WELCOME TO TECHNICAL TALK WITH RF

January 22, 2024

TECHNICAL TALK WITH RF

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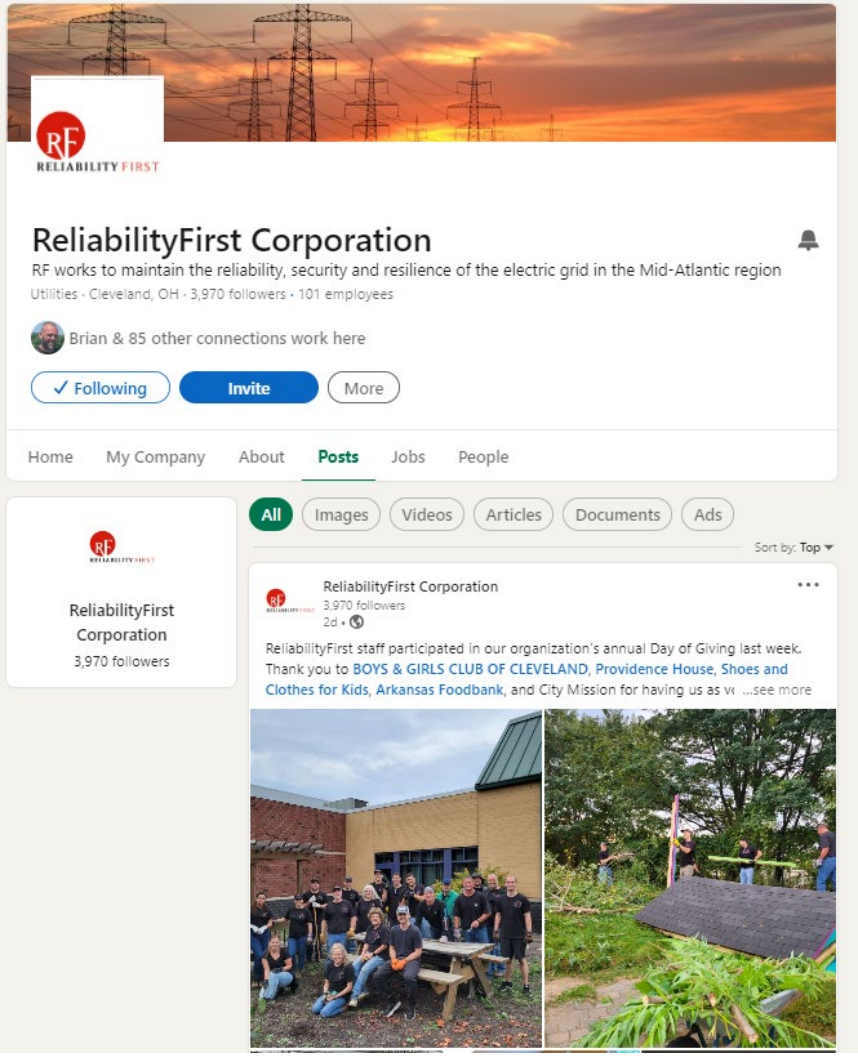


TECH TALK REMINDERS

Please keep your information up-to-date

- CORES, Generation Verification Forms, Entity Profile Questionnaires (quarterly)

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 quarterly newsletter:

- 2023 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 V7.0 is online, see website

WELCOME TO TECHNICAL TALK WITH RF

January 22, 2024

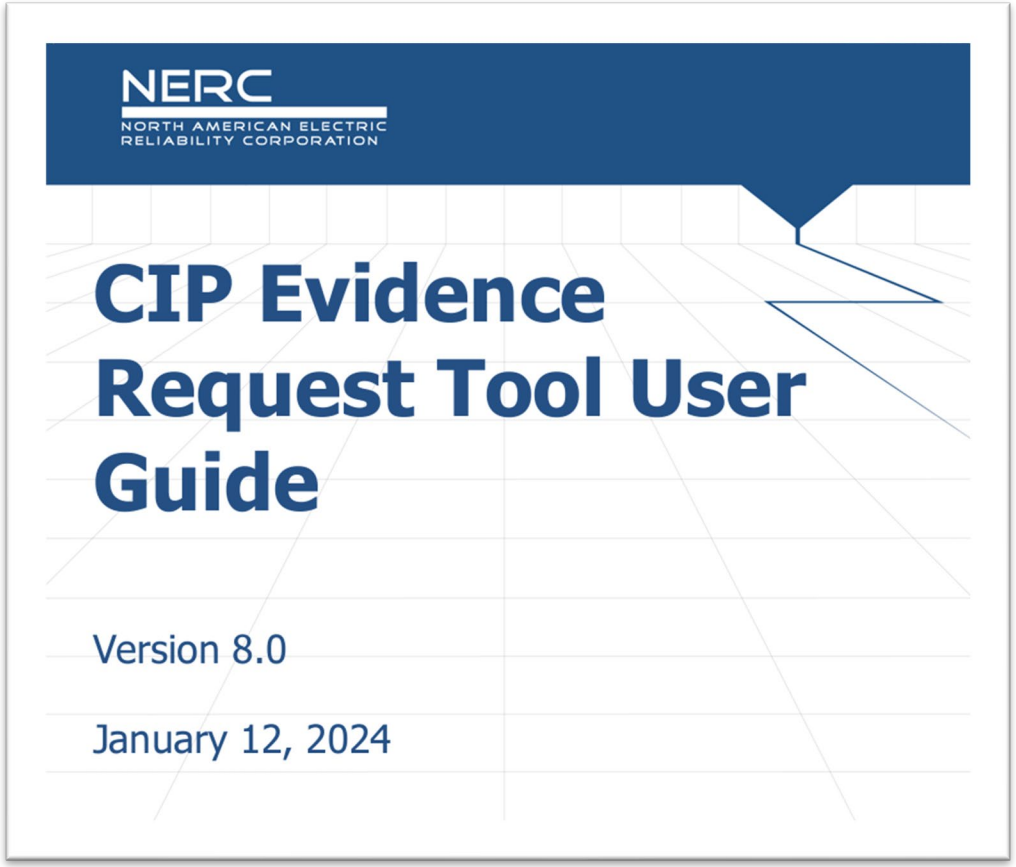
TECH TALK ANNOUNCEMENT

NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Posted ERO Enterprise Revised CIP Evidence Request Tool (ERT) v8.0

Click here for Version 8

NERC posted a revised ERO Enterprise CIP Evidence Request Tool (ERT), which is a common request for information tool for CIP Compliance monitoring engagements. The purpose of the CIP ERT is to help the ERO Enterprise with consistency and transparency in its audit approach. It will also help responsible entities (especially those that operate in multiple regions) fulfill these requests more efficiently, by understanding what types of evidence are useful in preparation for an audit.



TECH TALK ANNOUNCEMENT

NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

FERC, NERC, RE Joint Blackstart Availability Study in Texas

FERC, North American Electric Reliability Corporation (NERC) and Regional Entities released a Blackstart Study in December which recommends collaboration and planning for resilience. The study, prepared by staff from FERC, NERC and the Regional Entities, evaluated the availability of “blackstart” resources in the Texas Interconnection during extreme cold weather conditions.

The full study can be found here.

TECH TALK ANNOUNCEMENT

NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

NERC Announcement: Future of Electricity Demand and Energy Needs Rising Rapidly; Transmission Hurdles Impact Future Reliability

Click here to read: Announcement

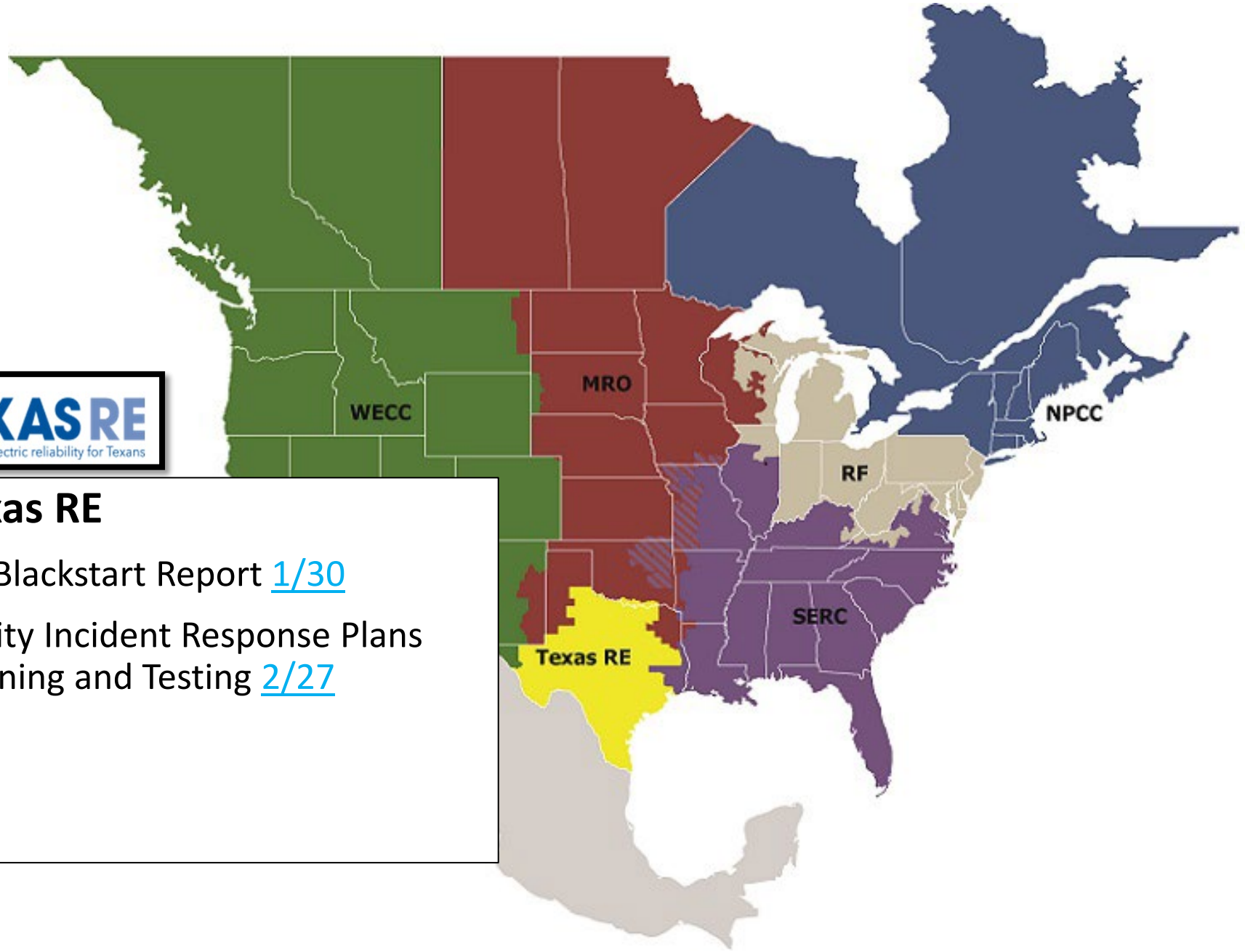
Sharp increases in peak demand forecasts and the potential for higher generator retirements are raising concerns for electric reliability over the next 10 years..

TECH TALK ANNOUNCEMENT

NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

NERC Releases Findings from Level 3 Alert on Cold Weather Preparedness for Extreme Cold Weather Events

NERC has posted a report summarizing the key findings from the Cold Weather Preparations for Extreme Weather Events III Level 3 Essential Action Alert, which was issued on May 15, 2023. The aggregated report is being posted for awareness to help industry better prepare for challenges due to extreme winter weather. .



