

Introduction to NPCC

Spring 2018 Workshop

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May 23, 2018
White Plains, NY

Agenda

- Overview of NPCC and NERC
- Risk Based Oversight Framework
- Audit and Enforcement Process
- NPCC Stats and Real World

About NPCC

- 501 (c) (6) NFP
- 8 BOD Sectors (x2)
 - 7 Stakeholder, 1 Independent
- 220 Registered Entities (NERC)
- Members of NPCC (Criteria)
 - 35 General, 64 Full
- Funding:
 - NERC/FERC (Statutory - NERC collects from LSE on MWH basis)
 - Criteria (Non Statutory-Full Member BA collects)

NPCC

- 20% of EI load
- NEL NPCC: 46% US and 54% Canadian sources
- 70% of Canadian NEL is within NPCC
- 1.2 million square miles
- Population of 55 million

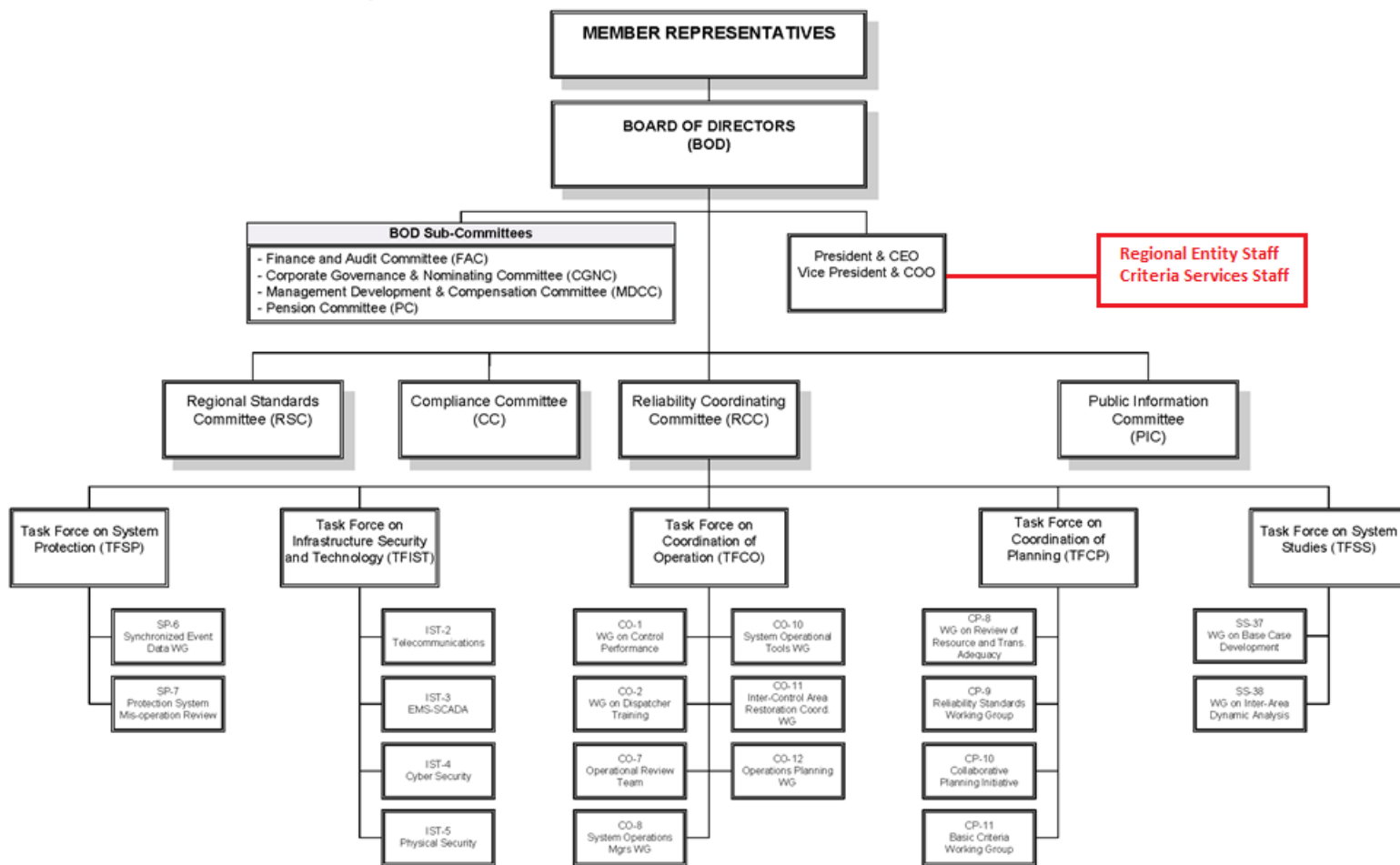
Role of NPCC

The NPCC mission is to enhance the reliability of and to promote the reliable and efficient operation of the international, interconnected bulk power system in Northeastern North America.



