WELCOME TO TECHNICAL TALK WITH RF

August 14, 2023

TECHNICAL TALK WITH RF

FORWARD TOGETHER RELIABILITYFIRST

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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

TECH TALK ANNOUNCEMENT

Level 3 NERC Alert FAQ Posted

NERC has published a FAQ document on the Level 3 **Extreme Cold Weather Alert** to address some of the common concerns heard during development of the alert and to provide more clarity of the Level 3 Alert Essential Actions and questions. For questions or comments, please send an email to nerc.alert@nerc.net

- FAQ: Level 3 Alert
- Essential Actions to Industry – Cold Weather Preparations
- NERC Alerts

Level 2 NERC Alert Extended

The Level 2 NERC Alert on **Inverter-Based Resource (IBR) Performance Issues** was released on March 14, 2023, and included a data submission worksheet for Generator Owners of all Bulk Electric System (BES) solar photovoltaic (PV) resources. NERC is issuing a one-month extension to complete the data submission worksheet and alert responses. The new deadline for approved responses is July 31, 2023.

- Please contact Alex.Shattuck@nerc.net with any questions or comments.

WELCOME TO TECHNICAL TALK WITH RF

August 14, 2023

ReliabilityFirst Fall Workshop 2023

PUBLIC

Please join us for the 2023 Fall Workshop at the Omni William Penn Hotel in Pittsburgh! On Day One, lunch will be served prior to the start of the workshop, and a reception will follow Tuesday evening. On Day Two, breakfast will be served prior to the start of the workshop and lunch will be served afterward. Please see details below on the topics and speakers planned for the event.

Day One, Tuesday, Sept. 26, 2023

Topic	Speaker(s)
Welcome	Brian Thiry, Director of External Affairs and Entity Engagement, ReliabilityFirst
Working Together with State Public Utility Commissions amid the Great Energy Transition	Commissioner Stephen DeFrank, Vice Chairman, Pennsylvania Public Utility Commission
Human Performance in the Energy Industry	Lesley Evancho, Chief Human Resources Officer, EQT and Independent Director, RF Board of Directors
Securing in Small Bytes: Tactically Addressing Cybersecurity in Critical Infrastructure	Matthew E. Luallen, Lead Research Scientist, Information Trust Institute at the University of Illinois, Urbana-Champaign
Parallels and Interdependencies between the Water and Electric Industries	Justin Ladner, President, Pennsylvania American Water
Panel Discussion: Electric Grid Interdependencies with State Government, Natural Gas, Cybersecurity and Water Industries	Host: Kevin Walker, President and CEO, Duquesne Light Holdings, Inc. Panelists: • Commissioner Stephen DeFrank, PA PUC • Lesley Evancho, EQT • Matt Luallen, UIUC • Justin Ladner, Pennsylvania American Water

Day Two, Wednesday, Sept. 27, 2023

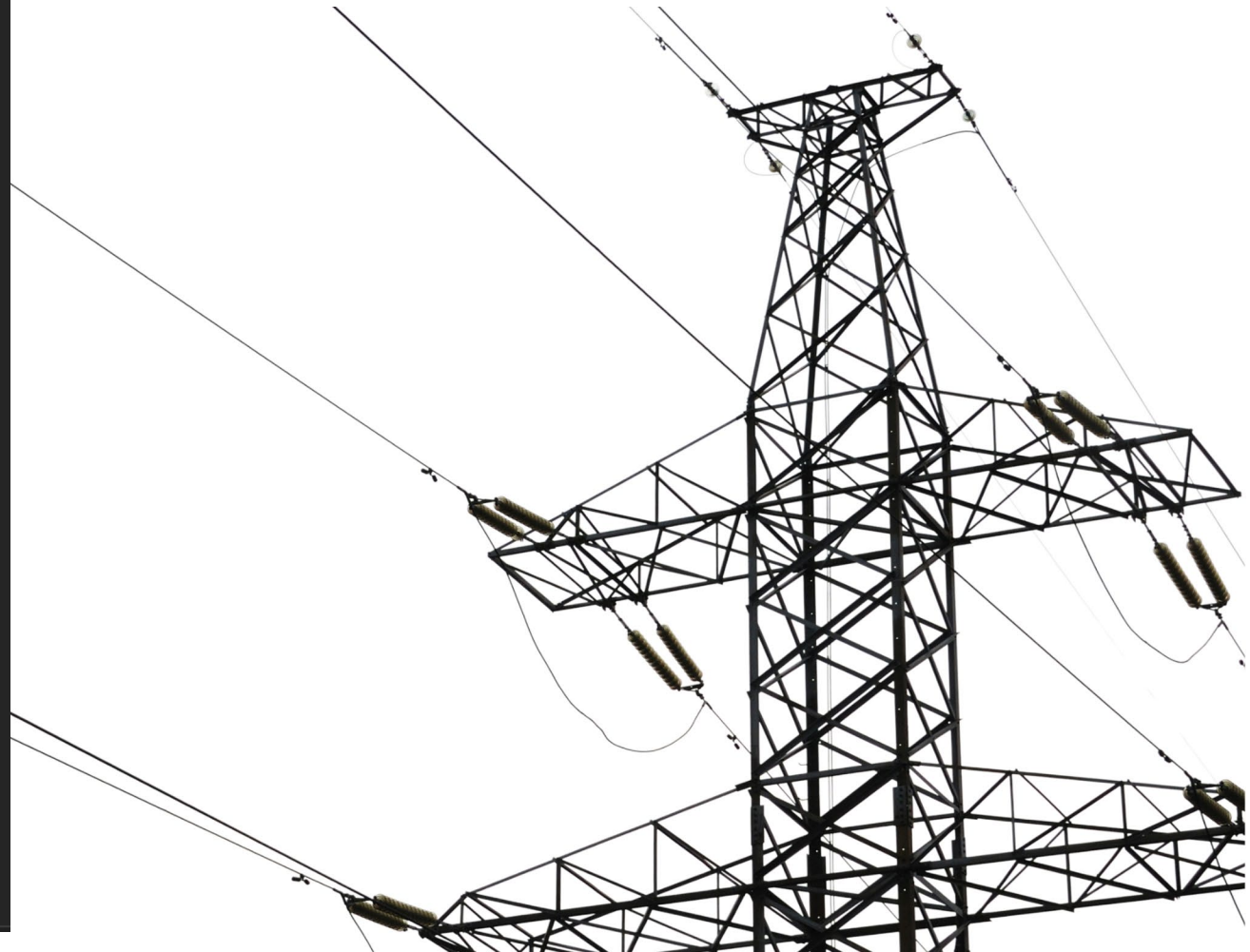
Topic	Speaker(s)
Welcome	Brian Thiry, Director of External Affairs and Entity Engagement, ReliabilityFirst
Federal Energy Regulatory Commission (FERC) Notice of Proposed Rulemaking (NOPR) Updates	Kal Ayoub, Critical Infrastructure and Resilience Advisor to the Chairman, FERC
Updates on NERC Projects	Latrice Harkness, Director of Standards Development, NERC
The Journey to Building a Successful Internal Controls Program	Talen Energy & DTE Energy
Noncompliance Trends	Max Reisinger, Senior Counsel, ReliabilityFirst
CMEP Updates	RF Staff

ReliabilityFirst Corporation • 3 Summit Park Drive, Suite 600, Cleveland, OH 44131 • www.rfirst.org

Register Today!

Sept 26-27 Omni William Penn, Pittsburgh, PA

Eventbrite Link



TECH TALK ANNOUNCEMENT

NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Industry Webinar

Project 2023-01 EOP-004 Inverter-Based Resources (IBR) Event Reporting

August 15, 1:00 – 2:30 PM Eastern

Join Webex

Meeting Number/Access Code: 734 167 043

Password: 081523

Introduction to IBRs on the Bulk Power System here

TECH TALK ANNOUNCEMENT

CYBERSECURITY & INFRASTRUCTURE SECURITY AGENCY

Webinar

Defend Against Ransomware Attacks

August 22, 11:00 – 12:00 PM Eastern

Register Now

CISA is proud to offer the cybersecurity awareness webinar, Defend Against Ransomware Attacks (IR109). This webinar is intended for a non-technical audience and beginning incident responders.

TECH TALK ANNOUNCEMENT

NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Winter Preparation for Severe Cold Weather Webinar

September 7, 1:00 – 3:00 PM Eastern

NERC will hold the Winter Preparation for Severe Cold Weather webinar on September 7, and is requesting abstracts from industry stakeholders on successful practices and lessons learned relating to severe cold weather preparation. Submission for presentations and panel discussions are welcome from all industry stakeholders, including asset owners and operators and OEMs who support the bulk power system.

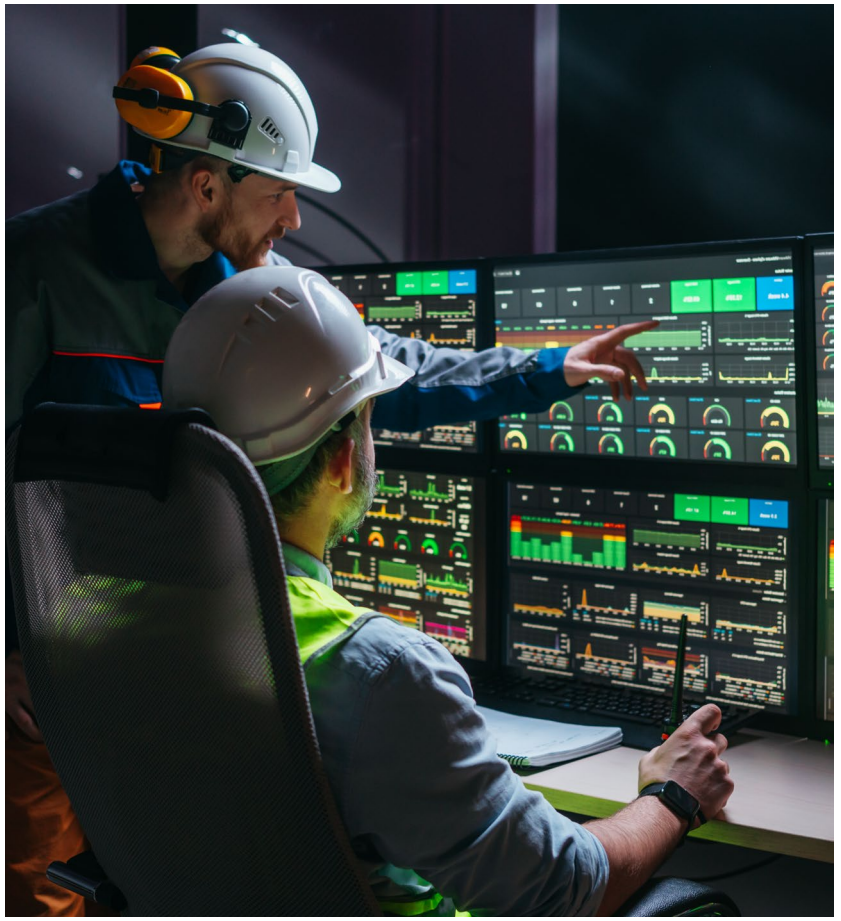
TECH TALK ANNOUNCEMENT

NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Monitoring & Situational Awareness Technical Conference

October 3-4, Salt Lake City, Utah (Hybrid)

This year's conference will unite expertise from various utilities to share cutting-edge ideas and good industry practices, and to identify trends and lessons learned from events across different vendors, energy management system platforms, and Interconnections. Detailed information about the conference, including registration, will be published at the end of August.



TECH TALK ANNOUNCEMENT

NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Probabilistic Analysis Forum (PAF)

October 10-12, Salt Lake City, Utah (Hybrid)

More details, including the event registration and successful submissions, will be made available on the NERC and WECC websites closer to the forum.

