WELCOME to:

Power Operations & Planning Training

For Internal MWD Training

Guidelines:

- Your questions sent via chat will remain anonymous to the audience.

- All Participants are currently on Mute
- Please feel free to use Q/A at bottom of your screen to submit your questions to the panelists during the presentation

- After the presentation, audio & camera use will be available for all participants to ask questions

- Presentation will take 45 minutes

Sit back, relax and enjoy

Our intention is to provide support for MWD team members to better understand energy markets.

Part 1: MWD's "New Normal" in the CAISO Marketplace – Dyanne Kellough 8/13/21 1pm

Part 2: How the CAISO and Energy Markets work & How MWD participates in the CAISO – Scot Rolfe 8/27/21 1pm

Part 3: Why the CAISO needs Resource Adequacy Capacity & How Resource Adequacy works for MWD – Sal Heredia 9/10/21 1pm

Part 4: Electric Reliability Standards and Compliance
Nayeem M.A. 9/24/21 09:30am

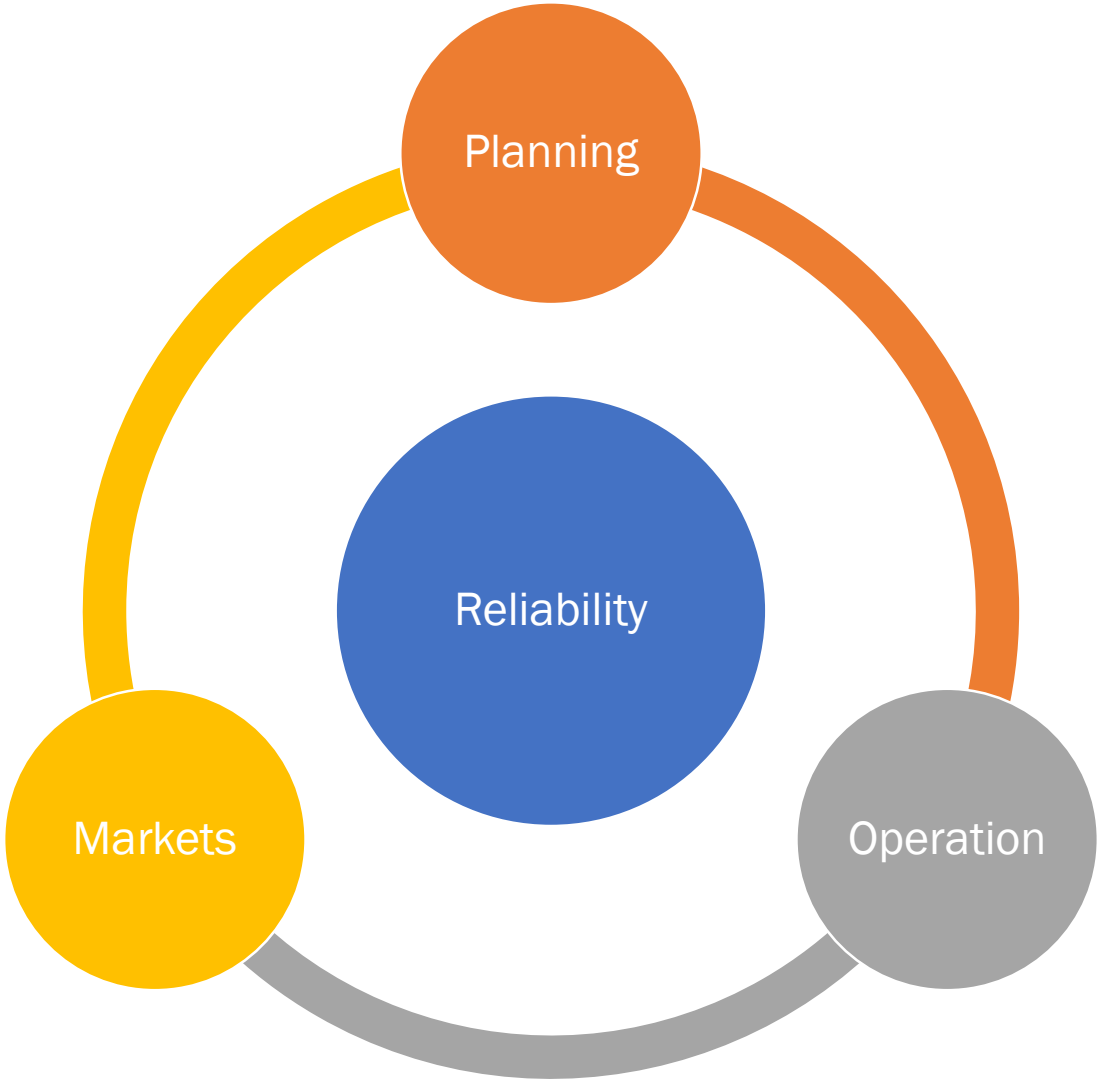
Electric Reliability Standards and Compliance

Nayeem Mohammad Abdullah,
Francisco Trigueros &
Sharon Skinner

Topics for Today

- Background – Power System and Reliability
- NERC Reliability Standards
- MWD System – Applicable Standards
- What role do ‘W(I)E’ play?
- Compliance Assessment
- Questions & Answers