NORTHEAST POWER COORDINATING COUNCIL, INC. (NPCC)

FUNCTIONAL ORGANIZATIONAL CHART

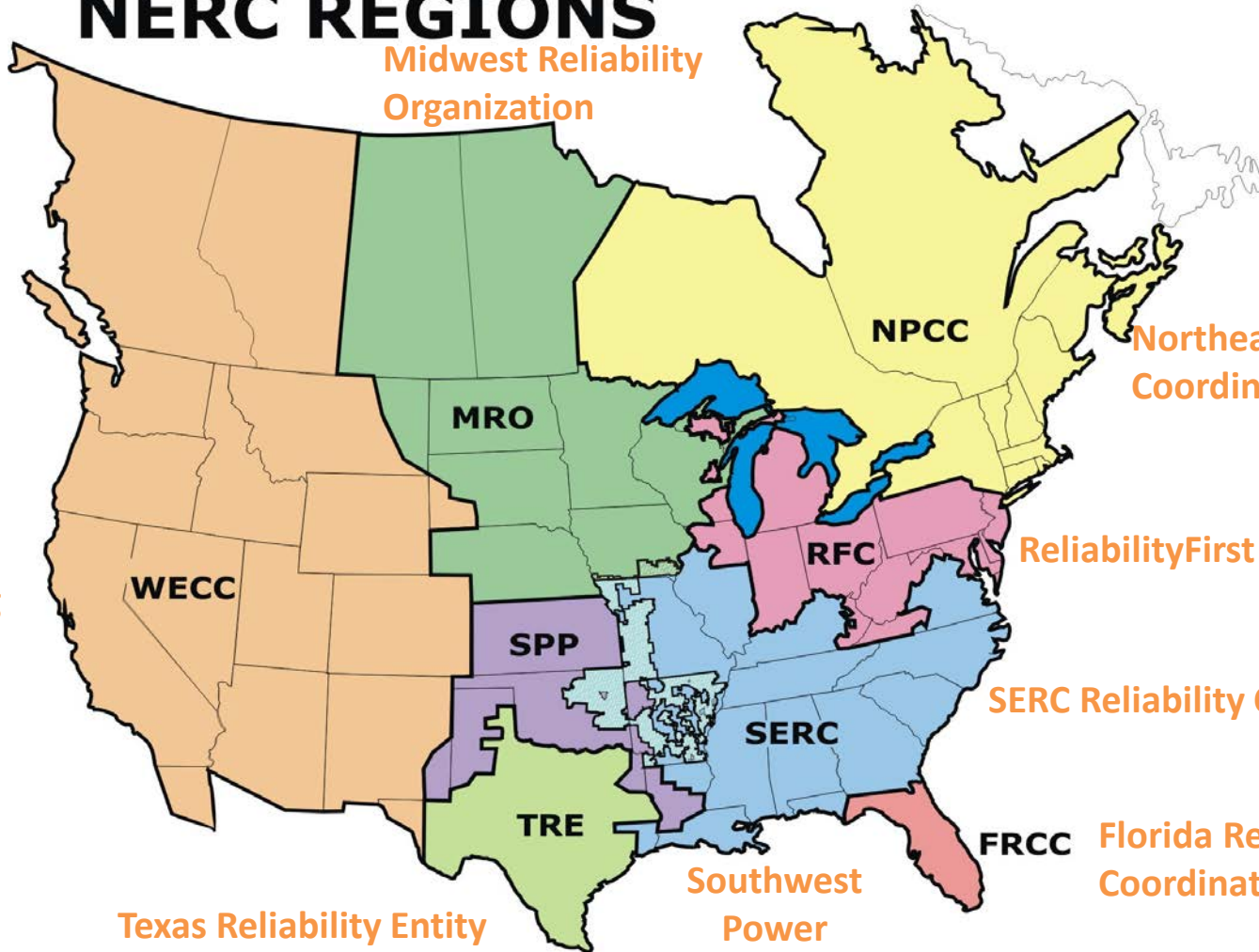




NERC REGIONS

Midwest Reliability
Organization

Western
Electricity
Coordinating
Council



Northeast Power
Coordinating Council

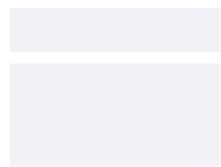
ReliabilityFirst Organization

SERC Reliability Corporation

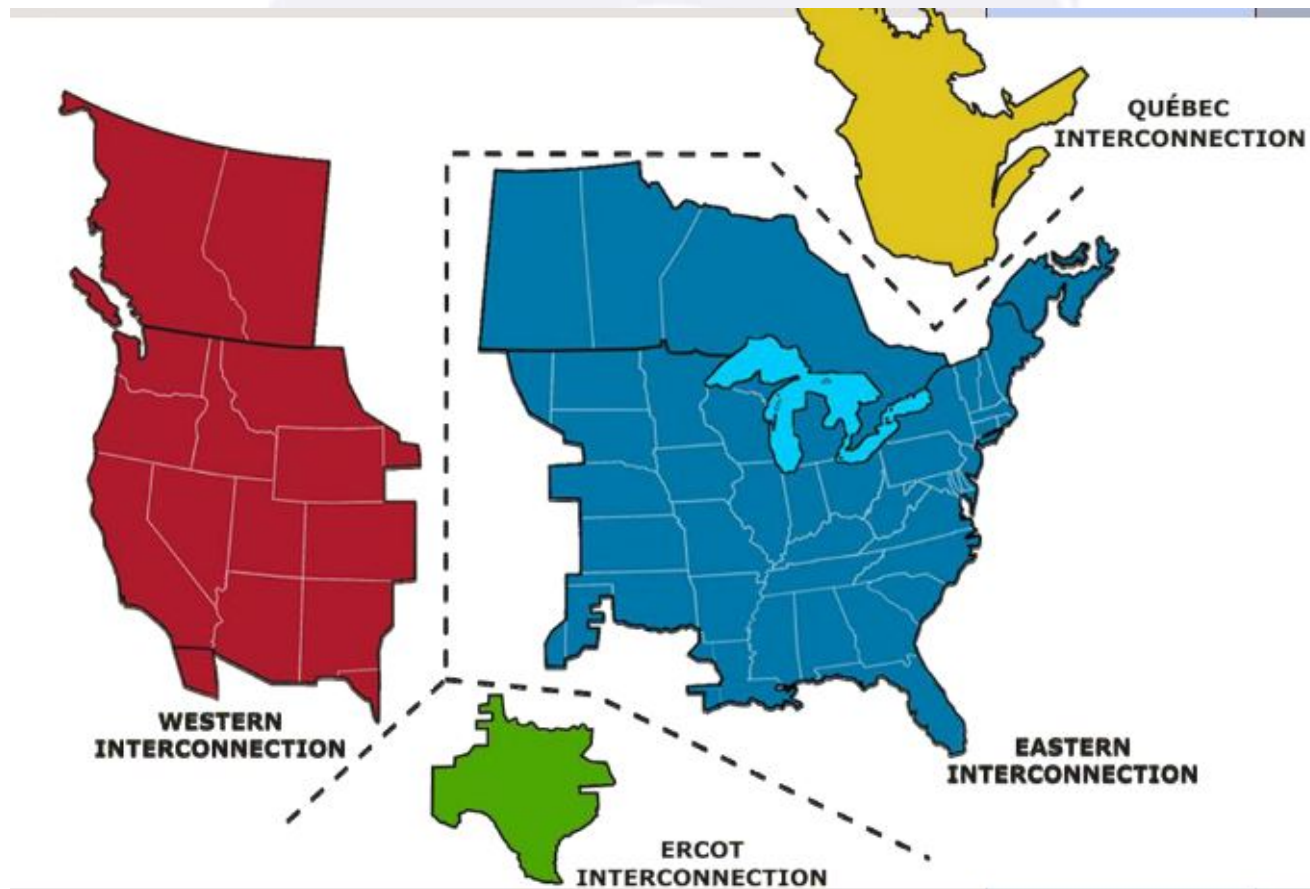
Florida Reliability
Coordinating Council

Southwest
Power
Pool RE

Texas Reliability Entity



North American Interconnections



Interconnection Data

- Eastern: 575 GW peak, 650 GW of Nameplate
 - NPCC 110 GW Winter peak, 165 GW Installed Capacity
- WECC: 147 GW peak, 284 GW
- Quebec: 38 GW peak, 46 GW
- ERCOT: 68 GW peak, 77 GW

(Data is approximate)

Electric Reliability Governance



Federal Energy Regulatory Commission

The Energy Authority and Governing Body

NERC

NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

North American Electric Reliability Corporation

Certified as the "Electric Reliability Organization"
for the continental United States

Reliability
Standards

Catalyst for
Positive Change

Operate
and Plan

Lessons
Learned



Regional Reliability Organizations

Compliance Monitoring & Enforcement of Standards
Perform regular and scheduled compliance audits,
random spot checks, and specific for-cause investigations

Key Aspects of NERC



The North American Electric Reliability Corporation (NERC) develops and implements reliability standards in accordance with FERC-approved procedures. NERC does not enforce these reliability standards directly; rather, it delegates enforcement to the Regional Reliability Organizations.

