliance Obligations

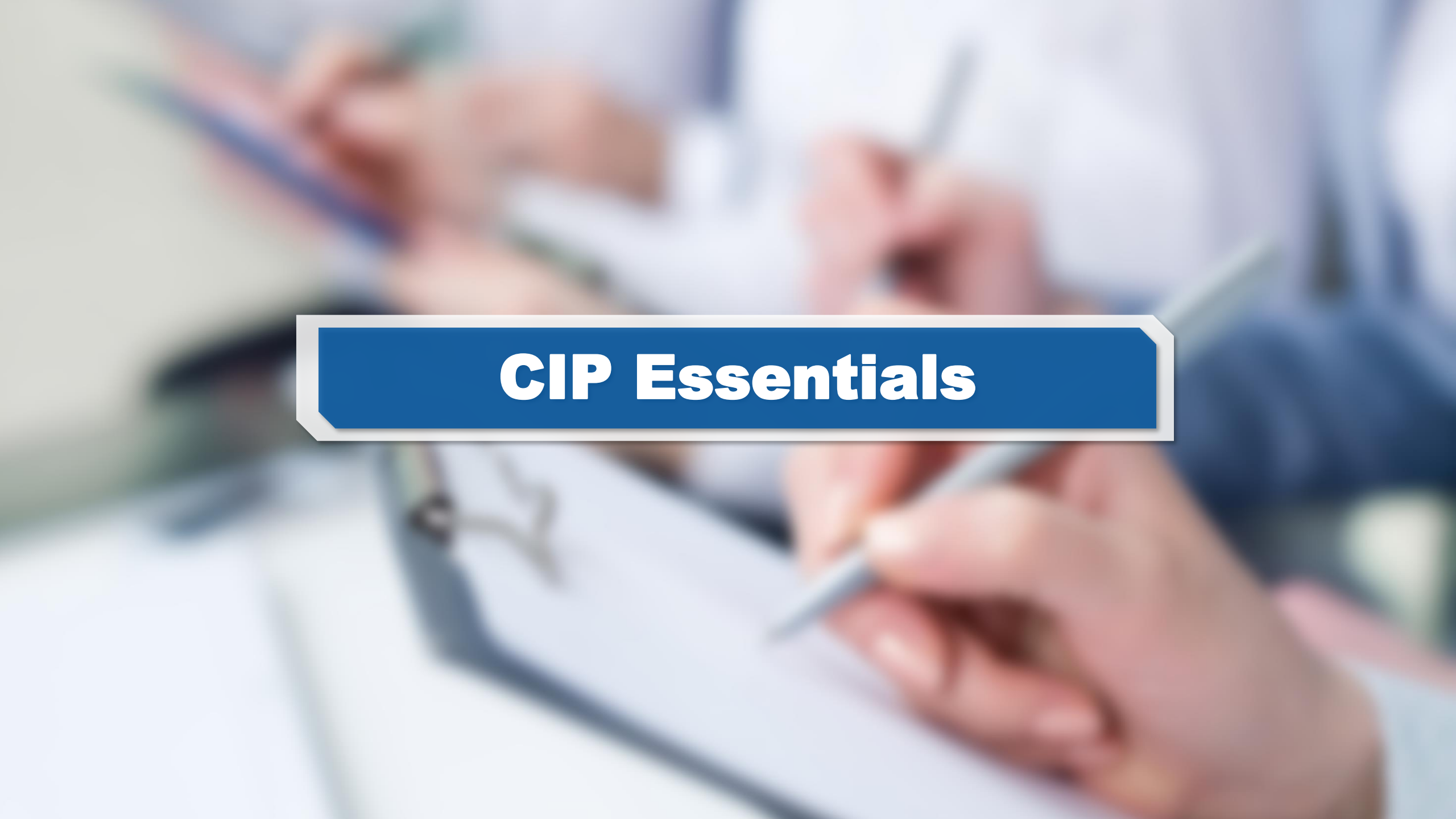
Blair Giffin
Manager, O&P Compliance Monitoring

Devin Ferris
Manager, CIP Compliance Monitoring

October 16, 2024

Agenda

- CIP Essentials
- O&P Essentials
- Resources
- Questions


CIP Essentials

CIP-002-5.1a—BES Cyber Systems Categorization

B. Requirements and Measures

R1. Each Responsible Entity shall implement a process that considers each of the following assets for purposes of parts 1.1 through 1.3: *[Violation Risk Factor: High][Time Horizon: Operations Planning]*

- **i.** Control Centers and backup Control Centers;
- **ii.** Transmission stations and substations;
- **iii.** Generation resources;
- **iv.** Systems and facilities critical to system restoration, including Blackstart Resources and Cranking Paths and initial switching requirements;
- **v.** Special Protection Systems that support the reliable operation of the Bulk Electric System; and
- **vi.** For Distribution Providers, Protection Systems specified in Applicability section 4.2.1 above.