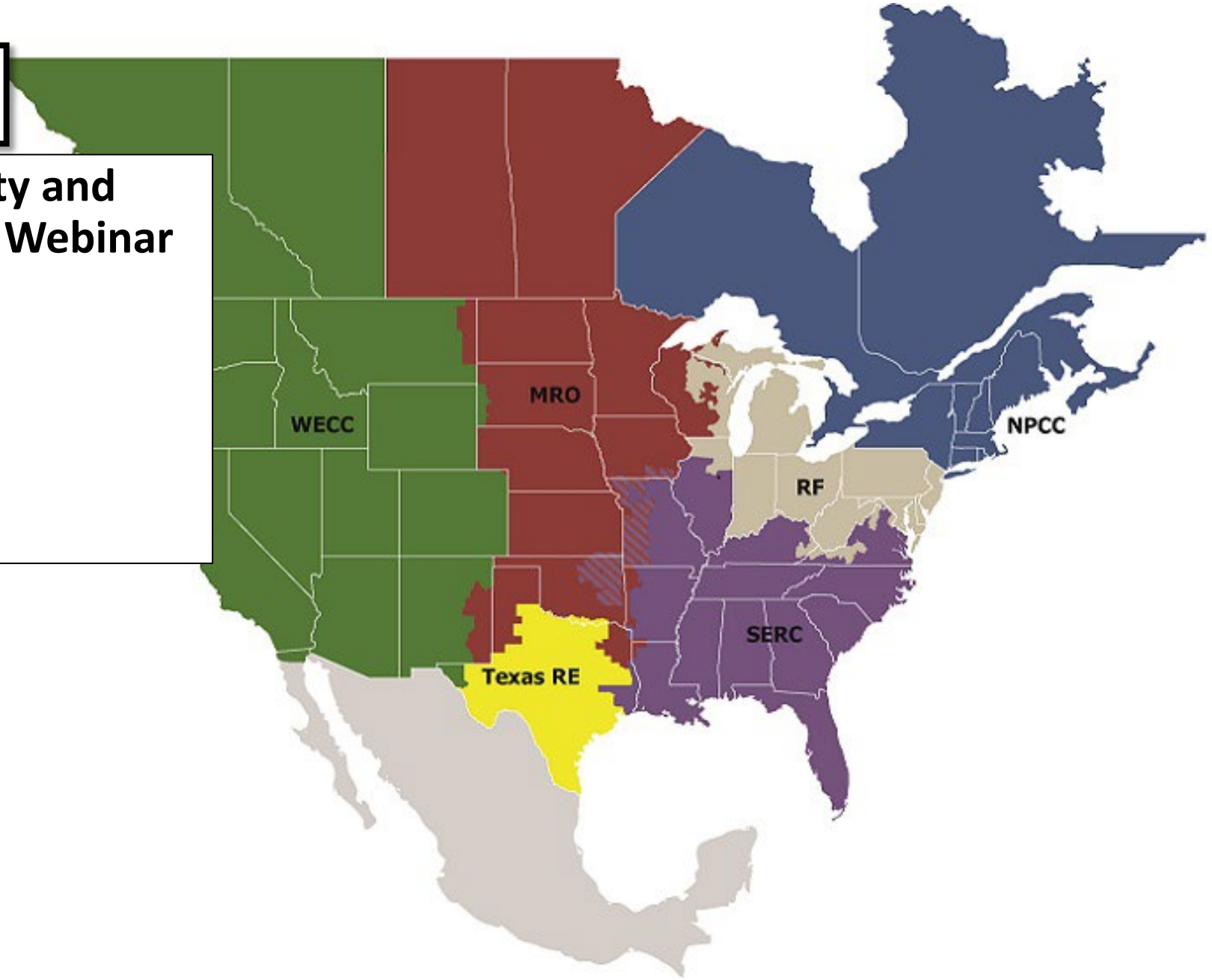
TEXAS RE
Ensuring electric reliability for Texans

Talk with Texas RE

- FERC-NERC Blackstart Report 1/30
- Cyber Security Incident Response Plans (CSIRP) Planning and Testing 2/27

Monthly Reliability and Security Monthly Webinar

- February 7th



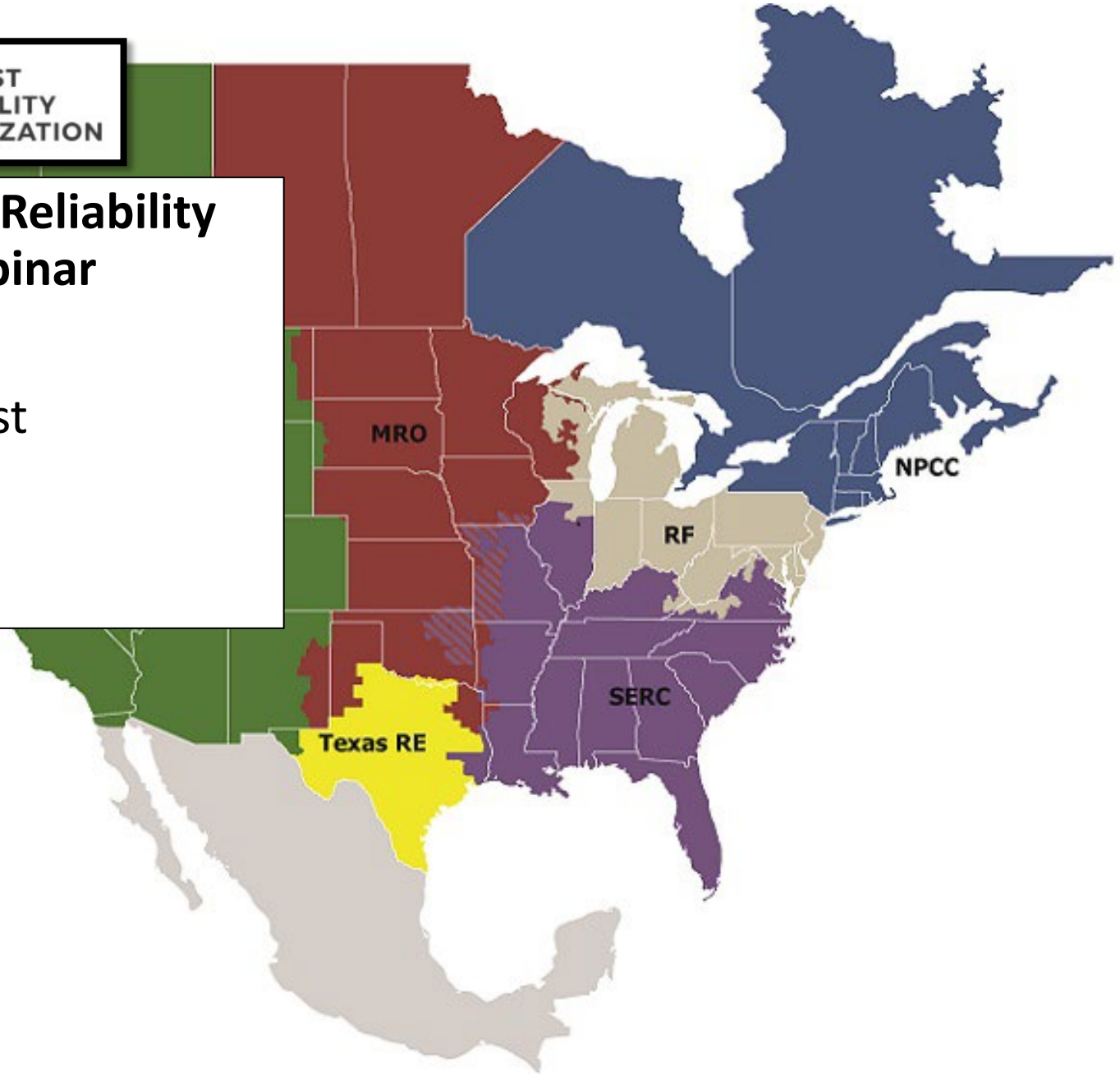
MIDWEST RELIABILITY ORGANIZATION

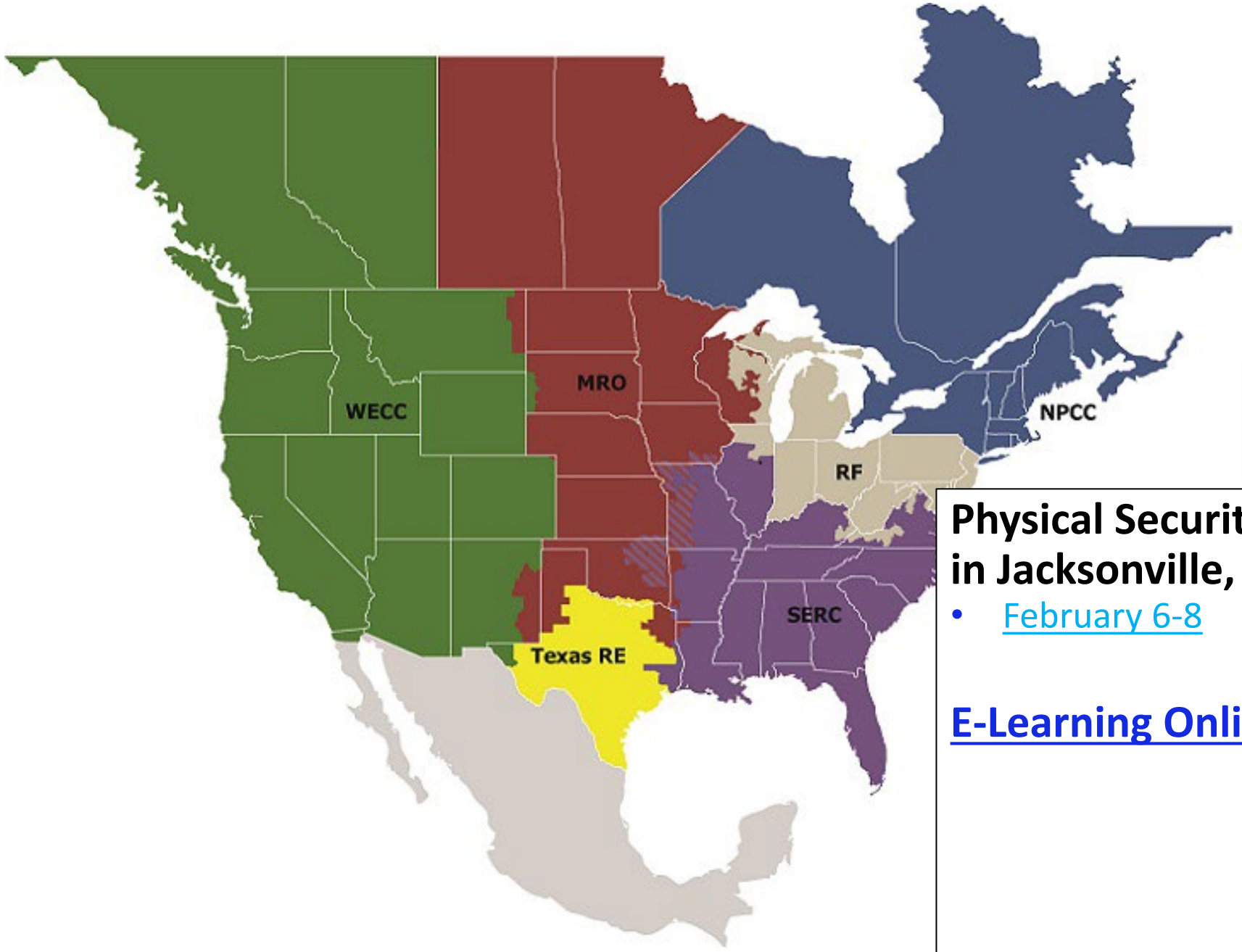
2023 Long-Term Reliability Assessment Webinar