Key Programs

- **Reliability** - address events and identifiable risks, thereby improving the reliability of the bulk power system
- **Assurance** - provide assurance to the public, industry, and government for the reliable performance of the bulk power system
- **Learning** - promote learning and continuous improvement of operations and adapt lessons learned for improvement of bulk power system reliability
- **Risk-based Approach** - focus attention, resources, and actions on issues most important to bulk power system reliability

Statutory Role – Regional Entity Division (NERC Budget Related)

- Monitor and Enforce National and Regional Reliability Stds
- Participate in National Standard Development Process
- Develop Regional Stds via the RRSDP using common attributes
- Organization Registration and Certification
- **Assess Reliability and Performance**
- Coordinate System Planning, Design, and Operation
- Training/Education, Situation Awareness, Event Analysis

Zoom In: Assess Reliability and Performance

- Seasonal Assessments, Resource Adequacy
- Distributed Energy Resources
 - NERC TF, DERs play into NERC LTRA
- MMWG – Eastern Inter Base Cases
- Task Force Support through Volunteer Army
- SP-7 Misoperations
- Governor Response
- Essential Reliability Services (ERS)

Non-Statutory Role - Criteria Services Division (Not NERC Related)

- Develop More Stringent Regional Criteria
- Criteria Compliance And Enforcement Program (CCEP)
 - Reporting Full Members Self Certify to a subset (non-monetary sanctions)
- Different Obligations for:
 - Full Members
 - General Members
 - Non-Members
 - 35 General, 64 Full