Examples of topics include, but are not limited to:

- Additional metrics/measurements vs expanding the use of existing metrics
- Resource Accreditation methods
- Battery Modeling and performance
- Natural Gas Constraints and Operational Risks
- Development of synthetic load models
- Capturing widespread geographic risks
- Extreme weather impacts
- Techniques and modelling approaches for managing forced outages
- Energy and Capacity evaluation

TECH TALK ANNOUNCEMENT

NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Industry Misoperation Workshop

October 25th – 26th (In-person)

NERC Atlanta Office
3353 Peachtree Rd NE
Suite 600, North Tower
Atlanta, Ga 30326

Click here for: Workshop Registration
Click here for: Draft Agenda
Click here for: 2023 Atlanta Travel Guide

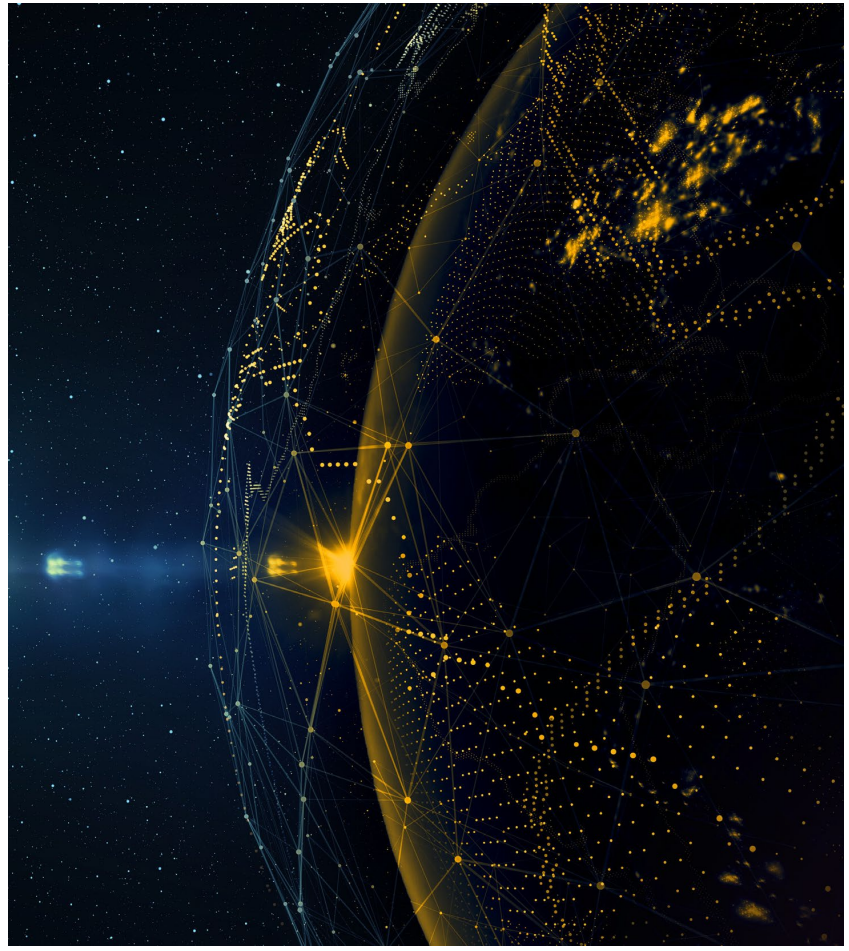
TECH TALK ANNOUNCEMENT

GridSecCon 2023

Quebec City, October 17-20

Registration

GridSecCon brings together cyber and physical security leaders from industry and government to deliver expert training sessions, share best practices and effective threat mitigation programs, and present lessons learned. Conference and hotel registration opened in May and more details are available on the E-ISAC, NERC and NPCC websites.



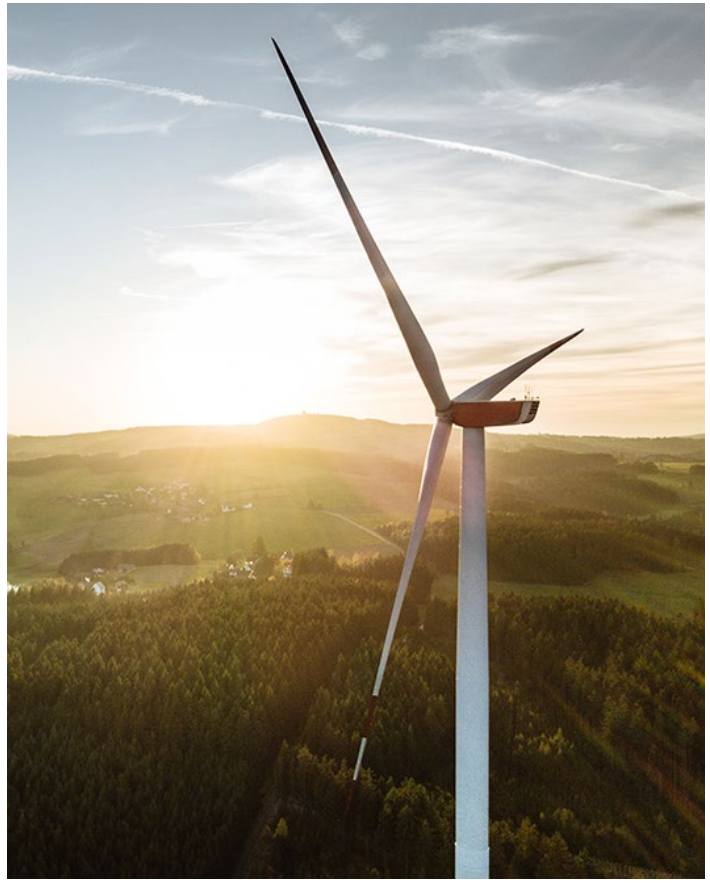
TECH TALK ANNOUNCEMENT

NERC-NATF-EPRI Annual Transmission Planning and Modeling Workshop

November 1-2, 1:00 – 5:00 PM Eastern

This year's seminar will focus on bulk power system load modeling, integrated system planning practices, IBR risk mitigation, and updates on the latest research and activities across the industry.

Dynamic Modeling Guideline Link



TECH TALK ANNOUNCEMENT

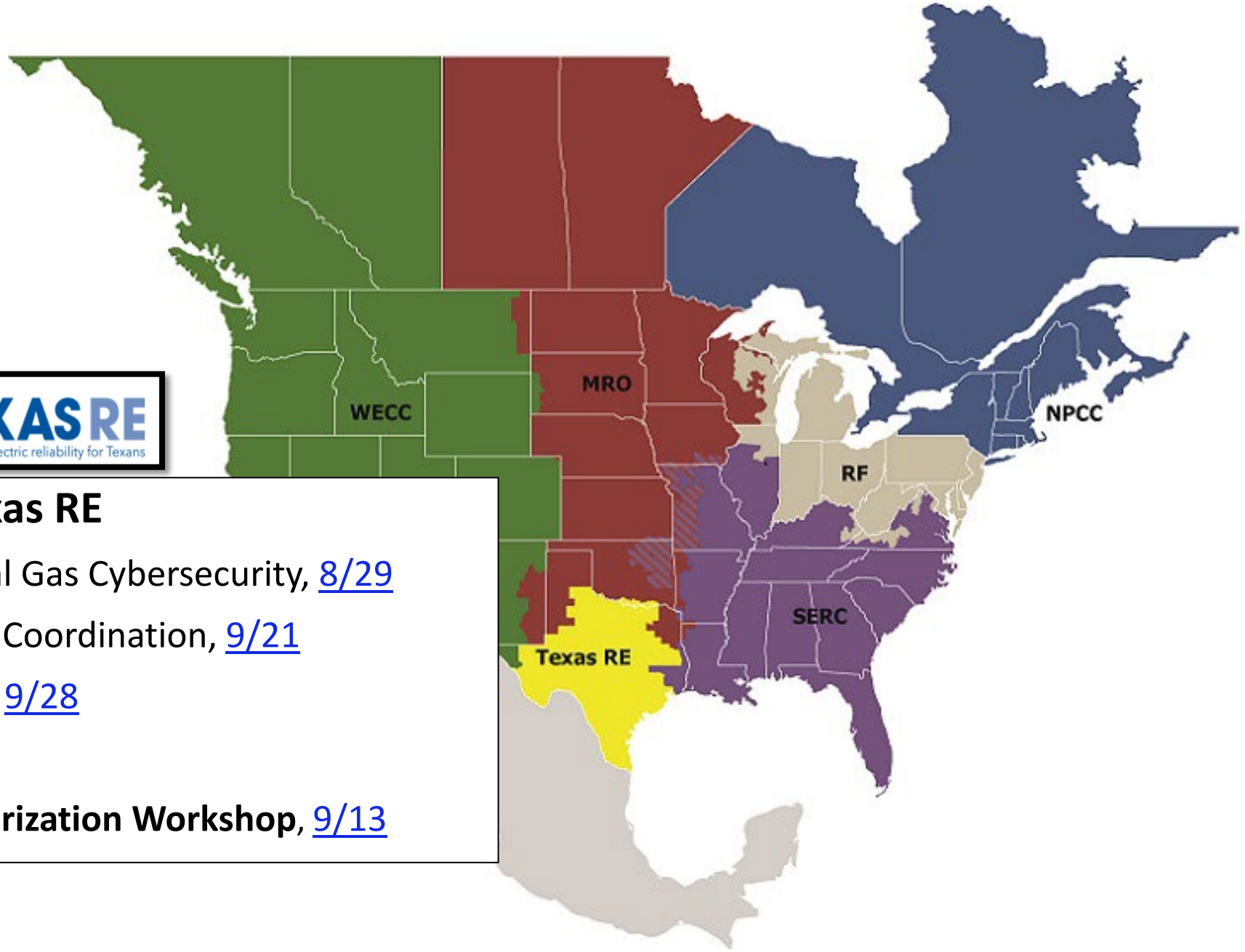
NERC NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

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

GridEx VII

November 14-15 Registration

Registration for GridEx VII remains open until September 1 for Lead Planners and Planners. Industry members and government partners are encouraged to have their Planners register to coordinate their organization's planning process and exercise conduct. Lead planners and planners must have E-ISAC Portal access to register for GridEx VII. Organizations that are not eligible for E-ISAC Portal access can participate in GridEx VII by partnering with E-ISAC members. For questions regarding E-ISAC membership, contact our Membership team at memberservices@eisac.com.



TEXAS RE
Ensuring electric reliability for Texans

Talk with Texas RE

- Oil & Natural Gas Cybersecurity, 8/29
- Electric-Gas Coordination, 9/21
- IROL Report 9/28

Winter Weatherization Workshop, 9/13

Resource Adequacy Discussion Series

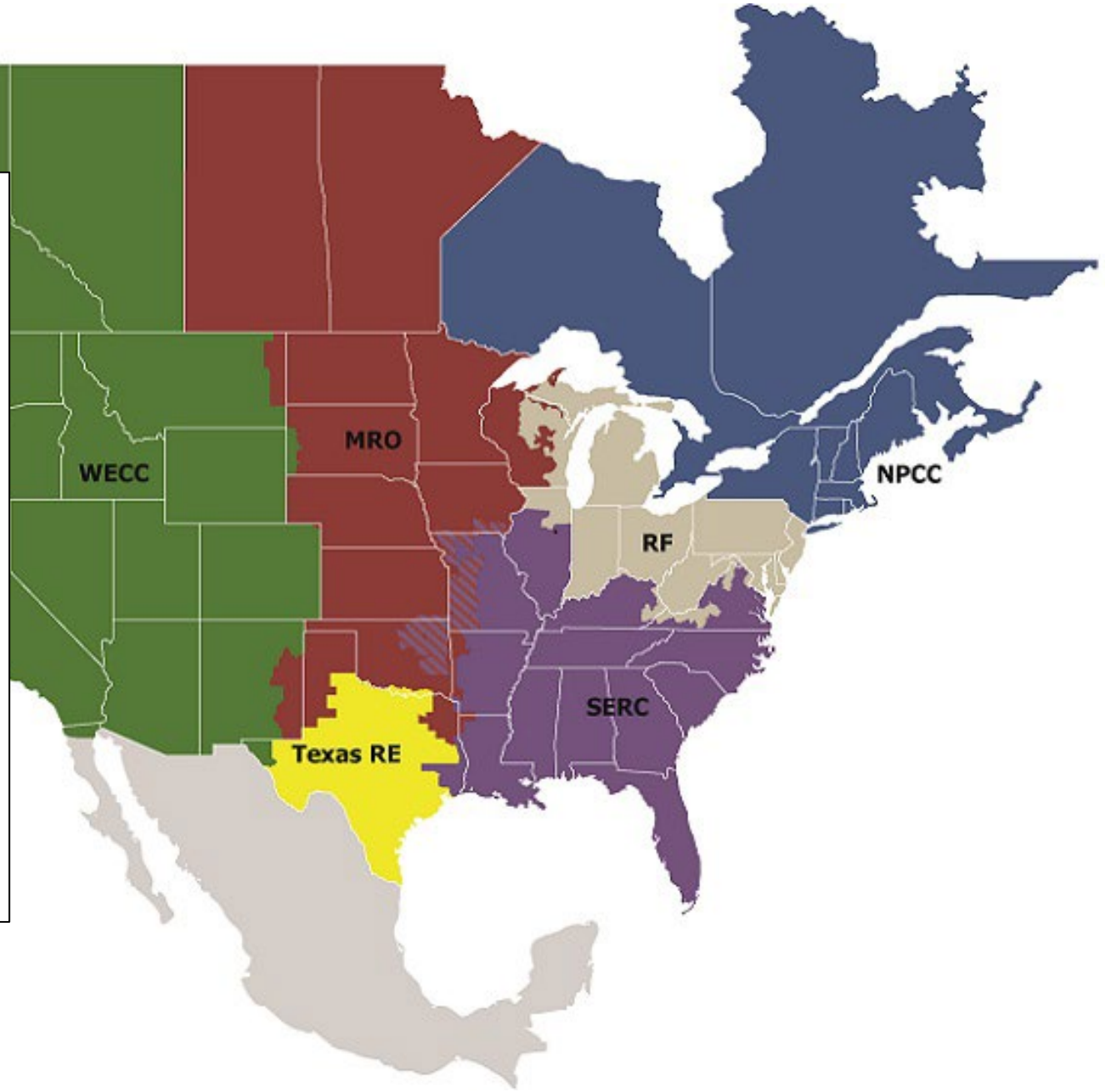
- Past Webinars (Link)