- January 25th

Defending Against Ransomware

- February 29th



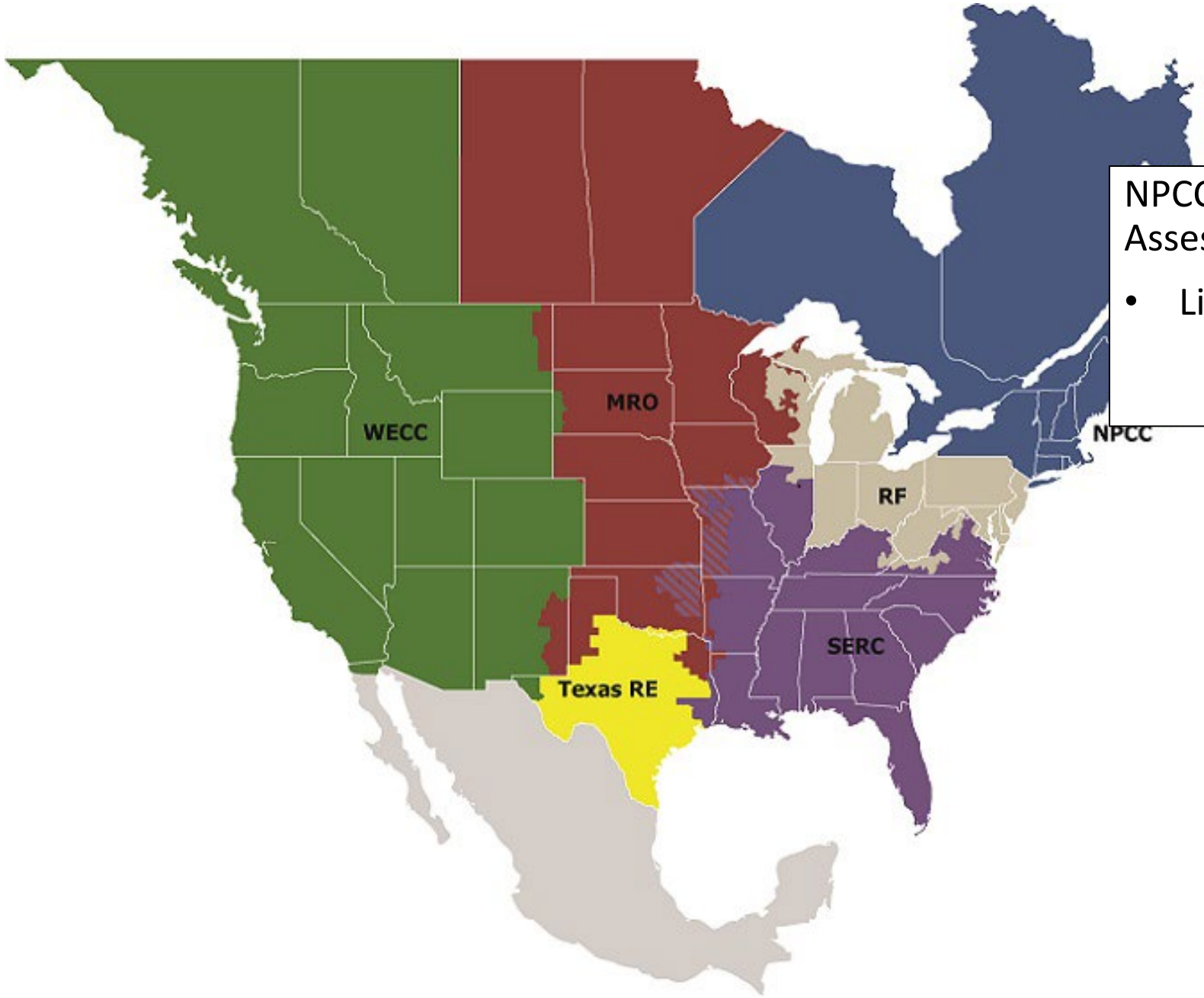


SERC Reliability Corporation

Physical Security Workshop in Jacksonville, FL

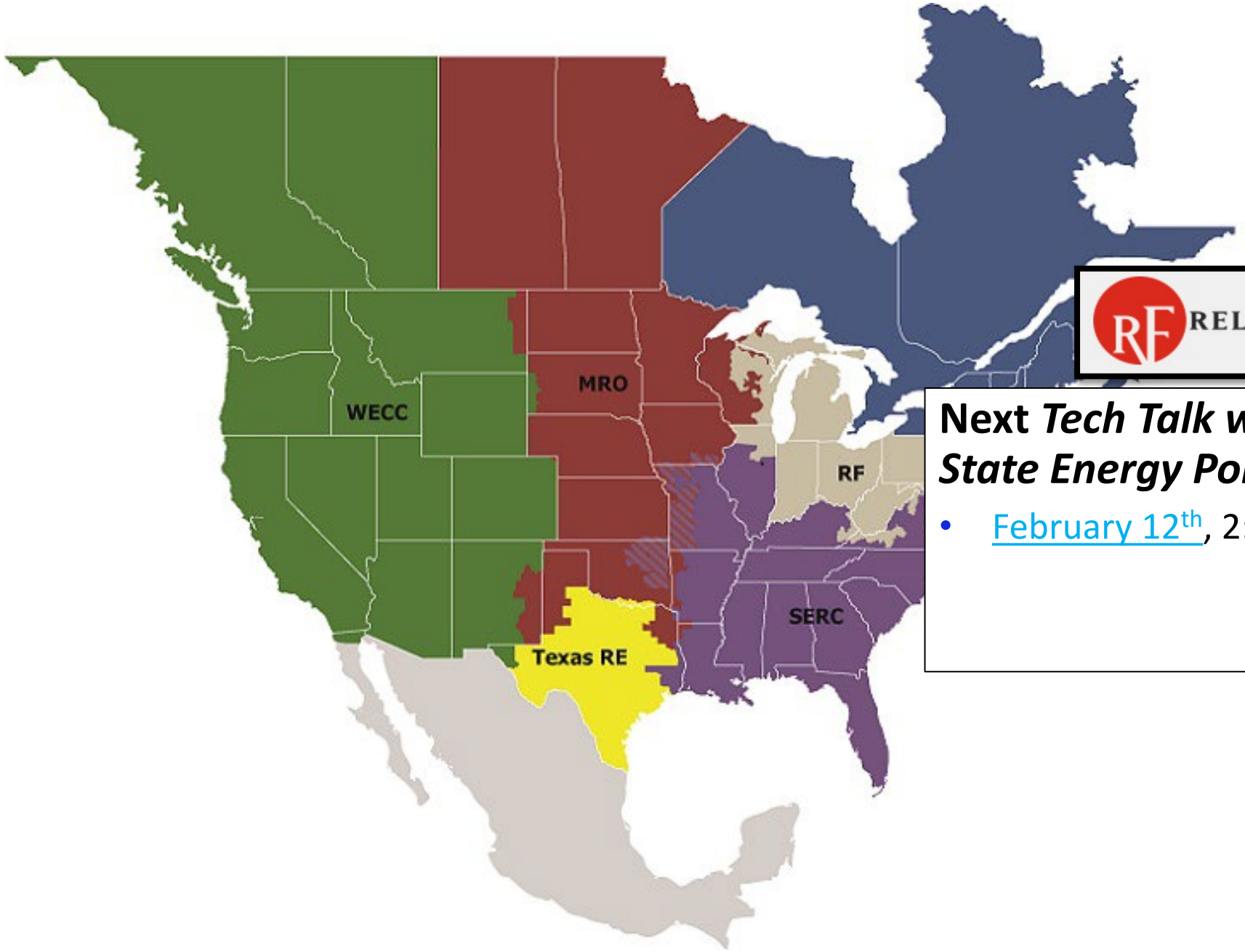
- February 6-8

E-Learning Online Courses



NPCC Winter Reliability Assessment

- Link to Assessment



RELIABILITYFIRST

Next *Tech Talk with RF – State Energy Policy Edition*

- February 12th, 2:00 – 3:30 PM

TECHNICAL TALK WITH RF

FORWARD TOGETHER RELIABILITYFIRST

Join the conversation at

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TECH TALK REMINDER

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

CLICK HERE

January 2024

MON
22

January 22, 2024 @ 2:00 pm - 3:30 pm

Technical Talk with RF

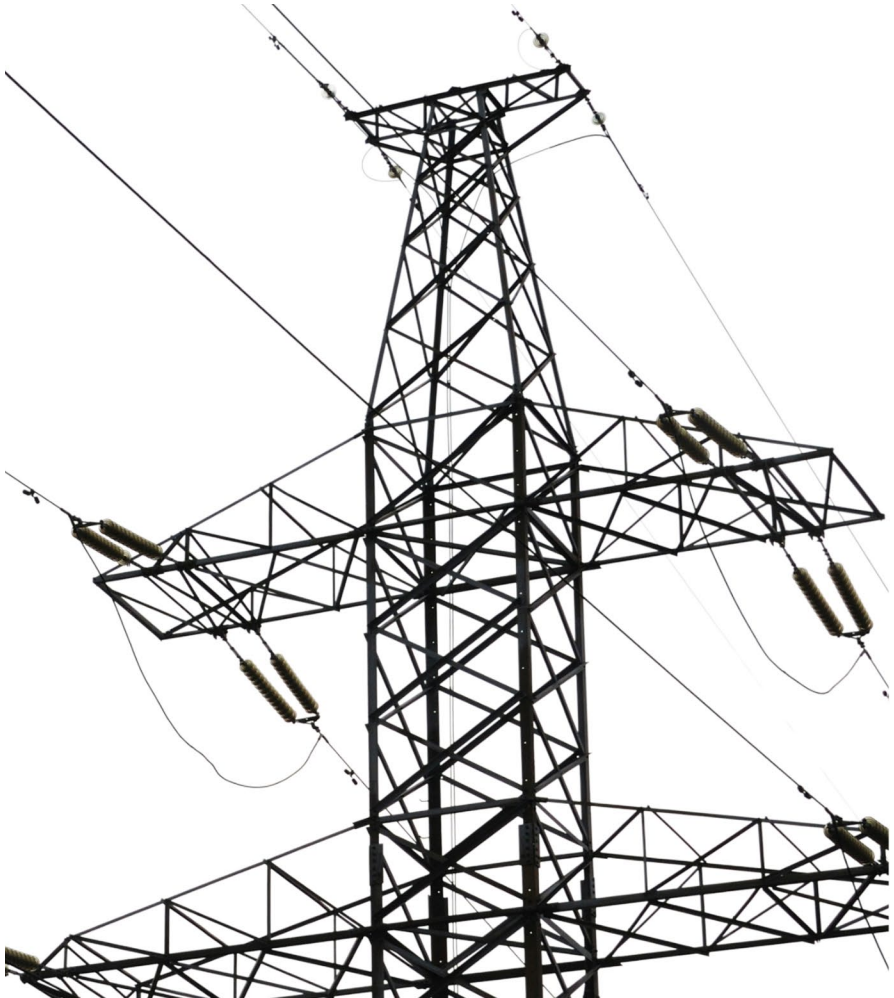
Virtual (Webex)