Reason for Standards and Compliance ? - Reliability

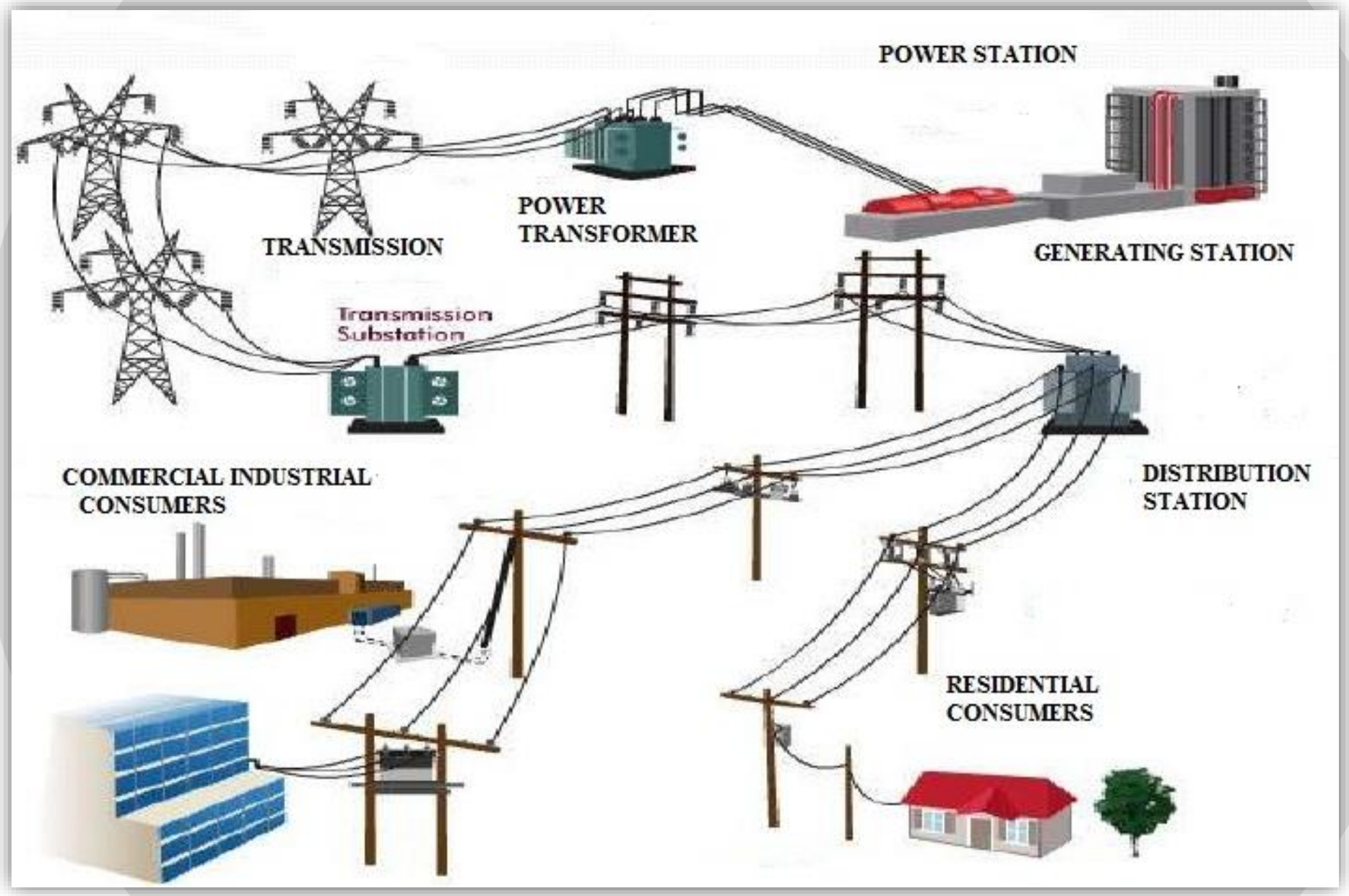


Context – Standards across Industries

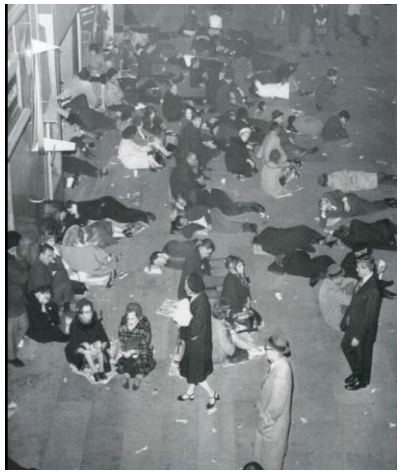
Poll 1

Background – Power System and Reliability

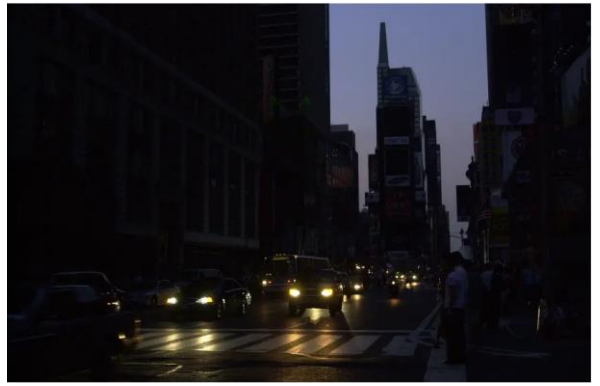
Electric Power System



Electric Reliability Organization Development Timeline



Timeline!



1968: National Electric Reliability council established by Utility Industry

2002: NERC standards become enforceable in Ontario, Canada

1968 | 1968 | 1981 | 2002 | 2003

Nov 9, 1965
Northeast Blackout

1981: North American Electric Reliability Council

2002: Northeast Blackout 50 million people lose power

Electric Reliability Organization Development Timeline

Timeline Cont..

U.S. Energy Policy Act creates Electric Reliability Organization (ERO)

The Electric system and infrastructure continues to observe new challenges and threats

2005 — U.S. Energy Policy Act creates Electric Reliability Organization (ERO)

2006 — North American Electric Reliability Corporation; FERC Order 693 approves 83 of 107 proposed reliability standards; mandatory and enforceable