Reliability & Security Oversight Monthly Update

- August 17 (Link)

Grid Fundamentals (in person)

- August 22 (Link)



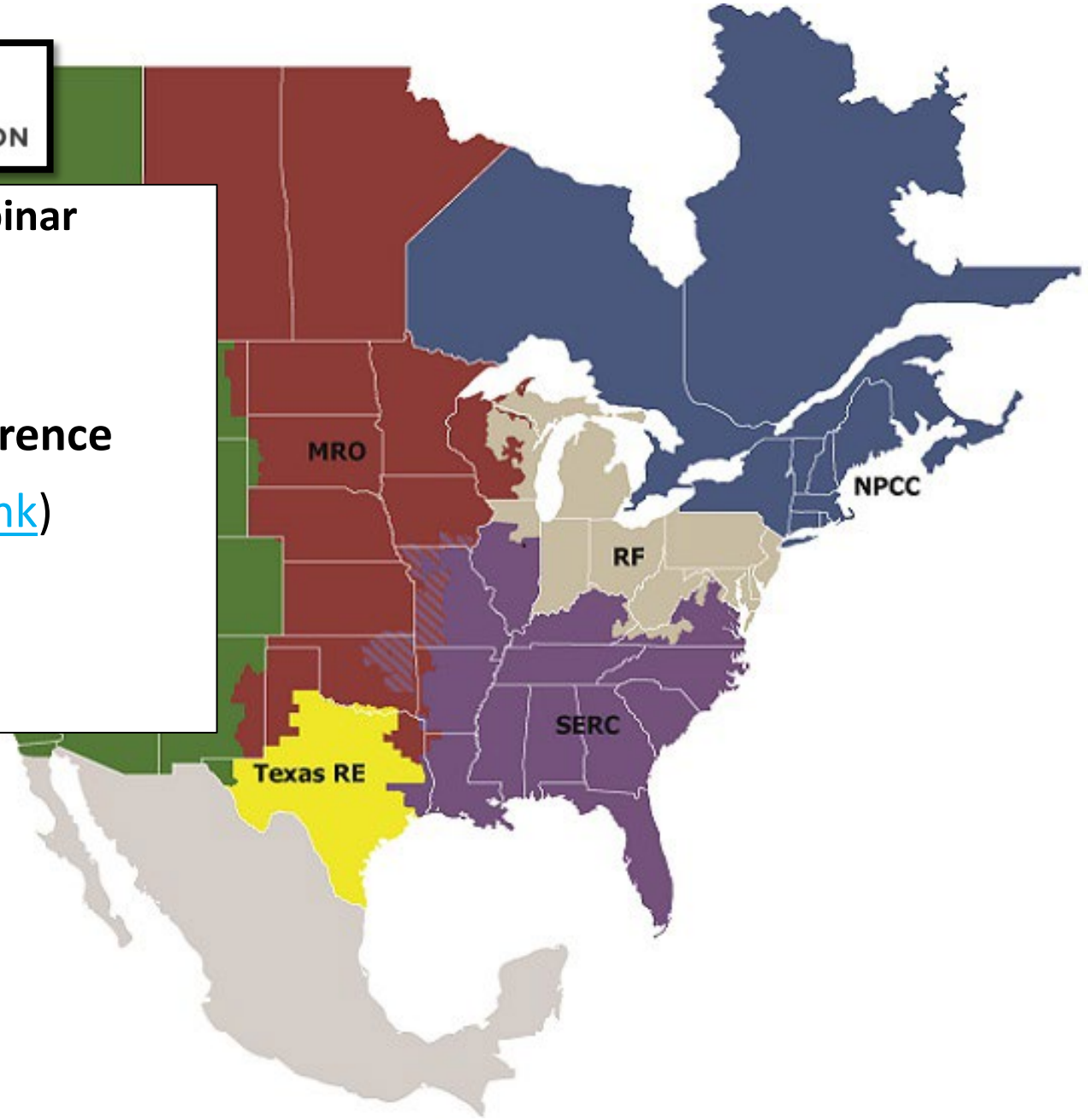
MIDWEST RELIABILITY ORGANIZATION

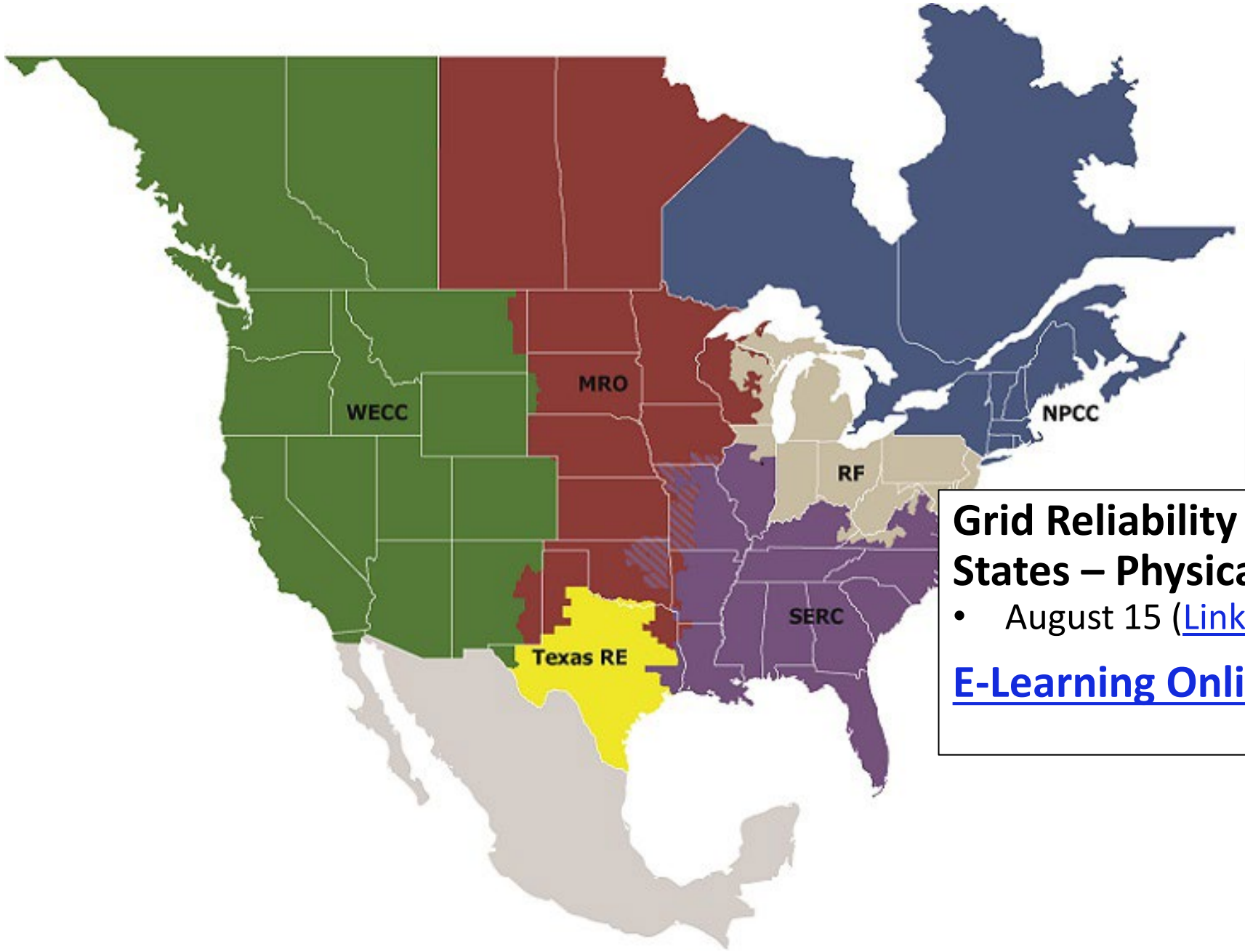
IT/OT Convergence Webinar

- August 29th (Link)

Hybrid Security Conference

- Sept 26th – 27th (Link)



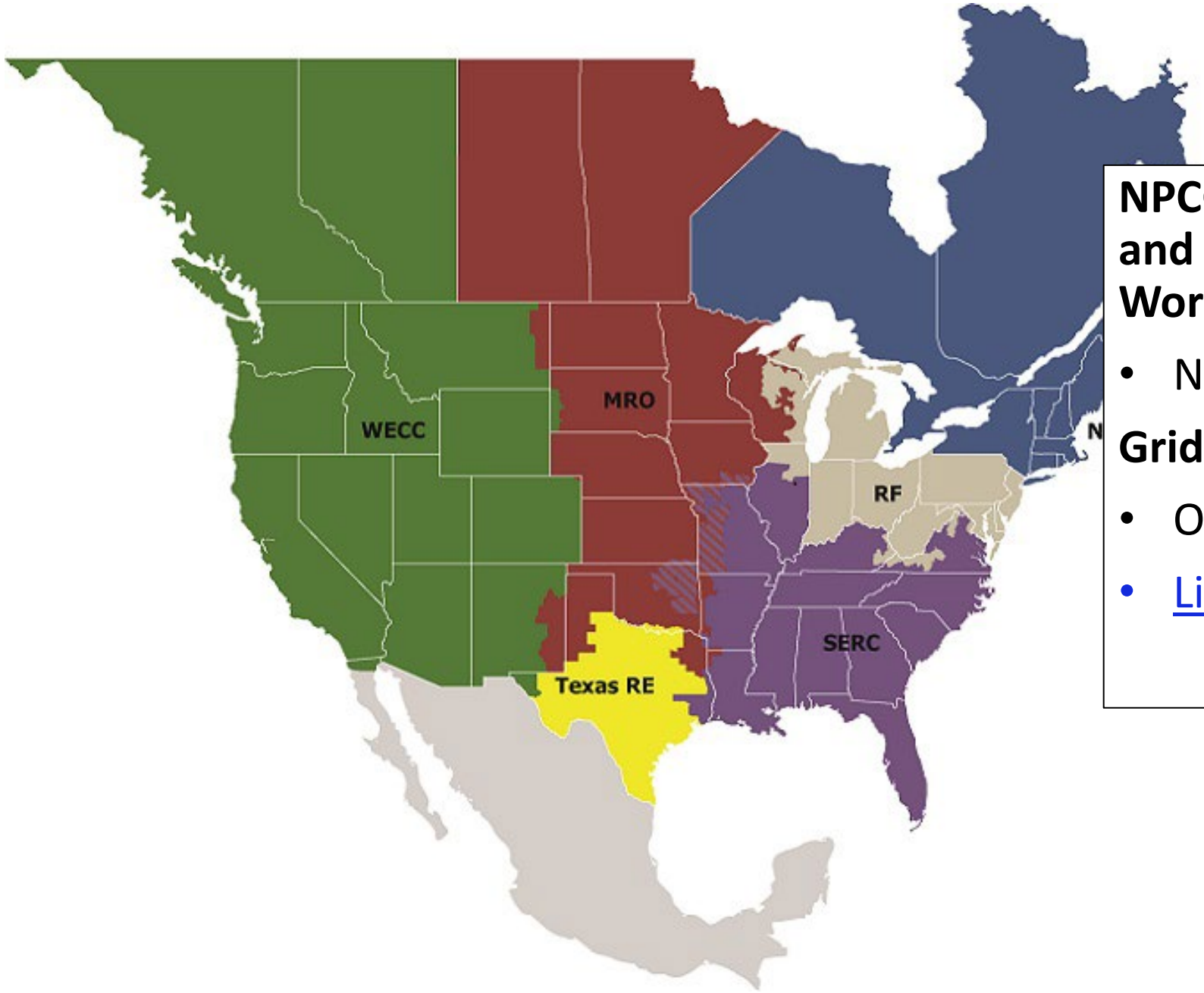


SERC Reliability Corporation

Grid Reliability Update for States – Physical Security

- August 15 (Link)

