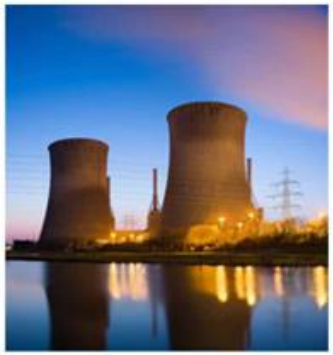
NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

NERC Overview

Howard Gugel
Vice President of Regulatory Oversight

RELIABILITY | RESILIENCE | SECURITY

Agenda

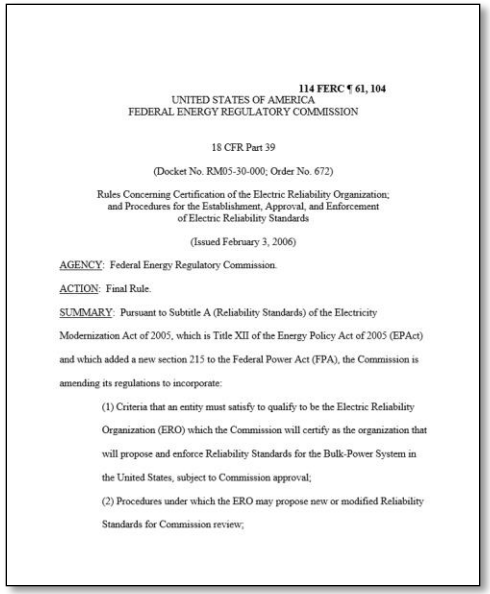
- ERO and ERO Enterprise
- Stakeholder Process
- Program Areas
- IBR Registration Overview

As the international, multi-jurisdictional ERO, NERC is authorized to:

Propose, monitor compliance with, and enforce mandatory reliability standards for the North American BPS, subject to regulatory oversight and approvals of FERC in the U.S. and applicable authorities in Canada;	Conduct near-term and long-term assessments of the reliability and future adequacy of the North American BPS;	Certify BPS operators as having and maintaining the necessary knowledge and skills; and	Maintain situational awareness of events and conditions that may threaten reliability.

Electric Reliability Organization (ERO)

- As the international, multi-jurisdictional **Electric Reliability Organization (ERO)**, NERC is authorized to:
  - Propose, monitor compliance with, and enforce mandatory Reliability Standards for the North American bulk power system (BPS), subject to regulatory oversight and approvals of FERC in the U.S. and applicable authorities in Canada;
  - Conduct near-term and long-term assessments of the reliability and future adequacy of the North American BPS;
  - Certify BPS operators as having and maintaining the necessary knowledge and skills; and
  - Maintain situational awareness of events and conditions that may threaten reliability.



114 FERC ¶ 61, 104
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

18 CFR Part 39

(Docket No. RM05-30-000; Order No. 672)

Rules Concerning Certification of the Electric Reliability Organization; and Procedures for the Establishment, Approval, and Enforcement of Electric Reliability Standards

(Issued February 3, 2006)

AGENCY: Federal Energy Regulatory Commission.

ACTION: Final Rule.

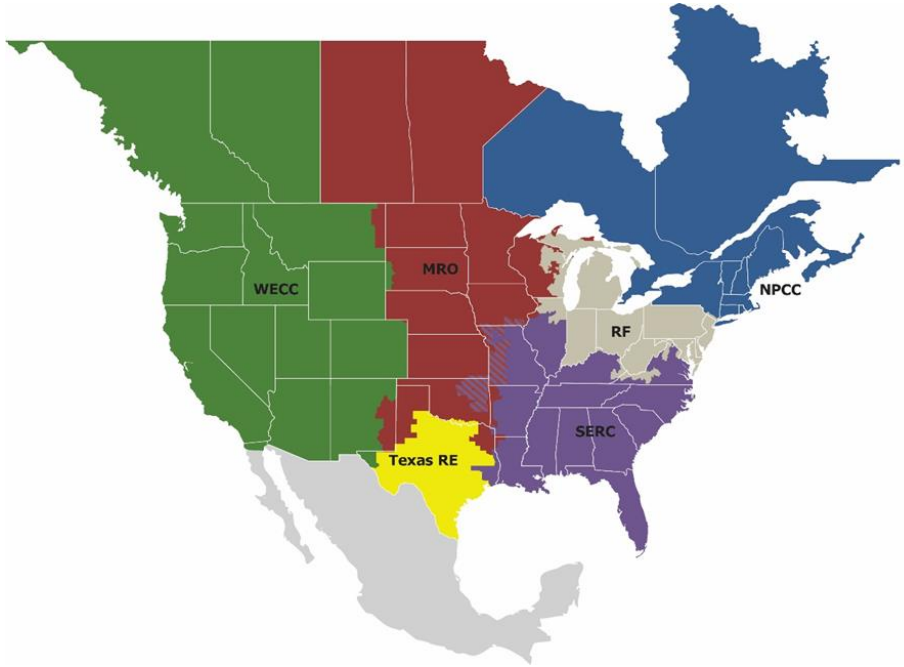
SUMMARY: Pursuant to Subtitle A (Reliability Standards) of the Electricity Modernization Act of 2005, which is Title XII of the Energy Policy Act of 2005 (EPAct) and which added a new section 215 to the Federal Power Act (FPA), the Commission is amending its regulations to incorporate:

(1) Criteria that an entity must satisfy to qualify to be the Electric Reliability Organization (ERO) which the Commission will certify as the organization that will propose and enforce Reliability Standards for the Bulk-Power System in the United States, subject to Commission approval;

(2) Procedures under which the ERO may propose new or modified Reliability Standards for Commission review;

ERO Enterprise

The **ERO Enterprise** is comprised of NERC and the six Regional Entities (REs).



[Midwest Reliability Organization](#) **(MRO)**

[Northeast Power Coordinating Council, Inc.](#) **(NPCC)**

[ReliabilityFirst](#) **(RF)**

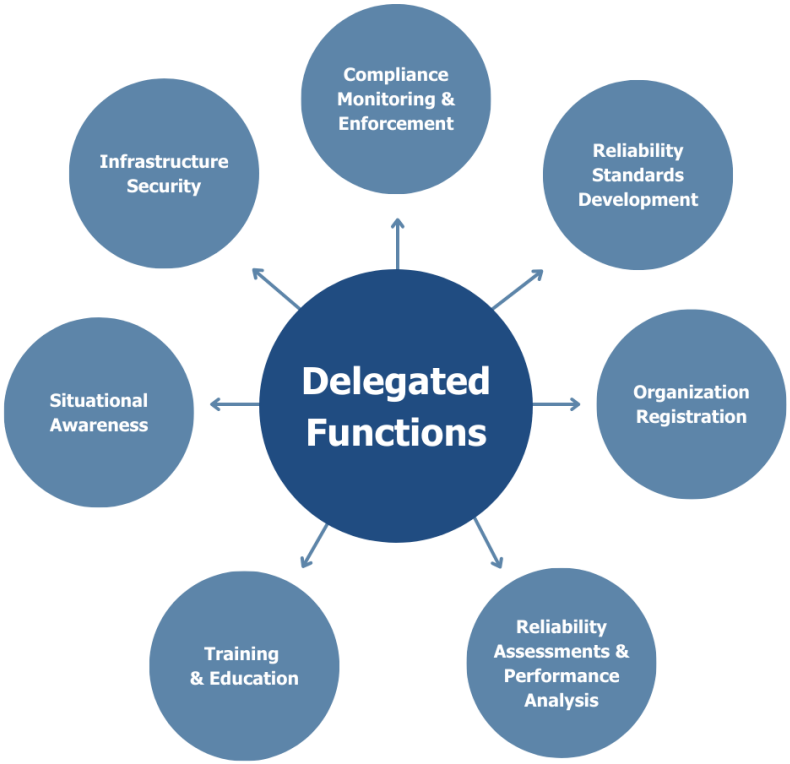
[SERC Reliability Corporation](#) **(SERC)**

[Texas Reliability Entity, Inc.](#) **(Texas RE)**

[WECC](#)

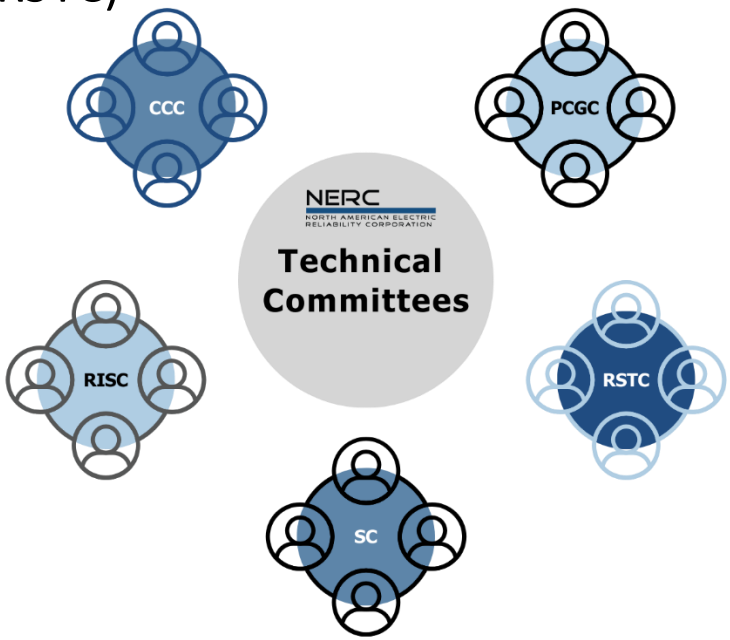
Delegated Functions

- NERC provides delegated authority to the REs.
- Regional consistency is key for transparency and predictability.