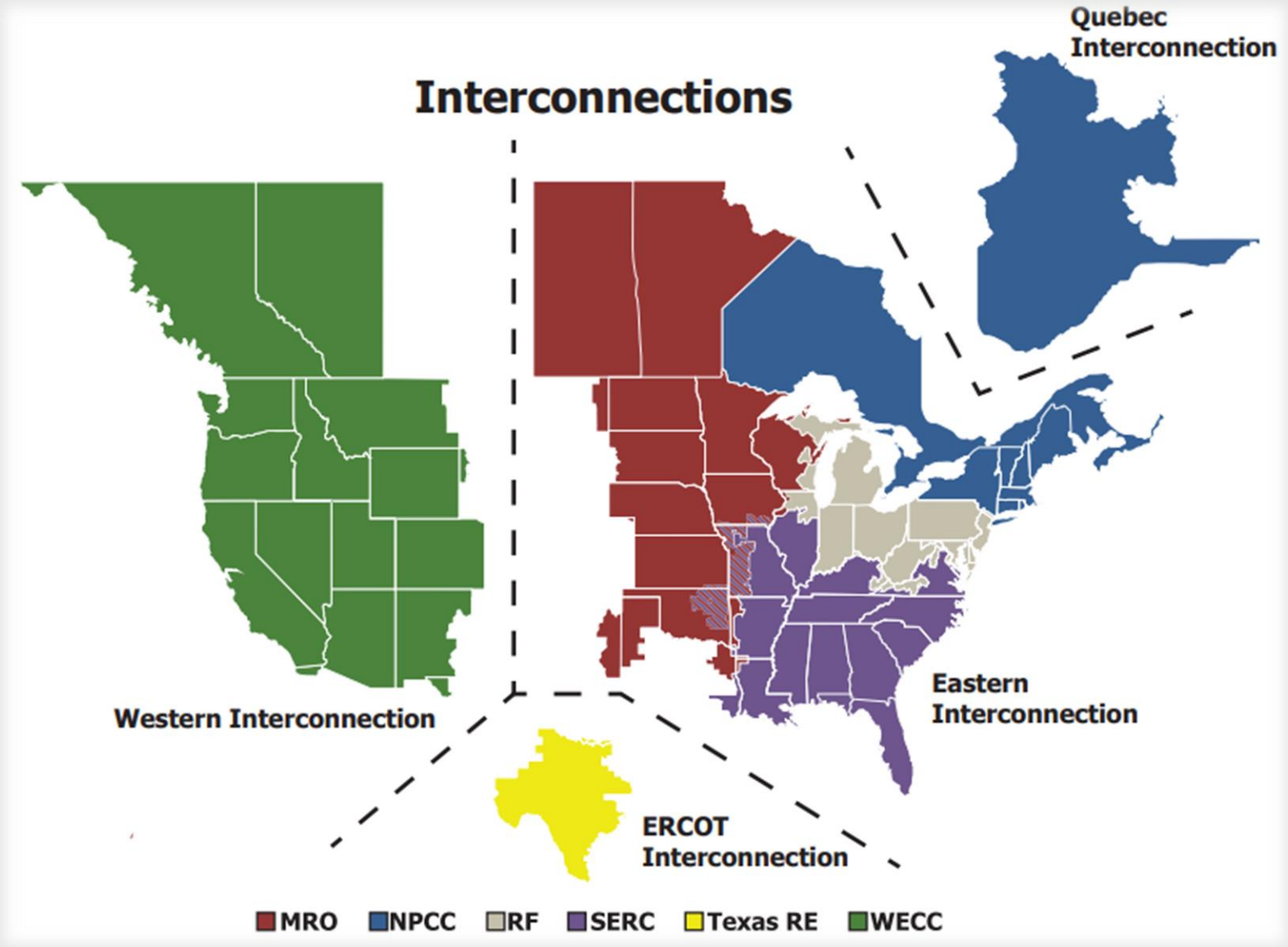
2007

20XX

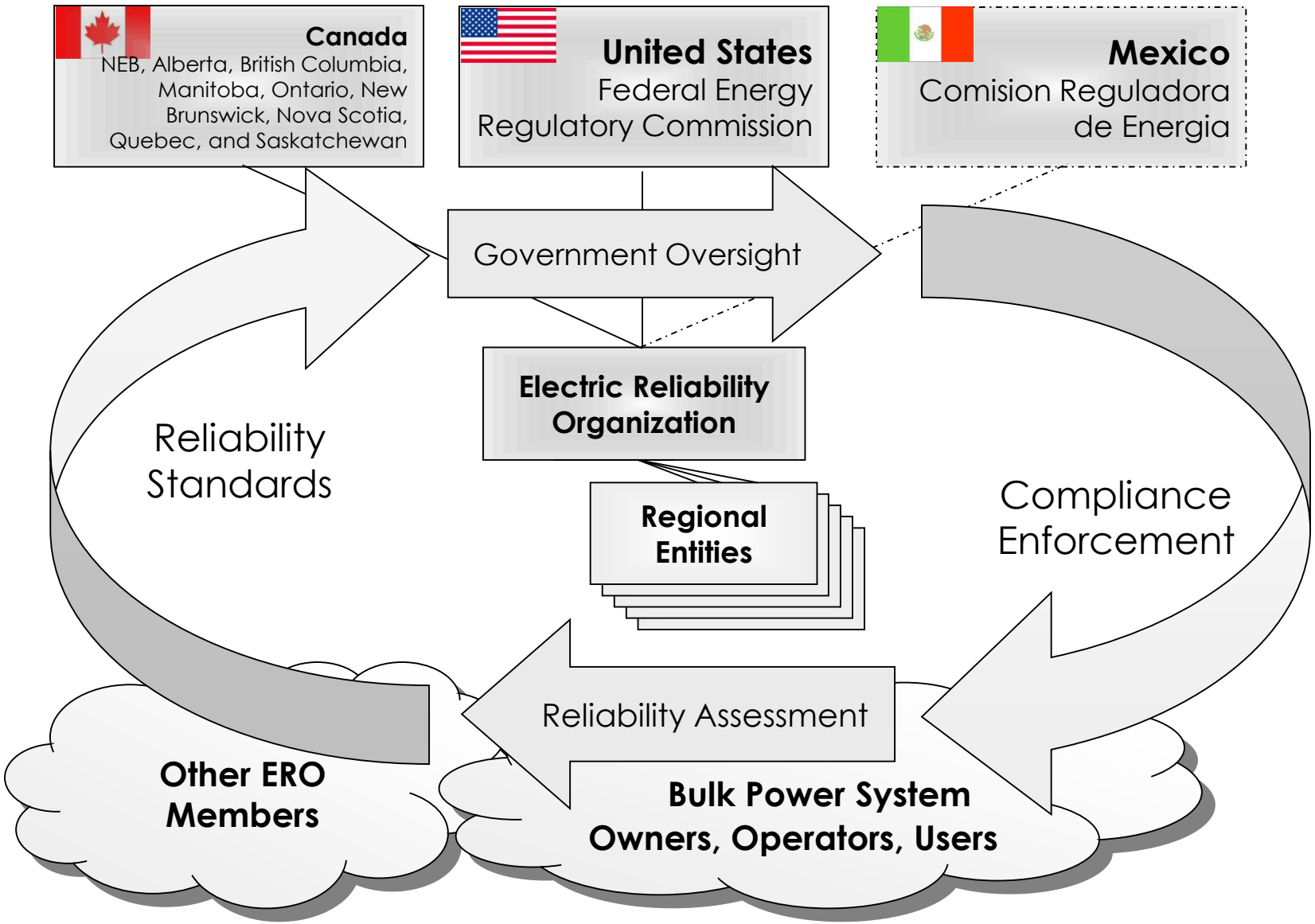
20YY — Standards will also evolve to ensure reliability and maintain system security

Poll 2

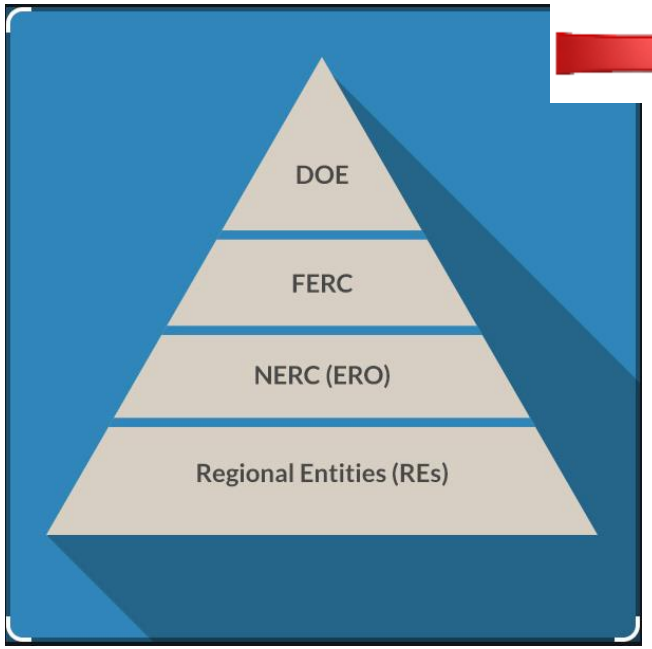
North American Electric Interconnections and Regional Entities