E-Learning Online Courses

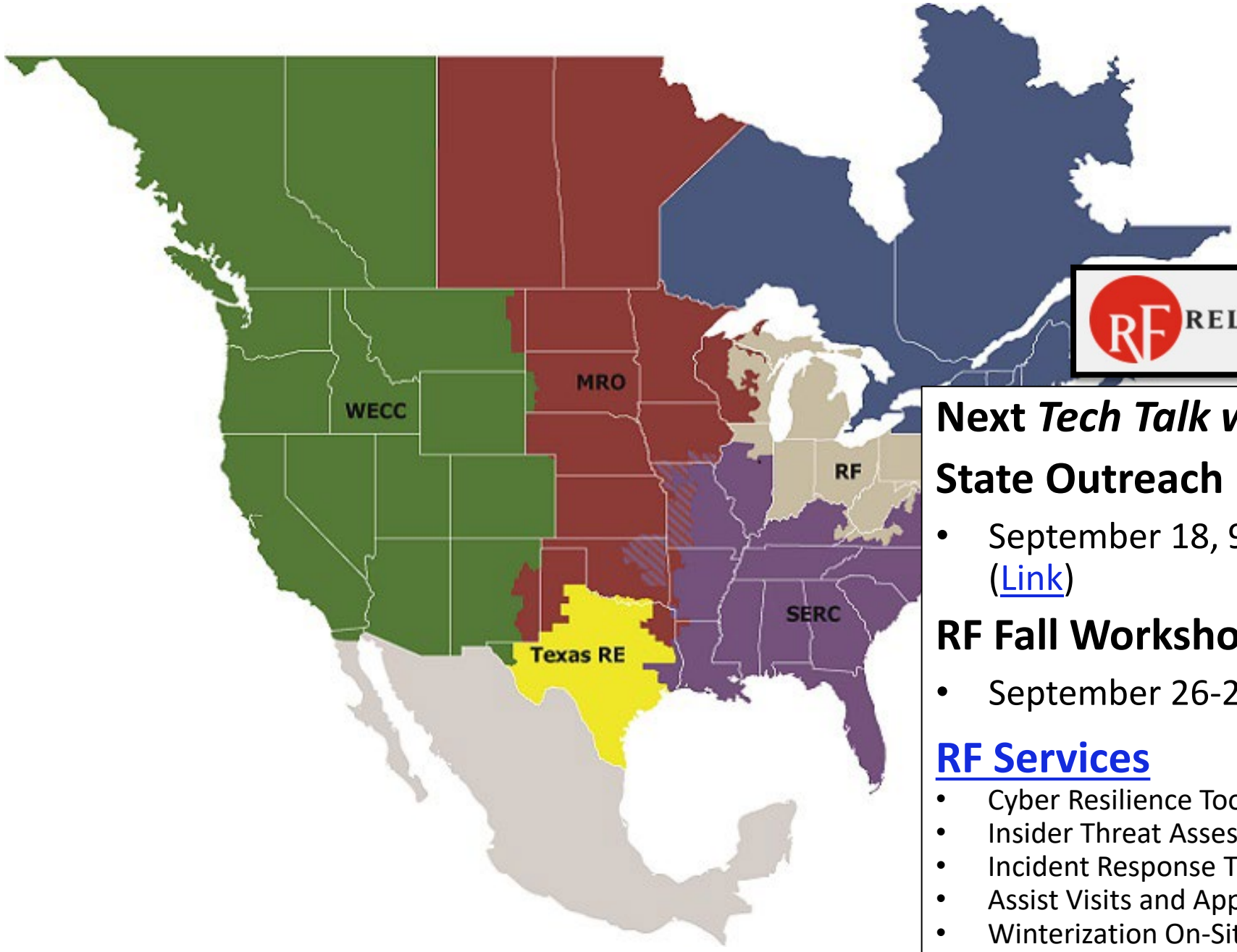


NPCC Fall Compliance and Reliability Workshop

- November 8 (Link)

GridSecCon 2023

- October 17-20
- Link



RELIABILITYFIRST

New Time

Next *Tech Talk with RF* State Outreach Edition

- September 18, 9:00 – 11:00AM (Link)

RF Fall Workshop

- September 26-27 (Link)

RF Services

- Cyber Resilience Tool
- Insider Threat Assessment
- Incident Response Tabletops
- Assist Visits and Appraisals
- Winterization On-Site Visits
- Committees

TECHNICAL TALK WITH RF

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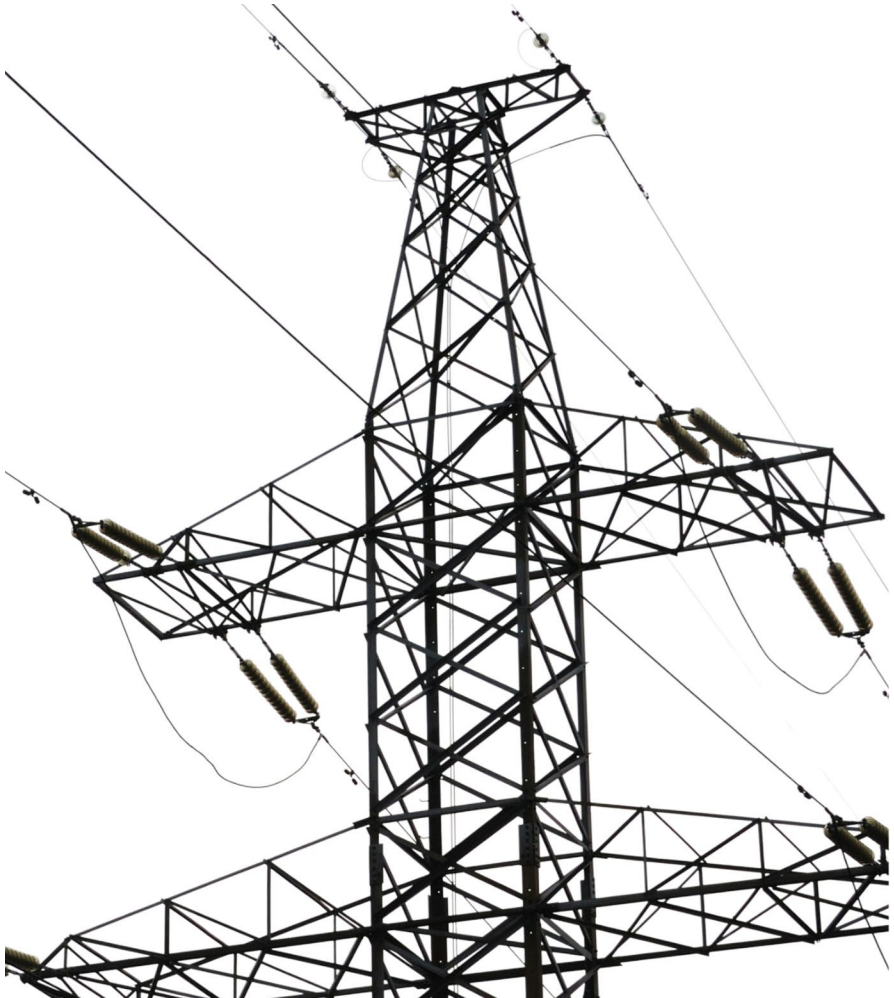
TECH TALK REMINDER

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

THE 2003 NORTHEAST BLACKOUT

ERO Video: The Grid – 20 Years of Progress Since the 2003 Northeast Blackout

Industry Perspective of What has Changed

- Joseph McClelland,FERC Director of the Office of Energy Infrastructure Security
- David Nevius, Retired NERC Senior Vice President

Inside the Control Room of NY ISO

- Steve Swan, RF Principal Technical Auditor

THE GRID – 20 YEARS OF PROGRESS SINCE THE 2003 NORTHEAST BLACKOUT

RF Tech Talk
August 14, 2003 Blackout

August 14, 2023

Joe McClelland
Director, Office of Energy Infrastructure Security (OEIS)
FEDERAL ENERGY REGULATORY COMMISSION

Disclaimer

The views expressed in this presentation are my own and do not necessarily represent the views of any Commissioner or the Commission.

Key Legislation

The Blackout of August 14, 2003

The Division of Reliability was established in July of 2004 at FERC

Energy Policy Act of 2005 enacted on Aug 8, 2005

Provided FERC significant new authorities with respect to overseeing the reliability and cybersecurity of the bulk power system (BPS) including:

- Certifying the Electric Reliability Organization
- Approving or remanding the proposed new or modified standards or enforcement actions of the ERO
- Calling for new and/or revised standards when necessary
- Approving the creation of the Regional Entities
- Overseeing the operations and budget of the ERO

Note: Originally, in 1968, the National Electric Reliability Council (the original NERC formed as a voluntary organization after a blackout in 1965 affected 30 million people in the United States and parts of Canada.

Key Regulatory Milestones

3 Feb. 2006

Order 672 was issued establishing:

- Rules Concerning Certification of the Electric Reliability Organization (ERO)
- Procedures for the Establishment, Approval, and Enforcement of Electric Reliability Standards

20 July 2006

The Commission certifies NERC as the ERO.

16 Mar. 2007

Order 693 was issued:

- The Commission approved the ***first set of 83 mandatory reliability standards for the planning and operations*** enforceable: June 18, 2007.

20 Sep 2007

The Office of Electric Reliability was formed (formerly the Division of Reliability within the Office of Markets, Tariffs and Rates) to administer FERC's new reliability and cybersecurity authorities

18 Jan. 2008

Order No. 706 was issued:

The Commission approved the first set of ***8 mandatory standards for critical infrastructure protection (CIP).***

Operations and Planning Standards

- BAL: Resource and Demand Balancing,
- CIP: Critical Infrastructure Protection (recognizing sabotage incidents, associated procedures, and mandatory reporting)
- COM: Communications
- EOP: Emergency Preparedness and Operations
- FAC: Facilities Design, Connections, Maintenance, and Transfer Capabilities
- INT: Interchange Scheduling and Coordination
- IRO: Interconnection Reliability Operations and Coordination
- MOD: Modeling, Data, and Analysis
- PER: Personnel Performance, Training and Qualifications
- PRC: Protection and Control
- TOP: Transmission Operations
- TPL: Transmission Planning
- VAR: Voltage and Reactive Control

Critical Infrastructure Protection (CIP) Standards

- Initial Set:
  - CIP-002-1 (6 – current version) – Critical Cyber Asset Identification
  - CIP-003-1 (9) – Security Management Controls
  - CIP-004-1 (7) – Personnel and Training
  - CIP-005-1 (7) – Electronic Security Perimeter(s)
  - CIP-006-1 (6) – Physical Security of Critical Cyber Assets
  - CIP-007-1 (6) – Systems Security Management
  - CIP-008-1 (6) – Incident Reporting & Response Planning
  - CIP-009-1 (6) – Recovery Plans for Critical Cyber Assets.
- Expanded Set:
  - CIP-010-4 – Configuration Management and Vulnerability Assessments
  - CIP-011-2 – Information Protection
  - CIP-012-1 – Communications Between Control Centers
  - CIP-013-2 – Supply Chain Risk Management
  - CIP-014-3 – Physical Security

The Process Continues to Adapt: "Extreme Weather, Cyber and Physical Security Continue to Create Reliability Challenges"

- **"…cyber security compromises and increased physical attacks on critical infrastructure in the latter part of 2022 reinforce the need for further development and adaptation of reliability standards and guidelines."**

