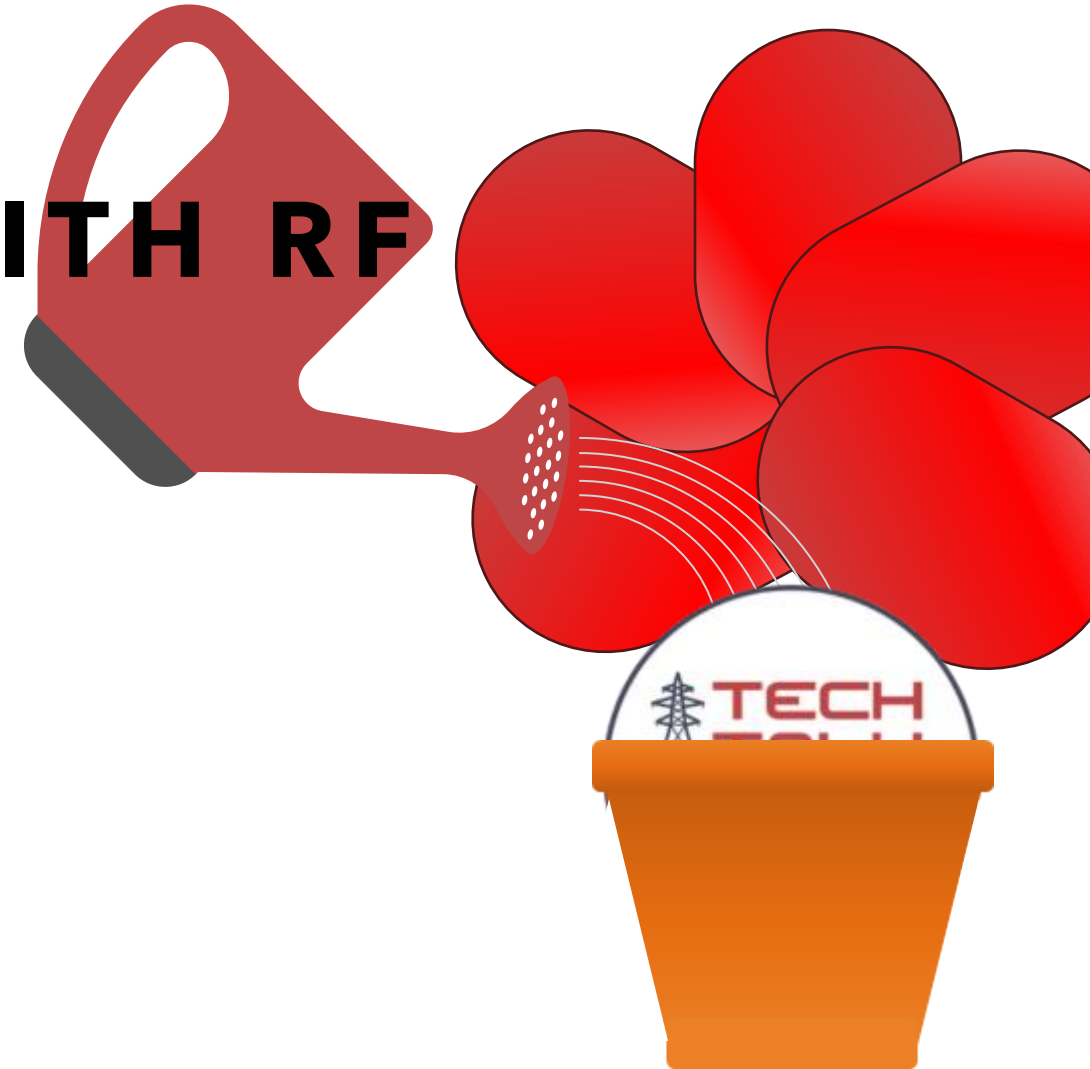
WELCOME TO TECHNICAL TALK WITH RF

April 20, 2026



TECHNICAL TALK WITH RF

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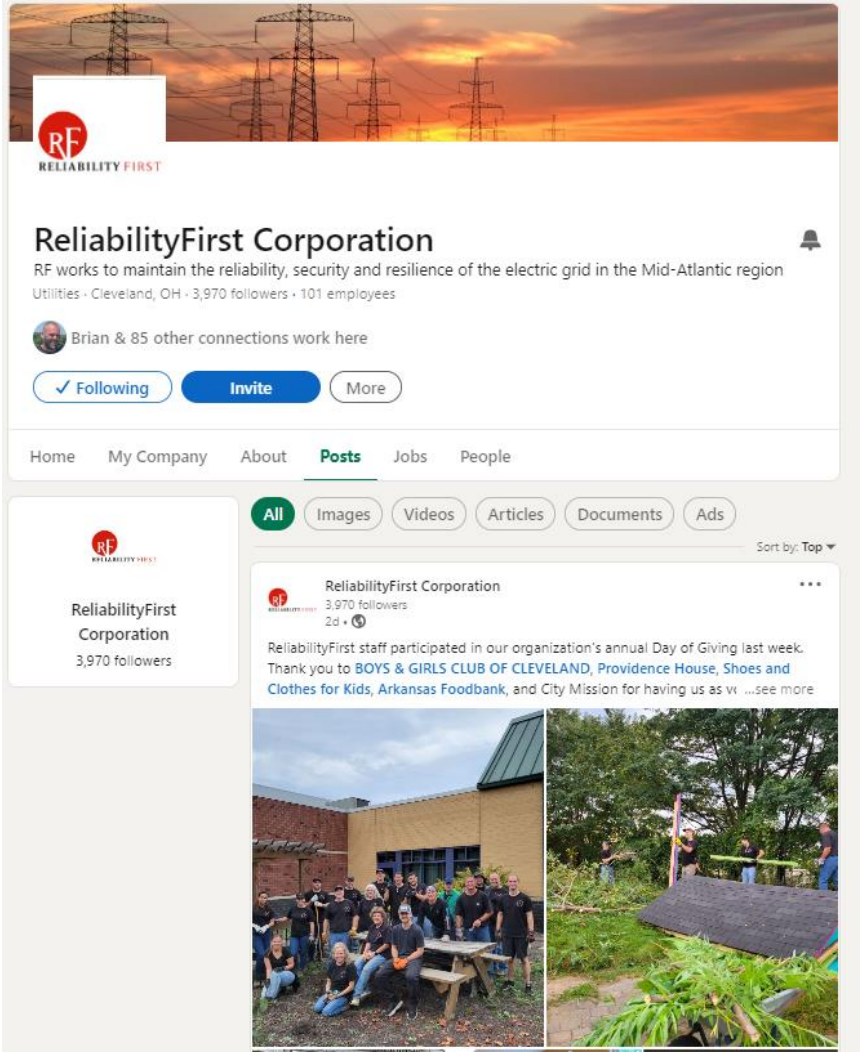


TECH TALK REMINDERS

Please keep your information up-to-date

- CORES and Generation Verification Forms

Following an event, send EOP-004 or OE-417 forms to disturbance@rfirst.org

CIP-008-6 incident reports are sent to the E-ISAC and the DHS CISA

Check our monthly CMEP update and newsletter:

- 2026 ERO Periodic Data Submittal schedule
- Timing of Standard effectiveness

BES Cyber System Categorization (CIP-002-5.1a)

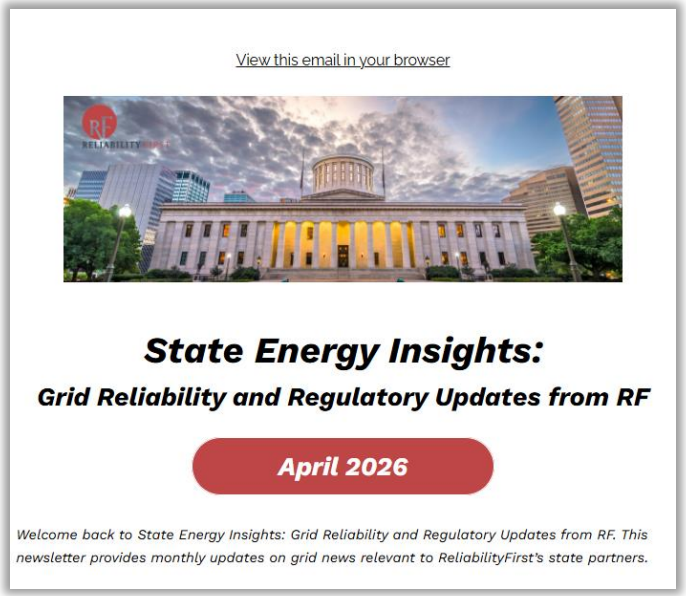
- Assess categorization (low, medium, or high) regularly and notify us of changes