Electric Reliability Organization Overview



Entity Structure



Department of Energy (DOE)

Federal Energy Regulatory Commission (FERC)

North American Electric Reliability Corporation (NERC)

Western Electricity Coordination Council (WECC)

California Independent System Operator (CAISO)

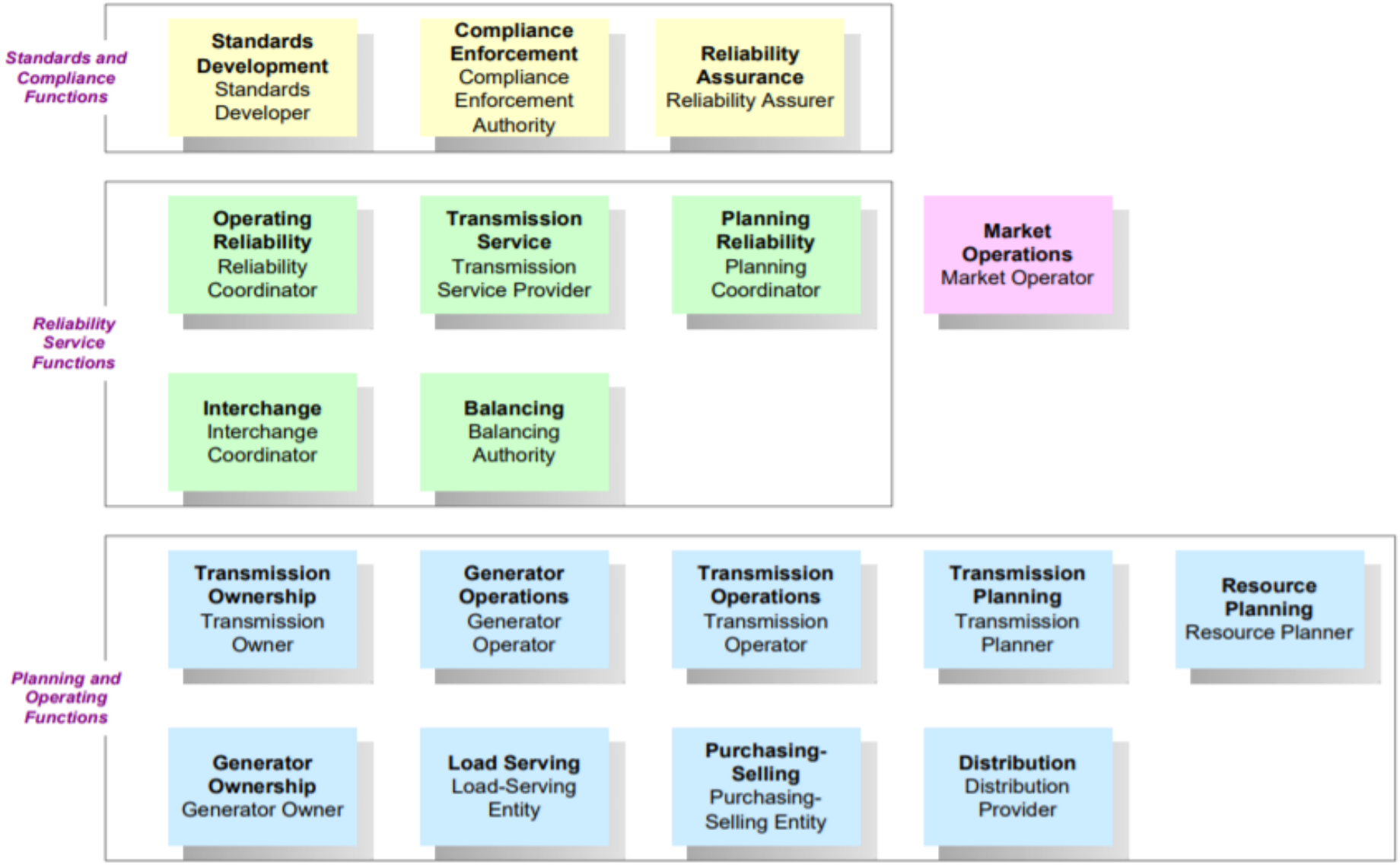
- **FERC [Federal Electric Reliability Commission]**
  - **Functions:**
    - Regulates the transmission and wholesale sales of electricity
    - Monitors and investigates energy markets
    - Assists consumers in obtaining reliable, efficient, and sustainable energy services at reasonable cost through appropriate regulatory and market

- **NERC [North American Electric Reliability Corp]**
  - **Functions:**
    - Develop standards for power system operation, monitoring, and enforce compliance
    - Assess Resource Adequacy
    - Provide educational and training resources
    - Investigate and analyze causes of significant power system disturbances

- **WECC [Western Electric Coordinating Council]**
  - **Functions:**
    - Regional Entity for Western Interconnection – responsible for compliance monitoring and enforcement
    - Assure reliable bulk electric system in the geographical area of western interconnection

NERC Reliability Standards

NERC Reliability Functional Model



NERC Reliability Standards Functional Area

Standard Abbreviation	Function
BAL	Resource and Demand Balancing
COM	Communications
CIP	Critical Infrastructure Protection
EOP	Emergency Preparedness and Operations
FAC	Facilities Design, Connections, and Maintenance
INT	Interchange Scheduling and Coordination
IRO	Interconnection Reliability Operations and Coordination
MOD	Modeling, Data, and Analysis
NUC	Nuclear
PER	Personnel Performance, Training, and Qualifications
PRC	Protection and Control
TOP	Transmission Operations
TPL	Transmission Planning
VAR	Voltage and Reactive

Example Standard – TPL 001-5 (Transmission Planner)

TPL-001-5 — Transmission System Planning Performance Requirements

A. Introduction

1. **Title:** **Transmission System Planning Performance Requirements**
2. **Number:** **TPL-001-5**
3. **Purpose:** Establish Transmission system planning performance requirements within the planning horizon to develop a Bulk Electric System (BES) that will operate reliably over a broad spectrum of System conditions and following a wide range of probable Contingencies.
4. **Applicability:**