Critical Infrastructure Threats

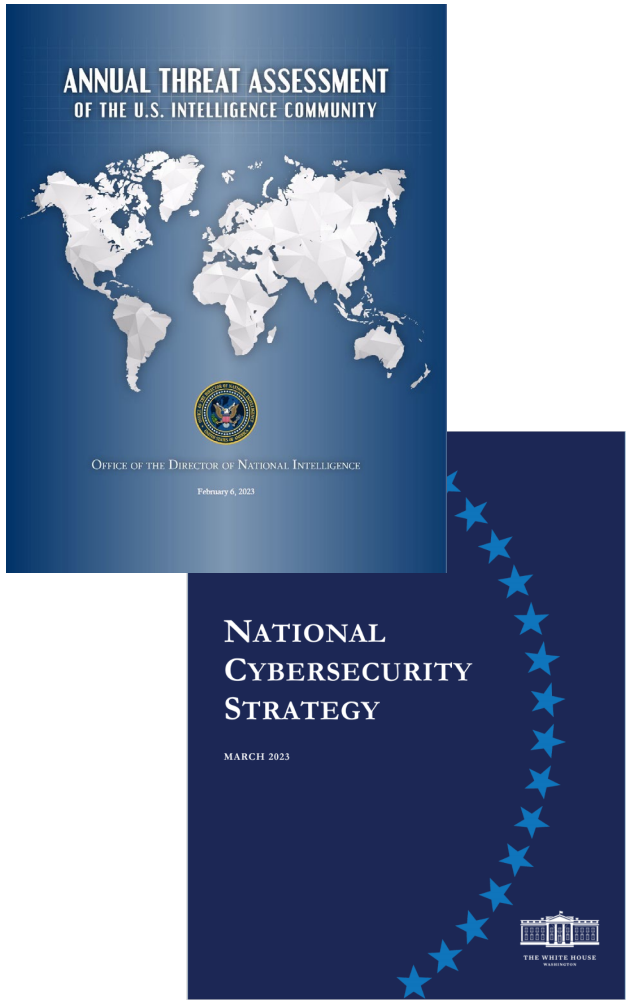
"China almost certainly is capable of launching cyber attacks that would disrupt [CI] services within the [US], including against oil and gas pipelines and rail systems."
[1 p.10]

On July 21, 2021, CISA issued a Cybersecurity Advisory entitled "Chinese Gas Pipeline Intrusion Campaign, 2011 to 2013"[3]

"The [PRC] now presents the broadest, most active, and most persistent threat to both government and private sector networks…"
[2 p.3]

"Russia is particularly focused on improving its ability to target [CI], including underwater cables and [ICS], in the [US] and allied and partner countries…"
[1 p.15]

"Russia remains a persistent cyber threat as it refines its cyber espionage, attack, influence, and disinformation capabilities…"
[2 p.3]



"The governments of Iran and [North Korea] are similarly growing in their sophistication and willingness to conduct malicious activity in cyberspace."
[2 p.3]

"Iran's opportunistic approach to cyber attacks makes [CI] owners in the [US] susceptible to being targeted by Tehran, particularly when Tehran believes it must demonstrate that it can push back against the [US] in other domains."
[1 p.19]

"[North Korea] probably possesses the expertise to cause temporary, limited disruptions of some [CI] networks and disrupt business networks in the [US]."
[1 p.21]

Sources:
[1] ODNI: Annual Threat Assessment of the U.S. Intelligence Community
[2] Whitehouse: National Cybersecurity Strategy 2023
[3] CISA: Alert AA21-201A

FERC Two-Pronged Approach

Office of Energy Infrastructure Security

Identify and Promote voluntary ***Best Practices*** to help Identify and Address Advanced and Targeted Threats to Key Facilities

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

Establish Broad Foundational Reliability and Security **Regulations**

Office of Electric Reliability

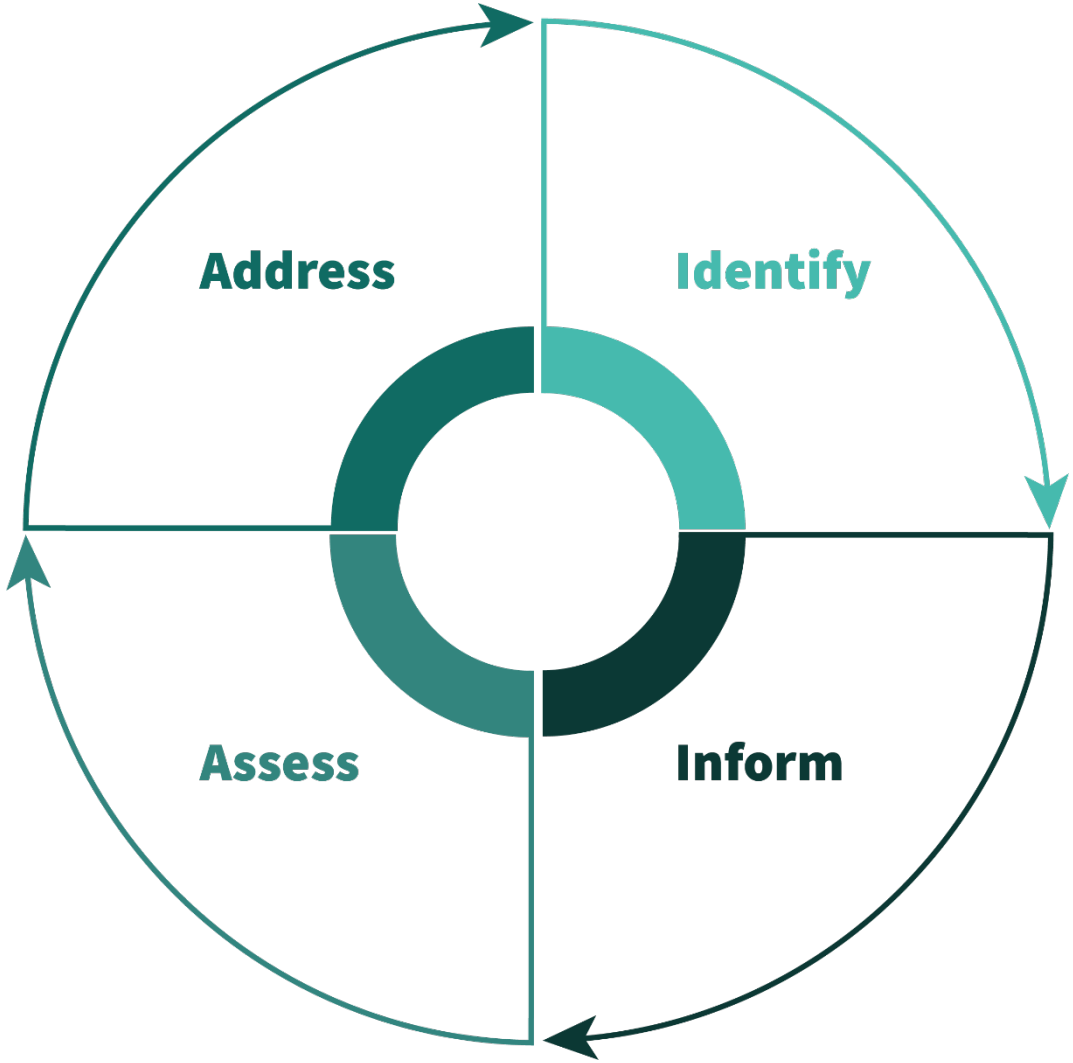
NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

"Regulations will define minimum expected cybersecurity practices or outcomes but the Administration encourages and will support further efforts by entities to exceed these requirements."

Collaborative Questions for Protective Actions

Security-Focused Discussions

1. Do you know who's targeting your utility's systems and how?
2. Do you know how to stop them?
3. Have you identified the systems that are most critical?

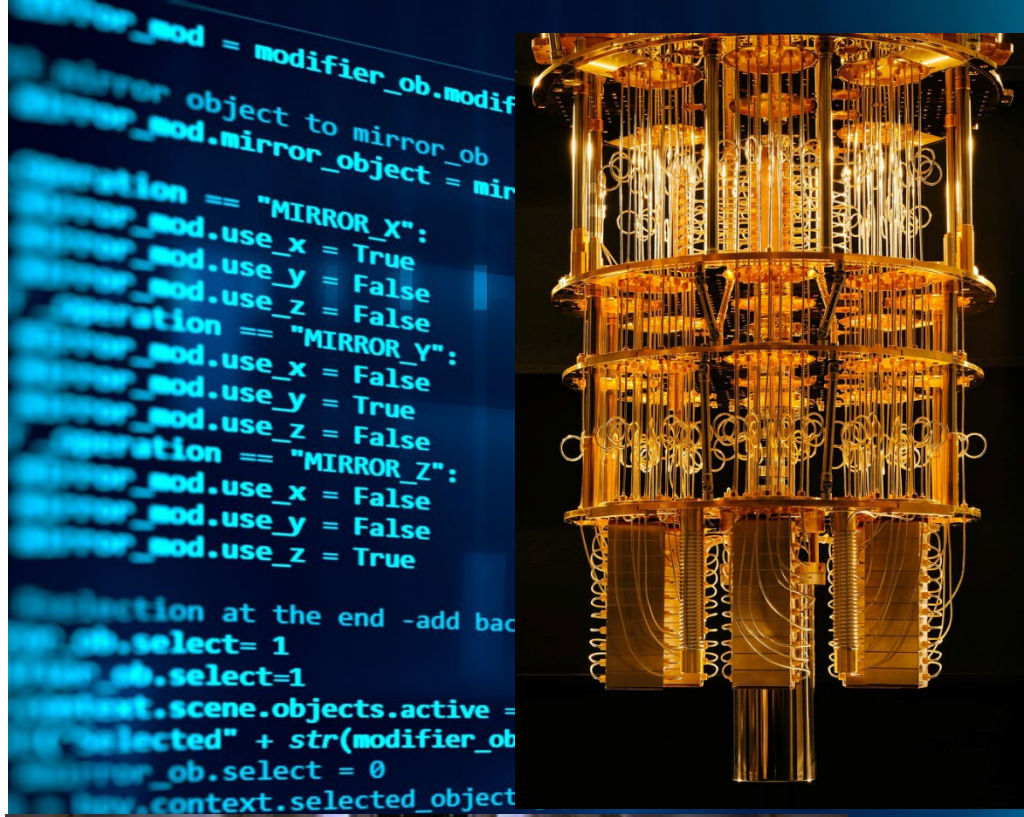


PHYSICAL SECURITY

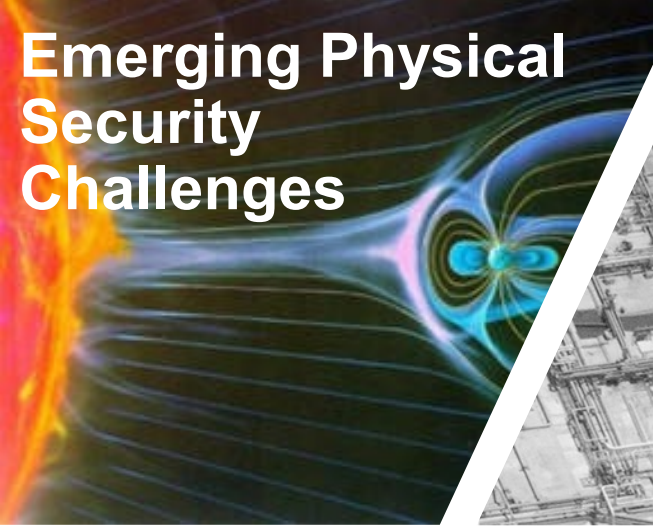
CYBERSECURITY

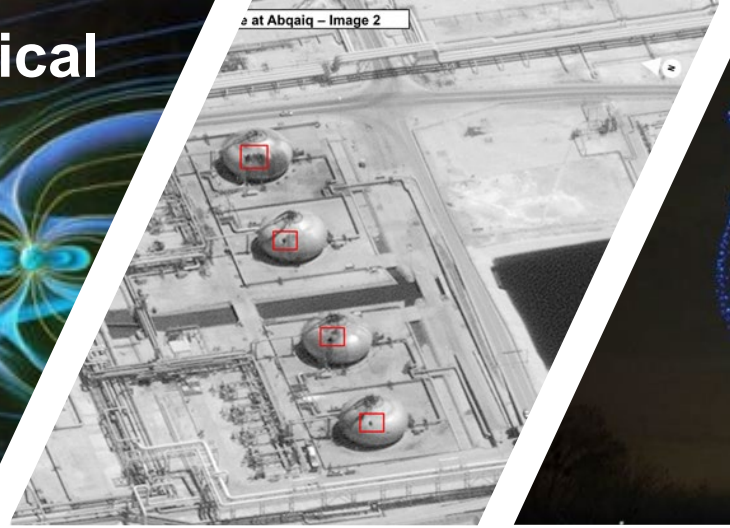
Best Cybersecurity Practices and Emerging Challenges

- Phishing Prevention Training
- Jump Host Hardening
- Identity and Access Management
- Recurring Background Investigations
- Firewall Deny Log Review
- Incident Response Playbooks
- Procurement / Supply Chain
- Continuity of Operations
- Penetration Testing



Emerging Physical Security Challenges





- Ballistic attacks inside and outside the substation perimeter
- Attacks on control buildings
- Miscellaneous attacks and theft
- Damage to both overhead and underground conductors
- Intrusions without damage and drone flyovers

Questions ??