Stakeholder Process

- Through NERC's technical committees, experts from all segments of the electricity industry contribute their knowledge to promote the reliability of the North American BPS
  - Compliance and Certification Committee (CCC)
  - Personnel Certification Governance Committee (PCGC)
  - Reliability and Security Technical Committee (RSTC)
  - Reliability Issues Steering Committee (RISC)
  - Standards Committee (SC)



NERC Program Areas

- Standards
- Compliance & Enforcement
- Reliability Risk Management
- System Operator Certification and Continuing Education
- Electricity Information Sharing and Analysis Center (E-ISAC)

Standards Framework

- Mandatory and enforceable to registered entities
- Reliability Standards define the reliability requirements for planning and operating the North American bulk power system
- Requirements organized by topic areas (for example, transmission operations, transmission planning, coordination, communication, system protection, cybersecurity, etc.)
- Reflect a results-based approach that focuses on performance, risk management, and entity capabilities
- Process includes opportunity for regional variances where necessary

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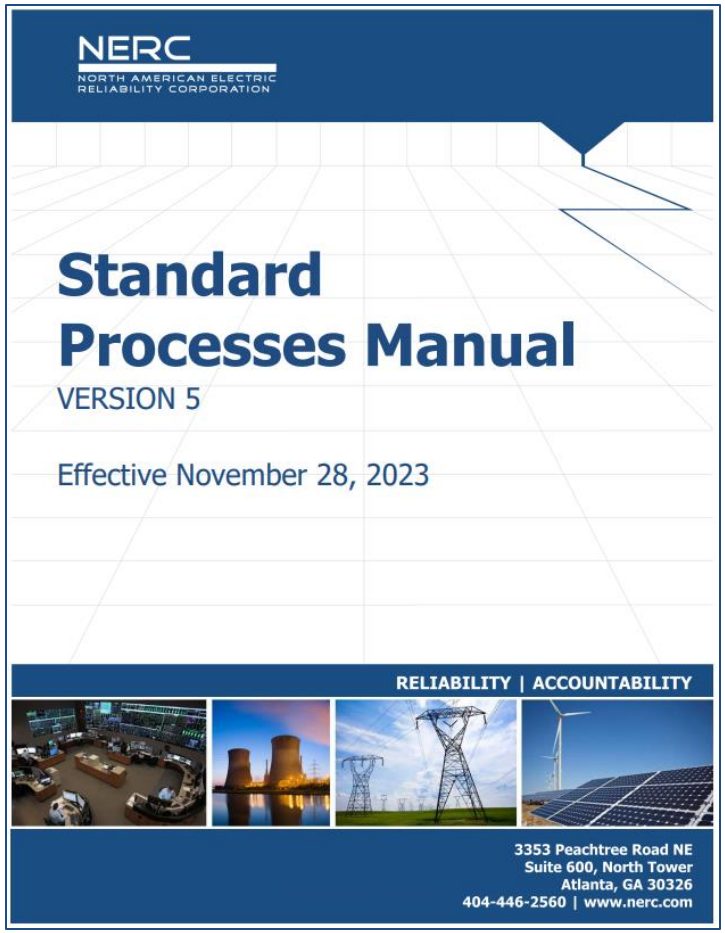
Standards Families