CIP Evidence Request Tool V10 was released and is on NERC's website

TECH TALK REMINDER

Are you getting our newsletter ***First Things RFirst?***

- Sign up today **here**

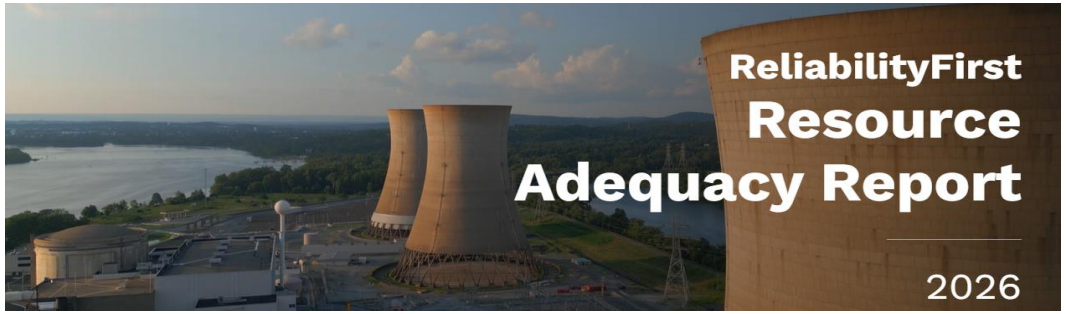


Make sure to check out our

2025 Impact Report and **video**

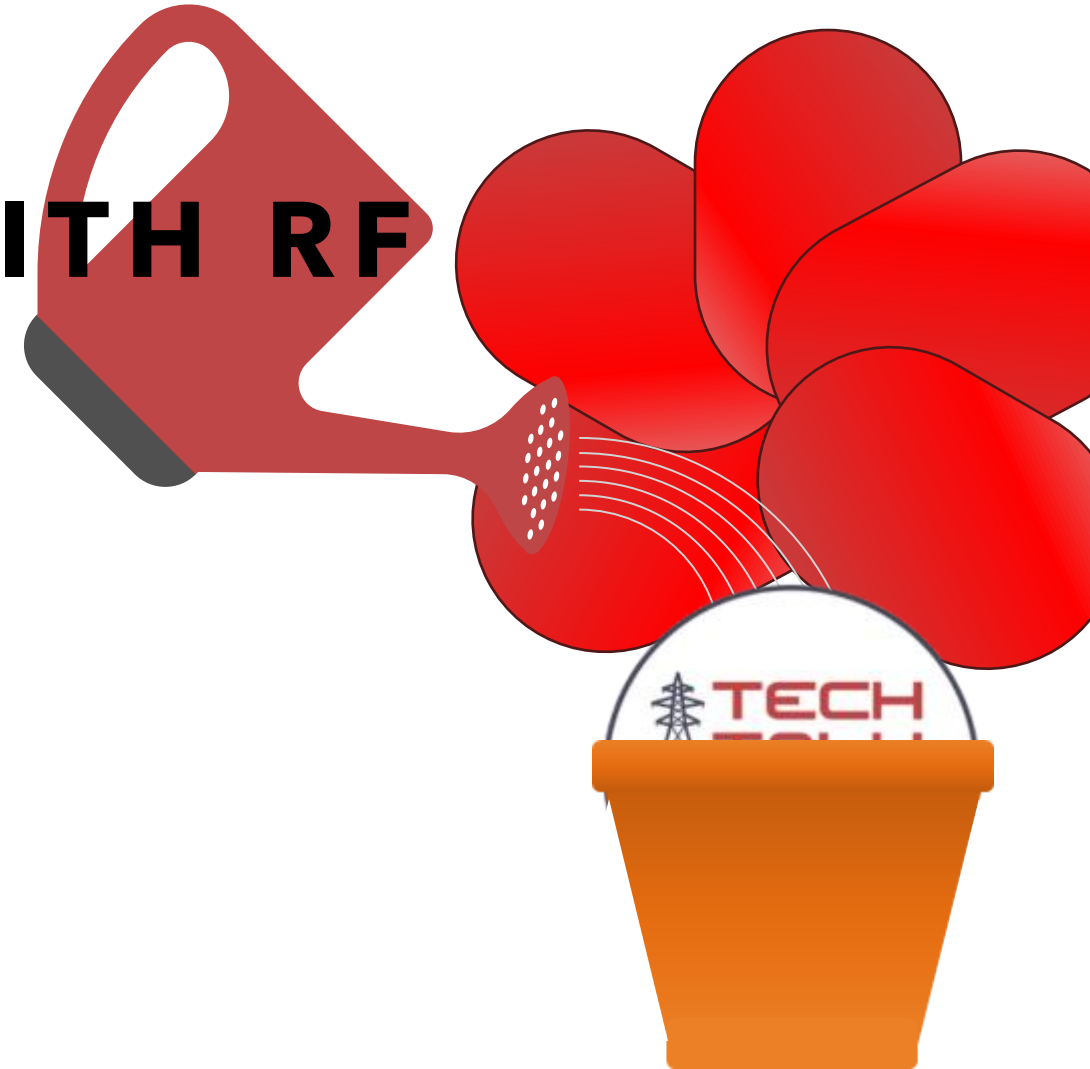
Visit our website to read RF's

2026 Resource Adequacy Report



WELCOME TO TECHNICAL TALK WITH RF

April 20, 2026



TECH TALK ANNOUNCEMENT

RELIABILITYFIRST

CIP WORKSHOP

MAY 4-7, 2026

CLEVELAND

Be sure to register today via Eventbrite or link on RF website

Day 1, Monday, May 4, 1 to 5 p.m. ET *(Optional)*
This session provides an introductory overview of both cyber security/CIP and O&P/Operations.

Day 2, Tuesday, May 5, 8 a.m. to 5 p.m. ET
Select from three training tracks:

Internal Network Security Monitoring	Physical Security	CIP Low Impact from the Ground Up
Lunch will be provided		
IBR Security, CIP-003-9 Controls, and CIP Evidence Submittals	BES & Operations Basics	CIP Low Impact from the Ground Up - Continued

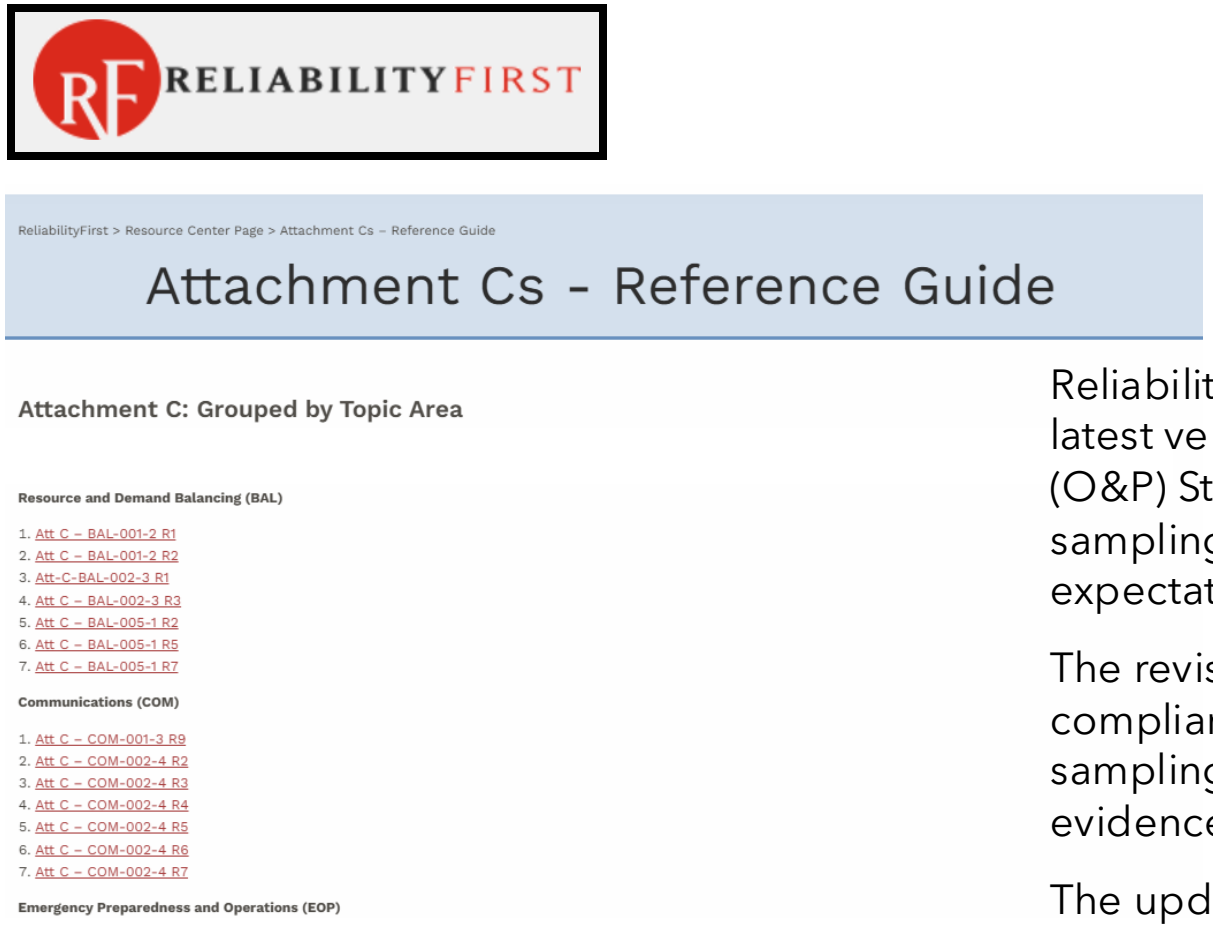
Reception 5-6:30 PM

Day 3, Wednesday, May 6, 8 a.m. to 5 p.m. ET
A single session with presentations and panels on various CIP topics:

- Keynote from DOE
- Compliance Command Center
- Analytic Cameras
- INSM
- Remote Access Risk
- IBR Cyber Risk
- Emerging Cyber Risks
- RF Enforcement
- Cloud drafting team update

Day 4, Thursday, May 7, 8 a.m. to 12 p.m. ET *(Optional)*
RF CIPC Meeting is limited to regular employees of entities registered in the RF footprint.

TECH TALK ANNOUNCEMENT


ReliabilityFirst > Resource Center Page > Attachment Cs – Reference Guide

Attachment Cs - Reference Guide

Attachment C: Grouped by Topic Area

Resource and Demand Balancing (BAL)

1. Att C – BAL-001-2 R1
2. Att C – BAL-001-2 R2
3. Att-C-BAL-002-3 R1
4. Att C – BAL-002-3 R3
5. Att C – BAL-005-1 R2
6. Att C – BAL-005-1 R5
7. Att C – BAL-005-1 R7

Communications (COM)

1. Att C – COM-001-3 R9
2. Att C – COM-002-4 R2
3. Att C – COM-002-4 R3
4. Att C – COM-002-4 R4
5. Att C – COM-002-4 R5
6. Att C – COM-002-4 R6
7. Att C – COM-002-4 R7

Emergency Preparedness and Operations (EOP)

https://www.rfirst.org/resource-center/attachment-c-preparing-for-an-audit/

Attachment Cs Updated

Attachment Cs

ReliabilityFirst's Attachment Cs have been updated to reflect the latest versions of the applicable NERC Operations & Planning (O&P) Standards. These updates ensure that population and data sampling requests remain aligned with current requirements and expectations.

The revised Attachment Cs are used at the beginning of compliance engagements to support population identification and sampling, helping establish a clear and consistent foundation for evidence requests throughout the engagement.

The updated templates are available for download on the ReliabilityFirst website. Entities are encouraged to use the most current versions when preparing for upcoming engagements.

If you have questions regarding the updated Attachment Cs or their use during an engagement, please contact your ReliabilityFirst Compliance representative.

TECH TALK ANNOUNCEMENT

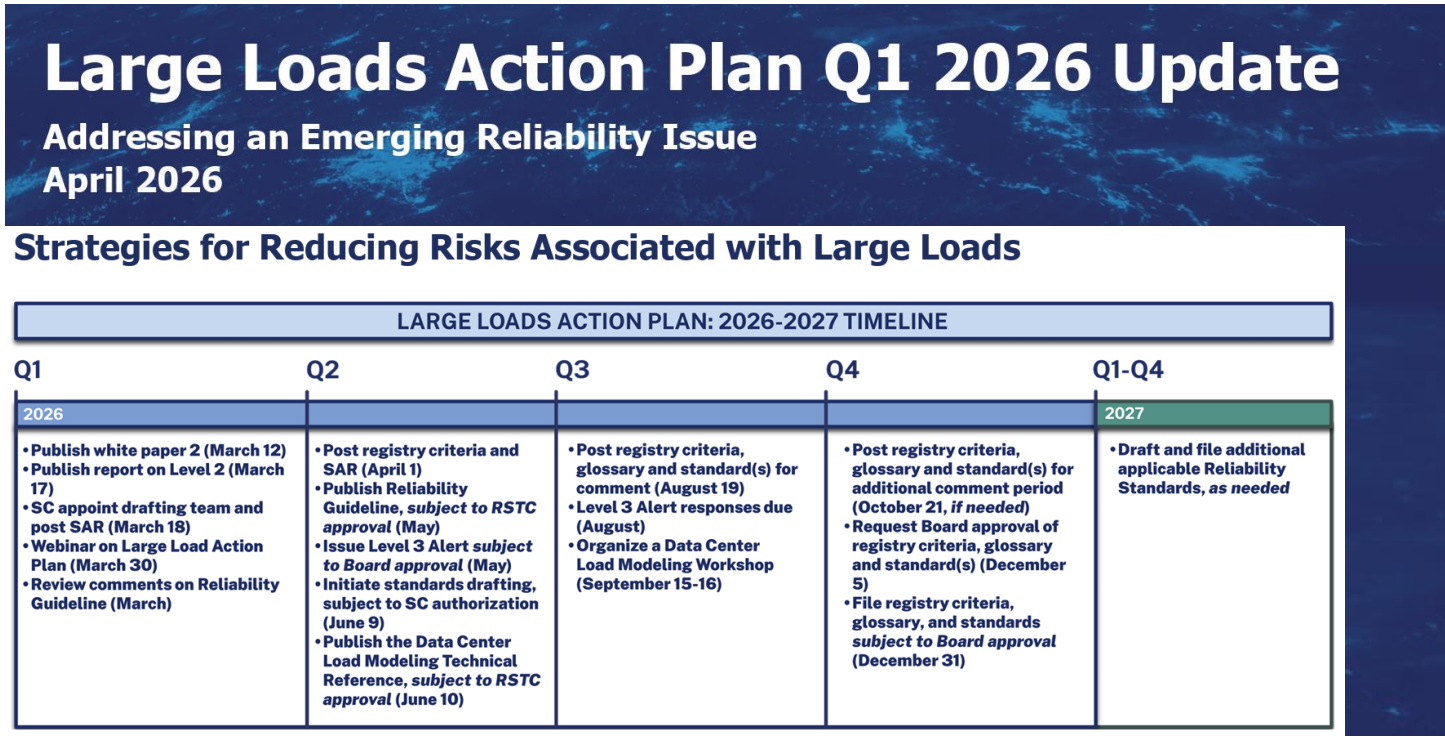
NERC

NERC Releases Large Loads Action Plan Q1 2026

Full Announcement | Action Plan Materials

NERC has released the Q1 2026 Update on Large Loads Action Plan, including a list of upcoming engagement opportunities, recent actions taken by NERC to address large loads on the grid, and key milestones.