1.1. Identify each of the high impact BES Cyber Systems according to Attachment 1, Section 1, if any, at each asset;

1.2. Identify each of the medium impact BES Cyber Systems according to Attachment 1, Section 2, if any, at each asset; and

1.3. Identify each asset that contains a low impact BES Cyber System according to Attachment 1, Section 3, if any (a discrete list of low impact BES Cyber Systems is not required).

CIP-002-5.1a

CIP-002-5.1a—Attachment 1

Key Points

- Control Center
- Functional Obligations
- Criteria

CIP-002-5.1a — Cyber Security — BES Cyber System Categorization

CIP-002-5.1a - Attachment 1

Impact Rating Criteria

The criteria defined in Attachment 1 do not constitute stand-alone compliance requirements, but are criteria characterizing the level of impact and are referenced by requirements.

1. High Impact Rating (H)

Each BES Cyber System used by and located at any of the following:

1.1. Each Control Center or backup Control Center used to perform the functional obligations of the Reliability Coordinator.

1.2. Each Control Center or backup Control Center used to perform the functional obligations of the Balancing Authority: 1) for generation equal to or greater than an aggregate of 3000 MW in a single Interconnection, or 2) for one or more of the assets that meet criterion 2.3, 2.6, or 2.9.

1.3. Each Control Center or backup Control Center used to perform the functional obligations of the Transmission Operator for one or more of the assets that meet criterion 2.2, 2.4, 2.5, 2.7, 2.8, 2.9, or 2.10.

1.4 Each Control Center or backup Control Center used to perform the functional obligations of the Generator Operator for one or more of the assets that meet criterion 2.1, 2.3, 2.6, or 2.9.

NERC Glossary of Terms

Cyber Assets

Programmable Electronic Devices

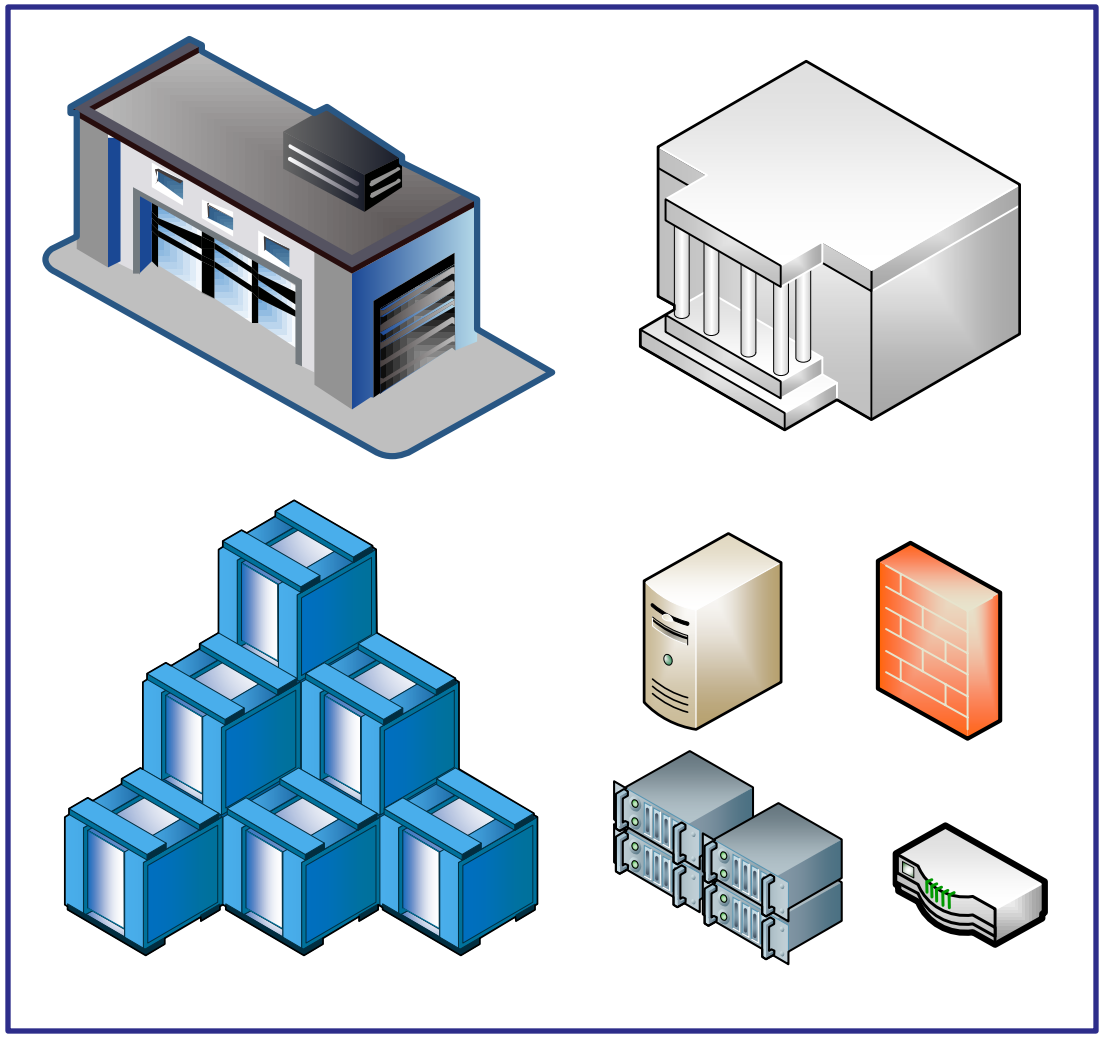
- Hardware
- Software
- Data

BES Cyber Asset (BCA)