FORWARD TOGETHER RELIABILITYFIRST

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

ENFORCEMENT ACTIVITIES

- KRISTEN SENK, RELIABILITYFIRST DIRECTOR, LEGAL AND ENFORCEMENT

2023-2024 NERC AND RF REGIONAL OVERVIEW OF WINTER RELIABILITY AND LONG-TERM RELIABILITY ASSESSMENTS

- TIM FRYFOGLE, RELIABILITYFIRST PRINCIPAL ENGINEER

ENFORCEMENT ACTIVITIES

Kristen Senk, Director, Legal and Enforcement

January 22, 2024

RELIABILITY FIRST

FORWARD TOGETHER RELIABILITYFIRST

AGENDA

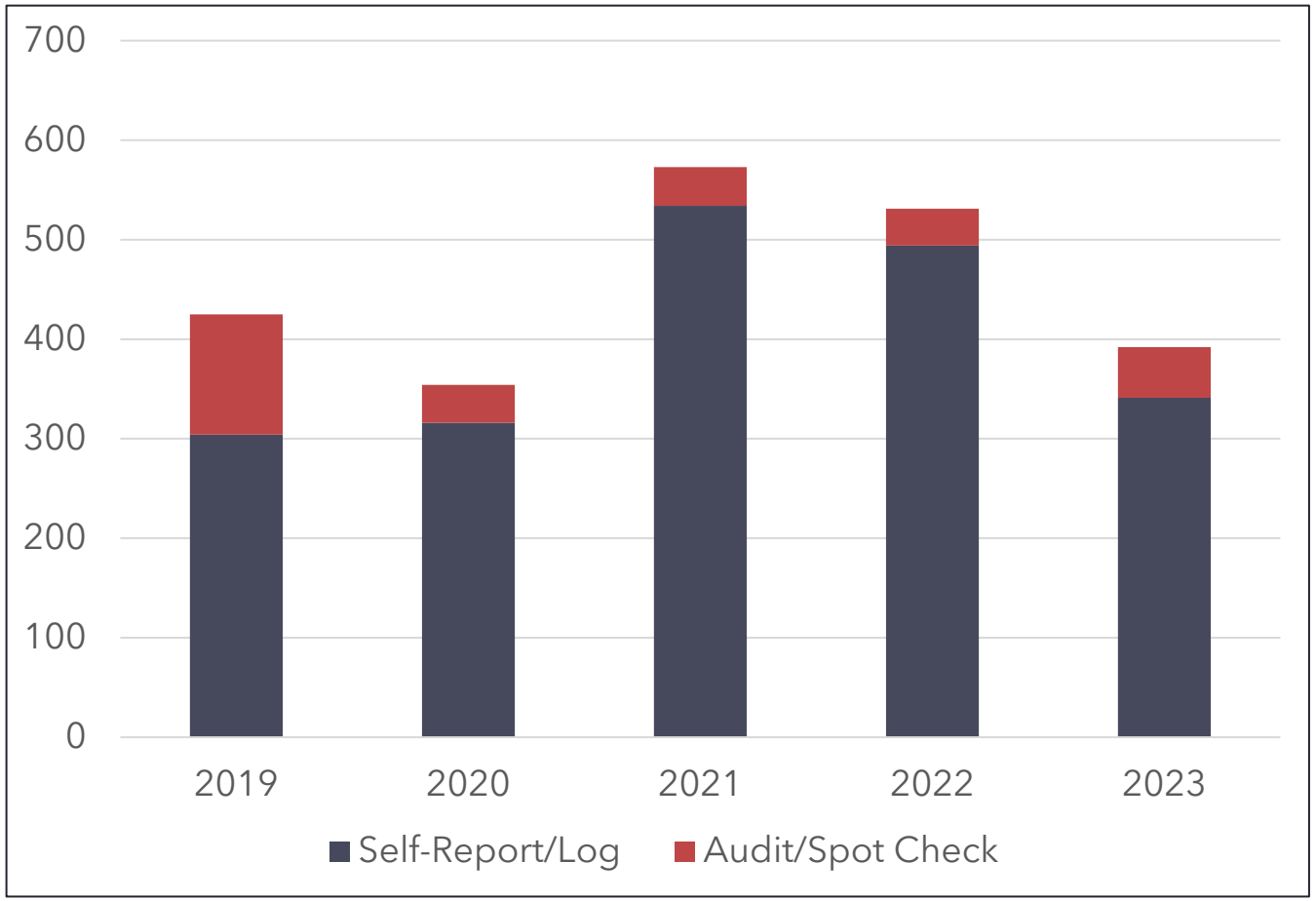
VIOLATION INTAKE

VIOLATION DISPOSITIONS

INVENTORY

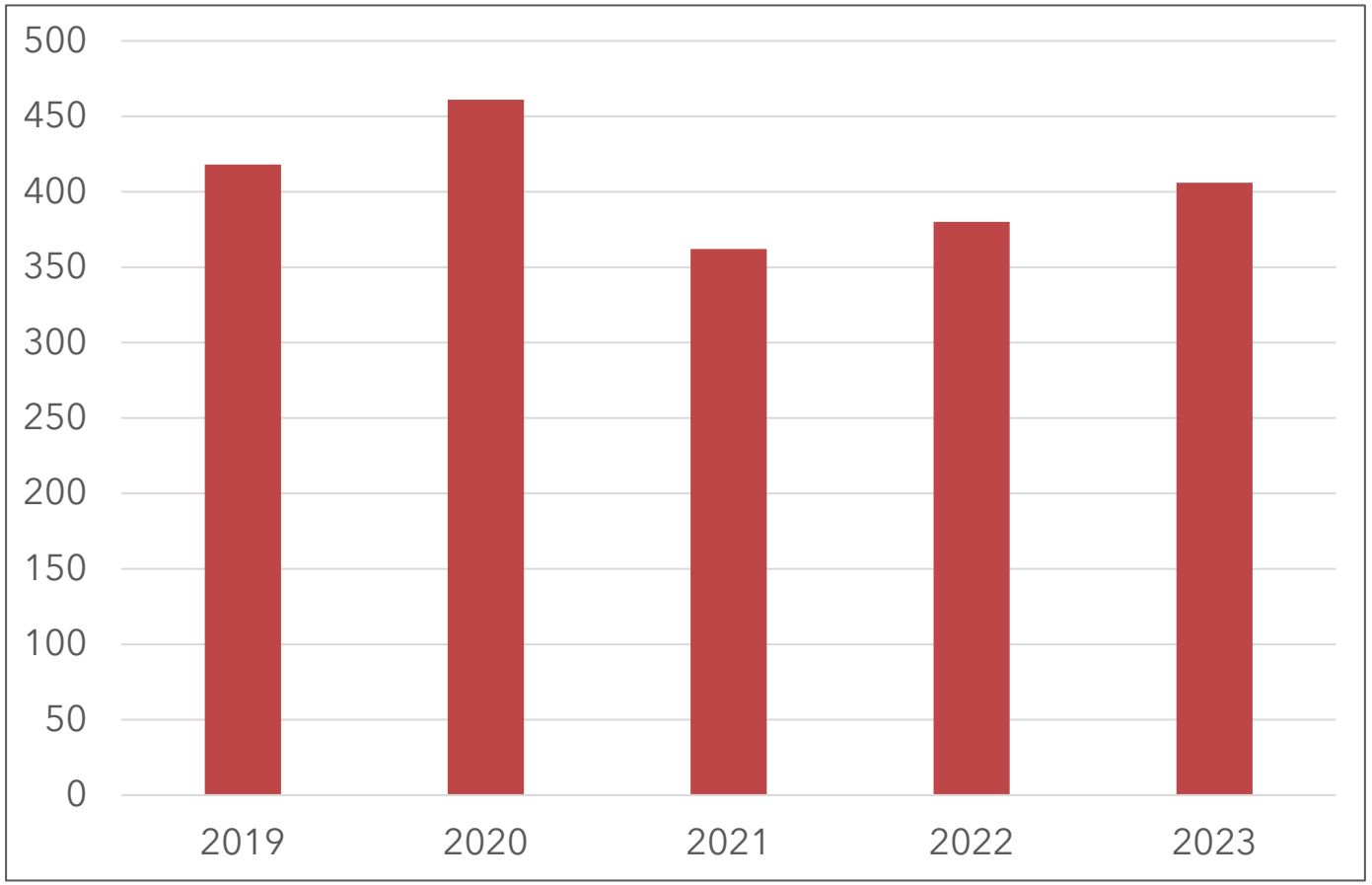
OTHER FOCUS AREAS

RF ANNUAL VIOLATION INTAKE



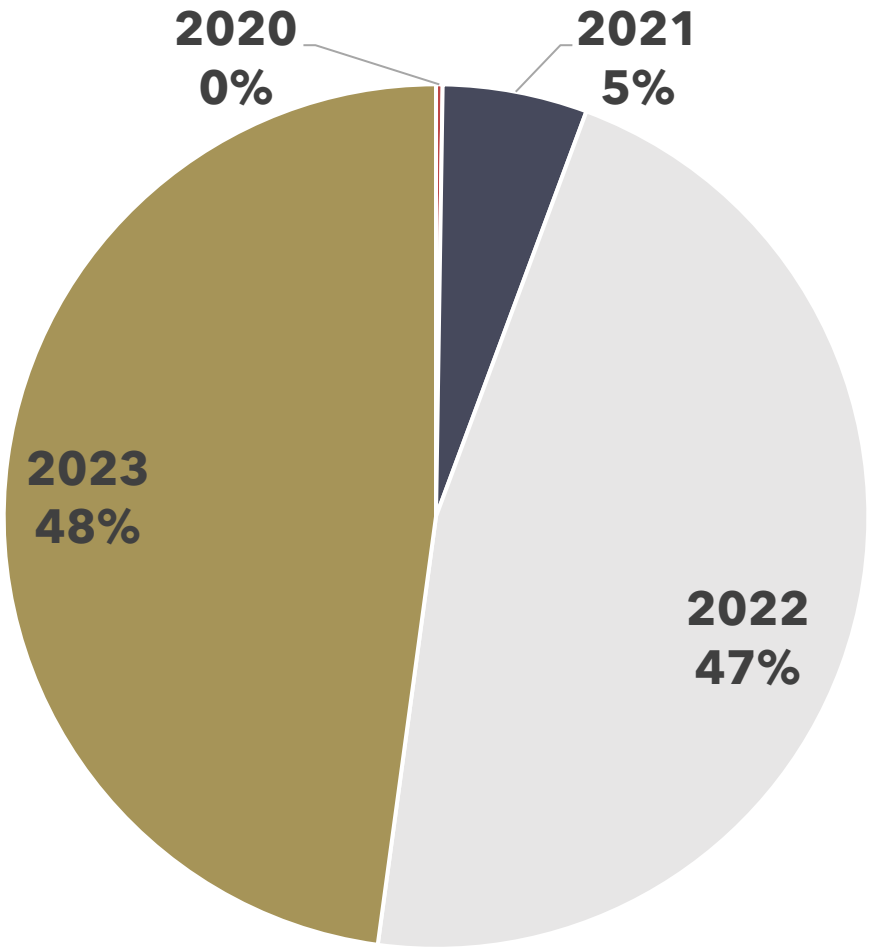
- Slight decrease in intake (closer to projected average); majority CIP

RF ANNUAL DISPOSITIONS



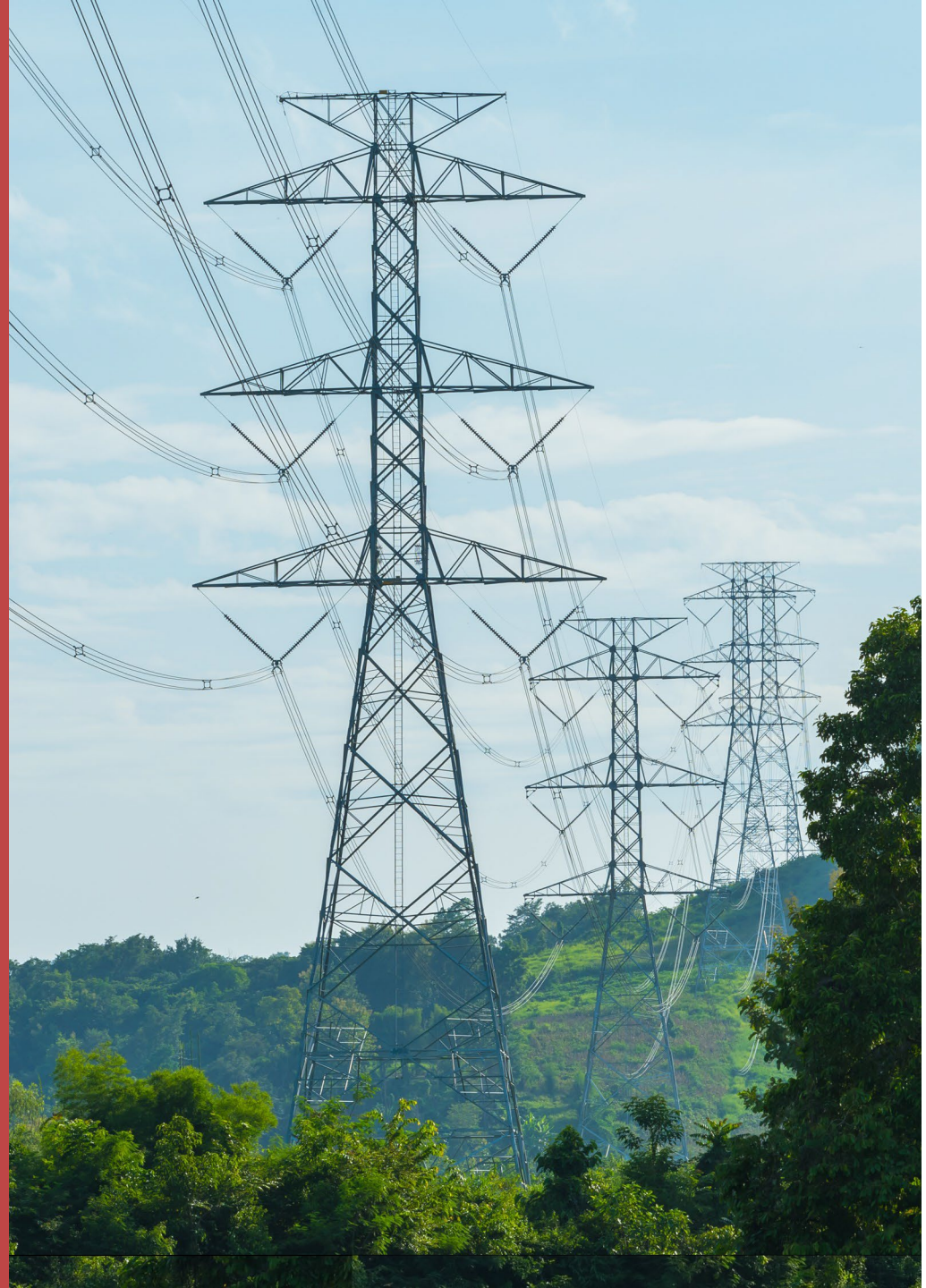
- Focus on aging inventory and higher risk issues
- High-risk areas: access provisioning/revocation, protecting BES Cyber System Information, managing electronic security perimeters, and protection system maintenance and testing

RF VIOLATION INVENTORY



Outreach

- Targeted outreach to multiple entities
- EBA conference panels
- Recurring newsletter articles
- RF Workshop
- ERO webinars



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QUESTIONS & ANSWERS

Kristen Senk

Kristen.senk@rfirst.org

NERC/RELIABILITYFIRST 2023-24 WINTER AND LONG-TERM RELIABILITY RESOURCE RISK ASSESSMENT

January 22, 2024

RELIABILITY FIRST

KEY RELIABILITY CONCERNS

- Pace and Complexity of Change
- Resource Adequacy
- Essential Reliability Services

Key Reliability
CONCERNS
Facing Grid Transformation

RESOURCE ADEQUACY CONCERNS

01

Reserve Margin Depletion

The System can be impacted beyond planned contingencies (such as during extreme weather or cyber security events)

- Actions taken can include transfers from neighboring RTOs, voluntary curtailments, rolling blackouts or load shed.

02

Analysis Complexity

Variable generation and weather dependency requires the study of weather patterns and a new, more probabilistic approach to planning

- New planning and forecasting approach will require new tools, methods and skillsets.

03

Electrification

Proliferation of electrification in the transportation and other sectors

- Electrification could mean a surge in demand, and when coupled with increased reliance on variable resources and natural gas, plus retirements, balancing and forecasting is becoming more and more complex.

NERC AND RELIABILITYFIRST WINTER RELIABILITY ASSESSMENT (WRA)

RELIABILITY FIRST

COMPARISON OF ASSESSMENTS

- RF analysis uses the same load and resources data gathered during the NERC Assessment and both are in alignment regarding conclusions.

- RF publishes the results of the assessment in the RF quarterly newsletter and posts it on our public website.

Differences in analysis:

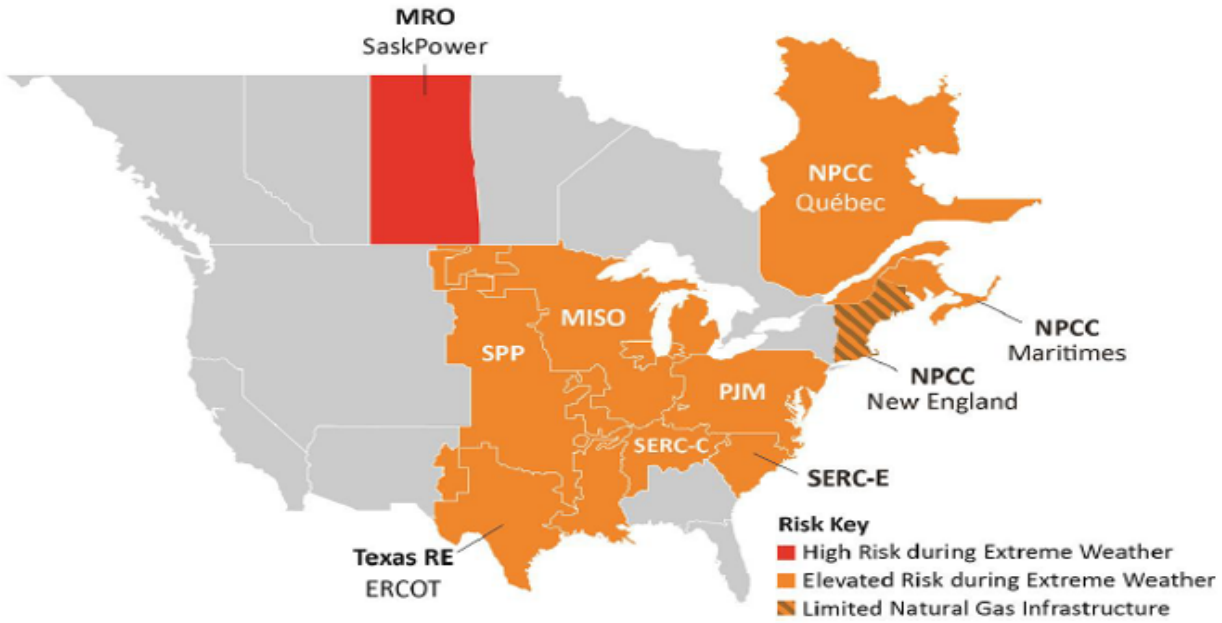
- RF uses actual historical Generator Availability Data System (GADS) data from a rolling five-year period between November through February.