David Nevius Speaking - Retired NERC Senior Vice President

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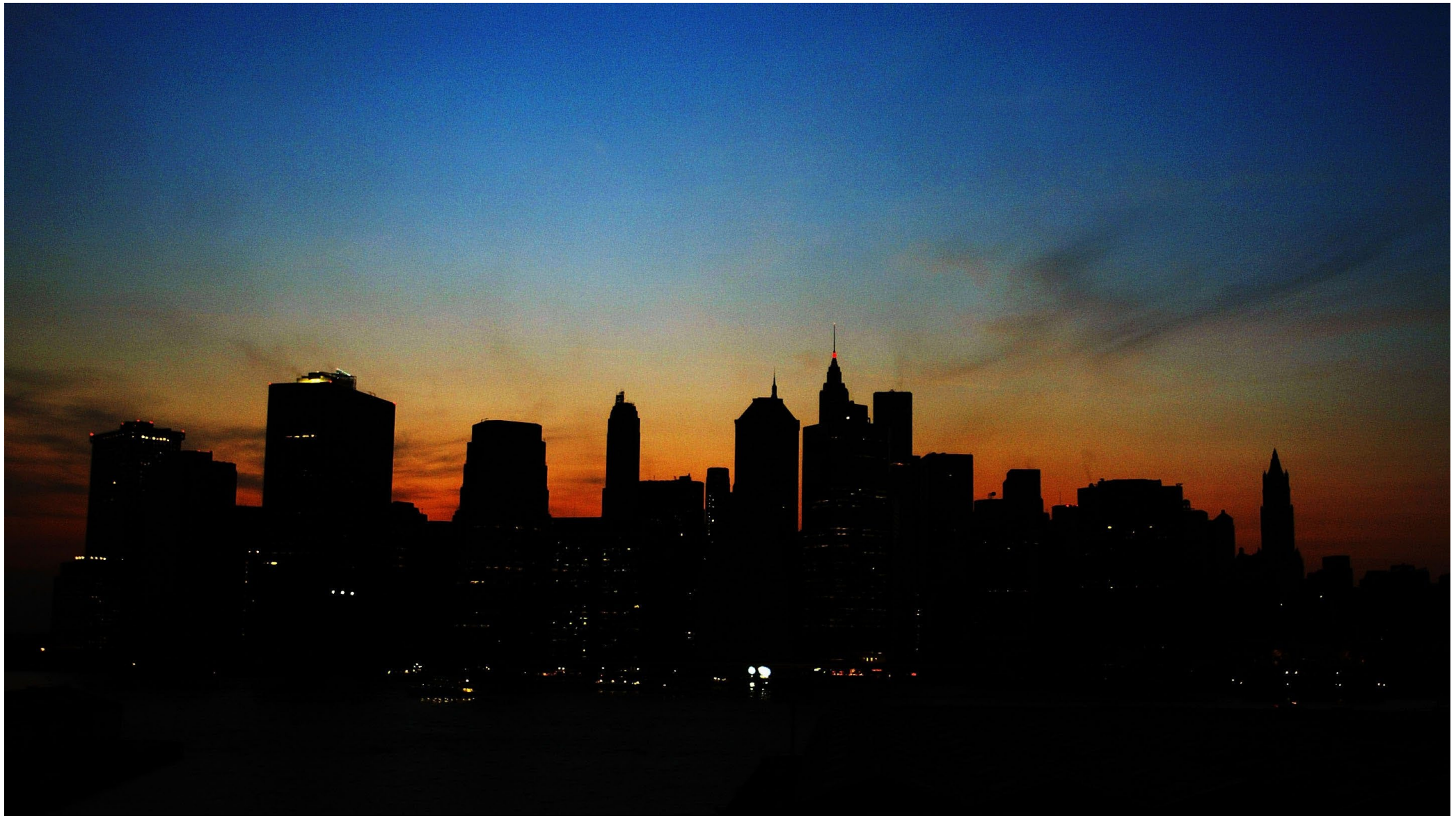

Steve Swan Speaking – ReliabilityFirst, Principal Technical Auditor

A QUICK REVIEW OF EVENT

From NERC Report

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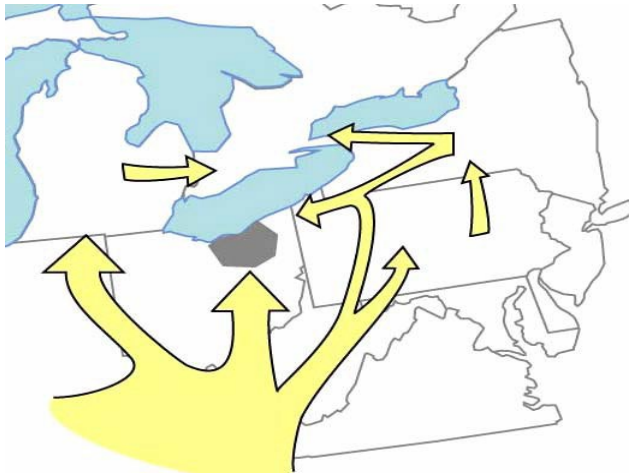

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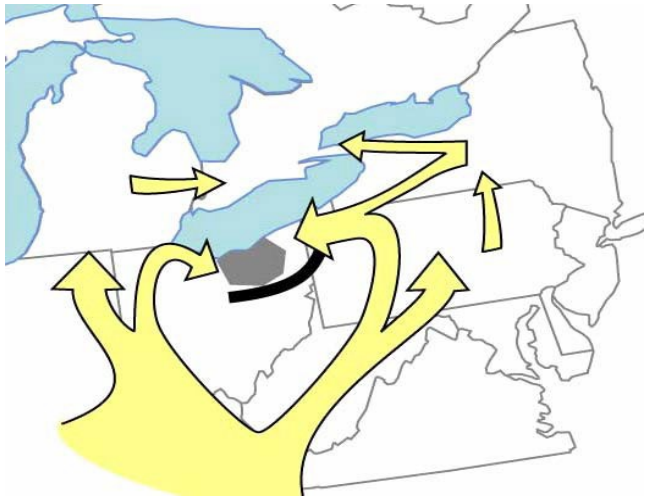

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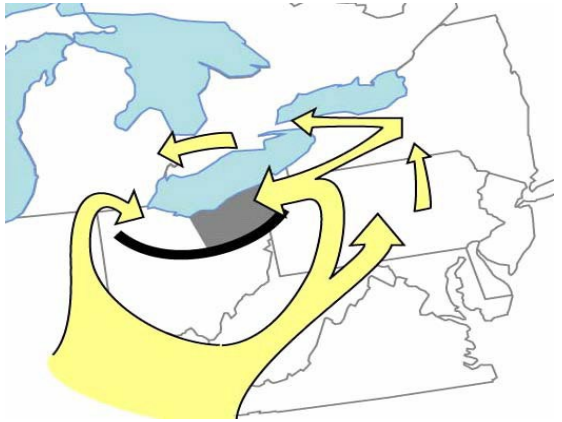

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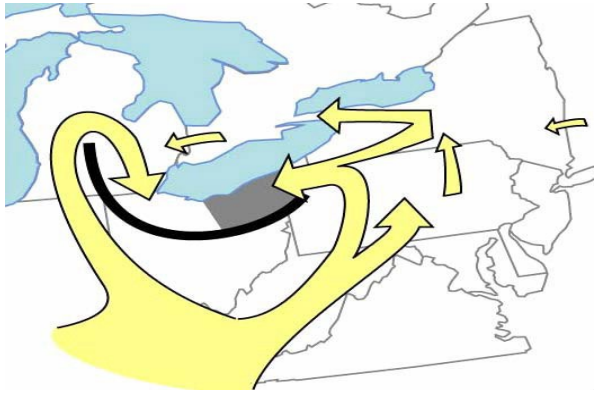

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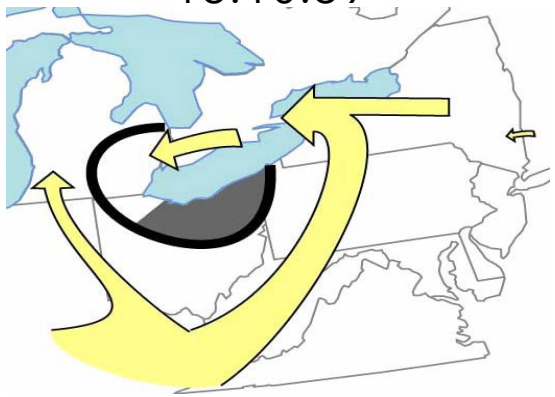

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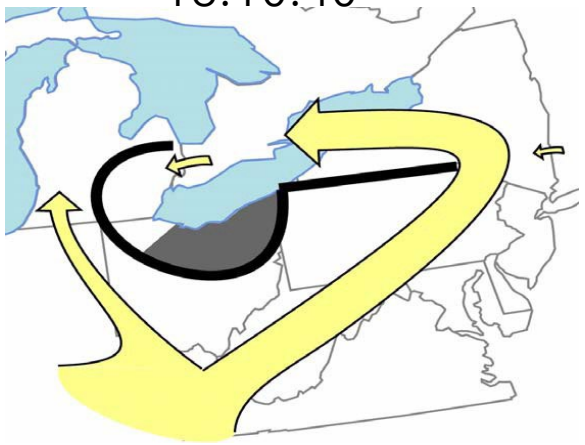
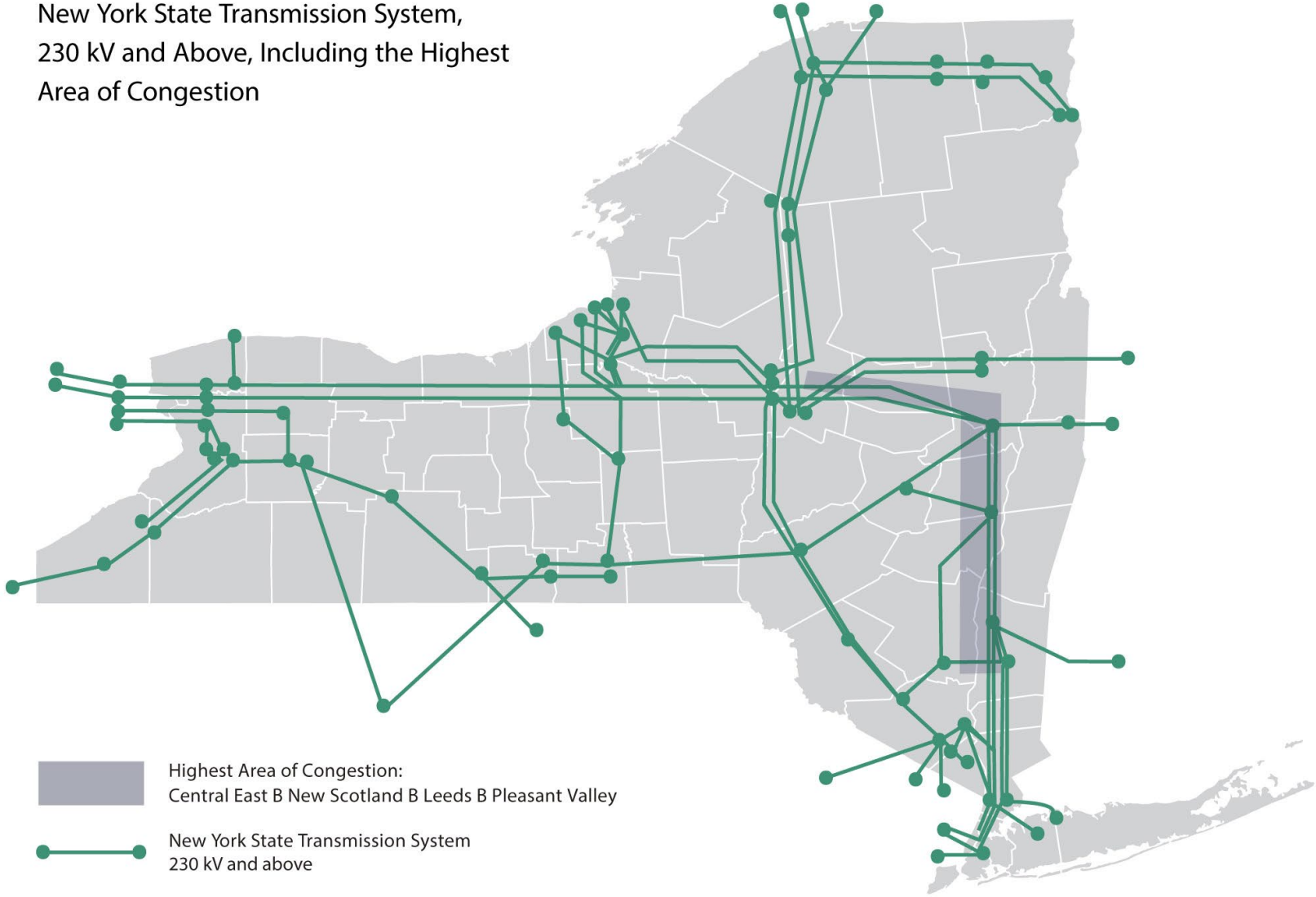