- Unavailable
- Degraded
- Misused
- Adverse impact within 15 minutes
- Redundancy shall not be considered

Cyber Assets Typically Evaluated as BES Assets

Control Centers	Generation Plants
Application servers	Programmable Logic Controller (PLC)
Data servers	Distributed Control System (DCS)
HMI workstations	HMI workstation
Data acquisition	Application server
Data interchange	Data server
Computer networking	Computer networking
Communication processing	Intelligent Electronic Device (IED)/relay
Precision time device	Remote Terminal Unit (RTU)



BES and Non-BES Generation

BES Generation + Non-BES Generation =

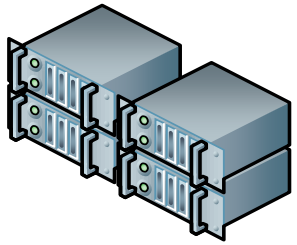
2.11: Each Control Center or backup Control Center, not already included in High Impact Rating (H) above, used to perform the functional obligations of the Generator Operator for an aggregate highest rated net Real Power capability of the preceding 12 calendar months equal to or exceeding 1500 MW in a single Interconnection

Joint Ownership/Shared

Entity A

- Low Impact BES Cyber System

Shared Facility

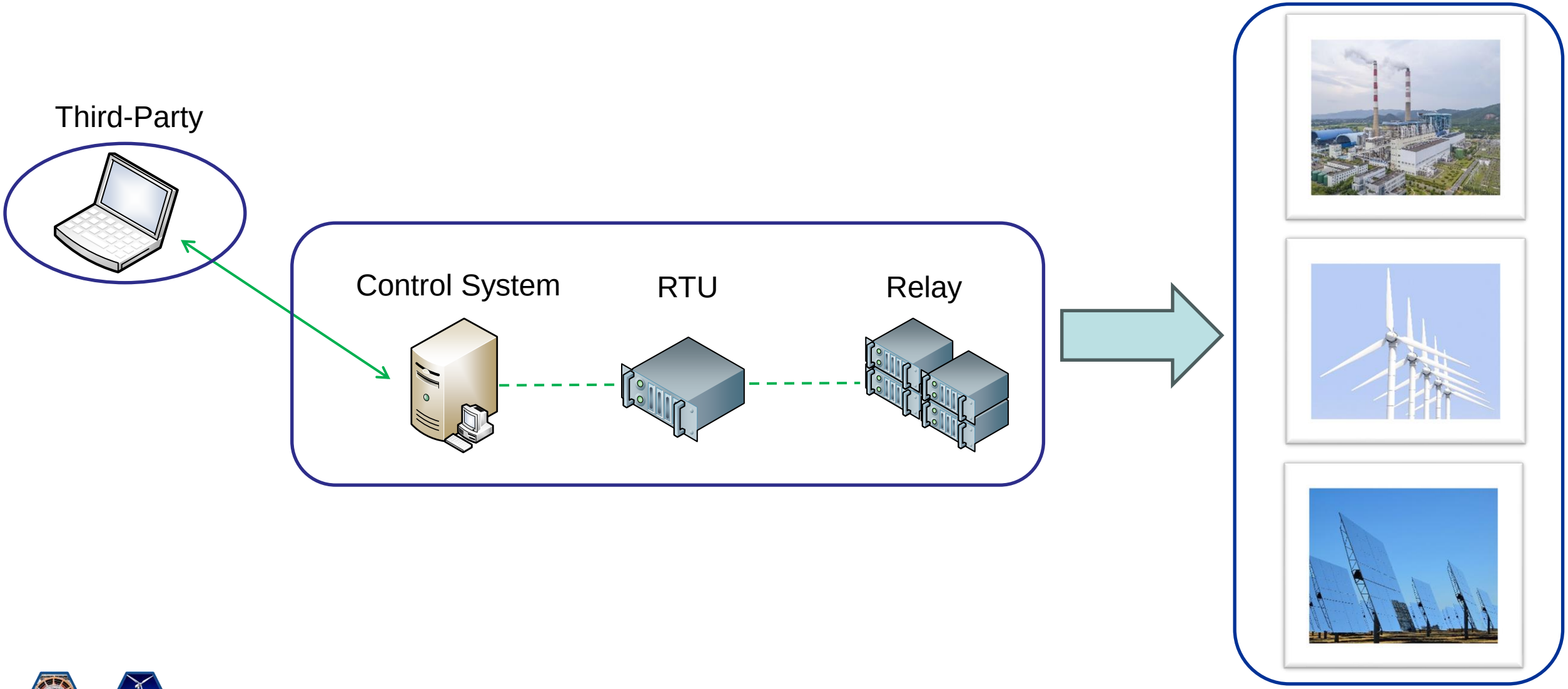


BES Cyber System

Entity B

- Medium Impact BES Cyber System

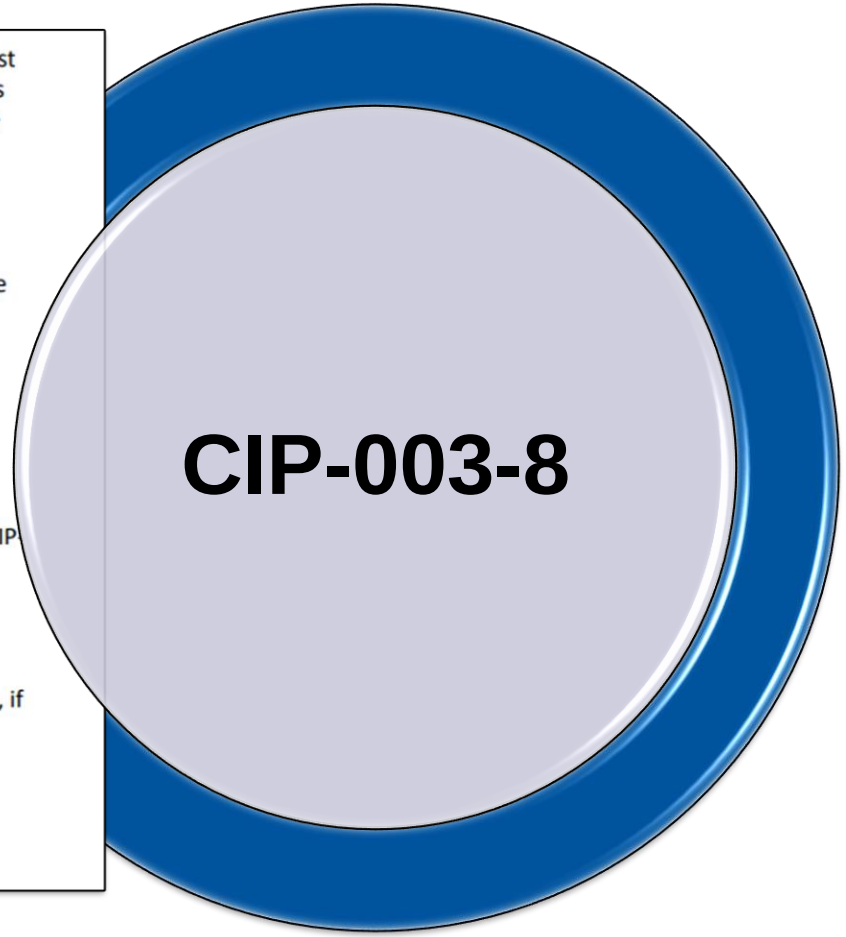
Third-Party Monitoring and Control



CIP-003-8—Security Management Controls

R1. Each Responsible Entity shall review and obtain CIP Senior Manager approval at least once every 15 calendar months for one or more documented cyber security policies that collectively address the following topics: *[Violation Risk Factor: Medium] [Time Horizon: Operations Planning]*