Large Loads Resources



All relevant info on NERC's large loads action plan can be found here: https://www.nerc.com/initiatives/large-loads-action-plan

TECH TALK ANNOUNCEMENT

NERC

"Currently Compliant"

Full Announcement | Episode 9

NERC released the ninth installment of its compliance podcast, "Currently Compliant." This episode is hosted by William Sweet (NERC) along with other subject matter experts from the ERO Enterprise, including Adam Flink (MRO) and Michael Belle (SERC).

Currently Compliant: Episode 9 focuses on the topic of Inherent Risk Assessments (IRA) and the Entity Risk Profile Questionnaire (ERPQ). Regional Entities send these questionnaires to registered entities during an IRA.

The questionnaires were updated in Align Release 7.6 deployed March 21, 2026. Specifically, the Risk Factor Questionnaire (RFQ) was integrated into the ERPQ, facilitating one questionnaire for entities to complete. Additionally, many questions were revised for clarity and to better inform the Regional Entities of necessary information to perform risk assessments. This episode breaks down what the risk assessment is and how the data acquired from the questionnaires help the Regional Entities understand each registered entity's inherent risk to the bulk power system.

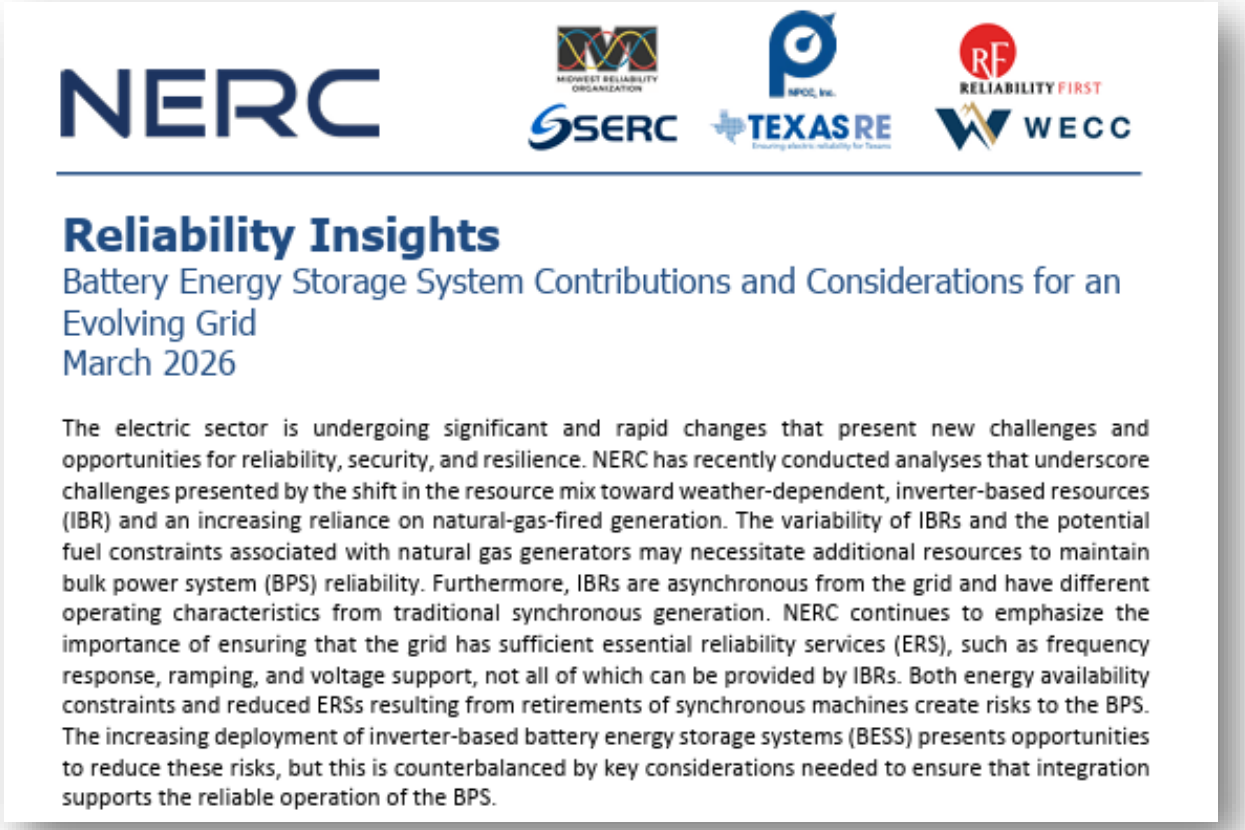
TECH TALK ANNOUNCEMENT

NERC

NERC Reliability Insights: Battery Energy Storage System Contributions and Considerations for an Evolving Grid

All Reliability Insights | Full Document

NERC has published a new Reliability Insights technical document, discussing the risks and opportunities associated with the increasing deployment of battery energy storage systems on the bulk power system.



NERC

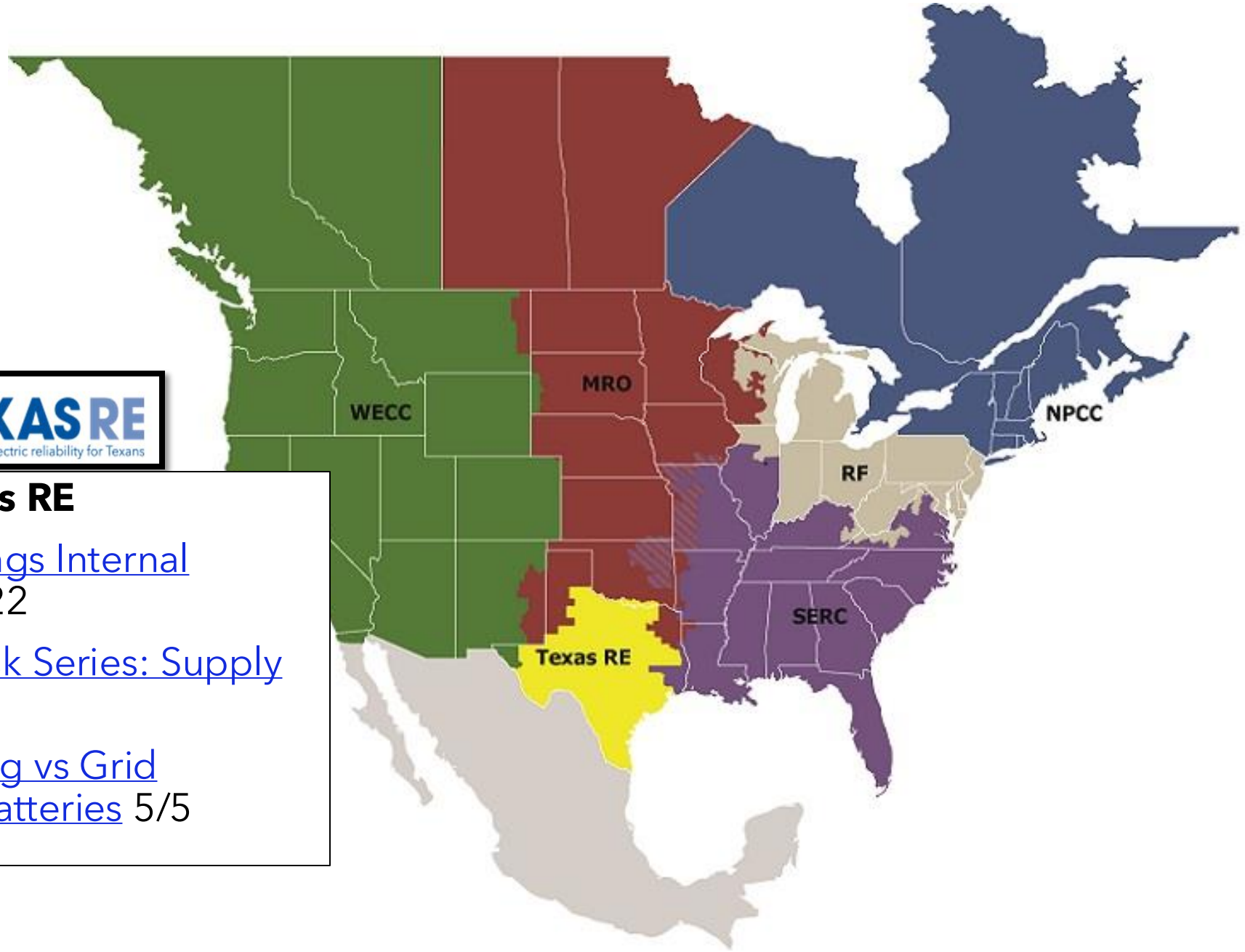
MIDWEST RELIABILITY ORGANIZATION SERC NPCC, Inc. TEXAS RE RELIABILITY FIRST WECC

Reliability Insights

Battery Energy Storage System Contributions and Considerations for an Evolving Grid

March 2026

The electric sector is undergoing significant and rapid changes that present new challenges and opportunities for reliability, security, and resilience. NERC has recently conducted analyses that underscore challenges presented by the shift in the resource mix toward weather-dependent, inverter-based resources (IBR) and an increasing reliance on natural-gas-fired generation. The variability of IBRs and the potential fuel constraints associated with natural gas generators may necessitate additional resources to maintain bulk power system (BPS) reliability. Furthermore, IBRs are asynchronous from the grid and have different operating characteristics from traditional synchronous generation. NERC continues to emphasize the importance of ensuring that the grid has sufficient essential reliability services (ERS), such as frequency response, ramping, and voltage support, not all of which can be provided by IBRs. Both energy availability constraints and reduced ERSs resulting from retirements of synchronous machines create risks to the BPS. The increasing deployment of inverter-based battery energy storage systems (BESS) presents opportunities to reduce these risks, but this is counterbalanced by key considerations needed to ensure that integration supports the reliable operation of the BPS.



TEXAS RE
Ensuring electric reliability for Texans

Talk with Texas RE

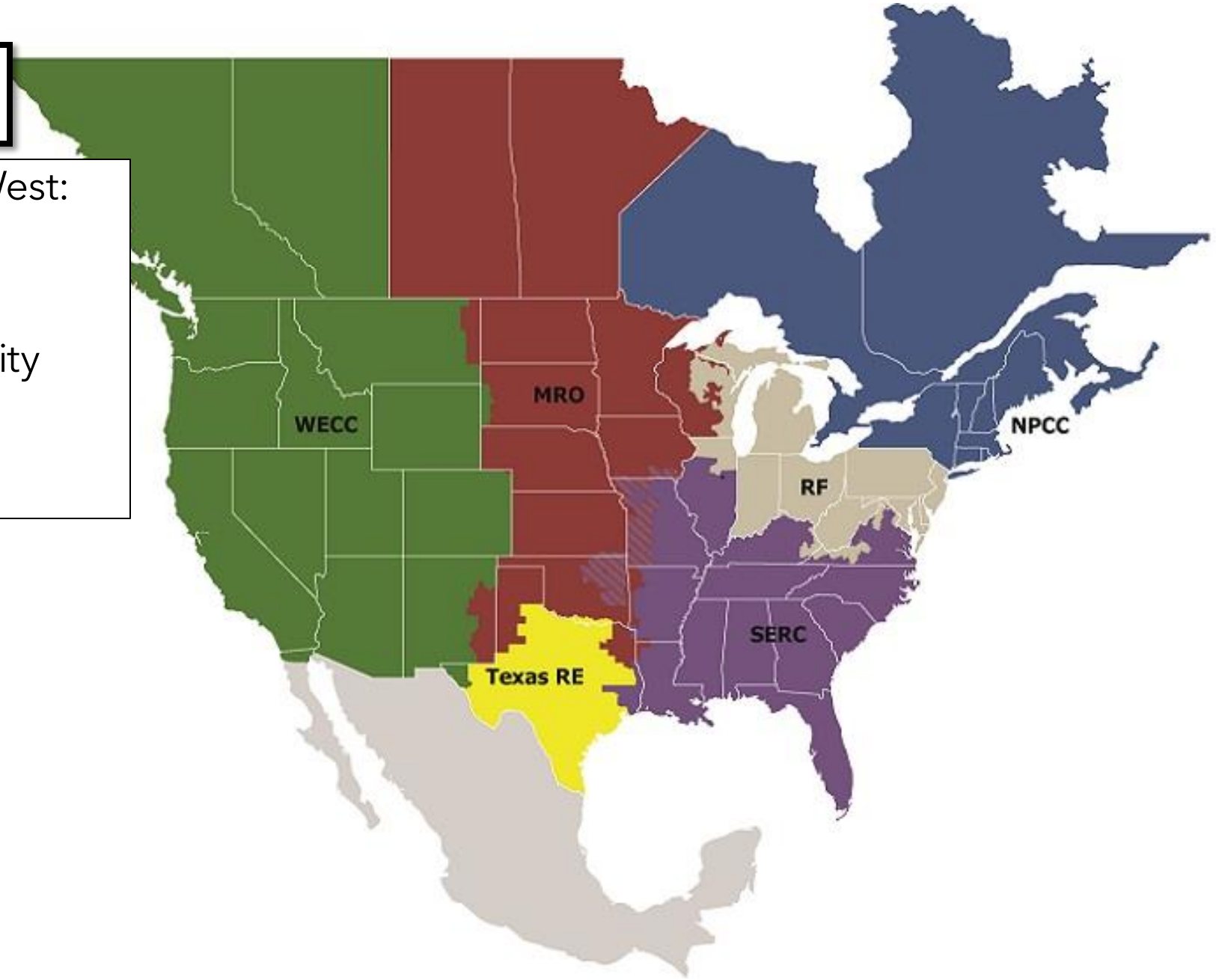
- Facility Ratings Internal Controls 4/22
- Regional Risk Series: Supply Chain 4/29
- Grid Forming vs Grid Following Batteries 5/5