NY TRANSMISSION MAP

New York State Transmission System,
230 kV and Above, Including the Highest
Area of Congestion

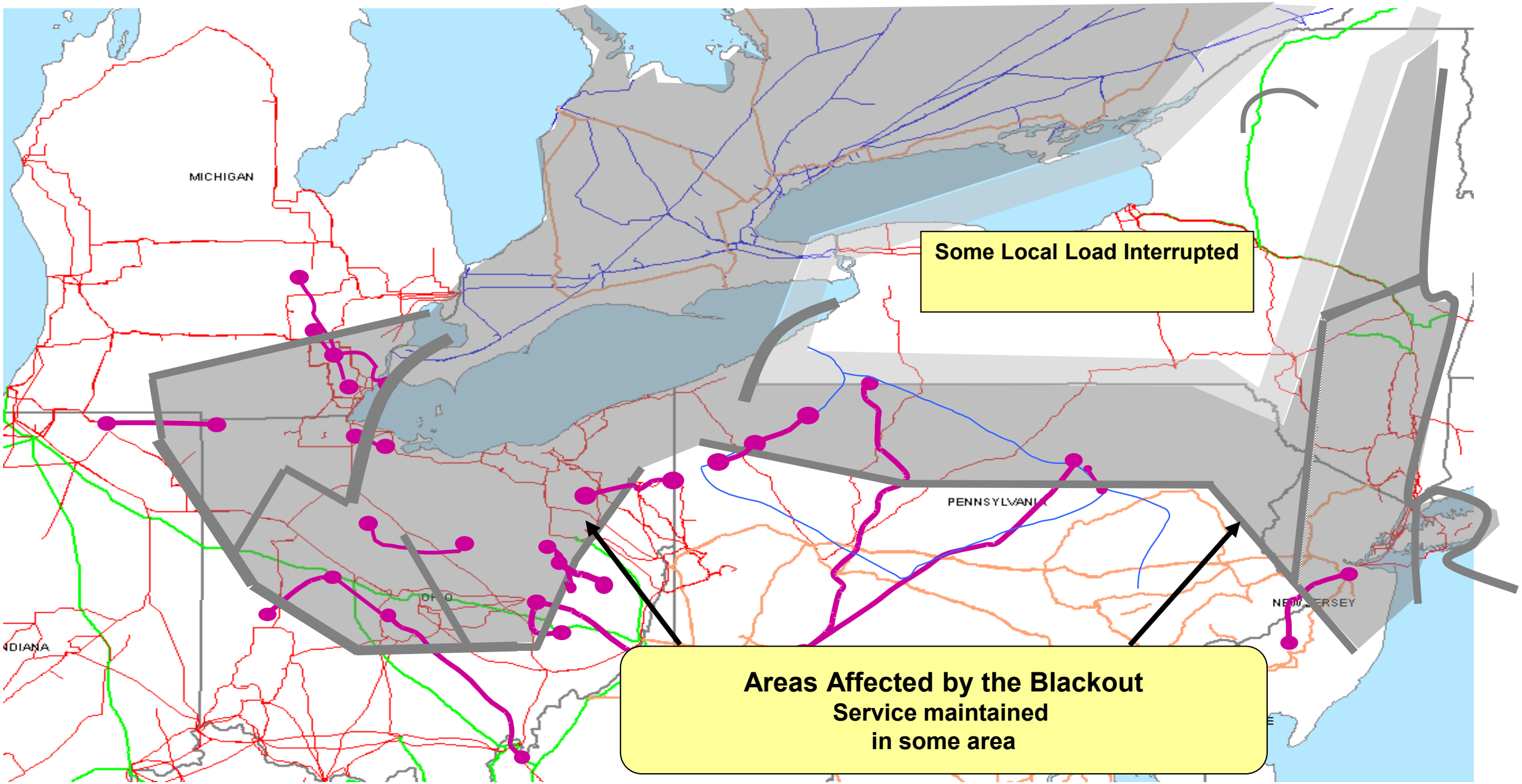


Highest Area of Congestion:
Central East B New Scotland B Leeds B Pleasant Valley

New York State Transmission System
230 kV and above

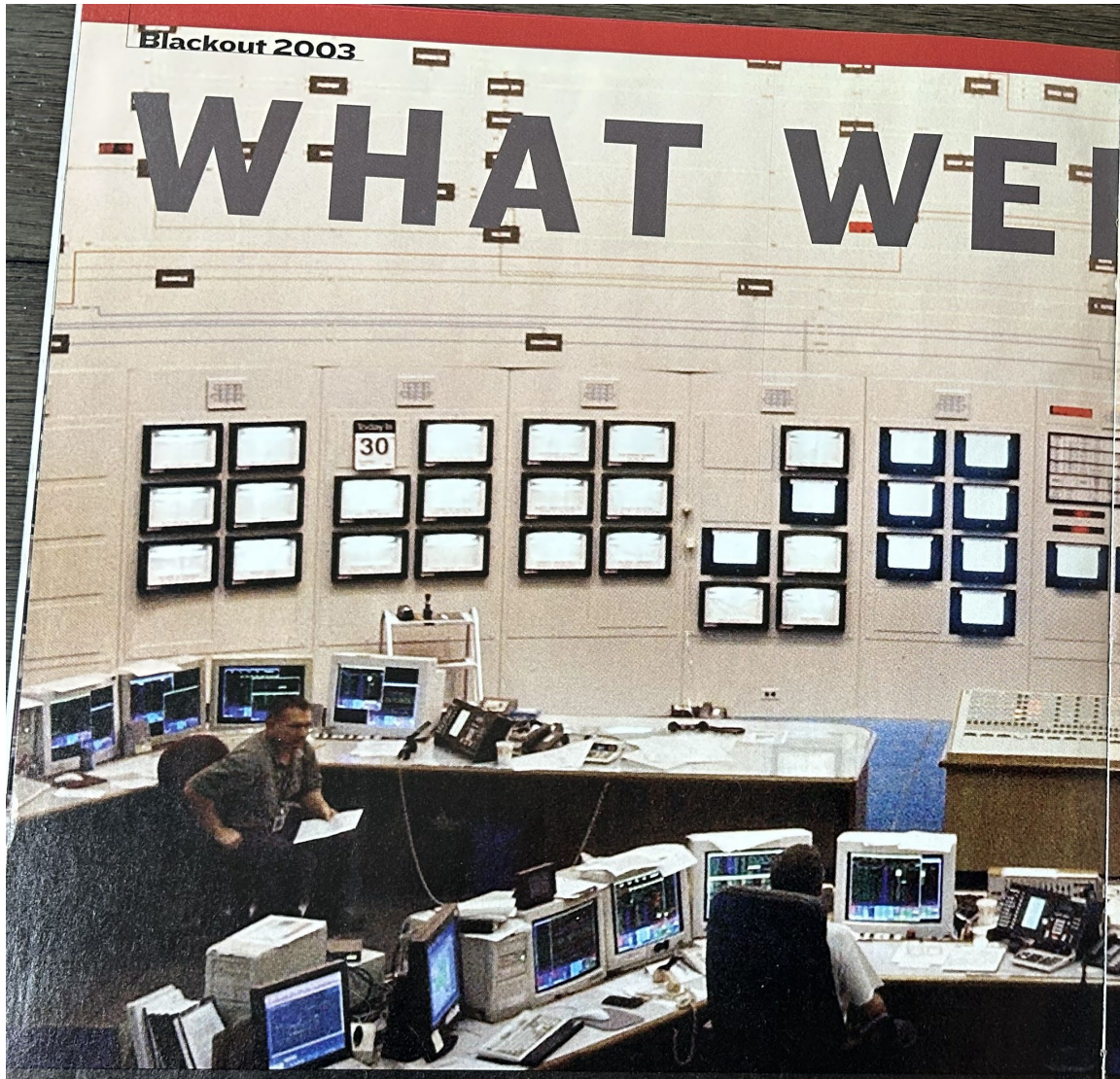
Note: Projects that may relieve congestion in the highlighted area may not necessarily be physically located within this area.

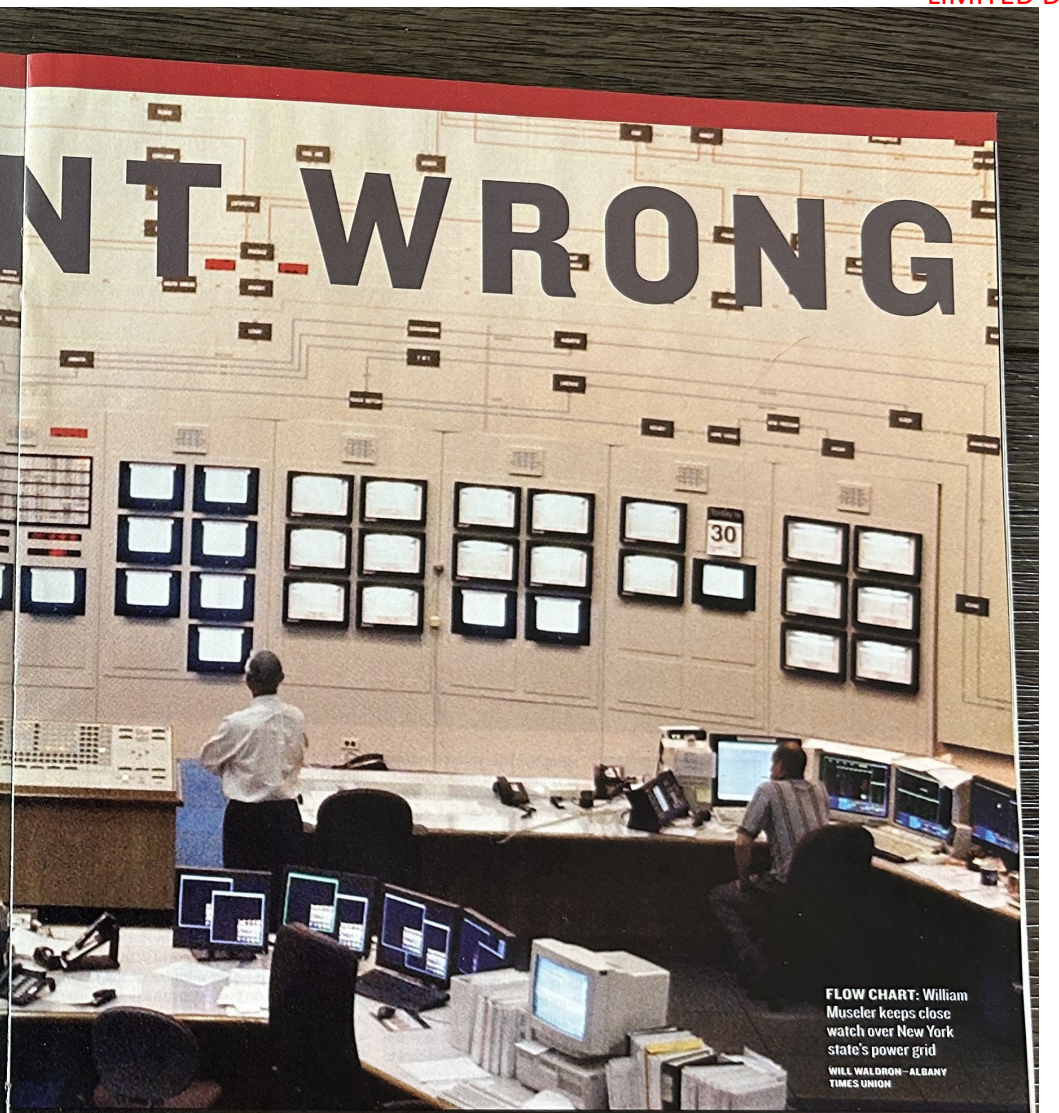
RESTORATION



NEWSWEEK MAGAZINE

WHAT WENT WRONG





FLOW CHART: William Museler keeps close watch over New York state's power grid

WILL WALDRON—ALBANY TIMES UNION

It was a blip on the screen that turned into a monster, leaving 50 million Americans powerless. The inside story of a sleepless night.