   4.1. Functional Entity

   - Planning Coordinator.
   - Transmission Planner.
5. **Effective Date: See Implementation Plan.**

B. Requirements and Measures

R1. Each Transmission Planner and Planning Coordinator shall maintain System models within its respective area for performing the studies needed to complete its Planning Assessment. The models shall use data consistent with that provided in accordance with the MOD-032 standard, supplemented by other sources as needed, including items represented in the Corrective Action Plan, and shall represent projected System conditions. This establishes Category P0 as the normal System condition in Table 1. *[Violation Risk Factor: High] [Time Horizon: Long-term Planning]*

1.1. System models shall represent:

1.1.1. Existing Facilities.

1.1.2. New planned Facilities and changes to existing Facilities.

1.1.3. Real and reactive Load forecasts.

1.1.4. Known commitments for Firm Transmission Service and Interchange.

1.1.5. Resources (supply or demand side) required for Load.

C. Compliance

1. **Compliance Monitoring Process**

1.1. Compliance Enforcement Authority: "Compliance Enforcement Authority" means NERC or the Regional Entity, or any entity as otherwise designated by an Applicable Governmental Authority, in their respective roles of monitoring and/or enforcing compliance with mandatory and enforceable Reliability Standards in their respective jurisdictions.

1.2. Evidence Retention: The following evidence retention period(s) identify the period of time an entity is required to retain specific evidence to demonstrate compliance. For instances where the evidence retention period specified below is shorter than the time since the last audit, the Compliance Enforcement Authority may ask an entity to provide other evidence to show that it was compliant for the full-time period since the last audit.

The applicable entity shall keep data identified in Measures M1 through M8 or evidence to show compliance as identified below unless directed by its Compliance Enforcement Authority to retain specific evidence for a longer period of time as part of an investigation.

- Each Responsible Entity shall retain evidence of each requirement in this standard for three calendar years.

1.3. Compliance Monitoring and Enforcement Program: As defined in the NERC Rules of Procedure, "Compliance Monitoring and Enforcement Program" refers to the identification of the processes that will be used to evaluate data or information for the purpose of assessing performance or outcomes with the associated Reliability Standard.

1.4. Compliance Monitoring Period and Reset Timeframe:

Not applicable.

1.5. Compliance Monitoring and Enforcement Processes:

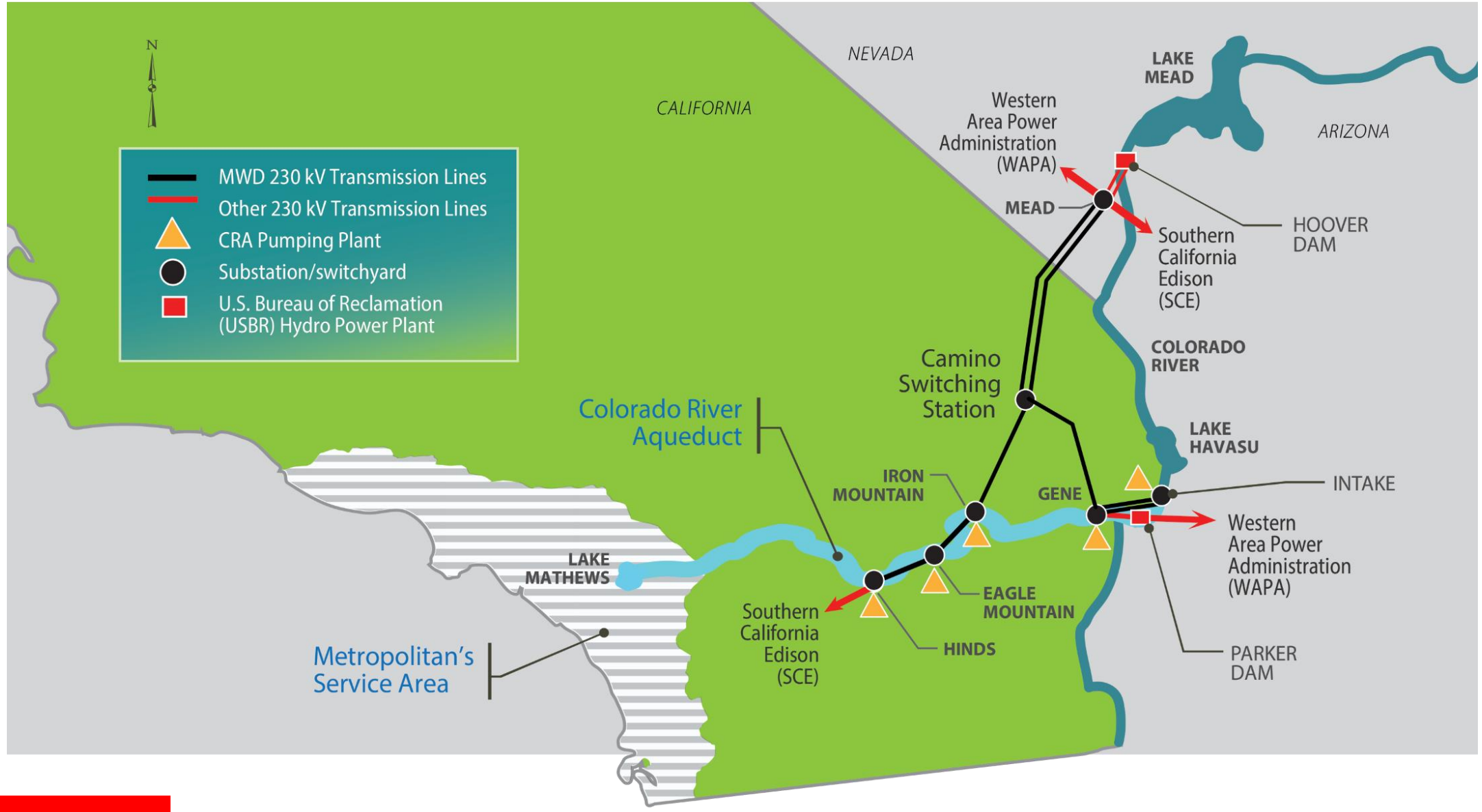
- Compliance Audits
- Self-Certifications
- Spot Checks
- Compliance Violation Investigations
- Self-Report
- Complaints

1.6. Additional Compliance Information

None.