Reliability in the West: Discussion Series

- May 6

Reliability & Security Oversight Update

- May 21

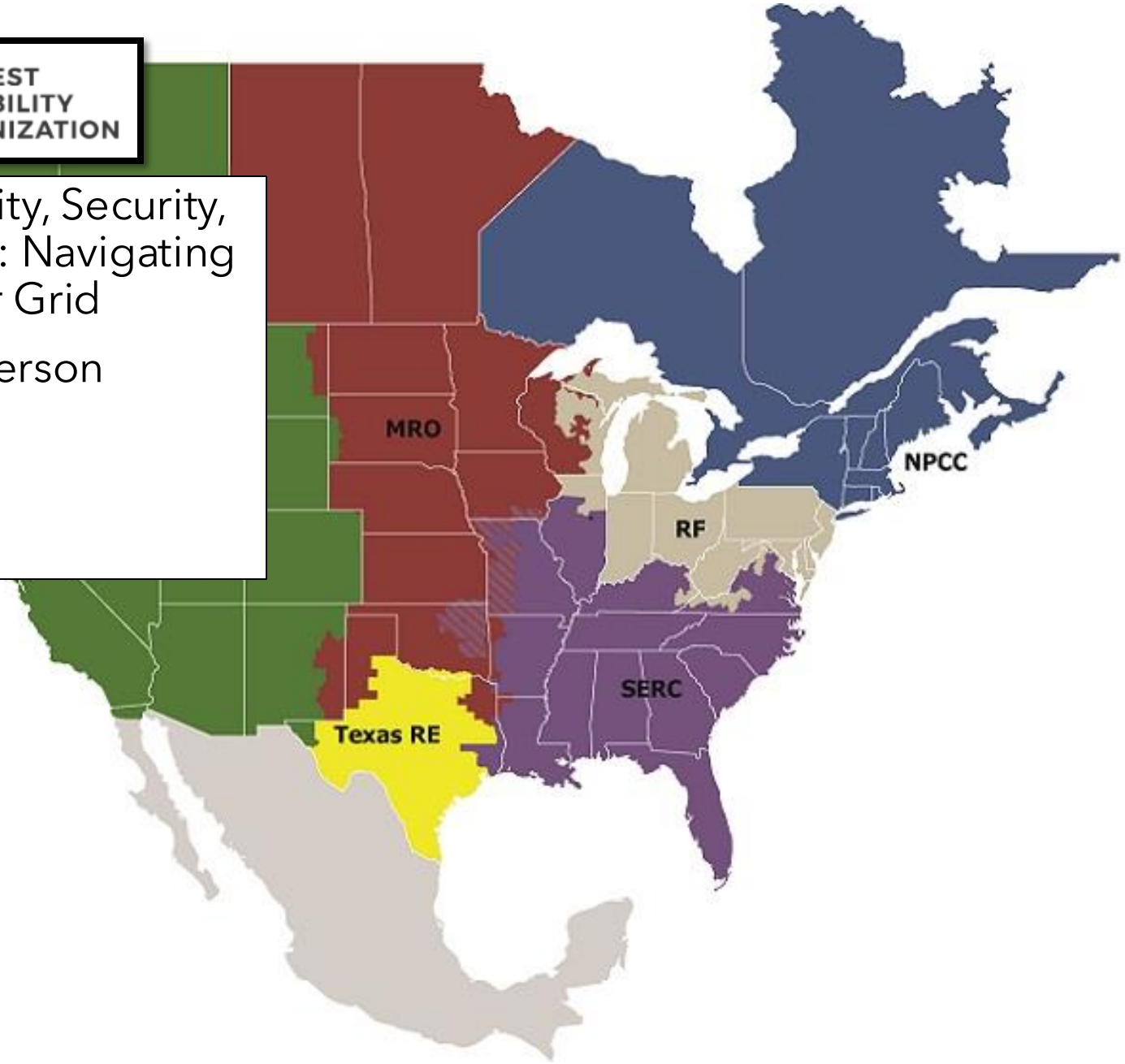


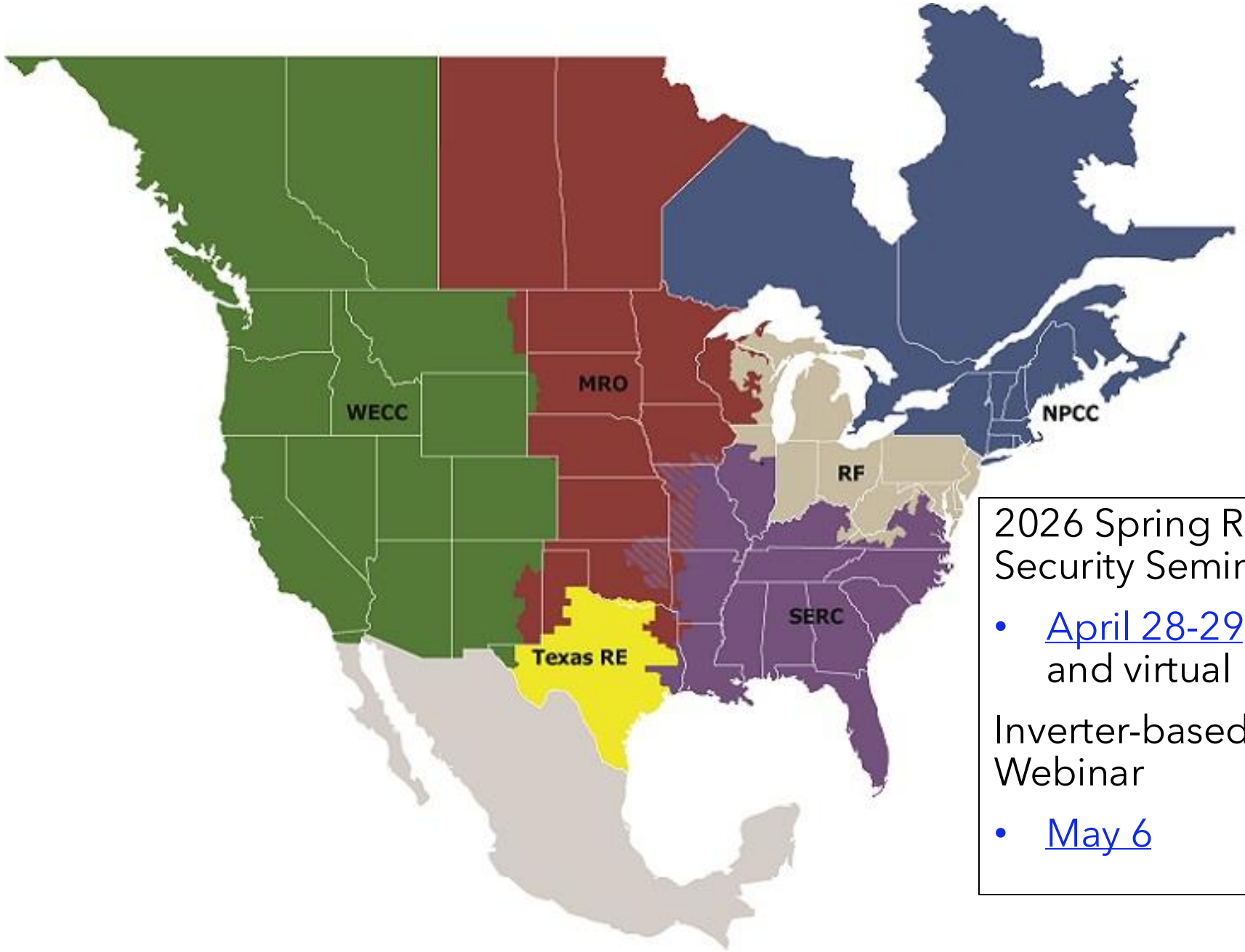
MIDWEST RELIABILITY ORGANIZATION

2026 MRO Reliability, Security, and CMEP Summit: Navigating the Evolving Power Grid

- May 12-13, in-person

Hilton Omaha
1001 Cass Street
Omaha, NE



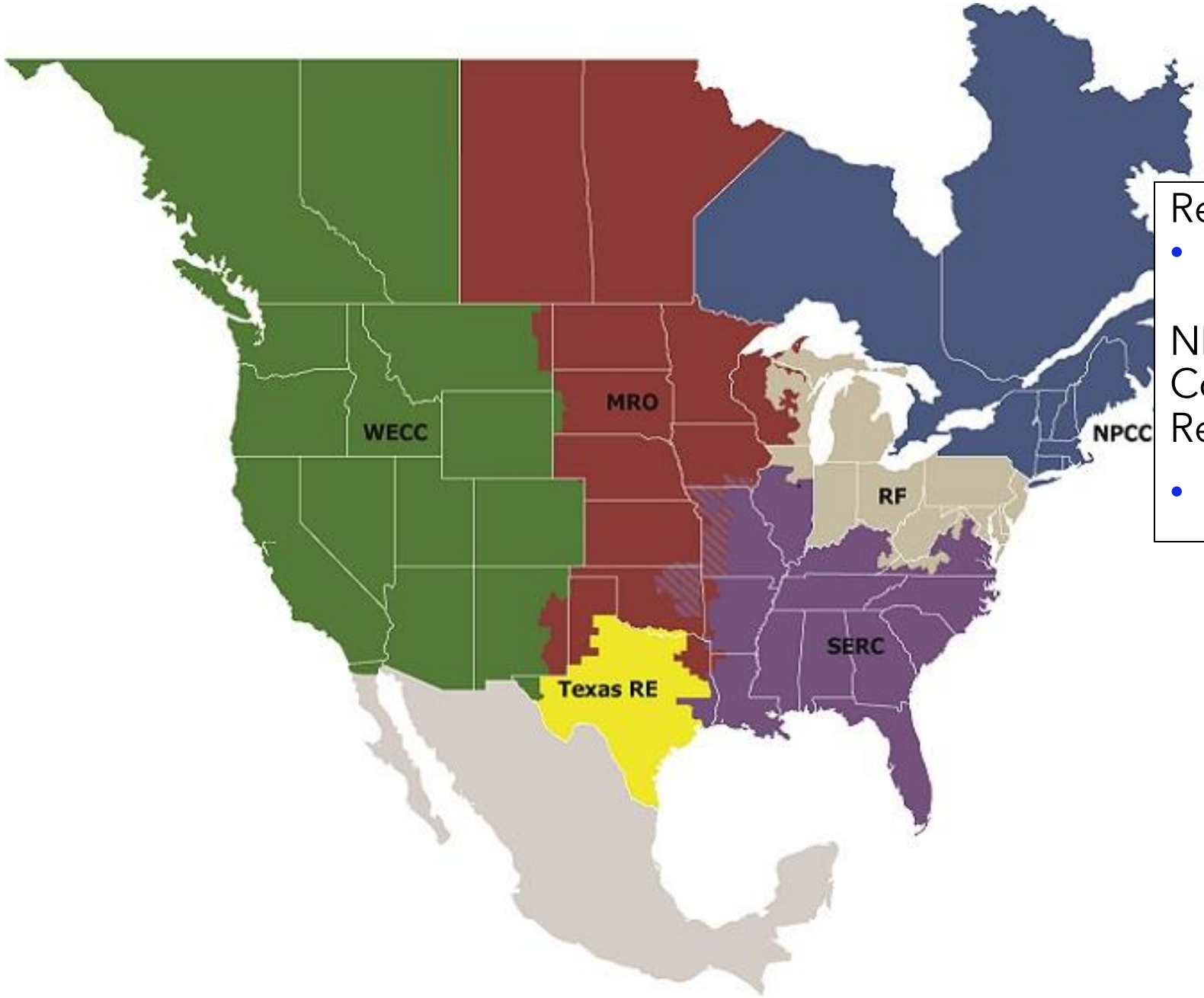


2026 Spring Reliability & Security Seminar

- April 28-29, in-person and virtual

Inverter-based Resources Webinar

- May 6

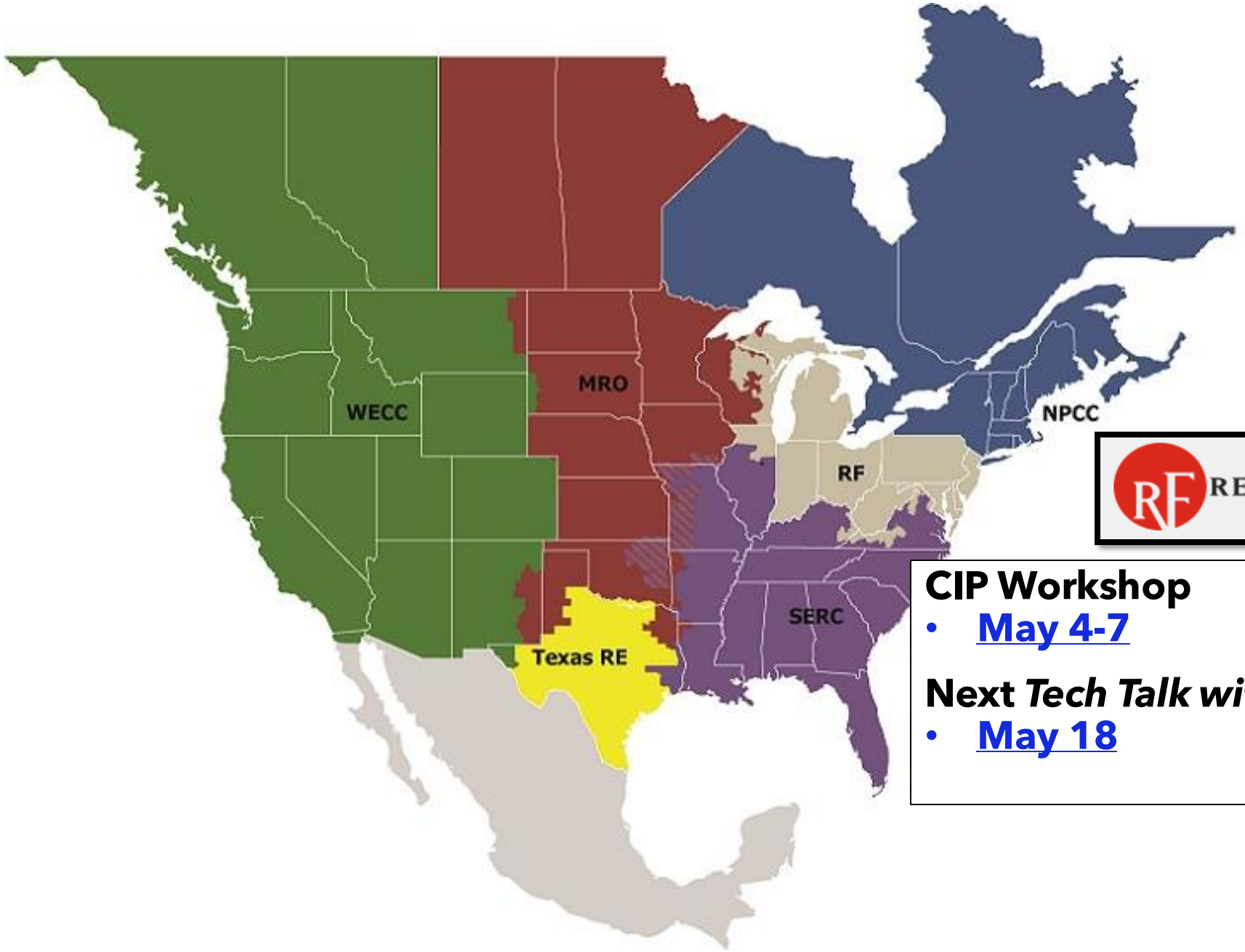


Reliability Forum

- May 7, virtual

NPCC 2026 Spring Compliance and Reliability Webinar

- May 20



RELIABILITY FIRST

CIP Workshop

- May 4-7

Next *Tech Talk with RF*

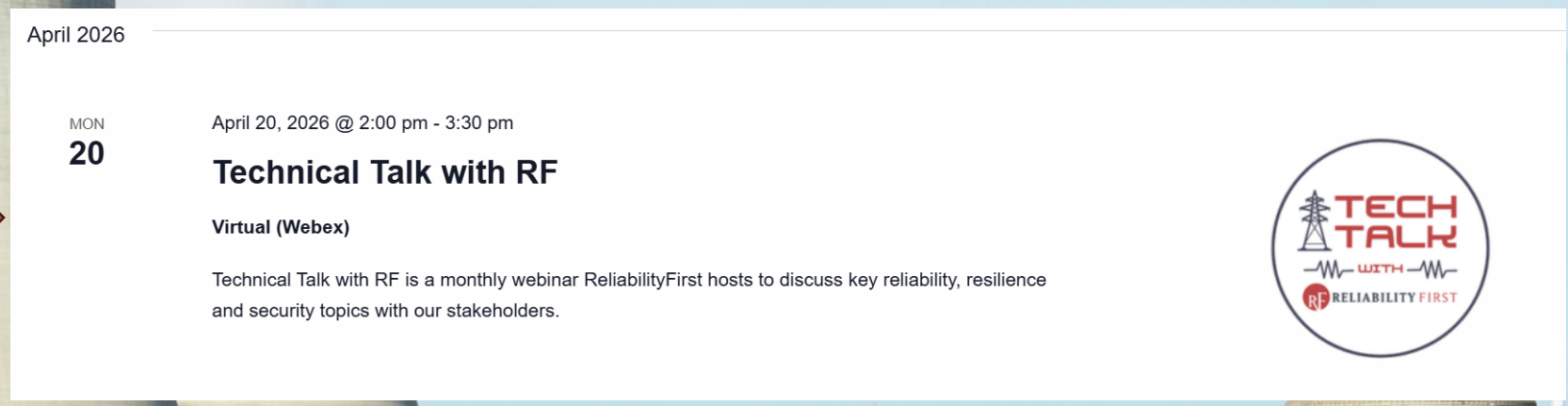
- May 18

TECH TALK REMINDER

FORWARD TOGETHER RELIABILITYFIRST

Technical Talk with RF announcements are posted on our calendar on www.rfirst.org under Calendar

CLICK HERE



April 2026

MON
20

April 20, 2026 @ 2:00 pm - 3:30 pm

Technical Talk with RF