BY MICHAEL HIRSH AND DANIEL KLAIDMAN

THURSDAY, AUGUST 14, BEGAN AS A TYPICAL late-summer day: hot, lazy and inconsequential. Up near Albany, Steve Swan was working as shift supervisor at the New York Independent System Operator, the nerve center of the state's power grid. Because of all the air conditioners in use around the region, the grid was carrying a heavy load that day. But it was nothing special for August. In fact, most of the East and Midwest was operating only at about 75 percent of capacity; in past summers, power systems in the region have used more capacity on hotter days without incident. Hunkered down at their terminals, the electrical engineers and other "utility geeks" know that their job of monitoring power flows isn't very glamorous. "A lot of days we sit there for hours and it doesn't look like we're doing anything," says one dispatcher. Rarely does the guy standing guard at a utility feel a part of history.

But at 4:06 p.m., ET, something caught Swan's eye on the big screen at the front of the room. He noticed a large amount of power flowing from New York toward Ontario through the transmission lines—underground and overhead cables. That wasn't so unusual. A power plant must have gone down. But seconds later, something happened that he'd never seen before. The 800-megawatt surge reversed course and began hurtling back toward New York, like some giant ectoplasmic monster on a rampage. Emergency sirens began to wail through the facility—klaxons not unlike the sirens from "Star Trek." Just outside the control room, the operator's chief executive, William Museler, was finishing up a budget report when his room went dark. He rushed through the secure doors into the control room, where what he saw reminded him of a "science-fiction movie," he recalled to NEWSWEEK. People were standing up in stunned silence as they gazed at the power board. Normally, there would be a couple of illuminated red lines representing downed transmission lines. But now

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Aug. 25 issue — Thursday, August 14, began as a typical late-summer day: hot, lazy and inconsequential. Up near Albany, Steve Swan was working as shift supervisor at the New York Independent System Operator, the nerve center of the state’s power grid. Because of all the air conditioners in use around the region, the grid was carrying a heavy load that day. But it was nothing special for August.

IN FACT, MOST OF THE East and Midwest was operating only at about 75 percent of capacity; in past summers, power systems in the region have used more capacity on hotter days without incident. Hunkered down at their terminals, the electrical engineers and other "utility geeks" know that their job of monitoring power flows isn't very glamorous. "A lot of days we sit there for hours and it doesn't look like we're doing anything," says one dispatcher. Rarely does the guy standing guard at a utility feel a part of history.

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'THIS IS MY WORST NIGHTMARE'

Generators all over had shut down to ward off the surging megawatt monster, which could overload and burn them out. "No one had ever seen this before, and it happened instantaneously," said Museler, who had lived through Hurricane Gloria in 1985, which took down 750,000 customers. His heart sinking, he asked one of his employees, "Find out if New York City has gone dark." It had. Museler says he thought to himself: "This is my worst nightmare."

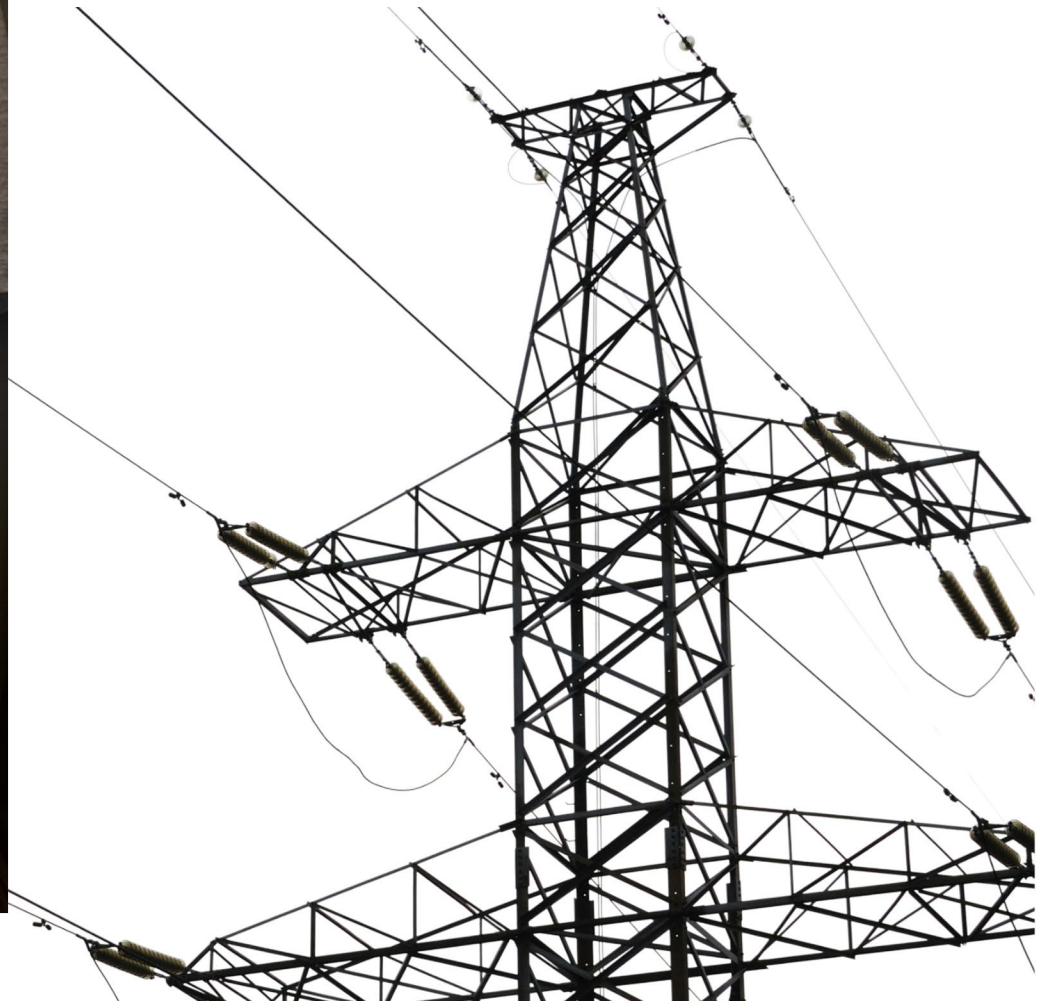
FROM NYISO REPORT

The Importance of Mandatory Standards

There are no national mandatory reliability rules or standards in the United States. Even though operators in New York, New England, and Ontario are obligated to follow NERC and NPCC standards by agreement and contract, the failure of a distant system to follow the rules can have catastrophic consequences hundreds of miles away.

Virtually all responsible parties, utilities, ISO's and RTO's, DOE, FERC, NERC, state commissions, and federal and provincial legislators in the United States and Canada agree that the root cause of the blackout was the failure to adhere to the existing reliability rules. The NYISO believes that the rules must be made mandatory on all participants in the interconnected system.

I got a t-shirt out of the deal !!



QUESTIONS?

Steve Swan – steve.swan@rfirst.org

NERC Report-

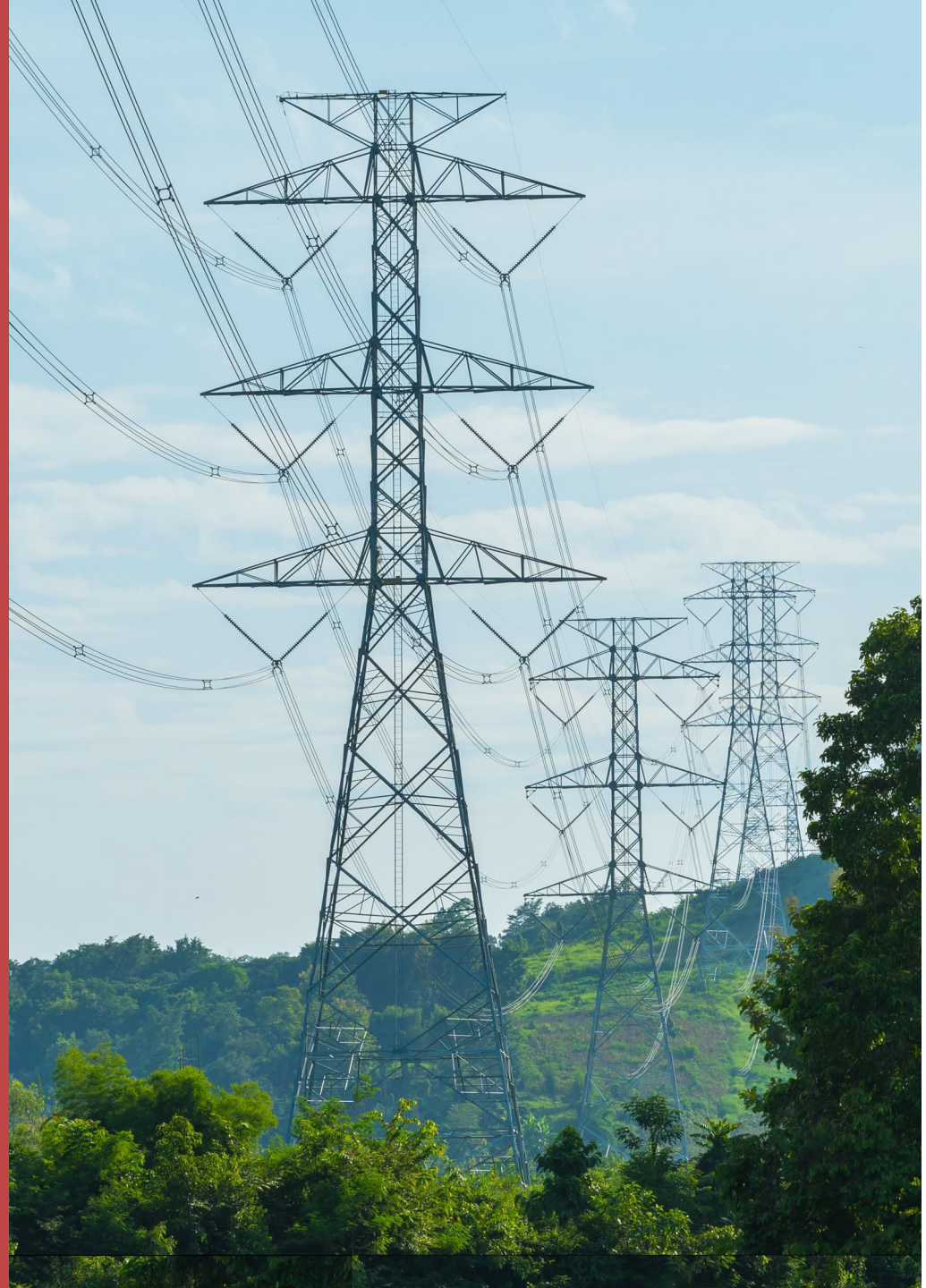
https://www.nerc.com/pa/rrm/ea/August%2014%202003%20Blackout%20Investigation%20DL/NERC_Final_Blackout_Report_07_13_04.pdf

NYISO Report -

https://www.nyiso.com/documents/20142/3059489/blackout_rpt_final.pdf

NEWSWEEK Article (text only) –

http://www.science.smith.edu/~jcardell/Courses/EGR220/blackout/2003BlkOutarticle.html



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