Reliability Based Impact Methodology

NPCC Criteria Document A10

- *Classification of Bulk Power System Elements*
- Bus Basis: Transient Stability and Steady State Stability tests for 3 phase faults
- Goal: Determine if there is a “significant adverse impact” outside of the “local area”
- Loss of synchronism of gen, tripping due to power swings, SPS operating when not required, voltage levels, thermal loading
- Pass the test: Everything connected to Bus must meet Criteria
- Result: The A10 List of BPS Facilities (a list of busses)

Criteria - Bottom Up Approach

- Criteria define the principles to be followed
- Task Forces and Working Groups develop
- Reviewed by Committees
- Posted for comments
- Members approve
- Members are bound

Key Dates in History

1965 - NE Blackout

1966 - NPCC Formed

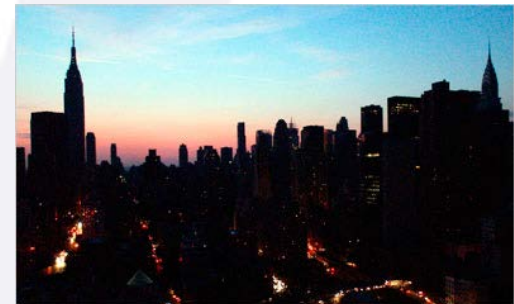
1968 - NERC Established

1977 - NYC Blackout

2003 - NE Blackout

2005 - Energy Policy Act of 2005

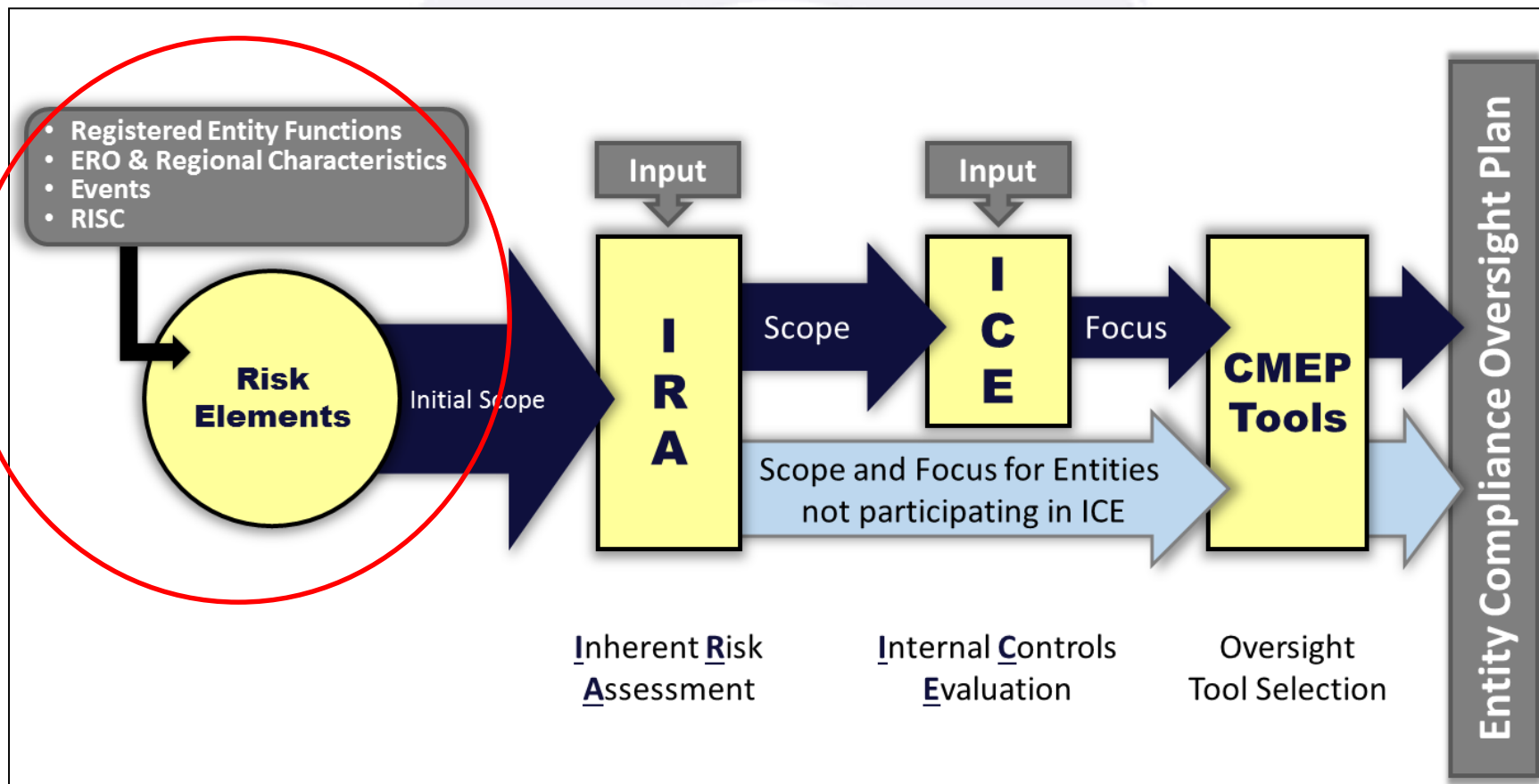
2016 — Risk Based Concepts for CMEP Fully Implemented