Virtual (Webex)

Technical Talk with RF is a monthly webinar ReliabilityFirst hosts to discuss key reliability, resilience and security topics with our stakeholders.

TECHNICAL TALK WITH RF

FORWARD TOGETHER RELIABILITYFIRST

Join the conversation at

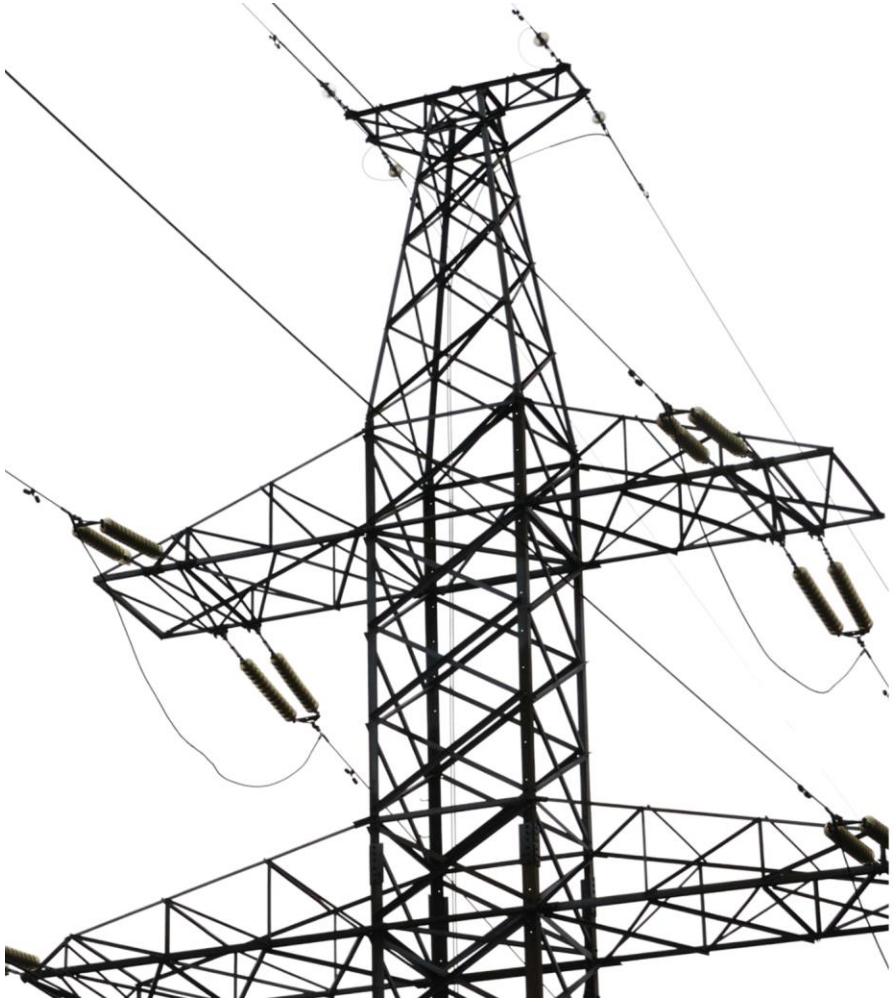
SLIDO.com

#TechTalkRF

Anti-Trust Statement

It is ReliabilityFirst's policy and practice to obey the antitrust laws and to avoid all conduct that unreasonably restrains competition. This policy requires the avoidance of any conduct which violates, or which might appear to violate, the antitrust laws. Among other things, the antitrust laws forbid any agreement between or among competitors regarding prices, availability of service, product design, terms of sale, division of markets, allocation of customers or any other activity that unreasonably restrains competition.

It is the responsibility of every ReliabilityFirst participant and employee who may in any way affect ReliabilityFirst's compliance with the antitrust laws to carry out this policy.