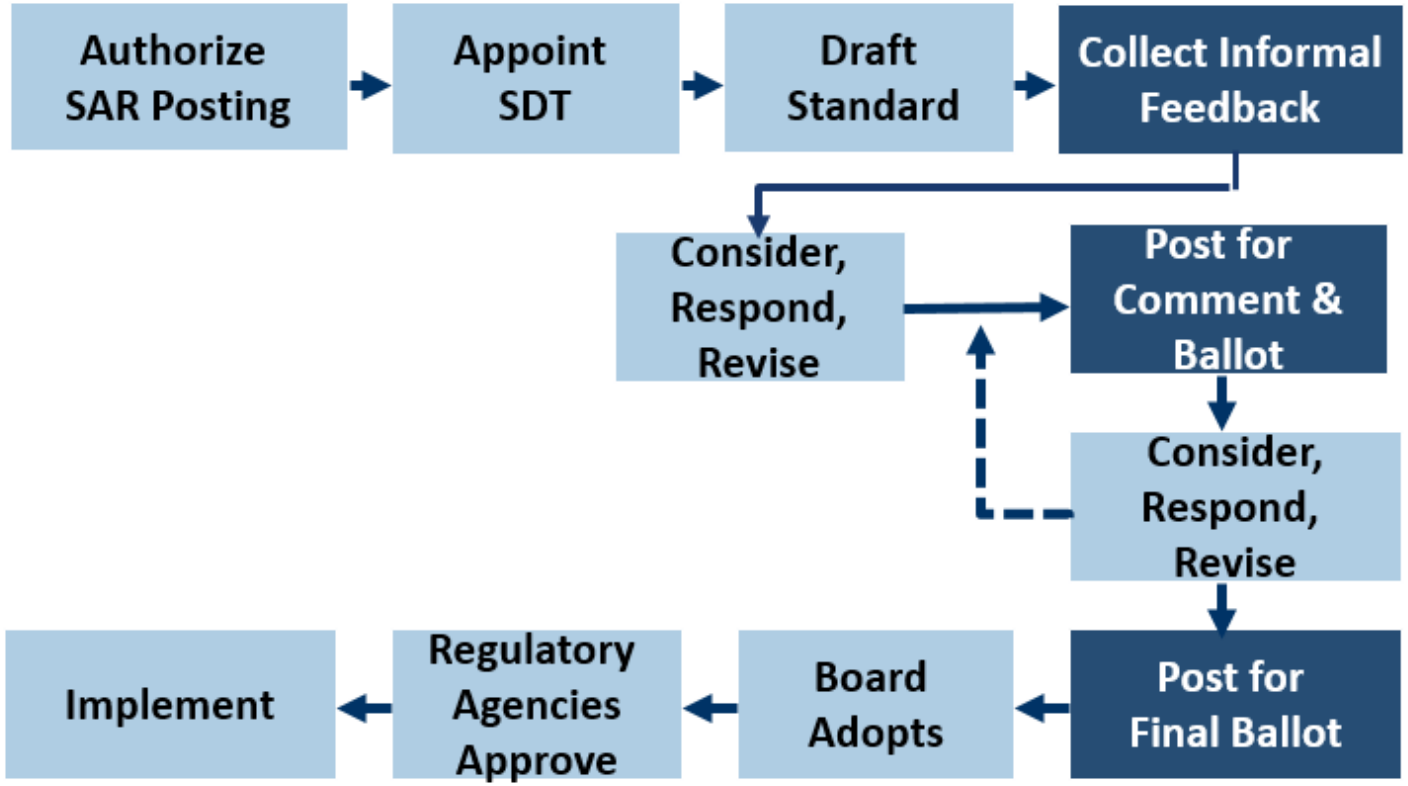
BAL Balancing Load and Generation	**CIP** Critical Infrastructure Protection	**COM** Verbal Communications	**EOP** Emergency Operations and System Restoration	**FAC** Facility Requirements
INT Interchange Requirements	**IRO** Real-time Operations (mostly RC)	**MOD** System Modeling	**NUC** Nuclear Plant Interface	**PER** Personnel Training
PRC System Protection and Maintenance	**TOP** Transmission Operations (mostly TOP)	**TPL** Transmission Planning	**VAR** Voltage Control	**NUC** Nuclear Plant Interface
PER Personnel Training	**PRC** System Protection and Maintenance	**TOP** Transmission Operations (mostly TOP)	**TPL** Transmission Planning	**VAR** Voltage Control

Standards Development



- Fair, open, and balanced process that depends on stakeholder input and participation
- Stakeholder technical expertise is essential to standard development process
- Stakeholder drafting teams draft the standards
  - Involves comment periods with formal review and response
  - Approval achieved with two-thirds consensus vote
  - Must be approved by NERC Board of Trustees and Applicable Governmental Authorities
- Governed by Standard Processes Manual (SPM)

Standards Development Process



Compliance Foundations

- Energy Policy Act of 2005 – Federal Power Act section 215
- Rules of Procedure (ROP) – Section 400
  - NERC oversight of Regional Entities
  - Compliance program attributes (audit cycles, independence, confidentiality)
  - ROP Appendix 4C, Compliance Monitoring and Enforcement Program
- Regional Delegation Agreements (RDA)
  - Regional Entities "contract" with NERC
  - Regional Entities must adhere to ROP

One Hundred Ninth Congress
of the
United States of America

AT THE FIRST SESSION

Begun and held at the City of Washington on Tuesday, the fourth day of January, two thousand and five

An Act

To ensure jobs for our future with secure, affordable, and reliable energy.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE; TABLE OF CONTENTS.

(a) SHORT TITLE.—This Act may be cited as the "Energy Policy Act of 2005".