- NERC polls the assessment area (i.e., PJM and MISO) and requests the average forced outages for December through February weekdays, over the past three years.

NERC WRA: 2023-2024 WRA

Midcontinent ISO (MISO): Recently, MISO implemented a seasonal resource adequacy construct that more effectively values risks and resource contributions that vary by time of year.

PJM: Forecasted peak demand has risen while resources have changed little in these areas since Winter Storm Elliot caused energy emergencies across the area in 2022.

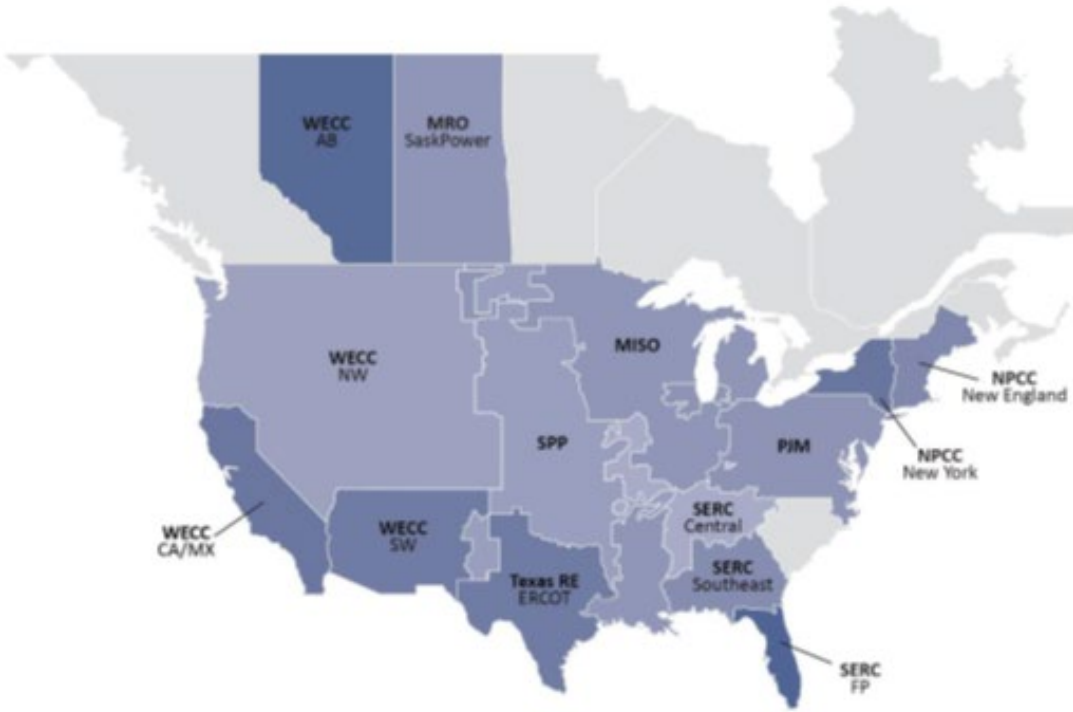


Winter Reliability Risk Area Summary

Seasonal Risk Assessment Summary	
High	Potential for insufficient operating reserves in normal peak conditions
Elevated	Potential for insufficient operating reserves in above-normal conditions
Low	Sufficient operating reserves expected

NERC WRA: NATURAL-GAS-FIRED GENERATION CAPACITY CONTRIBUTIONS

Wide-area extreme cold events increase the likelihood of natural gas production declines and result in increased demand for natural gas by local distribution company (LDC) customers and natural-gas-fired electric generators.



All other assessment areas have less than 35% natural gas fired generation contribution to winter resource mix.

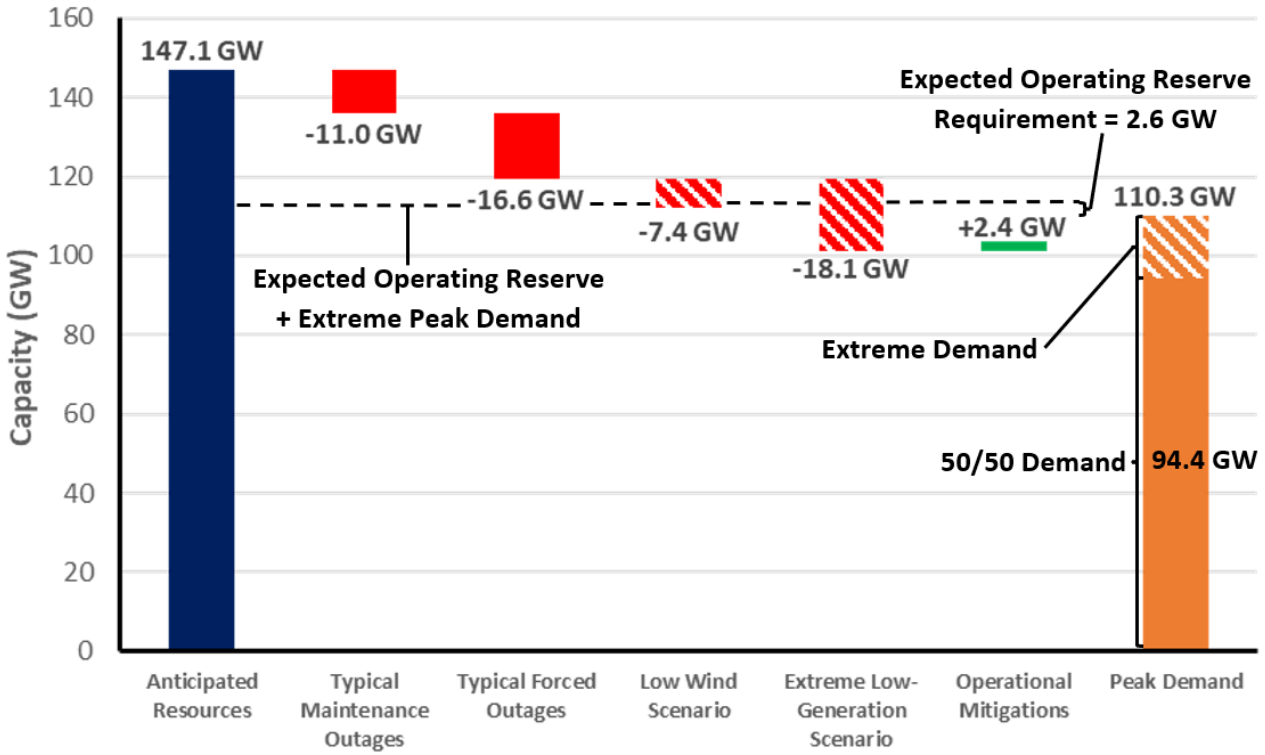
	Natural-Gas-Fired Generation	
	Peak Winter Capacity	Contribution to Total Winter Resource Mix
MISO	67.5 GW	46%
MRO-SaskPower	2.1 GW	46%
NPCC-New England	17.3 GW	54%
NPCC-New York	24.5 GW	66%
PJM	84.9 GW	47%
SERC-Central	22.7 GW	44%
SERC-Florida Peninsula	50.6 GW	79%
SERC-Southeast	31.5 GW	51%
SPP	27.4 GW	41%
Texas RE-ERCOT	54.2 GW	62%
WECC-AB	11.4 GW	75%
WECC-CA/MX	39.9 GW	65%
WECC-NW	31.0 GW	39%
WECC-SW	18.2 GW	62%

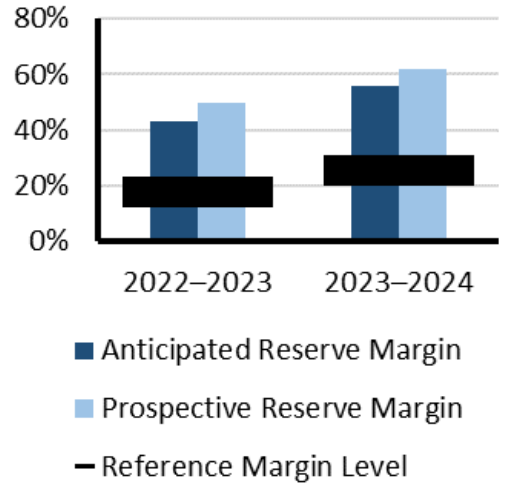
NERC WRA: MISO ASSESSMENT

ELEVATED RISK

Some risk has been identified for this upcoming winter season in a high generation outage and high winter load scenario. Reliability is expected to be maintained using:

- load modifying resources
- non-firm energy transfers into the system
- energy-only resources
- internal transfers





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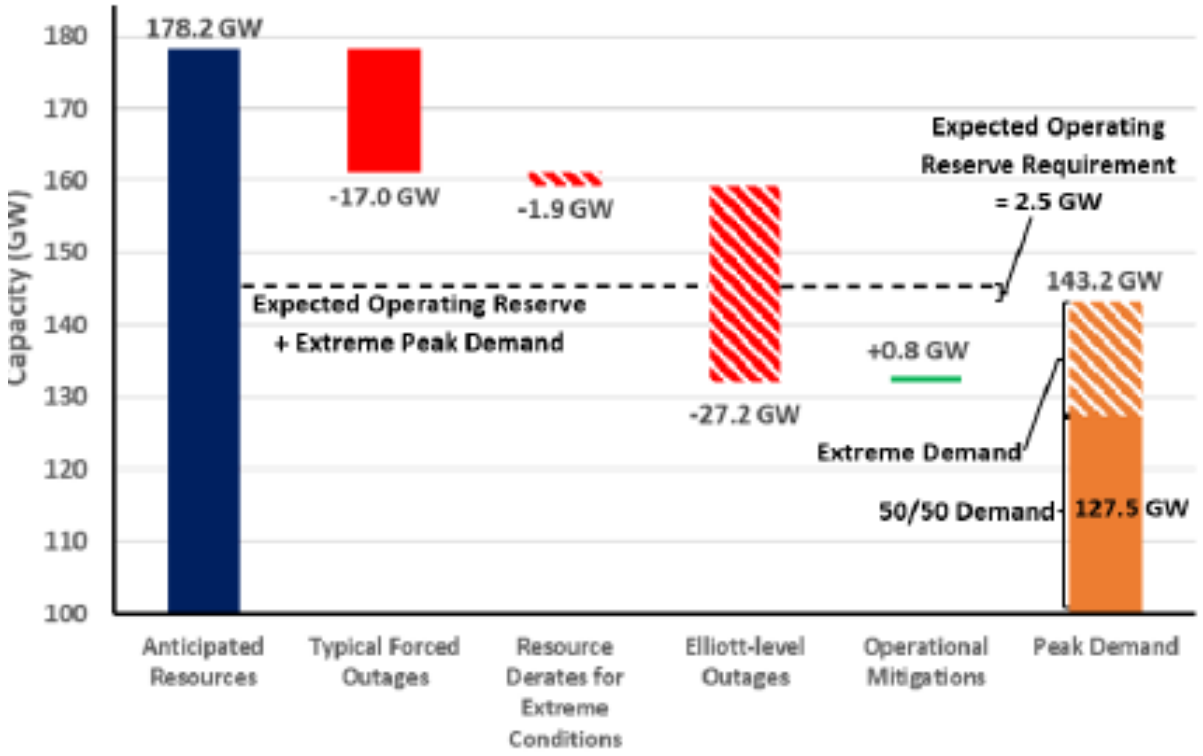
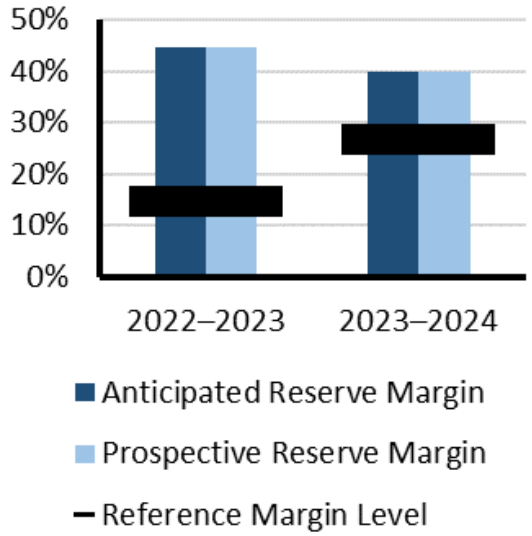
NERC WRA: PJM ASSESSMENT

ELEVATED RISK

PJM does not expect to encounter resource problems for anticipated conditions over the 2023–2024 winter peak season.

A severe cold weather event that extends to the South can lead to energy emergencies as operators face sharp increases in generator forced outages and electricity demand.