- **1.1.** For its high impact and medium impact BES Cyber Systems, if any:
  - **1.1.1.** Personnel and training (CIP-004);
  - **1.1.2.** Electronic Security Perimeters (CIP-005) including Interactive Remote Access;
  - **1.1.3.** Physical security of BES Cyber Systems (CIP-006);
  - **1.1.4.** System security management (CIP-007);
  - **1.1.5.** Incident reporting and response planning (CIP-008);
  - **1.1.6.** Recovery plans for BES Cyber Systems (CIP-009);
  - **1.1.7.** Configuration change management and vulnerability assessments (CIP 010);
  - **1.1.8.** Information protection (CIP-011); and
  - **1.1.9.** Declaring and responding to CIP Exceptional Circumstances.
- **1.2.** For its assets identified in CIP-002 containing low impact BES Cyber Systems, if any:
  - **1.2.1.** Cyber security awareness;
  - **1.2.2.** Physical security controls;
  - **1.2.3.** Electronic access controls;



R2. Each Responsible Entity with at least one asset identified in CIP-002 containing low impact BES Cyber Systems shall implement one or more documented cyber security plan(s) for its low impact BES Cyber Systems that include the sections in Attachment 1.

CIP-003-8—Attachment 1

Cyber Security Plans

- Cyber security awareness
- Physical security controls
- Electronic access controls
- Cyber Security Incident **Response** Plan (CSIRP)
- Malicious code risk mitigation
- Transient Cyber Assets (TCA) and Removable Media (RM)