AGENDA

NEW NERC RELIABILITY STANDARDS APPLICABLE TO INVERTER-BASED RESOURCES: WHAT TO KNOW

- **GREG SORENSON,** PRINCIPAL TECHNICAL AUDITOR, OPERATIONS & PLANNING COMPLIANCE MONITORING, RELIABILITYFIRST

NERC MODERNIZATION OF STANDARDS, PROCESSES, AND PROCEDURES UPDATE

- **SOO JIN KIM**, VP, STANDARDS AND REGISTRATION, NERC
- **ALISON OSWALD**, MANAGER OF STANDARDS DEVELOPMENT, NERC

APRIL 2026 TECH TALK
PRC-028, PRC-029, AND PRC-030

Greg Sorenson, O&P Principal Technical Auditor

April 20, 2026

Cleveland, Ohio

RELIABILITY FIRST

PRC-028, PRC-029, AND PRC-030

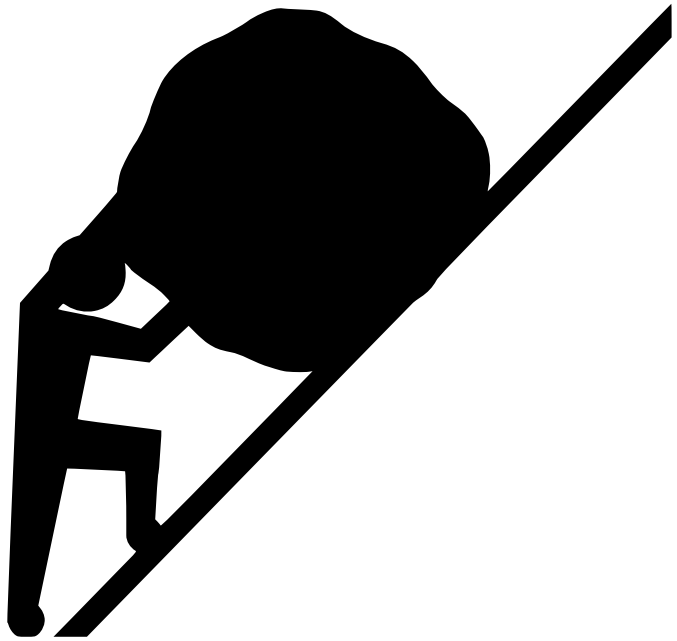
- **Importance**
  - The three new Standards are intended to improve reliability of Inverter-Based Resources (IBRs).
  - IBRs need to support the Bulk Electric System (BES) by remaining connected and supporting voltage and frequency during grid disturbances (ride-through).
  - Monitoring equipment and data collection will help improve performance by studying and analyzing system events and mitigating unfavorable actions as the result of the analysis.

- Disclaimer
  - Due to time, not every requirement will be discussed today.
  - To enhance slide legibility, () is used when certain language is not shown or has been summarized.
  - The full text of each standard should be reviewed.

PRC-028, PRC-029, AND PRC-030

- **The Main Ideas**
  - PRC-028-1 requires disturbance monitoring equipment for existing and new facilities with Inverter-Based Resources (IBRs). Similar to PRC-002-5 (Disturbance Monitoring and Reporting Requirements).
  - PRC-024-4 applies only to synchronous machines, while PRC-029-1 adds: Inverter-Based Resource frequency and voltage excursion ride-through requirements. (Q4 2026)
  - PRC-030-1introduces mitigation of Unexpected Inverter-Based Resource Events. Addresses reliability risks from unexpected or unwarranted performance of Bulk Electric System (BES) Inverter-Based Resources (IBRs) Real Power output. (Q4 2026). Similar to PRC-004-6 (Protection System Misoperation Identification and Correction).

NEW STANDARD AND REQUIREMENT CHALLENGES



- **Challenges with developing controls around new Standards and Requirements**
  - Identifying gaps
  - Understanding the process/obligations as they apply to your registered functions
  - Setting up controls with roles and responsibilities when those roles and responsibilities may not be known
  - Material challenges – equipment, software, hardware, other variables may not be at a place that allows easy development of internal controls
  - Understanding the initial lift
  - Equipment lead times

PRC-028

- R1. Each Generator Owner shall have sequence of event recording (SER) data for the following Elements that it owns:
- 1.1. Circuit breaker position (open/close) for circuit breakers associated with the main power transformer(s), collector bus(es), shunt static and dynamic reactive device(s), and AC-DC and DC-AC converters, if any, in case of VSC HVDC system with a dedicated connection to IBR.
- For IBR units in commercial operation after the effective date of this standard, the following data shall be recorded when triggered by ride-through operation or tripping of an IBR unit. 1.2.1. All fault codes. 1.2.2. All fault alarms. 1.2.3. High and low voltage ride-through mode status. 1.2.4. High and low frequency ride-through mode status.

PRC-028

- R1.3 For IBR units in commercial operation before the effective date of this standard, if capable, the following data shall be recorded when triggered by ride-through operation or tripping of an IBR unit. ()
- R2 – Trigger Fault Recorder (lots of current and voltage measuring points)
- R3- Specific triggers and 2 cycles prior to 2s after with 64 samples a second (note that this sampling applies to each point from R2)
- R4 – dynamic disturbance recording at the main power transformer (different points)
- R5- 960 samples input and 60 samples per second output

PRC-028

- R6- time synchronization expectations IBR unit +/- 100ms, other equip +/- 1ms
- R7- must be able to provide it to TP, PC, TOP, BA, RC, RF, or NERC within 15 days of request. Must retain data for 20 days. Specific formatting sub-requirements.
- R8 – if GO identifies a recording failure, have 90 days to correct or must send the CAP to RF.

PRC-028 IMPLEMENTATION PLAN

- Effective date: April 1, 2025
- R8 – effective now
- R1-R7 – In commercial operation prior to April 1, 2025
- At least 50% of IBR Resources by Dec. 31, 2028, 100% by Jan. 1, 2030
- R1-R7- In commercial operation after April 1, 2025
- Later of 15 calendar months (July 2026) or commercial operations date
- Cat 2 – In commercial operation prior to May 15, 2026… 100% by Jan. 1, 2030
- Cat 2 – in commercial operation after May 15, 2026 … later of 15 months (Aug 2027) or COD

PRC-029

- R1 - each GO shall ensure the design and operation is such that each IBR meets or exceeds ride-through requirements, in accordance with the "must ride-through zone" as specified in Attachment 1, except in the following conditions:
  - The IBR needed to electrically disconnect in order to clear a fault;
  - The voltage at the high-side of the main power transformer went outside an accepted hardware limitation, in accordance with Requirement R4;
  - The instantaneous positive sequence voltage phase angle change is more than 25 electrical degrees at the high-side of the main power transformer and is initiated by a non-fault switching event on the transmission system; or
  - The volts per Hz (V/Hz) at the high-side of the main power transformer exceed 1.1 per unit for longer than 45 seconds or exceed 1.18 per unit for longer than 2 seconds.

PRC-029

- R2. Each Generator Owner shall ensure the design and operation is such that the voltage performance for each IBR adheres to the following during a voltage excursion, unless a documented hardware limitation exists in accordance with Requirement R4.
- (lots of specific requirements follow – some behavior requires coordination with TOP, RC, TP, and/or PC)
- R3. Ride-through frequency excursions per Att 2

PRC-029

- R4. Each Generator Owner identifying an IBR that is in-service by the effective date of PRC-029-1, has known hardware limitations that prevent the IBR from meeting ride-through criteria as detailed in Requirements R1-R3, and requires an exemption from specific ride-through criteria shall:
  - Document information supporting the identified hardware limitation no later than 12 months following the effective date of PRC-029-1: (basic info)
  - Technical documentation verifying the limitation is due to hardware that would need to be physically replaced to meet all ride-through criteria, and that the limitation cannot be remedied by software updates or setting changes;

PRC-029

- Request must be provided to PC, TP, TOP, RC, and RF. Additional info within 90 days. You must notify the PC, TP, TOP, and RC if RF approves your request.
- Current plan is to process in Align.
- 4.3 if hardware causing the problem must be replaced, it is expected to be compliant.

PRC-029 IMPLEMENTATION PLAN

- R1-R3: Design must be evaluated by Oct. 1, 2026 (for Cat 2 IBRs Jan. 1, 2027)
- Operational aspects align with the PRC-028 implementation plan
- For IBRs in commercial operation: The same 50% list applies to both PRC-028 and PRC-029 to Dec. 31, 2028. 100% by Jan. 1, 2030 (for Cat 2 IBRs -100% by Jan. 1, 2030)
- Operational aspects include making setting changes and evaluating performance after events
- R4: effective Oct. 1, 2026 (starts 12 month clock for all)

PRC-030

- R1. Each applicable Generator Owner shall implement a documented process to identify any complete facility loss of output, or changes in Real Power output that are at least 20 MW and at least 10% of the plant's gross nameplate rating, occurring within a 4 second period. Changes in Real Power for the following are excluded:
  - (Following dispatch or variation in wind/sun)
  - A transmission or collection system loss that, by configuration, disconnects the Inverter-Based Resource generator; or (requires some analysis)
  - (Misoperation under PRC-004)

PRC-030

- R2. Each applicable GO, within 90 calendar days of (an R1 event) or following a request from its associated RC, BA, or TOP that identified a Disturbance:
  - 2.1. Analyze its Inverter-Based Resource facility performance during the event, including: 2.1.1. Determine the root cause(s) of change(s) in Real Power output;
  - 2.1.2. Document the facility's ride-through performance including Reactive Power response during the event;
  - 2.1.3. Assess any performance issues identified and if corrective actions are needed; and 2.1.4. Determine the applicability of the root cause(s) to the Generator Owner's other Inverter-Based Resource facilities.
  - 2.2. Upon request, provide the analysis results to the requesting () RC, BA, and TOP.

PRC-030

- R3. Within 60 days, develop a Corrective Action Plan and provide it to your TOP, BA, and RC
- Must include other applicable facilities. Must justify “no action”
- R4. Implement the corrective actions, update timetables if needed and keep RC informed throughout

PRC-030 IMPLEMENTATION PLAN

- Effective date: Oct. 1, 2026
- Category 2 IBR facilities: Jan. 1, 2027
- All events need to be analyzed, even at facilities where PRC-028 equipment is not yet installed. Clearly it will be easier to analyze with PRC-028 data.
- Standard applies to events that occur after the applicable date above.

COMMON PROBLEMS PRC-002/PRC-028

- Installed recorders cannot write data and were not periodically tested; (i.e. failed during an event and entity had to self-report)
- Although capable, they were not correctly configured (i.e. set to only record 16 samples per second when unit could do 16, 32, 64, 128)
- Entity did not carefully review requirements and some data was not recorded (i.e. only 5 of the 6 needed breakers were recorded)
- Entity did not retrieve the data and it was overwritten
- Some needed equipment has longer lead time