RF WRA: RESOURCE ADEQUACY ANALYSIS

PJM Capacity and Reserves	
Net Capacity Resources	178,188 MW
Projected Peak Reserves	50,710 MW
Net Internal Demand (NID)	127,478 MW
Planning reserves margin	39.8%
Planning reserve requirement	27%

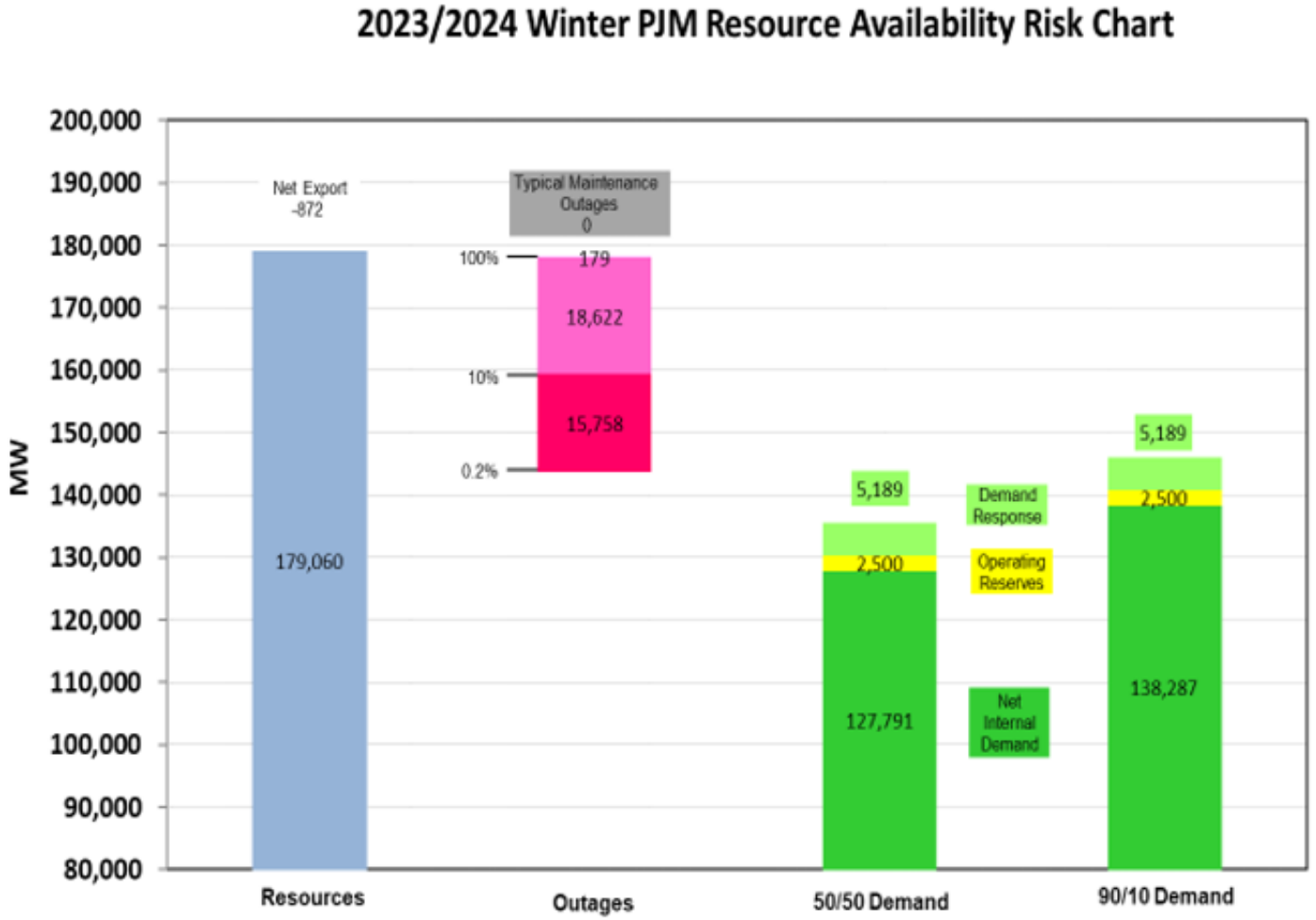
MISO Capacity and Reserves	
Net Capacity Resources	147,097 MW
Projected Peak Reserves	52,703 MW
Net Internal Demand (NID)	94,394 MW
Planning reserves margin	55.8%
Planning reserve requirement	25.5%

RF Footprint Resources	
Net Capacity Resources	195,083 MW
Projected Peak Reserves	60,718 MW
Net Internal Demand (NID)	134,365 MW
Total Internal Demand (TID)	141,738 MW

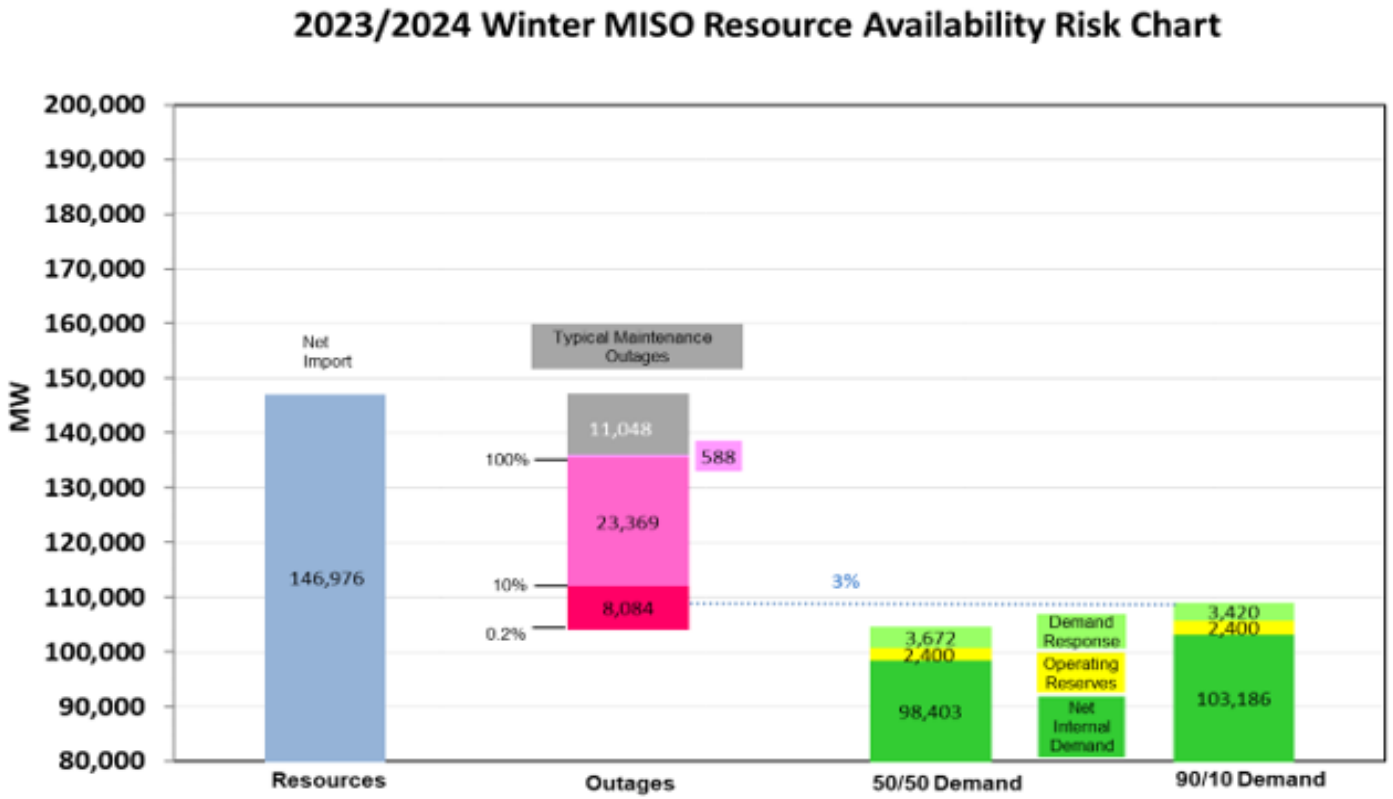
Since PJM and MISO are projected to have adequate resources to satisfy their respective forecasted reserve margin requirements, the RF region is projected to have sufficient resources for the 2023-24 winter period.

RF WRA: PJM RANDOM GENERATOR OUTAGE RISK ANALYSIS

PJM is projected to have adequate capacity to meet expected and 90/10 demand scenarios based on historical GADS outages.



RF WRA: MISO RANDOM GENERATOR OUTAGE RISK ANALYSIS



During normal operating conditions there will be minimal probability that there will be an amount of outages that will require Demand Response resources to be utilized.

The top of the 90/10 demand obligation with the operating reserves has a 3% probability that Demand Response will be required during high demand and high outages.

WINTER RESOURCE ADEQUACY – SUMMARY FOR NERC AND RF

PJM is projected to have adequate resources to satisfy their respective forecasted reserve margin requirement and has an **elevated** concern during extreme demand (90/10) based on our random generator outage risk analysis.

MISO is projected to have adequate resources to satisfy their respective forecasted reserve margin requirement and has an **elevated** concern during an extreme demand (90/10) based on our random generator outage risk analysis.

- MISO implemented a seasonal resource adequacy construct that more effectively values risks and resource contributions that vary by time of year.

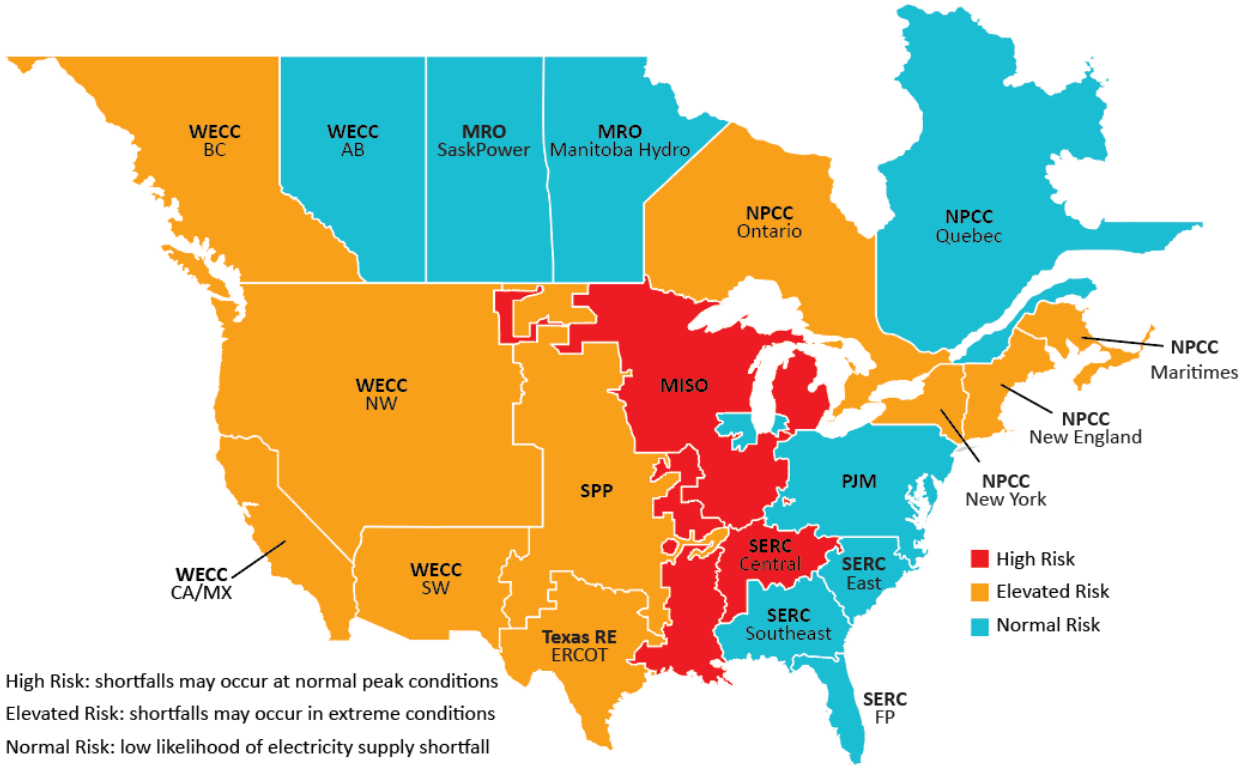
NERC AND RELIABILITYFIRST LONG-TERM RELIABILITY ASSESSMENT (LTRA)

RELIABILITY FIRST

NERC LTRA: RISK AREA SUMMARY 2024–2028

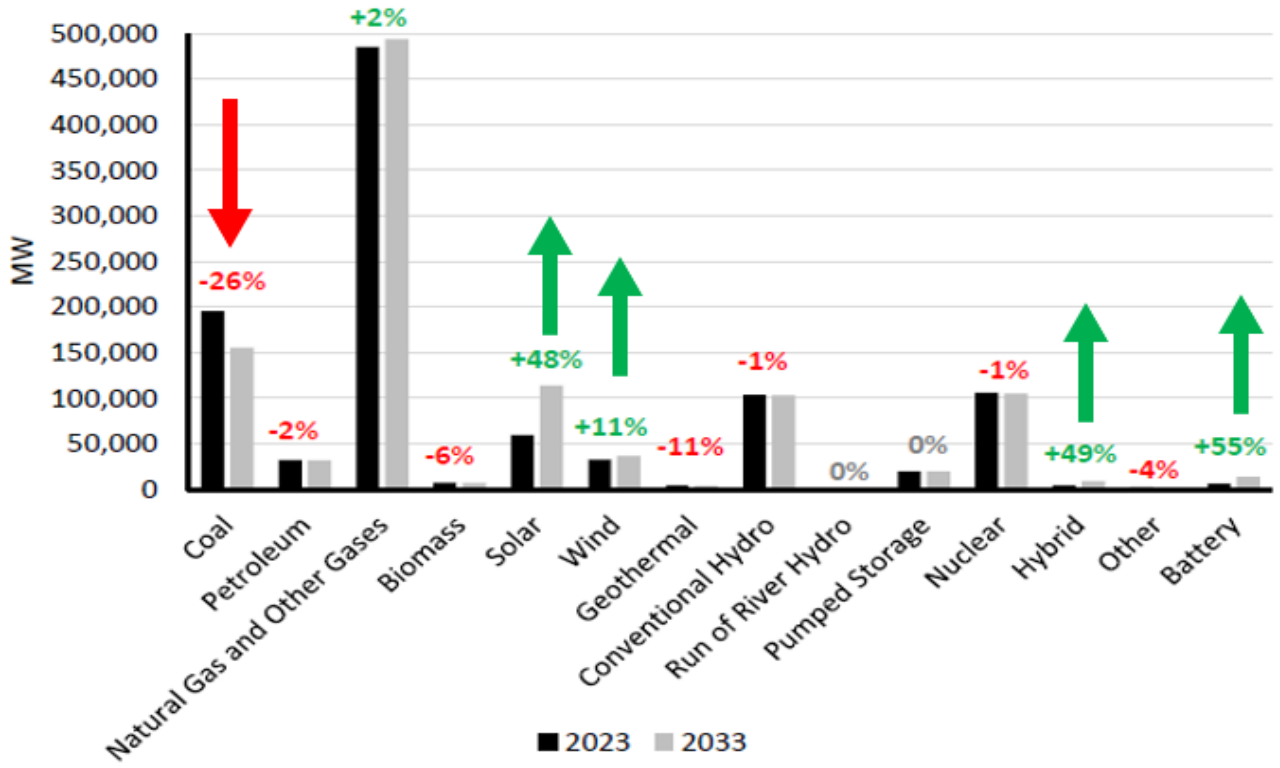
MISO's summer anticipated reserve margin (ARM) is projected to be above Reference Margin Levels (RML) through the 2027 summer.