CIP-003-8—Cyber Security Incident Response Plan

CIP Evidence Request Tool

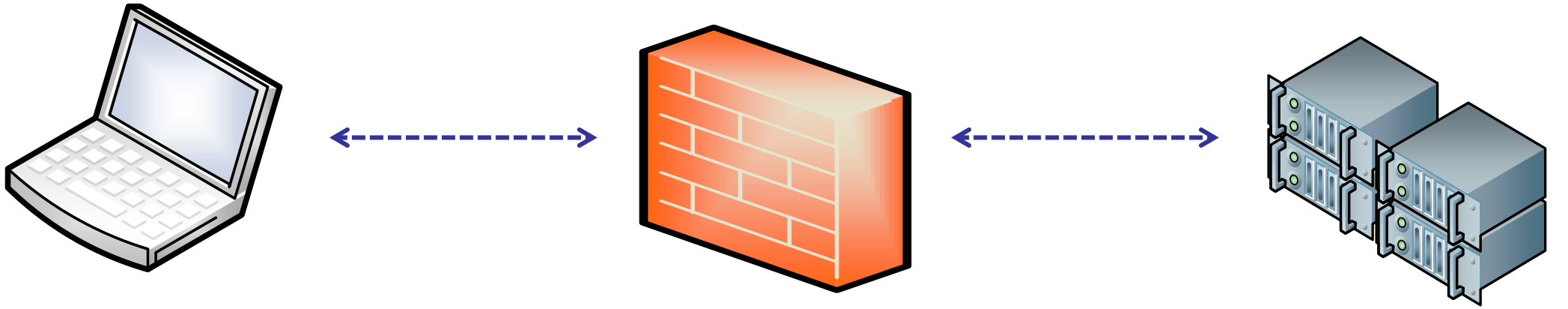
Level 1

CIP-003-R2-L1-03	CIP-003-8	R2 Sect 4.4	Provide documentation of each activation, if any, of each Cyber Security Incident response plan for low impact BES Cyber Systems. Include the date of activation and evidence that the Cyber Security Incident response plan was followed.
CIP-003-R2-L1-04	CIP-003-8	R2 Sect 4.5	For each Cyber Security incident response plan for low impact BES Cyber Systems, provide evidence of each test of the incident response plan occurred at least once every 36 calendar months during the audit period.
CIP-003-R2-L1-05	CIP-003-8	R2 Sect 4.6	Provide evidence of changes to a Cyber Security Incident response plan for low impact BES Cyber Systems in response to a test or activation of the response plan were documented within 180 calendar days of the test or incident.

Level 2

For each selected Reportable Cyber Security Incident in Sample Set CSI-L2-01, provide the date E-ISAC was notified.