COMMON PROBLEMS PRC-024/PRC-029

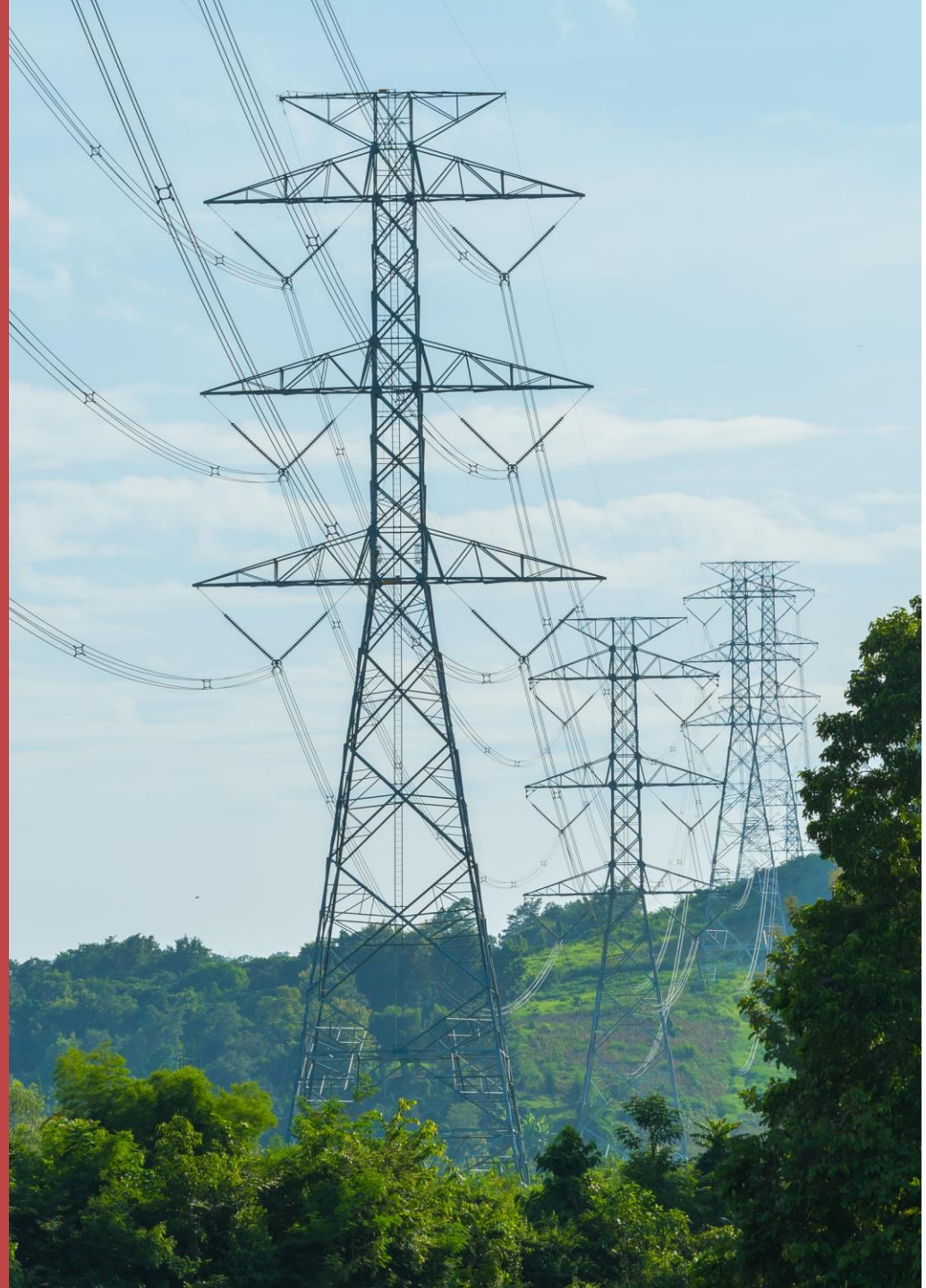
- Improper use of transformer ratios,
- Not considering voltage drop,
- Not recognizing *less than* vs. *less than or equal to*,
- Not obtaining appropriate (or any) manufacturer justification
- Not considering the V/Hz relays anywhere
- Upgrading relay or control software introduces new settings which have non-compliant defaults

COMMON PROBLEMS PRC-004/PRC-030

- Timelines on CAPs missed,
- Similar analysis across system not performed (i.e. same wind turbine at multiple plants, same inverter, etc.)

LET'S TALK ABOUT INTERNAL CONTROLS

- **PRC-028, PRC-029, or PRC-030**
  - When do we (you) need to be compliant?
  - Draw out your process (pick one of: substation installation, protection settings, or generator problem analysis)
  - What systems do we have in place or what will it take to be compliant?
  - Who will oversee compliance?
    - Setting up the systems
    - Tracking performance
    - Monitoring applicable assets
    - Meeting compliance obligations
  - What are our internal risks and what are the risks to our external partners?
  - What would be some good controls for this type of compliance expectation?



THANK YOU

Greg.Sorenson@rfirst.org

RELIABILITY | RESILIENCE | SECURITY

POWERING TODAY. PROTECTING TOMORROW.

NERC

Modernization of Standards Processes and Procedures (MSPP) Implementation

Technical Talk with RF

Alison Oswald
Manager, Standards Development

April 20, 2026

Guiding Principles

Transform and Modernize the Process

Re-envision a modernized standard development process to address evolving risks.

Create Efficiencies

Identify areas of opportunity and recommendations to save time and remove redundant steps in the current process.

Develop a Trusted Process

Provide clear opportunities for stakeholder input, due process, openness, and balance of interests.

MSPP Task Force Process Timeline

Q2 2025

- Developed scope document
- Identified areas for improvement
- Solicit stakeholder input

Q3 2025

- Develop white paper of potential improvement opportunities
- Solicit stakeholder input
- Develop draft recommendations

Q4 2025

- Solicit stakeholder input
- Finalize recommendations

Q1 2026

- Present recommendations to NERC Board

Communications and Engagement

- Individual task force engagement
- General communications to and broad engagement with industry and stakeholders
- Updates to NERC's Board, MRC, Standing Committees, and Industry Groups

Stakeholder Engagement by the Numbers

50+ Presentations
during standalone meetings or as agenda items

5,800+ Attendees
at presentations since May 2025

5 Interactive Sessions with 1,100+ Attendees
to provide stakeholder access to Task Force members

10+ U.S. and Canadian Trades & Forums
engaged by MSPPTF members

11 Regional Entity-Hosted Events
Including webinars and in-person presentations

MSPPTF Final Recommendations

Standard Initiation

Semi-annual review and prioritization process

RSTC technically vets all requests for standard development projects

New RISC subcommittee determines path forward and oversees term sheet development

Standard Drafting

New Stakeholder SME Pool as expert bench to help develop standards

RISC subcommittee oversees drafting standards leveraging SME Pool, NERC staff, and technology tools

Emphasis on public comment process with straw polls, rather than multiple ballots, to drive consensus

Balloting

Individual entity balloting process to confirm consensus

Improved Registered Ballot Body voting rules

Refined Registered Ballot Body segment structure

NERC Board Acceptance and Next Steps

On February 12, 2026, the MSPPTF brought the following recommendations to the Board:

- Accept *Recommendations for Transforming the Reliability Standard Framework*
- Direct NERC management, in consultation with the MSPPTF, to develop proposed changes to NERC Rules of Procedure documents and submit them for public comment through usual processes
- Direct NERC management, in consultation with the MSPPTF and respective Standing Committee members, to develop appropriate proposals regarding relevant Standing Committee charters
- Direct NERC management to report on the implementation status at regularly scheduled Board meetings until complete

NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

MSPP

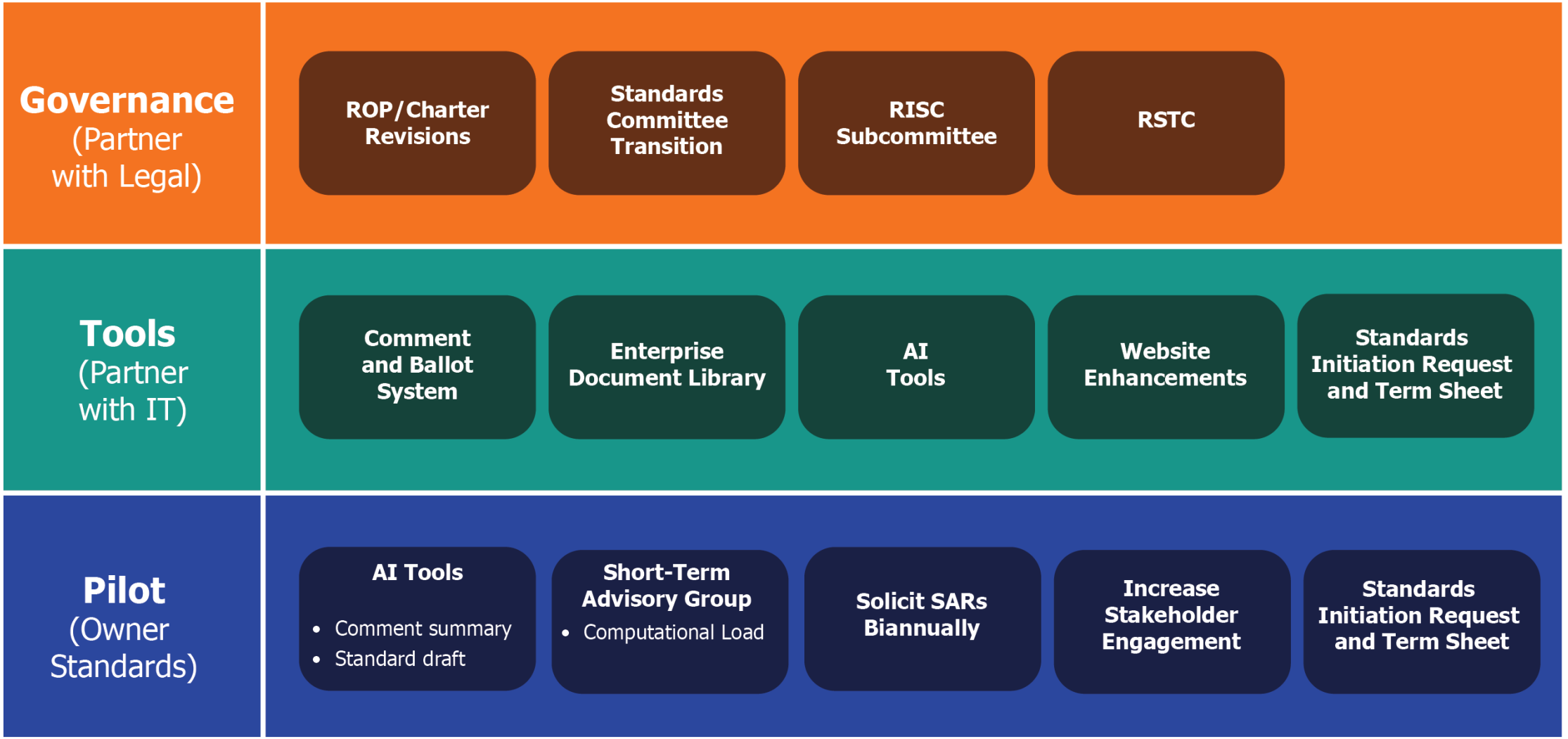
Announcement

NERC Board Accepts MSPPTF Recommendations; Focus Shifts to Implementation

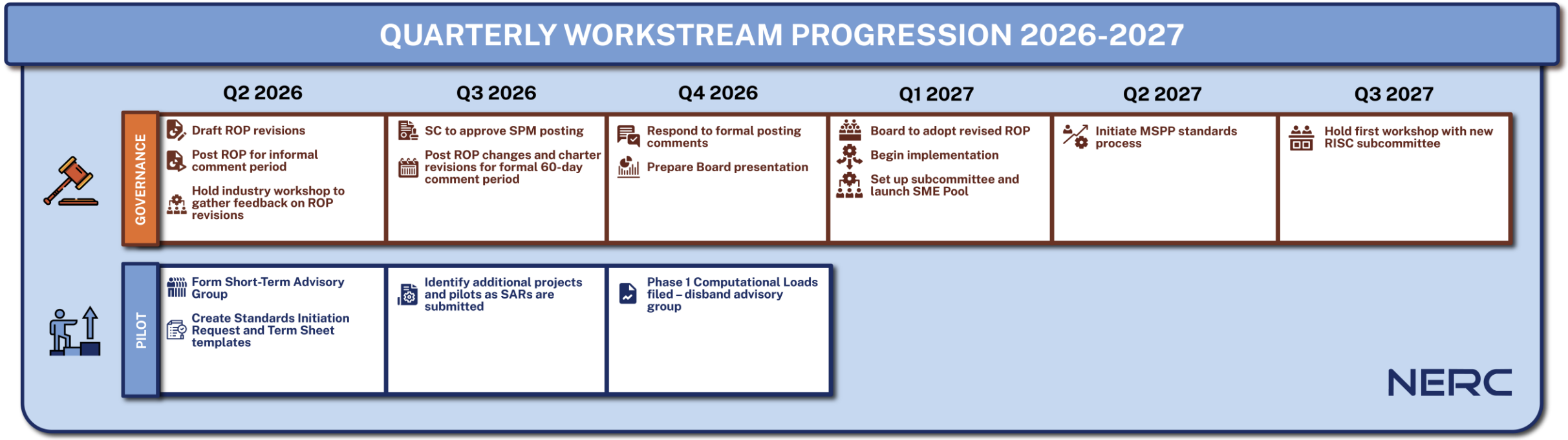
WASHINGTON D.C., – At its February 2026 meeting, the NERC Board of Trustees (Board) accepted the Modernization of Standards Processes and Procedures Task Force's (MSPPTF) ***Recommendations for Transforming the Reliability Standard Development Framework*** to more effectively and efficiently develop Reliability Standards to meet the speed at which risks to the bulk power system emerge. During the meeting the Board and MSPPTF members acknowledged the extensive outreach that occurred prior to the posting of the final recommendations and expressed their sincere appreciation for the significant contribution made by stakeholders throughout the process.