Beginning in 2028, MISO is projected to have a 4.7 GW shortfall if expected generator retirements occur despite the addition of new resources that total over 12 GW.



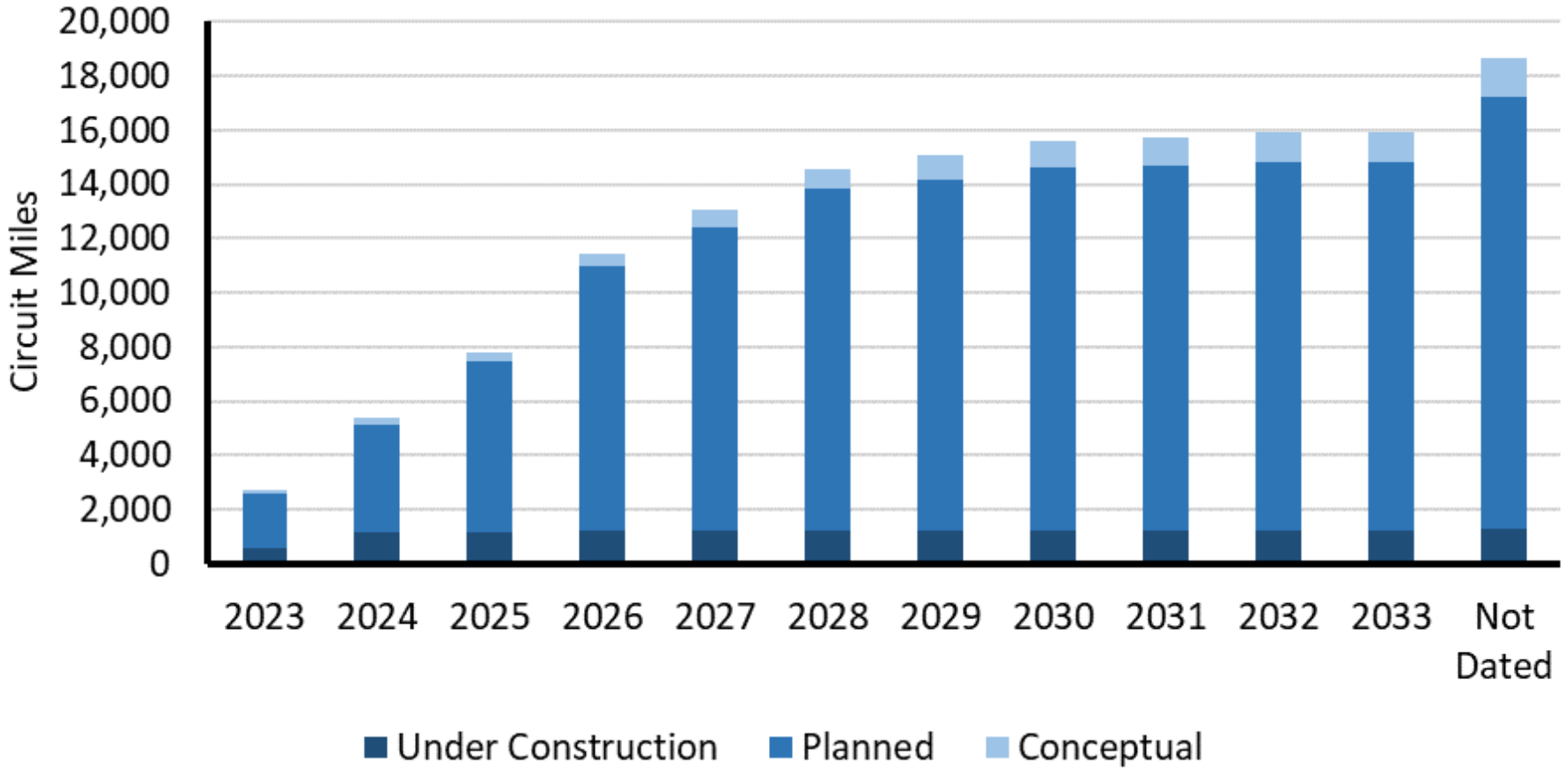
NERC LTRA: 2023 VS. 2033 EXISTING ON-PEAK CAPACITY BY FUEL TYPE WITH TIER 1 RESOURCES

Wind, solar PV, and hybrid generation are projected to be the primary additions to the resource mix over this 10-year assessment period, leading the continued energy transition as older thermal generators retire.



NERC LTRA: FUTURE TRANSMISSION CIRCUIT MILES >100 KV

The amount of transmission projects reported to NERC as under construction or in planning for construction over the next 10 years has increased, indicating an overall increase in transmission development.



RF LTRA: FORECASTED PEAK DEMAND DATA

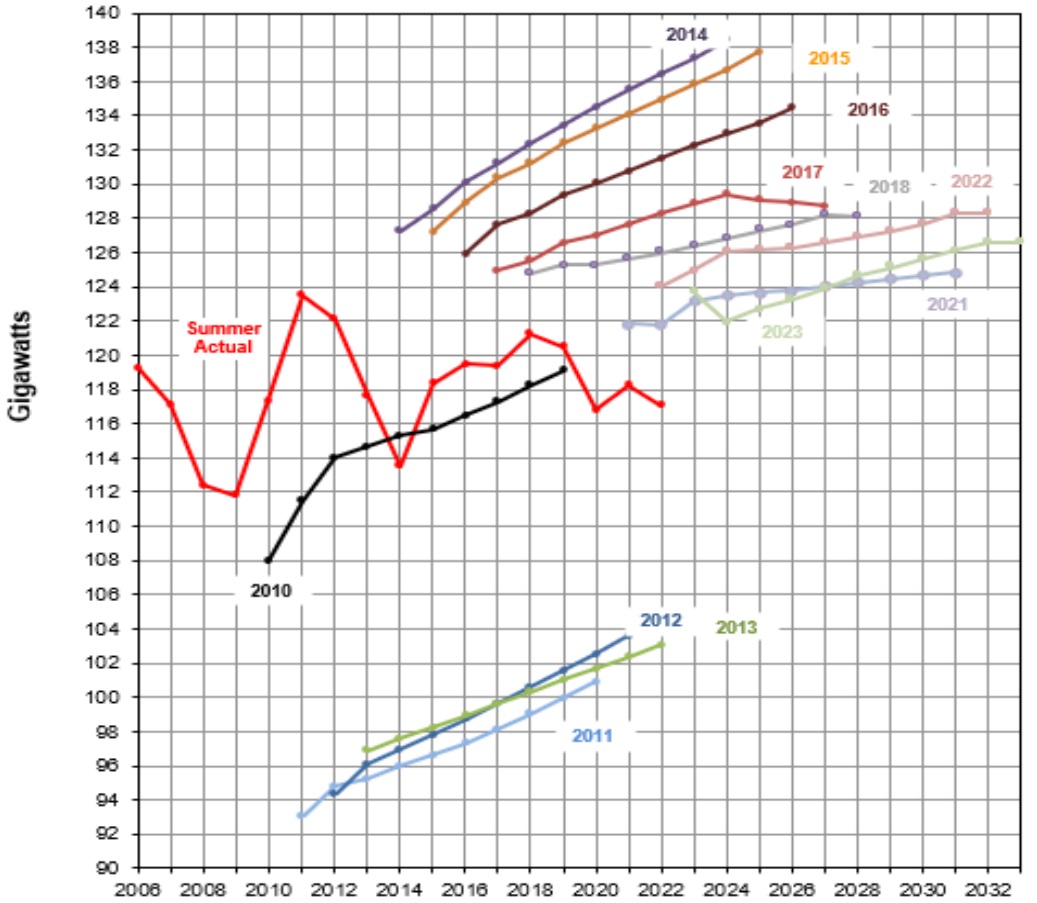
PJM RTO Peak Demand Data

Actual 2006 - 2022
Select 10 Year TID Forecasts Through 2033

2011 Includes the expansion of the PJM RTO footprint with First Energy (ATSI) and Duke Energy Ohio and Kentucky
2013 Includes the expansion of the PJM RTO footprint with East Kentucky Power Cooperative
2019 Includes the expansion of the PJM RTO footprint with Ohio Valley Electric Cooperative