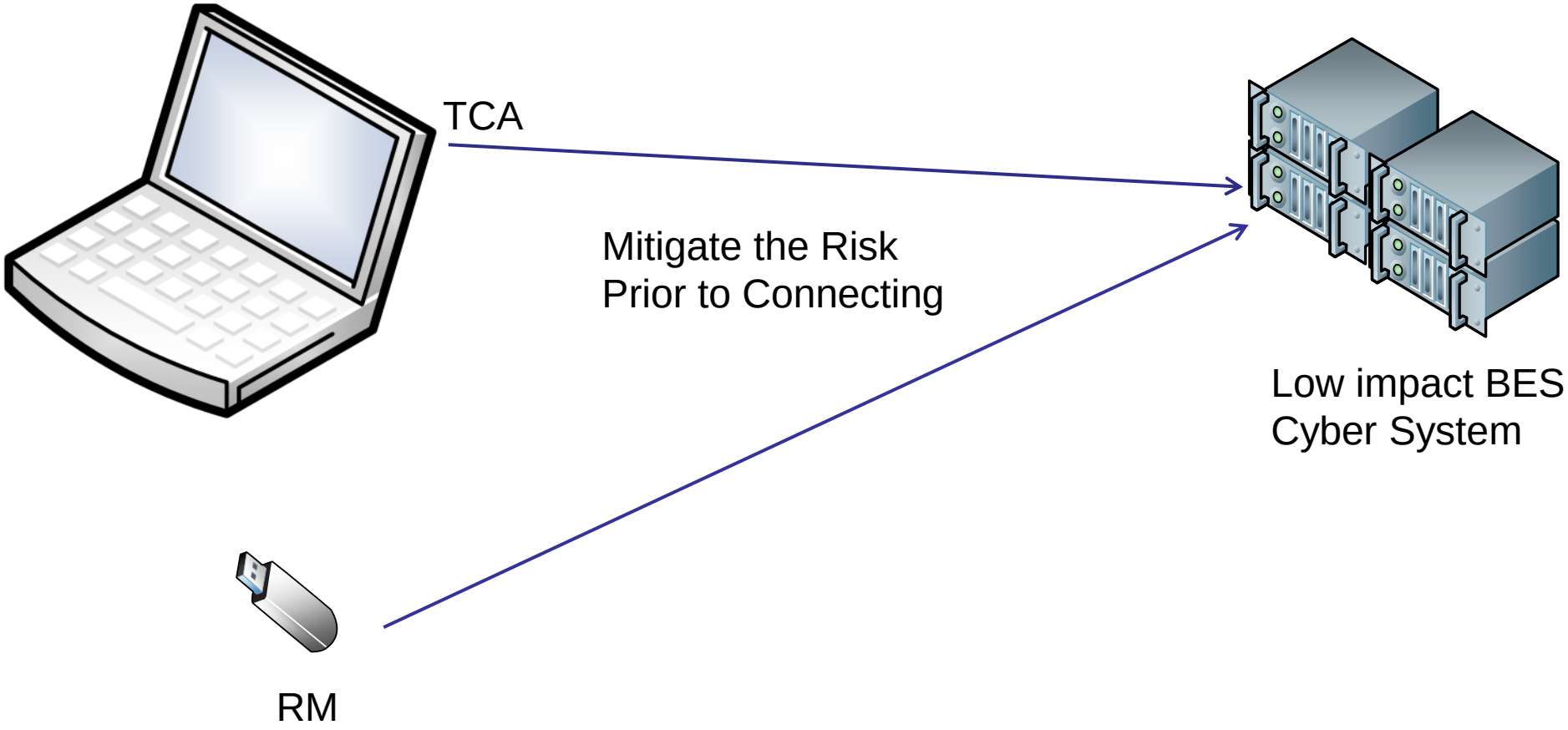
CIP-003-8—Electronic Access Controls



Electronic Access Controls

- Permit only necessary inbound and outbound electronic access
- Routable protocol entering or leaving the asset

CIP-003-8—TCAs and RM



CIP-003-9—Cyber Security Incident Response Plan

Effective Date

April 1, 2026

Additions

Vendor Remote Access

CIP-012-1—Communications Between Control Centers

R1. The Responsible Entity shall implement, except under CIP Exceptional Circumstances, one or more documented plan(s) to mitigate the risks posed by unauthorized disclosure and unauthorized modification of Real-time Assessment and Real-time monitoring data while being transmitted between any applicable Control Centers. The Responsible Entity is not required to include oral communications in its plan. The plan shall include: *[Violation Risk Factor: Medium] [Time Horizon: Operations Planning]*

Page 1 of 5

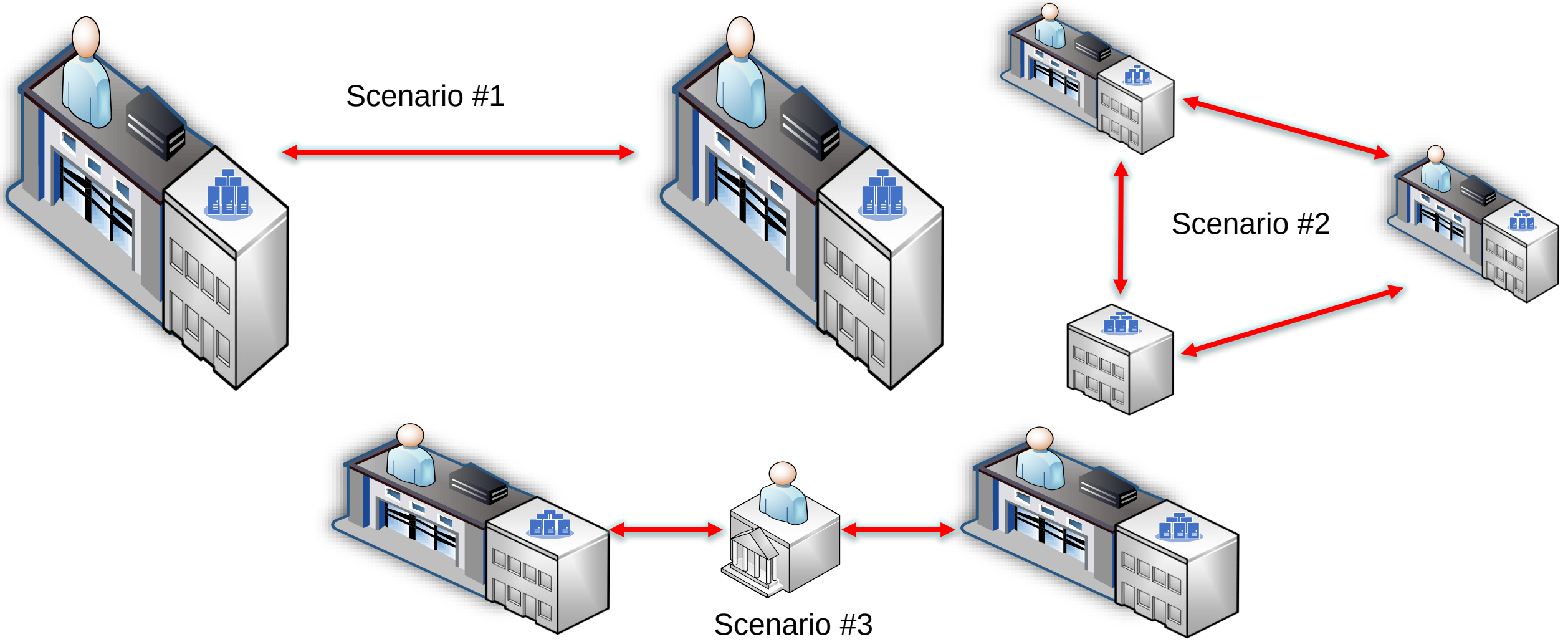
CIP-012-1 – Cyber Security – Communications between Control Centers

1.1. Identification of security protection used to mitigate the risks posed by unauthorized disclosure and unauthorized modification of Real-time Assessment and Real-time monitoring data while being transmitted between Control Centers;