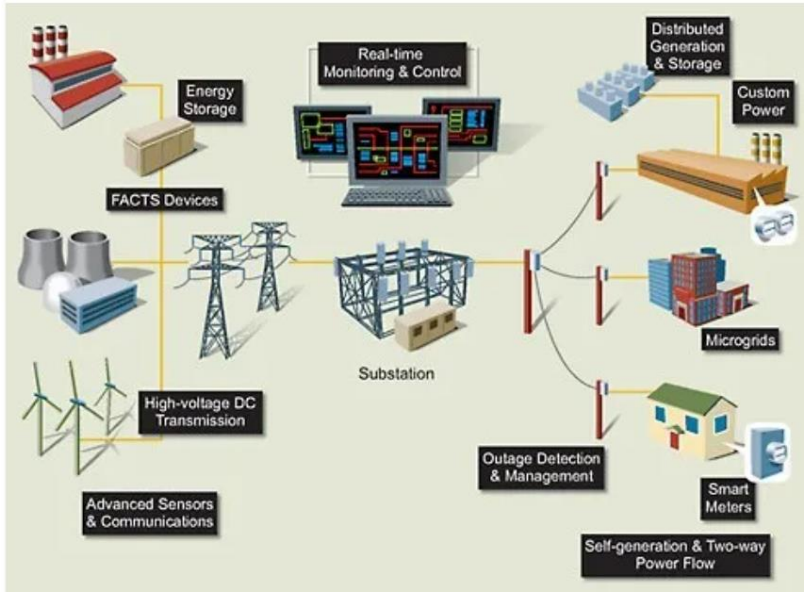
MWD System Applicable Standards

CRA 230kV Transmission System



CONFIDENTIAL

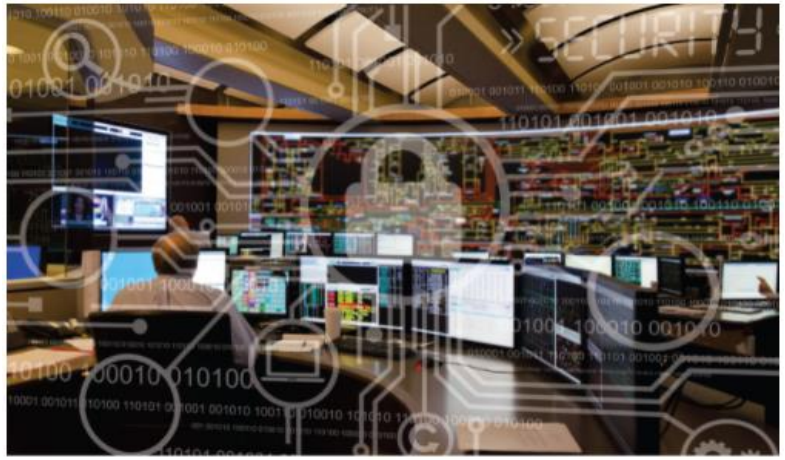
Applicable NERC Standards



- The Metropolitan 230kV system is part of the Bulk Electric System and must comply with NERC standards
- MWD is registered for the ***Transmission Owner (TO), Transmission Planner (TP), and Resource Planner (RP)*** functional areas
- Arizona Electric Power Cooperative (AEPCO) is registered as the Transmission Operator (TOP) for MWDs CRA 230kV system
- Metropolitan is subject to compliance for 41 separate NERC standards with 136 unique requirements (including tasks delegated to MWD from AEPCO)
- Standards are subject to WECC audit (Regional Entity) and non-compliance can result in fines of up to $1.3million/day/violation and/or other penalties

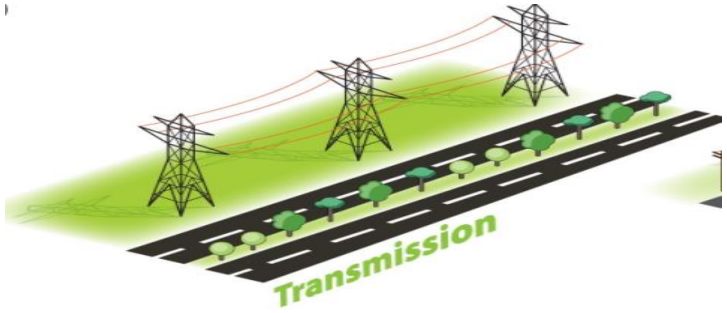
Transmission Owner Standards applicable to MWD

- **Critical Infrastructure Protection (CIP)**
  - ❑ Logging in and out of CIP restricted areas (Iron Mountain & Eagle Mountain)
  - ❑ Reporting Cyber security incident events
  - ❑ Periodic testing of cyber security incident response



- **Event Reporting (EOP)**
  - ❑ Reporting events such as physical threats, damage, or destruction to the BES Facilities (substations/ transmission lines)
  - ❑ Periodic review of process for reporting

- **Vegetation (FAC)**
  - ❑ Annual vegetation inspection of BES transmission line (Maintain a 12ft radial to a conductor clearance)
  - ❑ Annual vegetation work plan due in Dec for upcoming year
  - ❑ Periodic review of vegetation program



- **Relay Loadability (PRC)**
  - ❑ Periodic review of relay settings for Iron Mountain relays

Transmission Owner Standards applicable to MWD

- **Protection System Maintenance (PRC)**
  - ❑ Periodic testing of protection system components (Relays, CTs, PTs, Batteries, etc.) 4 months, 18 months, 3 years, 5 years
  - ❑ Identifying unresolved maintenance issues
  - ❑ Periodic review of maintenance program