Spotlight- EPA of 2005

- Amends the FPA in Section 215
- FERC given electric reliability oversight
- Mandated a self-regulating ERO
- Mandatory Rel Stds subject to FERC review
- Urged agreements with Canada and Mexico
- Laid out RDA framework for the ERO
- New Section 216 of FPA added to impose \$ penalties

Risk Based Oversight Framework



2017 Risk Elements in ERO CMEP IP

Table 1: Critical Comparison of 2015, 2016, and 2017 Risk Elements		
2015 Risk Elements	2016 Risk Elements	2017 Risk Elements
Cyber security	Critical Infrastructure Protection	Critical Infrastructure Protection
Extreme Physical Events	Extreme Physical Events	Extreme Physical Events
Infrastructure Maintenance	Maintenance and Management of BPS Assets	Maintenance and Management of BPS Assets
Monitoring and Situational Awareness	Monitoring and Situational Awareness	Monitoring and Situational Awareness
Protection System Misoperations	Protection System Failures	Protection System Failures
Uncoordinated Protection Systems		
Long-Term Planning and System Analysis	Event Response/Recovery	Event Response/Recovery
	Planning and System Analysis	Planning and System Analysis
Human Error	Human Performance	Human Performance
Workforce Capability	(N/A for 2016)	(N/A for 2017)

Monitoring and Situational Awareness (NERC IP 2017 Zoom In)

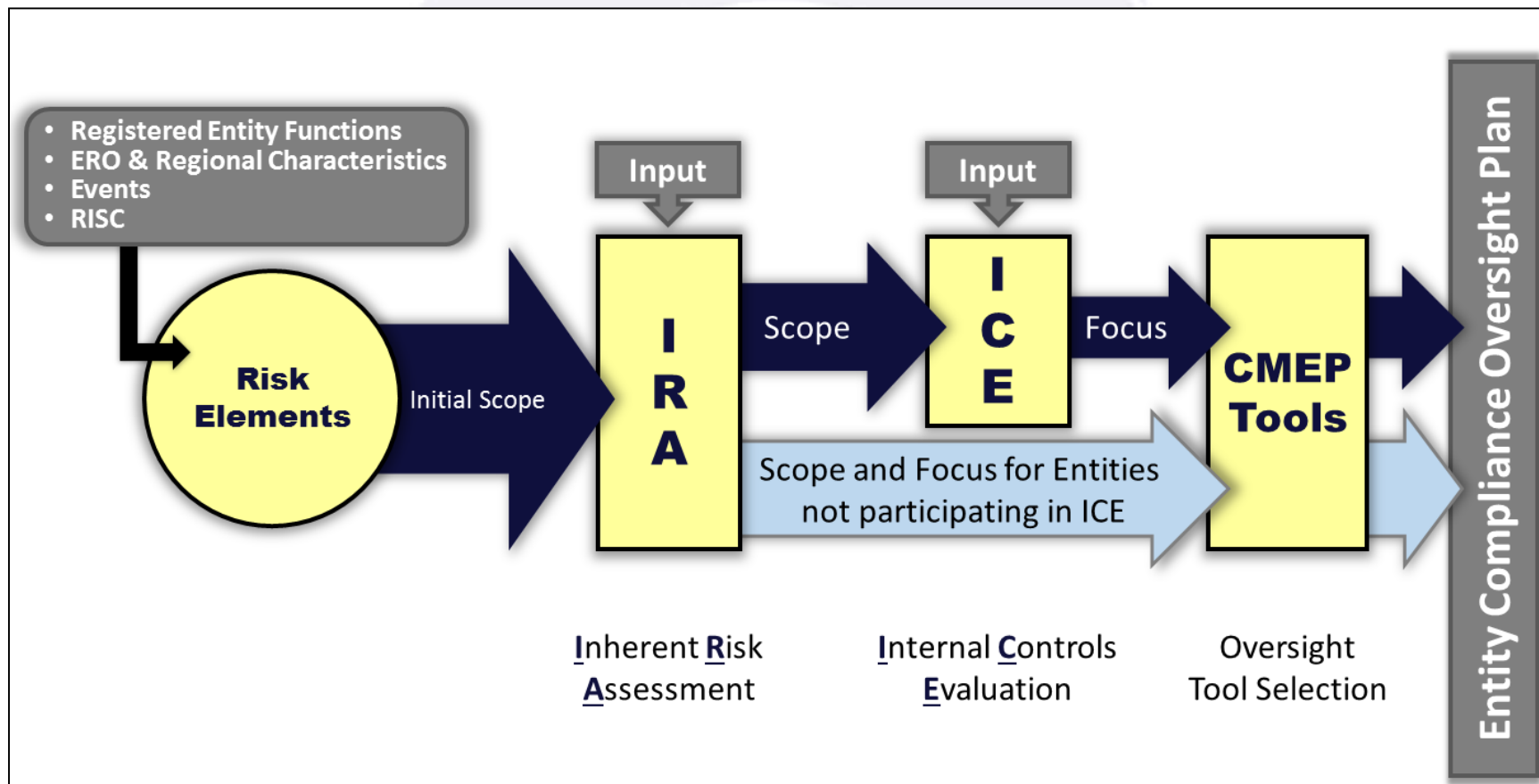
Table 5: Monitoring and Situational Awareness			
Standard	Requirements	Inactive/Enforcement Date (if applicable)	Entities for Attention
IRO-005-3.1a	R1, R2	03/31/2017	Reliability Coordinator
IRO-002-4*	R3, R4	04/01/2017	Reliability Coordinator
<i>*Replaces IRO-005-3.1a per dates noted</i>			
TOP-006-2	R1, R2, R7	03/31/2017	Balancing Authority Reliability Coordinator Transmission Operator
TOP-001-3*	R10, R11	04/01/2017	Balancing Authority Transmission Operator
<i>*Replaces TOP-006-2 per dates noted</i>			