Compliance Foundations

Compliance Monitoring and Enforcement Program (CMEP)

- Outlines compliance monitoring processes
- Provides guidance and requirements for each monitoring method

CMEP also addresses:

- Enforcement actions
- Mitigations of violations
- Remedial Action Directives
- Data retention and confidentiality

Risk-based Compliance

- Registered Entity specific
  - Inherent Risk Assessment (IRA)
  - Compliance Oversight Plan (COP)
- ERO Enterprise Guidance Documents
  - Overview of the ERO Enterprise's Risk-Based CMEP
  - ERO Enterprise Guide for Compliance Monitoring

Compliance Tools

- Compliance Monitoring Methods
  - Compliance Audits
  - Self-Certifications
  - Spot Checks
  - Self-Reports
  - Periodic Data Submittals
  - Complaints
  - Compliance Investigations

Compliance Activities: Self-Certifications

- REs will notify registered entities about self-certifying compliance to selected Reliability Standard/Requirement
  - Refer to Regional Annual CMEP Implementation Plans
  - Regional Entities also follow notification process in CMEP
- Registered entities must identify non-compliance when identified
- May request additional information

Compliance Activities: Spot Checks

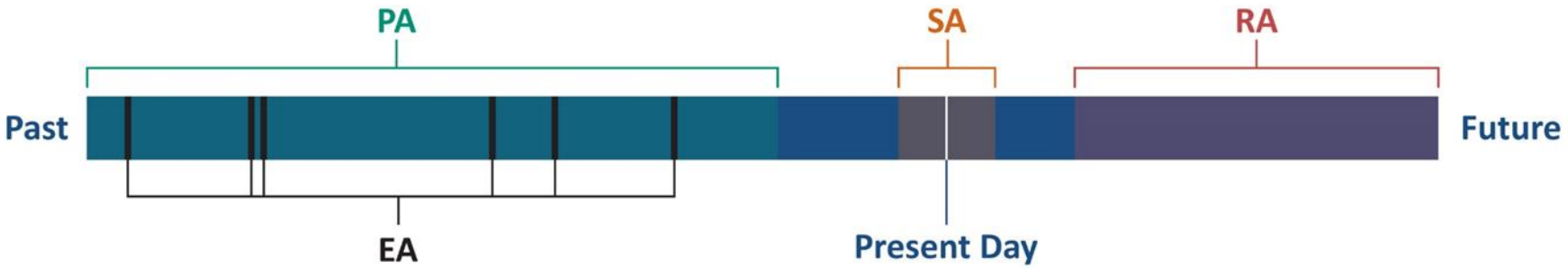
- REs may conduct a spot check at any time to determine compliance with any Reliability Standard/Requirement
  - Typically narrower scope than an audit
  - May result after an event, system disturbance, compliance issue, or to ensure mitigation of previous findings
  - REs follow process in CMEP
  - May be used in lieu of an audit

Compliance Activities: Self-Reports

- Entities should make a self-report once it becomes aware it:
  - Has/may have violated a Reliability Standard or Requirement
  - The Violation Severity Level (VSL) of a previously reported violation has changed
- REs have self-reporting processes entities must follow
  - RE makes available self-report forms
  - Entity should provide relevant documentation to support filing
  - RE will review information to evaluate compliance and needed mitigation

Reliability Risk Management

Performance Analysis	Event Analysis	Situational Awareness	Reliability Assessments
			
Focus: past	Focus: specific events	Focus: current events	Focus: future



Personnel Certification Program

Personnel Certification

- *"Maintaining the reliability of the Bulk Electric System through implementation of Reliability Standards requires skilled, trained and qualified system operators." (Section 601 Scope of Personnel Certification)*
  - International in scope
  - Provides a mechanism
  - Awards Certification Credentials