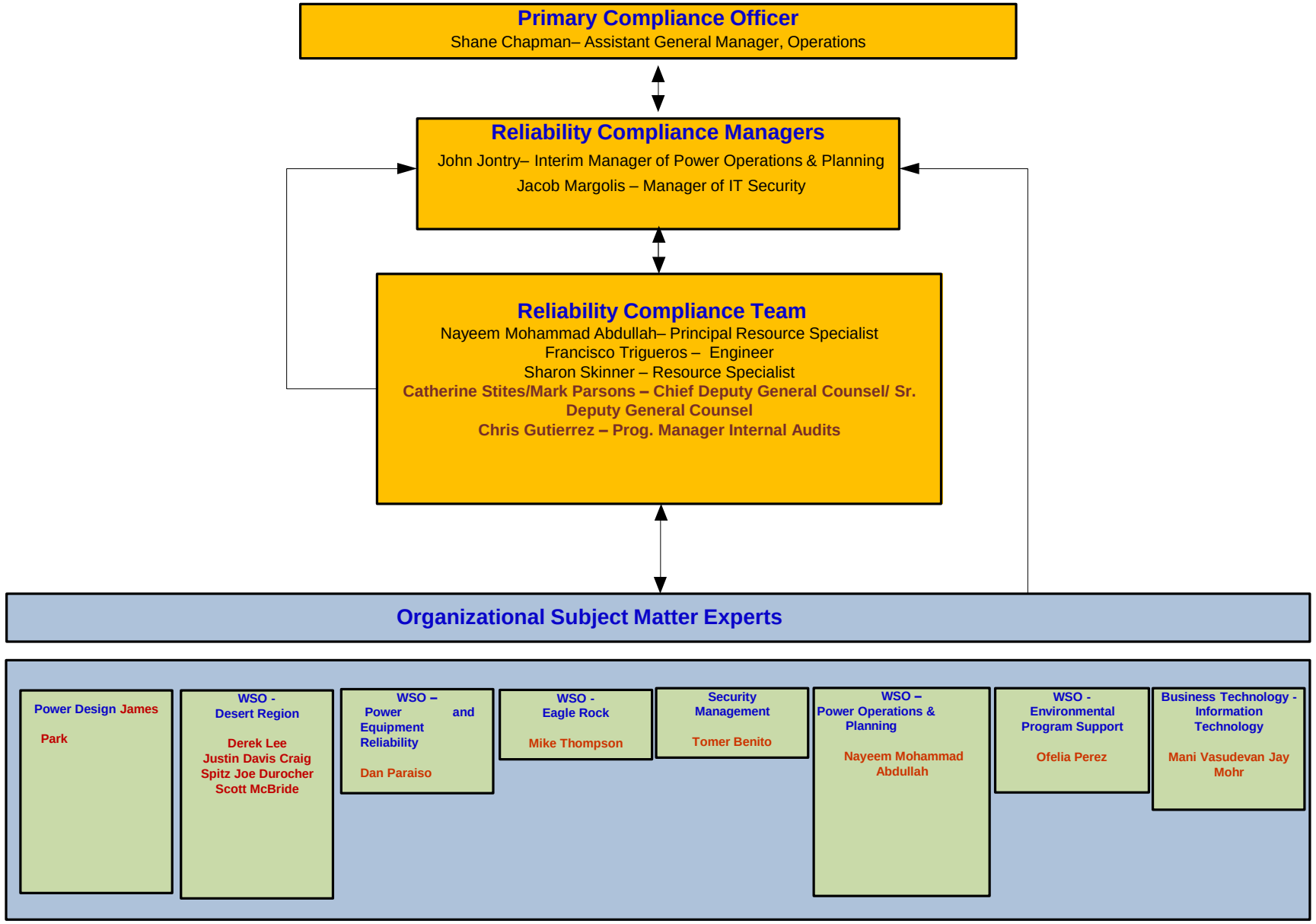
- **Protection System Misoperations (PRC)**
  - ❑ Data collection from relays when a operation occurs
  - ❑ Details of event that caused breaker operation

- **Disturbance monitoring (PRC)**
  - ❑ Data collection from relays (at Iron) when a fault occurs at the Gene bus
  - ❑ Perform time synchronization check when a fault occurs at the Gene bus
  - ❑ Restore recording capability of relay (at Iron) within 90 calendar days of the discovery of a failure to record data or create a corrective action plan (CAP)

- **Operations Personnel (PER)**
  - ❑ Three party communication with AEPCO (receive, repeat, & confirm orders by TOP)

- The standards listed above are some of the prominent ones, and not exhaustive
- In addition to those we also have other standards such as MOD for sharing modeling data, as well as requirement from TOP standards that have been delegated to MWD by AEPCO

MWD Internal Compliance Program Governance Model



* *Procedure Development & Maintenance*
* *Process/Controls/Procedure Execution*
* *Evidence Generation/Retention*
* *Adequate training*
* *Compliance documentation*

Poll 3

What role do ‘W(I)E’ play ?

Success comes from your active participation

- Identifying if any NERC standard directly applies to my/your role whether as an SME or someone who can impact a functional area
  - It could be as simple as completing training to access a NERC CIP (Critical Infrastructure Protection) security area
  - Or as critical as Gene dispatch communicating with AEPCO or CAISO control room
- SME's having complete knowledge of applicable standards and requirements
- Verifying with the Power Operations and Planning team for any applicable standards whenever in doubt; It's always better to ask before than ask later, and its always best to ask than to not ask any questions on compliance
- **Potential NERC Audit in 2022**