Monitoring and Situational Awareness (NPCC 2017 - Expanded ERO)

Appendix A3 - Northeast Power Coordinating Council (NPCC) 2017 CMEP Implementation Plan

Additional Areas of Focus for ERO Risk Elements		
Expanded ERO Risk Element	Justification	Associated Standard and Requirement(s)
Monitoring and Situational Awareness	Historical events in the Northeast (1965, 1977, 2003) have proven the need for the highest level of RC/BA/TOP real-time operator monitoring capability, decision making, and situational awareness of current and near-term system status. To that end, the requirements listed will allow NPCC to confirm, educate, and discuss with the RC/BA/TOP as necessary on how the entity accomplishes the following: Ensuring proper reserves, taking action to alleviate BES risks, the degree that entities identify and operate to the most limiting parameter, issuing alerts and communicating without delay when foreseeing a transmission problem, performing next day analyses, performing 30 minute assessments, implementing real-time time plans to prevent SOL and IROL <u>exceedences</u>, and having documented data exchange policies that will ensure that it can perform real-time monitoring and assessments,	<u>BAL-002-1</u> R1 (BA) R3 (BA) <u>IRO-005-3.1a (until 3/31/17)</u> R10 (RC, BA, TOP) R12 (RC) <u>EOP-002-3.1a (until 3/31/17)</u> R8 (RC) <u>IRO-002-4 (after 4/1/17)</u> R1 (RC) R2 (RC) <u>IRO-008-1 (until 3/31/17)</u> R1 (RC) R2 (RC) <u>IRO-008-2 (after 4/1/17)</u> R1 (RC) R2 (RC)

Risk Based Oversight Framework



Benefits of ICE

- Enhanced attainment of BES reliability, Corporate Goals and Objectives;
- Greater alignment of staff performance to Key Performance Indicators;
- Improved operational performance (i.e., exceeding standards and requirements);
- Enhanced entity communication and interaction across organizational business functions;
- Targeted BES reliability risk-focused scoping;
- ~~Reduction in audit duration;~~
- Improved risk and control awareness;
- Internal Control Design evaluation including:
 - Functional and Business Process Assessment;
 - Risk Identification, Mitigation & Remediation;
 - Design and Gap Analysis
 - Non-binding Recommendations for Internal Control Design Enhancement.
- ICE Training and Outreach.

Audit Process

- 120 days prior - NPCC sends formal audit notification package w/milestones for entity response
- Applicable standards/requirements
- Note: 6 Months in advance >>> NPCC will inquire about voluntary ICE

Audit Preparation by Entity

Prepare RSAWs and list supporting proof/documents

- Procedures, reports, logs, recordings
- The more information you supply to satisfy the auditor requests, the more time he has to review
- Pre-Audit - A lot of work is done by entity and NPCC prior to the onsite visit or offsite phone call.
- Evidence Tracking Sheet

Notes for 2018

- “Controls” are being assessed during the engagement.
 - NERC expectation
 - Will address in Areas of Concerns, Recommendations, or Positive Observances.

Enforcement Process

- NERC Compliance Monitoring and Enforcement Program
- [NERC Appendix 4C](#)

The Enforcement Queue

Leading methods of discovery

- Self Reports 85%
- Audit Findings
- Self Certifications

Disposition Methods

1. Dismissal
2. Compliance Exception
 - Minimal Risk, \$0, minimal paperwork
 - Not considered a “possible violation”; instead “potential non-compliance”
3. FFT
 - Moderate risk, \$0 penalty still
 - Still efficient and focuses resources, a bit more paperwork
 - Not considered a “confirmed violation”; but still a “possible violation” is sent
4. SNOP
 - \$ Involved
 - Short Settlement Form
 - Short NOCV Form
5. Full NOP
 - More \$ Involved
 - Long Settlement
 - Regular NOCV

We Need to Determine the Risk

- Lesser Risk violations qualify for less serious enforcement paths
- Smaller penalties or no penalties
- Quicker turnaround for NPCC Staff, NERC, and FERC, and the entity.
- Less paperwork, Quicker Disposition for Entity
- More reliable BES

What helps determine Risk?