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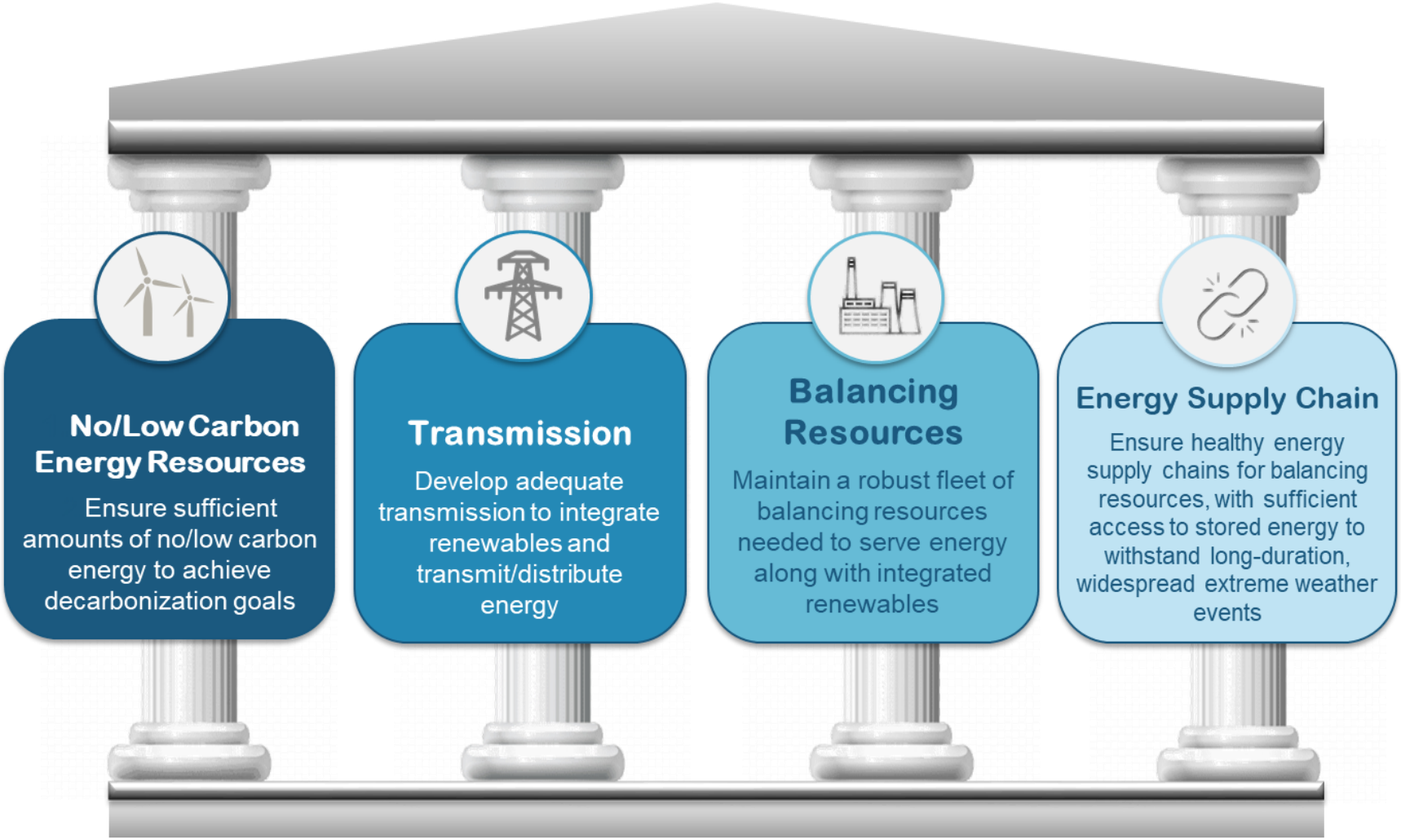
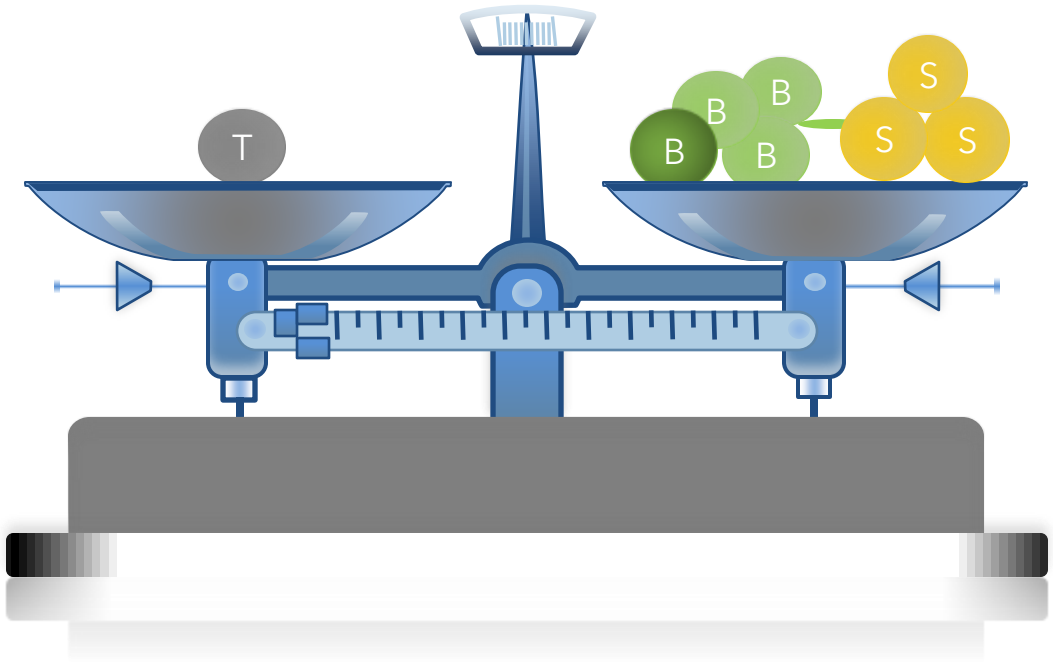
Moving Forward: The Four Pillars of the Energy Transition



Base Load Compared to Hybrid

Retire 100 MW Base Load Generation

- *100 MW Traditional Base Load generates 2400 MWh*



300 MW Solar + 400 MW Batteries

- Assume 8 hours of sunlight
- Assume no losses in conversion

Usage

- 100 MW **solar** for 8 hours (800 MWh)
- 400 MW **storage** for 4 hour discharge (1600 MWh)

Storage

- 200 MW **solar** to charge storage 8 hours (1600 MWh)

NERC Reports on IBR-related Disturbances

- Numerous ERO Enterprise reports determine that operational characteristics of inverter-based resources (IBRs) may cause reduced power output.
- Potential for IBRs to have a material impact on BPS, which is not limited to larger IBRs that typically register with NERC.