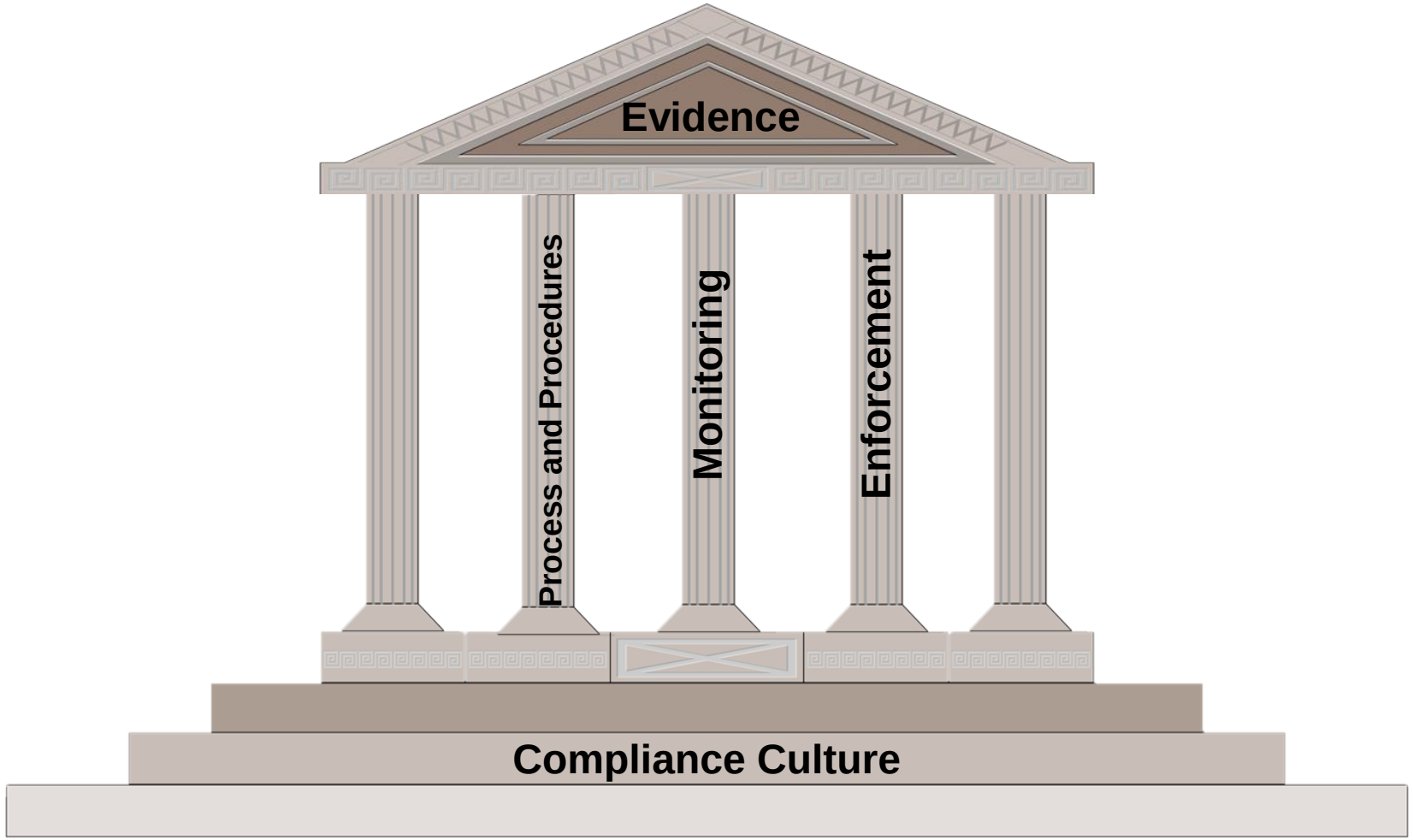
Poll 4

Building a Culture of Compliance

Components of Compliance

- NERC's Compliance efforts are comprised of three main efforts:
- Compliance Monitoring is the process to assess, investigate, evaluate, and audit in order to measure compliance with NERC standards.
- Compliance Enforcement ensures that corrective actions are taken when standards are violated. These actions may include financial penalties and sanctions for such violations.
- Due Process provides registered entities the opportunity to contest any finding of a violation of a NERC reliability standard.

Foundation of a successful NERC Compliance program is based on Compliance Culture



- Processes and Procedure help ensure consistency as well as agility in fixing any missing links
- Continuous monitoring allows us to self assess and mitigate risks
- Enforcing and implementing procedures will help us consistently ensure compliance
- All the above points will help us build a culture of compliance and ensure evidence for the external audits

Compliance Assessment

What is a violation?

A violation is a failure to demonstrate compliance pursuant to applicable NERC Reliability Standard Requirement

How Does WECC know of a possible violation

- ❑ Self-Reports
- ❑ Self-Certifications
- ❑ New possible violation
- ❑ Change in scope
- ❑ Compliance Audits
- ❑ Mock Audits
- ❑ Compliance Investigations
- ❑ Periodic Data Submittals
- ❑ Complaints

Possible Violation Review

- ❑ WECC Subject Matter Experts (SME) reviews the “possible violation”
- ❑ Analyze facts and circumstances
- ❑ Data Requests/conference call if necessary
- ❑ Technical assessment
- ❑ Facts and Timelines
- ❑ Risk Assessment
- ❑ Recommendation of Dismissal or Acceptance to Case Managers

Mitigation and Prevention Checklist

- ❑ Symptom
- ❑ Root Cause
- ❑ Corrective Actions
- ❑ Preventive Actions
- ❑ Detective Actions
- ❑ Assign tasks
- ❑ Timeline and milestones
- ❑ Interim Risk

NERC 2021 violation enforcement actions

Home > Program Areas & Departments > Compliance & Enforcement > > > Enforcement-Actions 2021

Enforcement-Actions 2021

Page Viewer

Date	Regulatory Authority	Docket Number	Regional Entity	Registered Entity	NCR ID	Total Penalty ($)	NERC Violation ID	Reliability Standard	Requirement	Violation Risk Factor
8/31/2021	FERC	NP21-28-000 View Filing>> View Spreadsheet>>	See Spreadsheets and NOP for Spreadsheet NOP Information	See Spreadsheets and NOP for Spreadsheet NOP Information	See Spreadsheets and NOP for Spreadsheet NOP Information	See Spreadsheets and NOP for Spreadsheet NOP Information	See Spreadsheets and NOP for Spreadsheet NOP Information	See Spreadsheets and NOP for Spreadsheet NOP Information	See Spreadsheets and NOP for Spreadsheet NOP Information	See Spreadsheets and NOP for Spreadsheet NOP Information
8/31/2021	FERC	NP21-26-000 View Filing>>	WECC	Pacific Gas and Electric Company	NCR05299	$2,200,000	WECC2018020493	FAC-009-1	R1	Medium
							WECC2018020786	FAC-501-WECC-1	R3	Medium
							WECC2018018998	PRC-005-6	R3	High
							WECC2020023337	PRC-005-1a	R2	High
							WECC2020023453	PRC-004-5(i)	R5	High
04/29/2021	FERC	NP21-16-000 View Filing>> View Errata>> View Notice>>	SERC	Entergy – Nuclear [illegible] Hydroelectric Generation	NCR11166	$420,000	SERC2017018666	VAR-002-4	R2	Medium
					NCR11167		SERC2019021949	VAR-002-3	[illegible]	Medium
04/29/2021	FERC	NP21-14-000 View Filing>> View Notice>>	NPCC	Vermont Transco, LLC	NCR07228	$100,000	NPCC2020023721	FAC-003-4	R2	High
							NPCC2020024276	FAC-003-4	R6	Medium
04/29/2021	FERC	NP21-13-000 View Filing>> View Spreadsheet>> View Notice >>	See Spreadsheets and NOP for Spreadsheet NOP Information	See Spreadsheets and NOP for Spreadsheet NOP Information	See Spreadsheets and NOP for Spreadsheet NOP Information	See Spreadsheets and NOP for Spreadsheet NOP Information	See Spreadsheets and NOP for Spreadsheet NOP Information	See Spreadsheets and NOP for Spreadsheet NOP Information	See Spreadsheets and NOP for Spreadsheet NOP Information	See Spreadsheets and NOP for Spreadsheet NOP Information
04/29/2021	FERC	NP21-11-000 View Filing>> View Errata>> View Notice>>	NPCC	Central Maine Power Company	NCR07029	$360,000	NPCC2019022452	TOP-001-4	R13	High
							NPCC2020023377	TOP-001-4	R13	High
01/28/2021	FERC	NP21-6-000 View Filing>> View Notice>>	WECC	NorthWestern Corporation	NCR05282	$205,000	WECC2018020264	FAC-003-4	R2	High
							WECC2019021260	FAC-003-4	R6	Medium

Additional Resources

Additional Resources

- NERC Reliability Standards - https://www.nerc.com/pa/Stand/Pages/default.aspx
- WECC Standards Dashboard - https://www.wecc.org/Standards/Pages/StandardsDashboard.aspx
- FERC Office of Public Participation - https://www.ferc.gov/industries-data/electric/industry-activities/nerc-standards
- North American Transmission Forum - https://www.natf.net/

Open for Questions