MSPP Implementation Phase

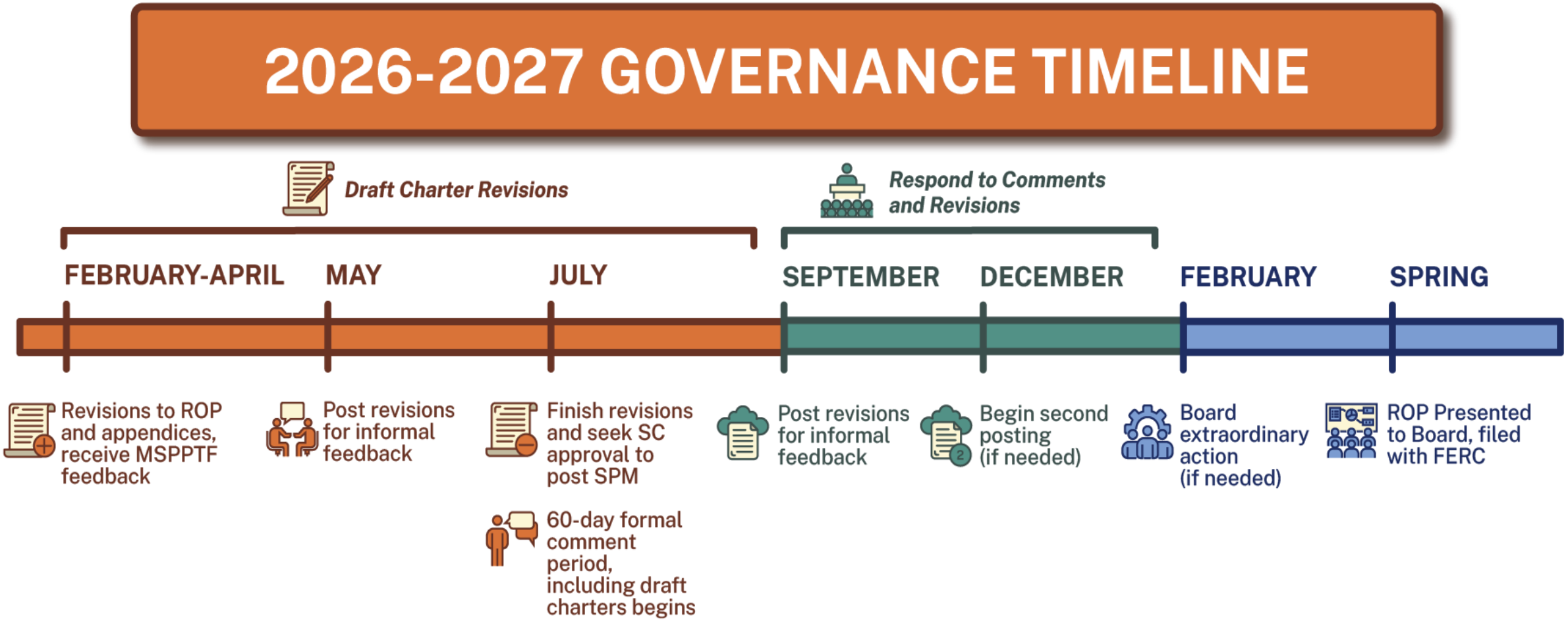
Areas of Focus



Implementation Timeline

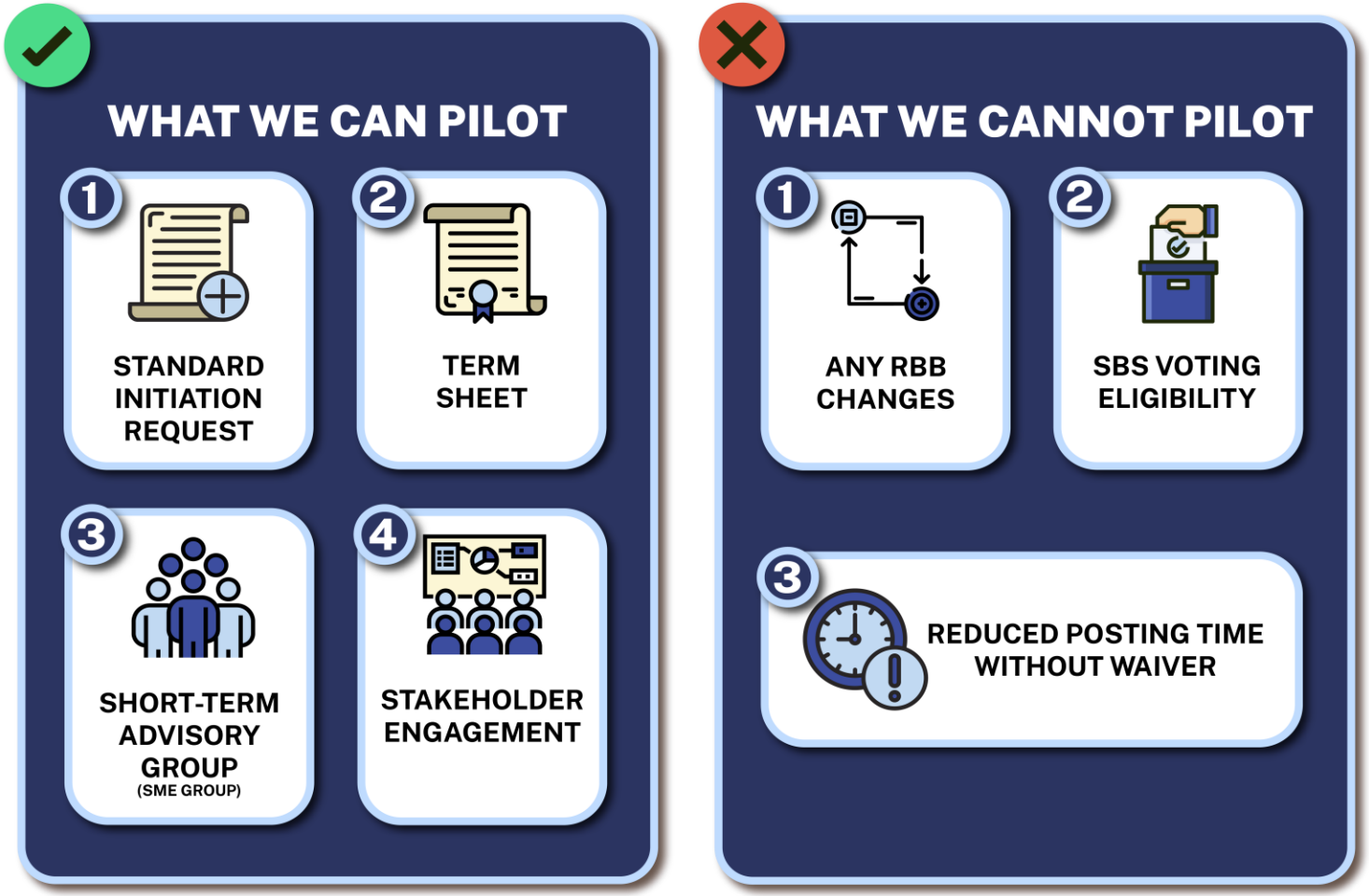


Governance


2026-2027 GOVERNANCE TIMELINE
Draft Charter Revisions
Respond to Comments and Revisions
FEBRUARY-APRIL
MAY
JULY
SEPTEMBER
DECEMBER
FEBRUARY
SPRING
Revisions to ROP and appendices, receive MSPPTF feedback
Post revisions for informal feedback
Finish revisions and seek SC approval to post SPM
60-day formal comment period, including draft charters begins
Post revisions for informal feedback
Begin second posting (if needed)
Board extraordinary action (if needed)
ROP Presented to Board, filed with FERC

Pilots

PILOTING: WHAT'S IN AND WHAT'S OUT



Engagement

MSPP Implementation Webpage

Newsletters

Committee Updates

June Industry Workshop

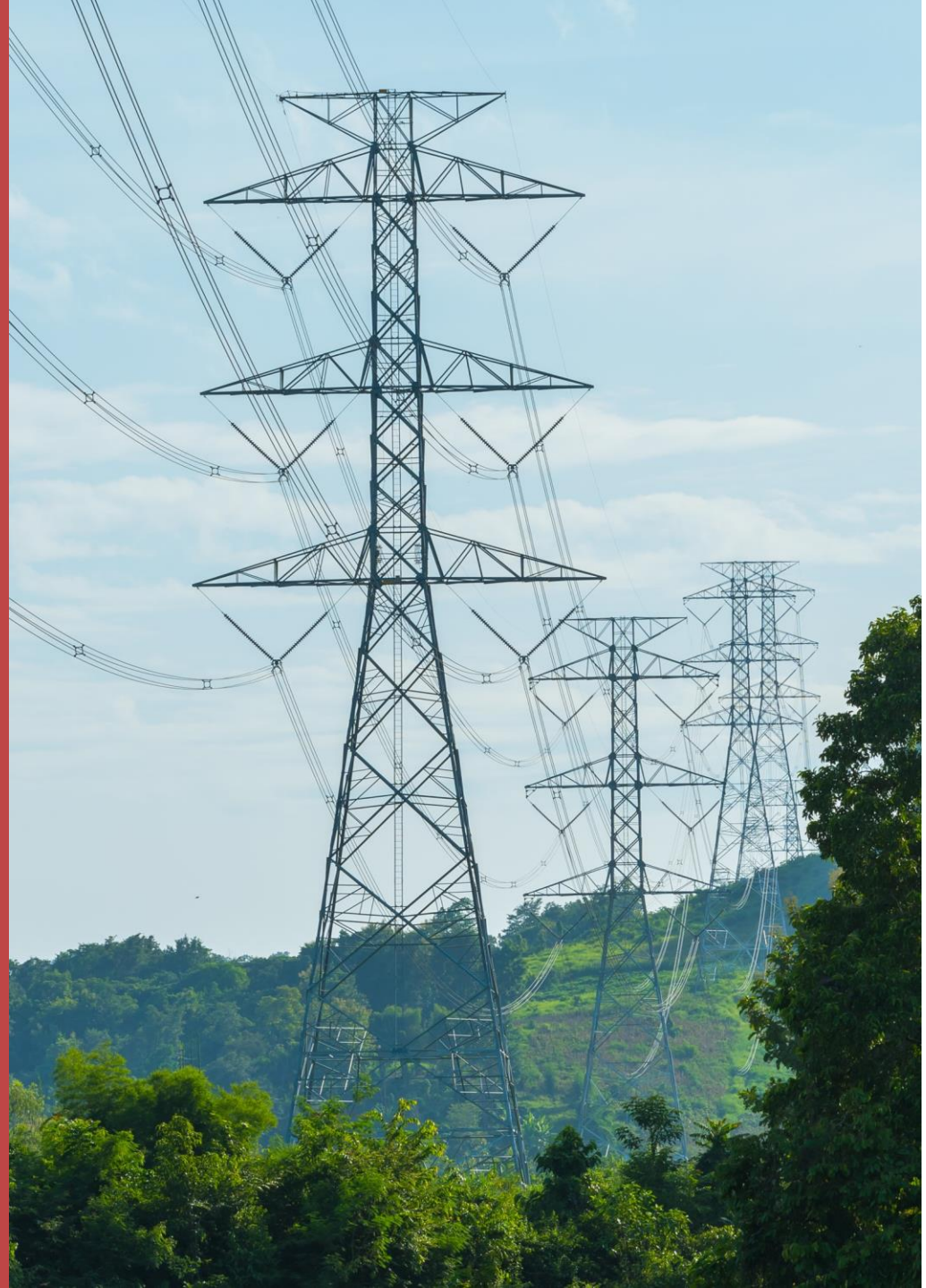
Email

Informal and Formal Comment Opportunities

Presentations

NERC

Discussion



FORWARD TOGETHER RELIABILITYFIRST

THANK YOU

Join us for our next Tech Talk – May 18th 2-3:30 pm EST

Webinar Link