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

Problem Statement & Risk Mitigation Strategy

Problem Statement: *Analysis by NERC and the REs found that integration of IBRs onto the BPS have material impacts on reliability that must be mitigated.*

Risk Mitigation Strategy: *NERC undertook two initiatives to mitigate IBR risk. At the direction of FERC, these steps include: (1) Revising NERC rules governing the registration of IBRs so these resources will be subject to NERC Reliability Standards, and (2) Revising and developing Reliability Standards applicable to IBRs.*

The Solution

NERC seeks to register Generator Owners (GO) and Generator Operators (GOP) of non-Bulk Electric System IBRs with aggregate nameplate capacity ≥20 MVA connected at a voltage ≥60 kV.

With this proposal, **97.5%** of BPS-impactful IBRs would become subject to NERC Reliability Standards, commensurate to the **97%** of BPS-impactful synchronous resources currently subject to these standards by nameplate capacity.

Current Legal Status

February

Board heard discussion of Rules of Procedure (RO)P proposal and stakeholder comments, which resulted in revising GO and GOP Registry Criteria to include Category 2 entities, and approved proposal.

March

NERC filed ROP proposal with FERC and requested an expedited review.

June

FERC approved revisions to the NERC ROP and directed NERC to submit a compliance filing.

Steps in Regulatory Process

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.)

What IBR Registration Candidates Can Expect

IBR Registration candidates will be connected to the appropriate **Regional Entity staff** and will be provided educational materials explaining the NERC Registration process, Reliability Standards development, compliance obligations, and more.

While this will be an ongoing effort with continued development, existing candidate entities are expected to be registered by **May 2026**.

Standards

All **GO/GOP standards** have been reviewed, and NERC has determined that no Reliability Standards will be applicable to IBR meeting the new registration criteria prior to **May 2026**.

Following this date, NERC will work with each drafting team to encourage a reasonable rollout strategy of new or modified standards to spread out the applicability to these IBR throughout May 2026 and beyond.

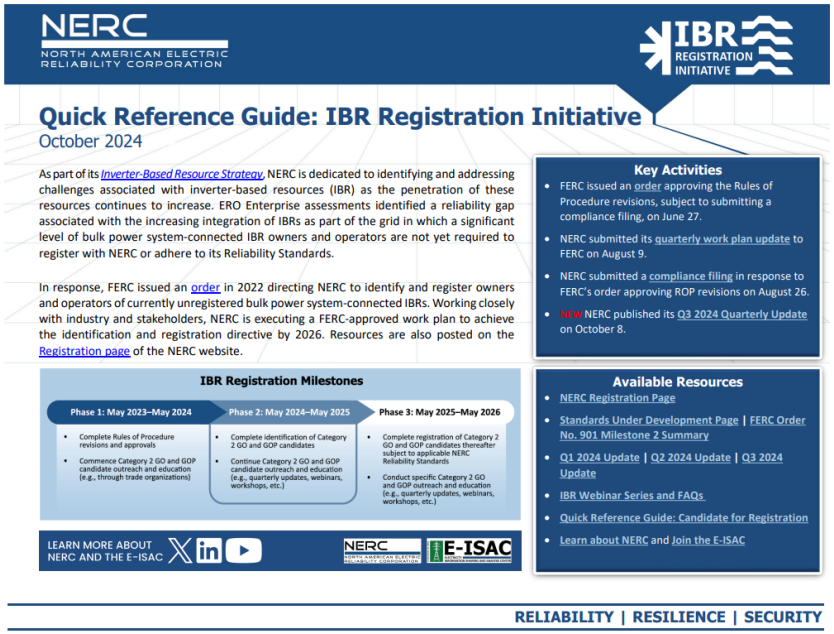
Order No. 901 Milestones

Resources

- Quarterly Updates: Q1 2024, Q2 2024, Q3 2024
- Quick Reference Guides and FAQS:
  - IBR Registration Initiative
  - IBR Activities
  - Candidate for Registration
  - Proposed Revisions to NERC ROP to Address Registration
  - IBR Webinar Series

Coming Soon

- NERC and E-ISAC 101: Guide for New Entrants
- Educational Videos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IBR REGISTRATION INITIATIVE

Quick Reference Guide: IBR Registration Initiative
October 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 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.
- NEW NERC published its Q3 2024 Quarterly Update on October 8.