1.2. Identification of where the Responsible Entity applied security protection for transmitting Real-time Assessment and Real-time monitoring data between

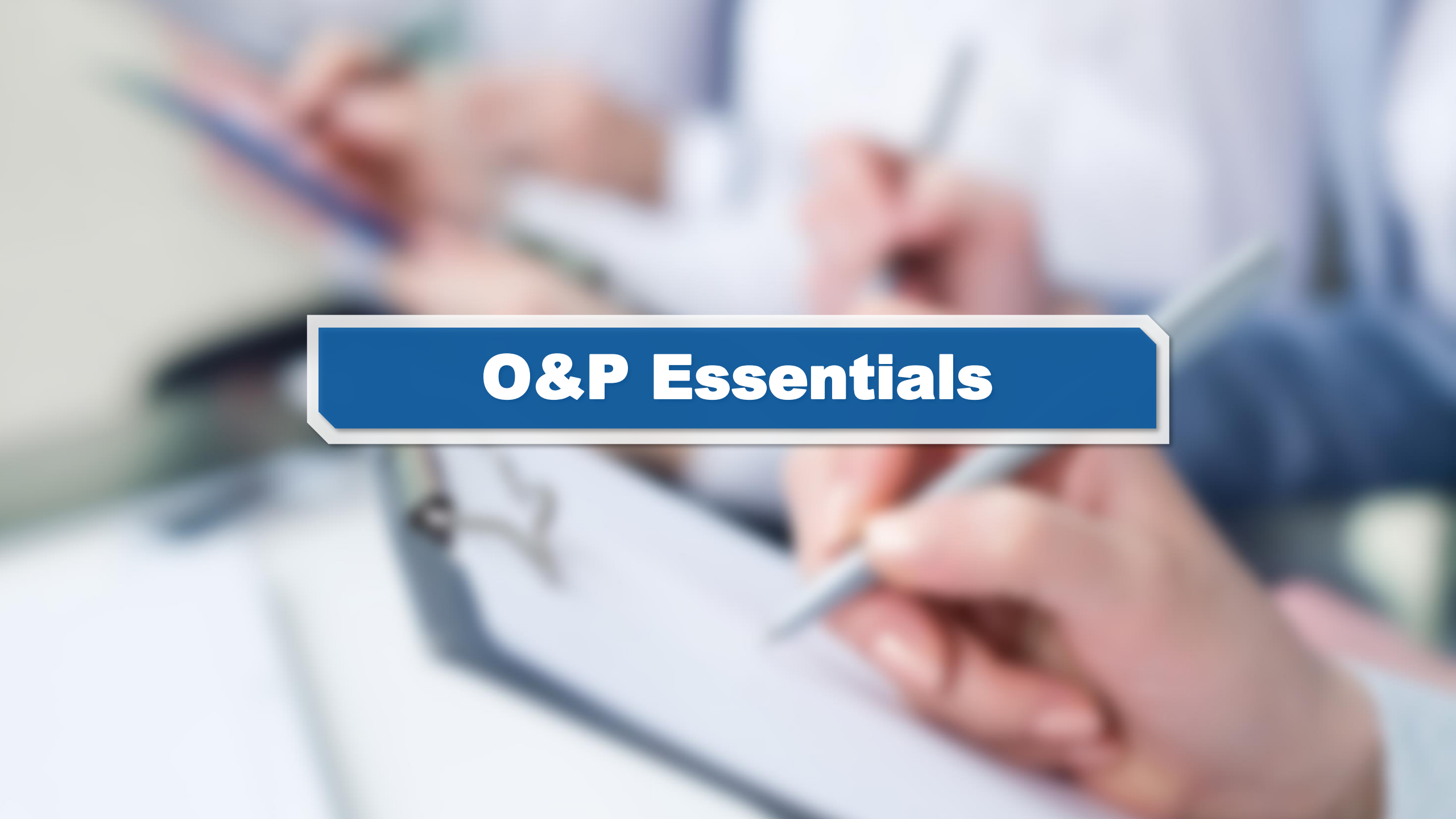
CIP-012-1

CIP-012-1—Examples



CIP-012-2—Communications Between Control Centers

Effective Date	July 1, 2026
Additions	Loss of availability


O&P Essentials

FAC-008 Essentials

- **Registration effective date is the due date**
  - Documentation for determining Facility Ratings and Facility Rating methodology
  - Establish Facility Ratings consistent with the methodology
- **Gaps in program execution**
  - Miscommunication and field changes not getting documented
  - Miscalculations—typos, voltage levels, and rounding errors
  - Third party coordination and oversight
- **Internal Controls**
  - Walk-downs
  - Revisions and peer reviews

FAC-008 Walk-downs

Definition

A walkthrough of the Facility to identify and confirm elements ratings that are listed in the Facility Rating workbook

Purpose

- Confirm the program and documentation are consistent
- Opportunity to demonstrate implementation
- Identify possible discrepancies

PRC-004-6 Control Objectives

Ensure entity maintains list of all BES interrupting device operations that have occurred during the monitoring period