- Well written Self Reports
- Well written audit reports, completed RSAWs
- SR: Step by step description of the issue and the Root Cause
- SR: Explanation of steps taken to mitigate
- SR: Explanation of compensating measures
- **RAI Self Report User Guide**
- [NERC RAI Page Link](#)

Settlement

- Registered Entities may request settlement negotiations at any time up to the point of NERC filing a “Notice of Penalty”
- Settlement Process provides for negotiation opportunity
- Emphasis for settlement is on reliability of the bulk power system

Factors associated with Penalties

- Risk to bulk power system (Primary Factor)
- Violation Risk Factor/Violation Severity Level
- Discovery Method
- Violation Duration
- Settlement
- Compliance History

More Factors

- Aggravating
 - Intentional / concealment / impeding the investigation
 - Management involvement/knowledge of bad behavior
- Mitigating
 - Admission
- Both
 - Cooperation
 - Internal Compliance Program

Cooperation is Expected

- Timely and accurately responding to questions and inquiries
- Keeping NPCC updated if answers will not be by expected date
- Appropriate staff resources and availability
- Candor/Disclosure
 - All facts; not just favorable facts
 - Providing NPCC with information unhelpful to your entity without a specific question asking for that information

Internal Compliance Program

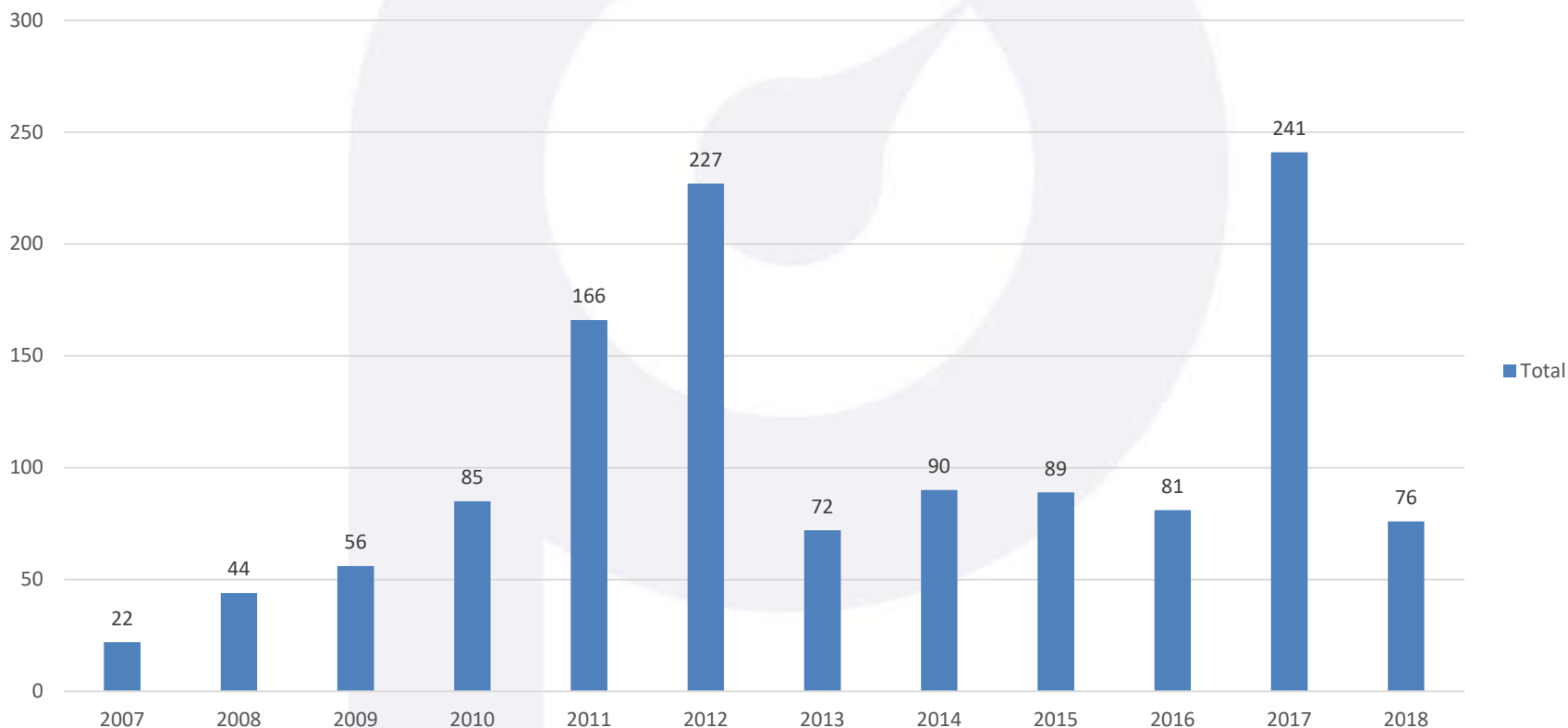
- Lack of an ICP or poor ICP can lead to aggravating penalty
- Excellent ICP can lead to penalty credits
- Scaled to company size

2018 Bigger Focus

- Root Cause Analysis
- Wide Area View in Mitigation
- Asking the right questions
- Human Performance/Awareness
- FAC-003 Vegetation
- FAC-008 Facility Ratings