IBR Registration Milestones

Phase 1: May 2023–May 2024
- Complete Rules of Procedure revisions and approvals
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Phase 2: May 2024–May 2025
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- Continue Category 2 GO and GOP candidate outreach and education (e.g., quarterly updates, webinars, workshops, etc.)

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- 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 | Q3 2024 Update
- IBR Webinar Series and FAQs
- Quick Reference Guide: Candidate for Registration
- Learn about NERC and Join the E-ISAC

LEARN MORE ABOUT NERC AND THE E-ISAC

NERC E-ISAC

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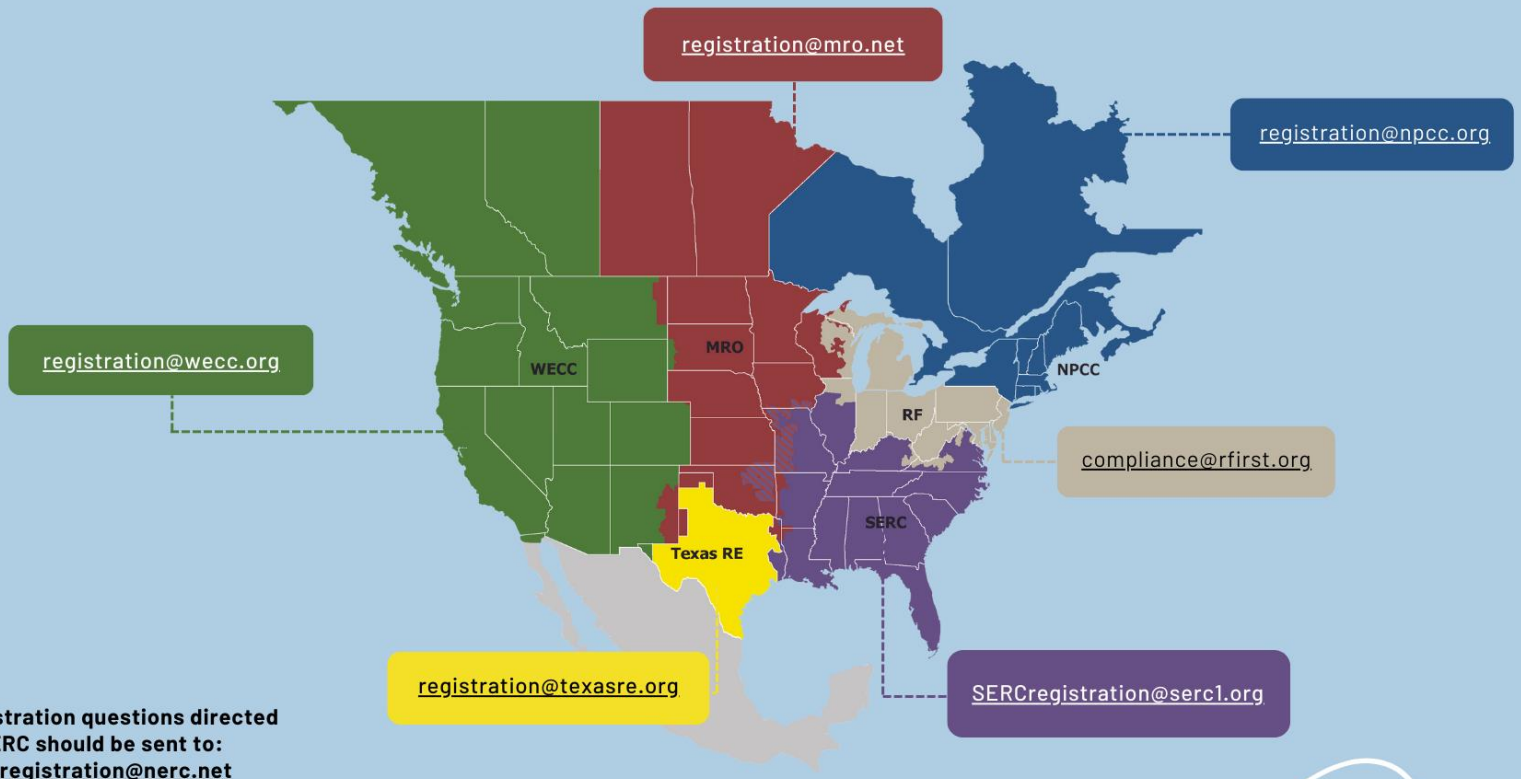
Regional Points of Contact

REGIONAL ENTITY REGISTRATION CONTACTS



Registration questions directed to NERC should be sent to:
nerc.registration@nerc.net

Additional Resources

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Learn more by visiting the website or emailing Communications@nerc.net

A DIVISION OF NERC
E-ISAC
ELECTRICITY INFORMATION SHARING AND ANALYSIS CENTER

Learn more by visiting the website or emailing memberservices@eisac.com

Questions and Answers