Dated evidence to demonstrate entity identified whether its Protection System components caused a Misoperation

- Operational analysis that includes a determination
- Determination should be made with 120 calendar days (R1)

Entity list of Misoperations identified

Review Corrective Action Plan (CAP)

- List of actions and timetable for implementation to remedy
- Evaluation of CAP applicability to other Protection Systems including other locations

PRC-004-6 Internal Controls

Develop process to:

- Identify BES Protection System ownership
- Identify and track BES interrupting device operations
- Evaluate BES operations and determine Misoperation (or not)

Define and communicate timeframes

- 120 calendar days to make determination (R1)
- 60 calendar days to develop CAP (R5)
- CAP timeframe to remedy

PRC-004-6 Corrective Action Plans

Corrective Action Plan (CAP)

- A list of actions and an associated timetable for implementation to remedy a specific problem
- The timetable associated with the CAP may shift depending on findings in performing the CAP or due to rescheduling outages

Possible CAP Actions

- Change of protection system settings
- Protection system coordination study
- Replacement of equipment
- Wiring or design change
- Update of procedure with additional training

PRC-005-6 Control Objectives

Purpose

- Document and implement programs for the maintenance of all Protections Systems, Automatic Reclosing, and Sudden Pressure Relaying affecting the reliability of the BES

Protections System Maintenance Program (PSMP)

- Mandatory maintenance activities
- Maximum intervals
- Tracking of unresolved maintenance issues

PSMP Considerations

- Time-based vs performance based
- Component attributes

PRC-005-6 Internal Controls

Process for managing information and tracking due dates

Oversight into maintenance procedures

Periodic review of forms and checklists

Lessons learned and training

PRC-024-3 Control Objectives

Ensure settings are properly calculated for all applicable frequency and voltage protection

Analyze the effects of frequency and voltage excursion on the system protection

Set frequency and voltage protection to prevent trips and momentary cessation with the “no trip zone”

PRC-024-3 Requirements

Frequency and Voltage Protection Settings for Generating Resources

- GO is responsible for
  - Setting their frequency protection (R1)
  - Setting their voltage protection (R2)
  - Documenting each known equipment limitation that prevents meeting protection criteria in R1 or R2 (R3)
  - Providing protection settings to its PC or TP

Ride-through vs. Protection Settings

- Remain connected during defined frequency and voltage events
- Specific to the voltage and frequency protective settings
- Outside of the curves is the “May-Trip Zone”

PRC-024-3 Internal Controls

Ensure settings are properly calculated

- Protective functions within control systems
- Protective relaying vs IBR protective functions
- Who has authority to make changes?

Ensure appropriate settings determined

- Process to coordinate with manufacturer
- Protections documented and communicated

Request to provide applicable settings to the PC and TP

- Who is responsible for responding?
- Controls to track a request (60 calendar days)

EOP-012-2 Extreme Cold Weather Preparedness and Ops

Ensure Generator Operators have developed and implemented plans to mitigate the impacts of extreme cold weather on its applicable generating units

Generator Owner – Generator Operator (R5)

- Each Generator Owner in conjunction with its Generator Operator shall identify the entity responsible for providing the generating unit-specific training, and that identified entity shall provide annual training to its maintenance or operations personnel responsible for implementing the cold weather preparedness plan(s) developed pursuant to Requirement R4.

Effective October 1, 2024

EOP-012-2 New Defined Terms

Generator Cold Weather Critical Component

Fixed Fuel Supply Component

Generator Cold Weather Reliability Event

Generator Cold Weather Constraint

Extreme Cold Weather Temperature

NERC Glossary of Terms

Cold Weather Preparedness SGAS

- **2024 Cold Weather Preparedness Small Group Advisory Sessions**
  - Focused on compliance monitoring approaches related to EOP-011-4, EOP-012-2 and TOP-002-5
- **2024 Cold Weather Preparedness FAQ**

EOP Common Themes

Personnel responsible for implementing the plan

Requirement subparts

- Capability and availability
- Environmental Constraints
- Generating Unit minimum

Training materials are limited on site specific details

- Checklists
- Dated material

Third-party coordination and oversight

Resources

Generator Welcome Package

- CIP-002 CIP-003 CIP-012
- COM-002
- EOP-011
- FAC-001 FAC-002 FAC-008
- MOD-026
- PRC-004 PRC-005 PRC-024
- VAR-002

Resources Continued

Texas RE

- Welcome Package
- Generator Welcome Package
- Engagement Common Questions
- CIP Evidence Request Tool
- O&P Spreadsheets (PRC-004, PRC-005, and MOD-026)

Outreach and Involvement

- Talks with Texas RE
- Monthly Newsletter
- NSRF/CIPWG
- Board and MRC Meetings
- Workshops
- Regional websites
- E-ISAC
- Gridex, GridSecCon

NERC

- One-Stop-Shop
- NERC Glossary of Terms
- Reliability Standards

Contact

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Wrap-Up

Thank you for coming!

You will receive a short survey via e-mail. Please complete it to help Texas RE develop future outreach.

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TOP WORK PLACES 2023