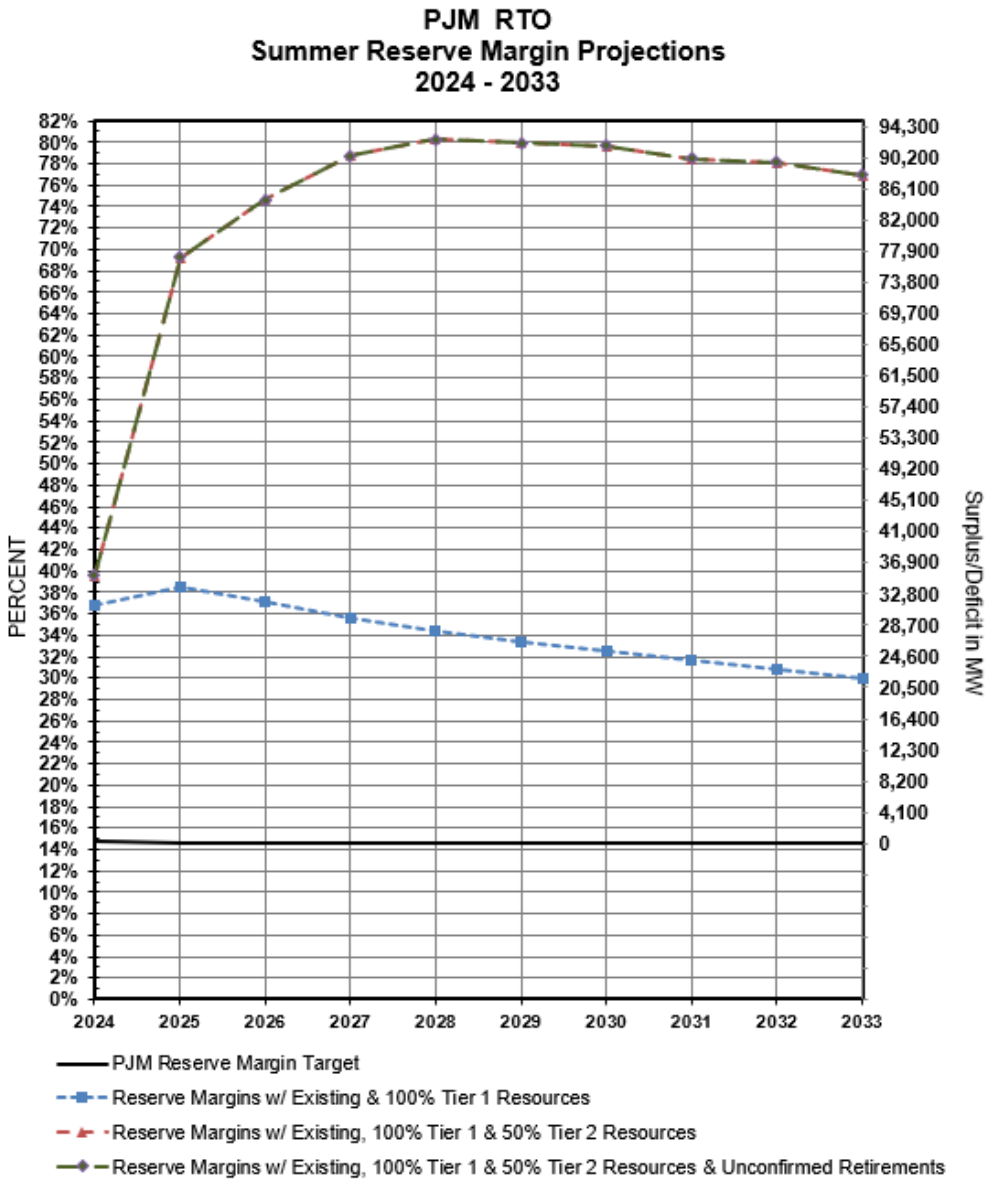
MISO RTO Peak Demand Data

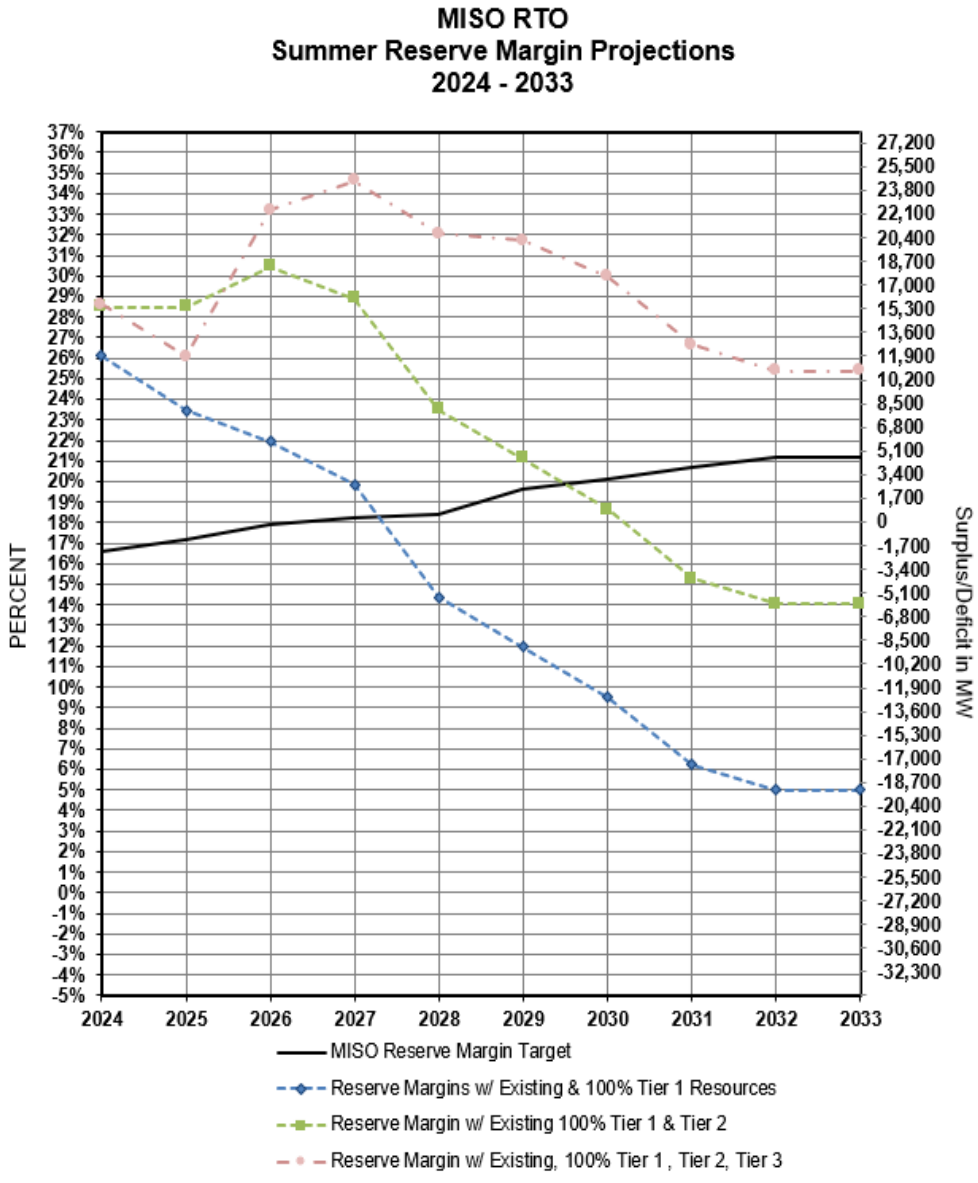
Actual 2006 - 2022
Select 10 Year TID Forecasts Through 2033



2011 Includes the reduction of the MISO RTO footprint with First Energy (ATSI), Cleveland Public Power and Duke Energy Ohio and Kentucky moving to PJM RTO
2014 Includes the expansion of MISO RTO footprint with MISO South

RF LTRA: RESERVE MARGIN





MISO RESERVE MARGIN

MISO projects a regional deficit of 4,729 MW in 2028 even with adding 12 GW of new generation with signed interconnection agreements

These results are driven by several factors:

- Drivers in the increase in MISO Reserve Margin requirement include electric demand, particularly the demand in electric vehicles and the increased penetration in variable resources.
- More additions from the planning queue are not likely to be completed in sufficient quantity to make up for the capacity shortfall.

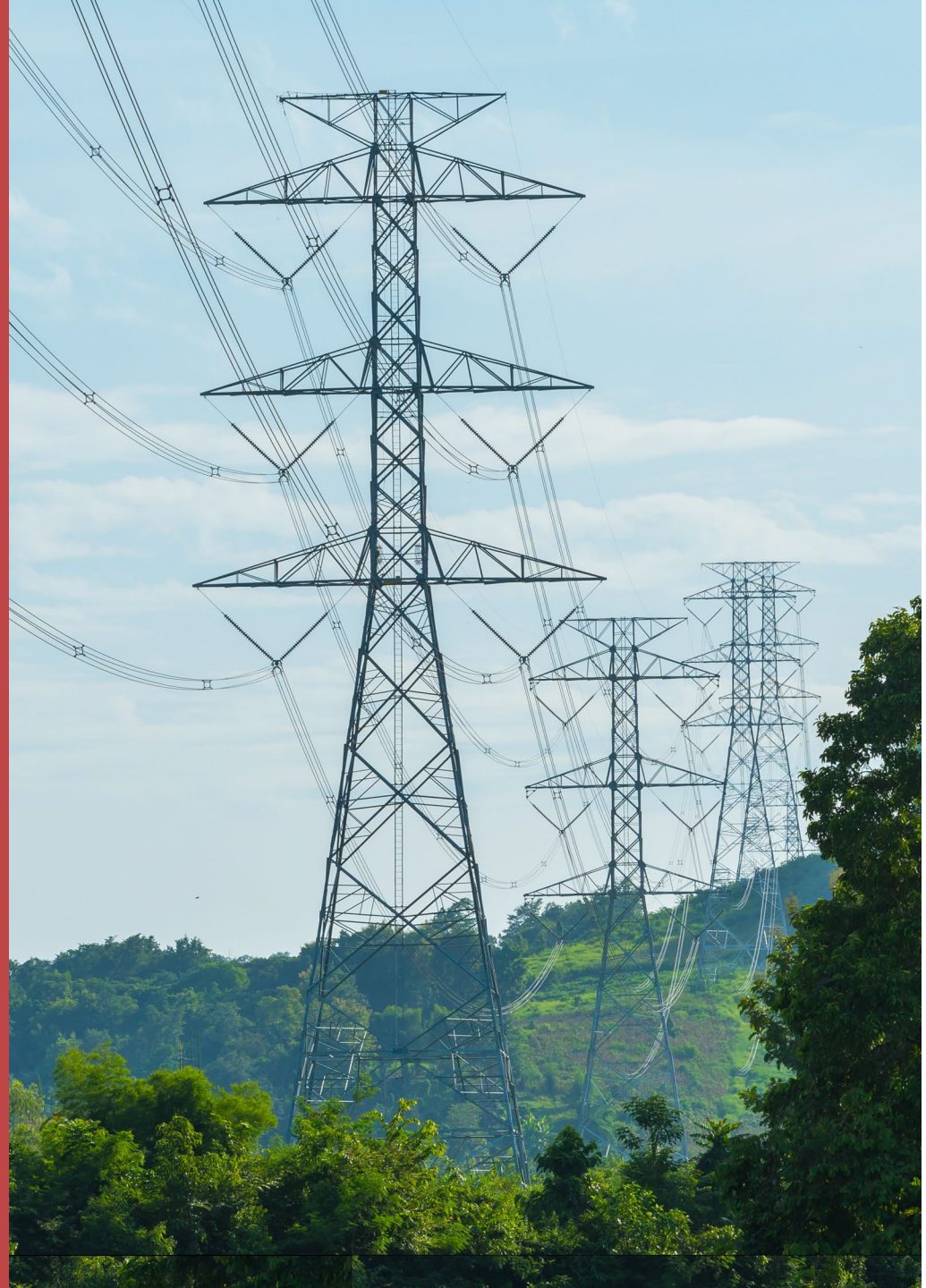
RF LTRA SUMMARY

PJM

- Projected to have a 0.81% load growth rate over the next 10 years
- Meet target reserve margin requirement of approximately 15%

MISO

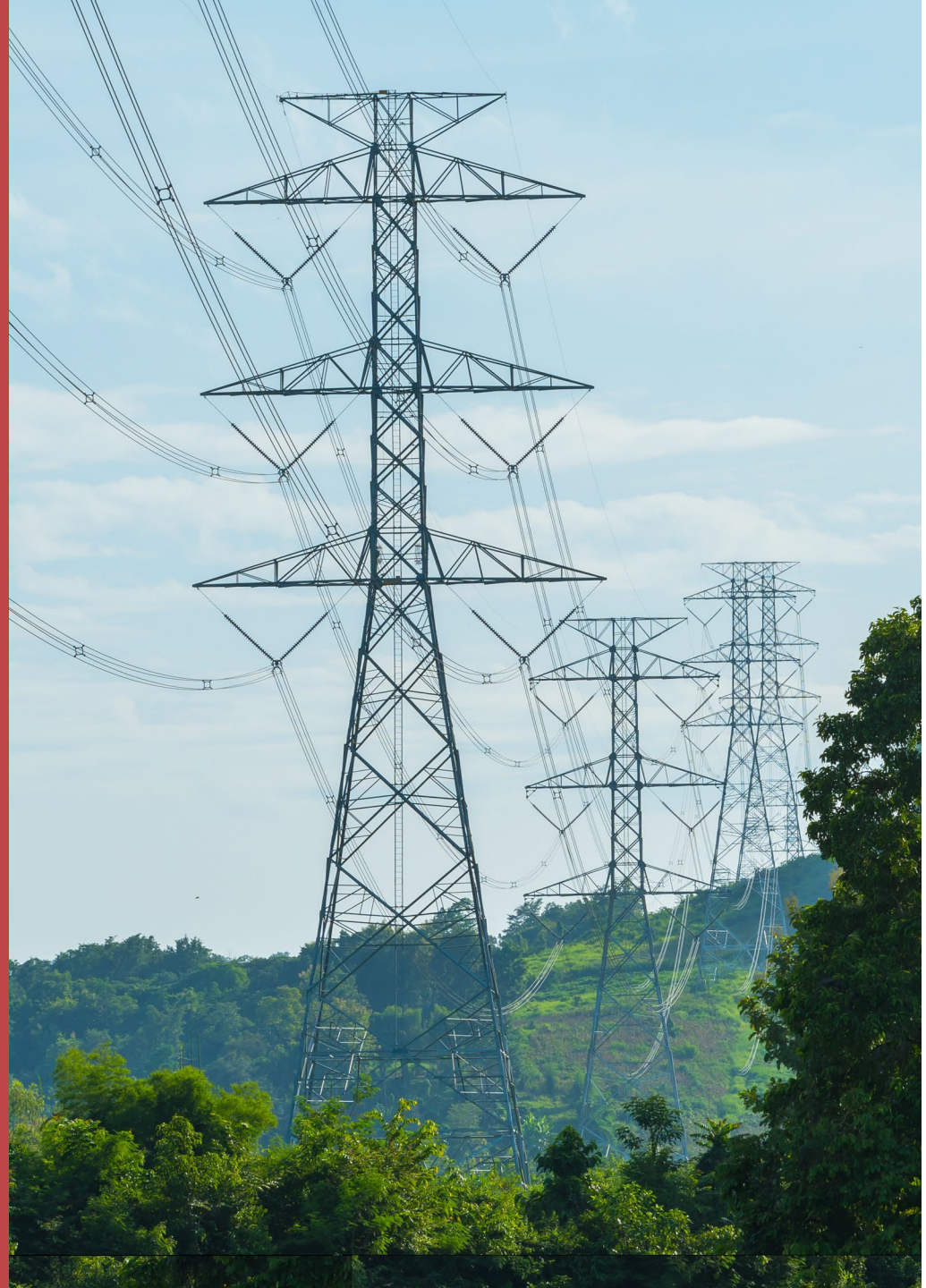
- Projected to average a 0.42% load growth rate from 2023 through 2033
- The anticipated reserve margin projected for 2028 is 4,729 MW below the reserve margin target
- The largest reserve margin deficit was identified in 2033, which was 19,255 MW below the target reserve margin
- MISO transitioned to its first year of seasonal Capacity Auctions (Summer, Fall, Winter, Spring) - the switch to seasonal construct now highlights non-summer risk, but it also derives seasonal accreditation and seasonal resource adequacy requirements



QUESTIONS & ANSWERS

Tim Fryfogle, Principal Engineer – Resources, Engineering & System Performance

tim.fryfogle@rfirst.org



THANK YOU

Join us for our next Tech Talk – State Energy Policy Edition February 12th

Webinar Link