NPCC Stats

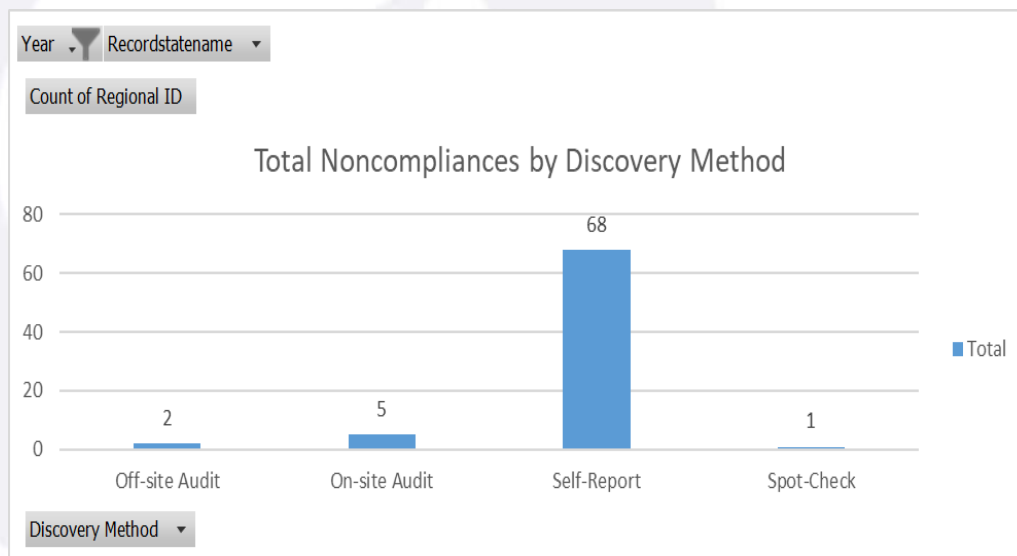
Total Noncompliances by Year



2018

- 2018: Top 10 and Discovery Methods

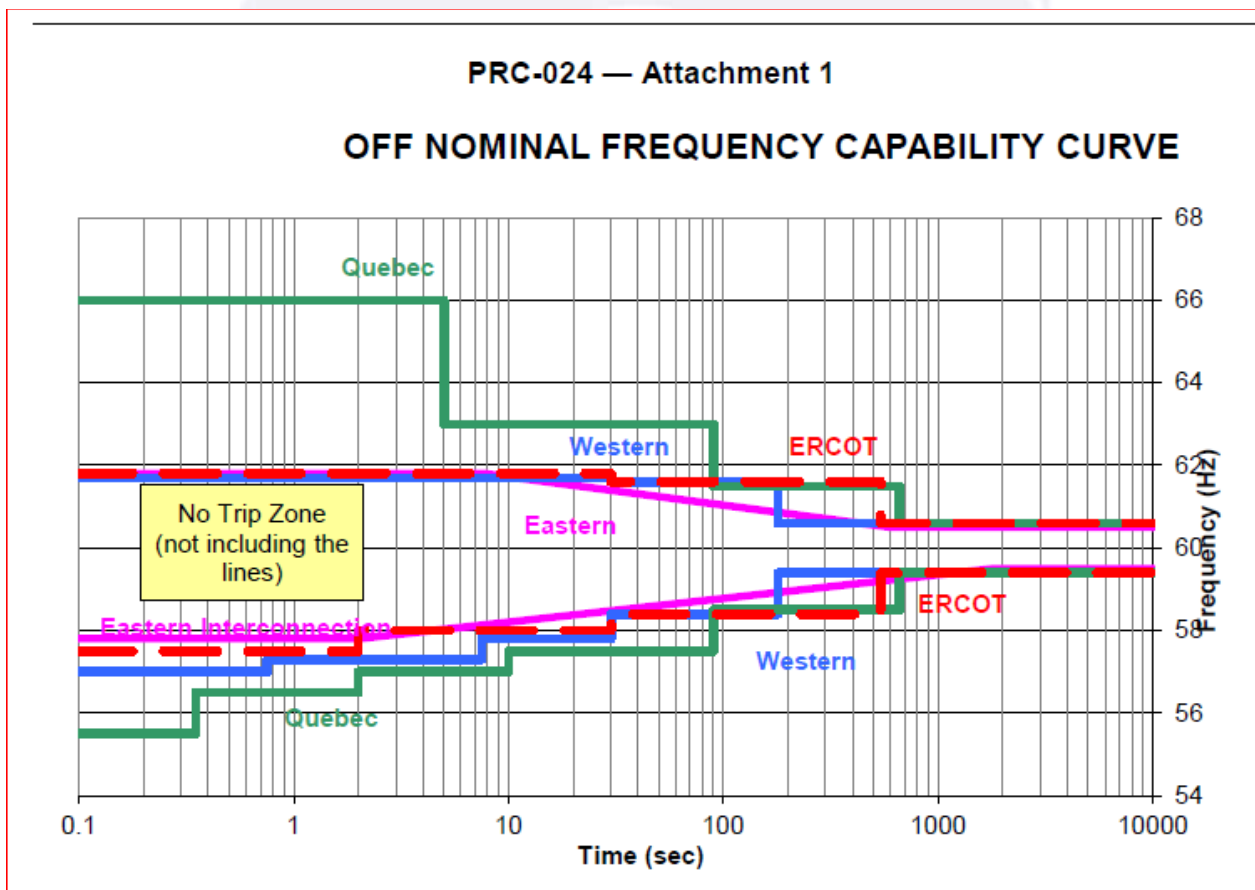
Row Labels	Count of Regional ID
MOD-025	20
CIP-010	11
CIP-007	8
CIP-004	5
PRC-024	4
CIP-006	4
CIP-008	4
PRC-019	3
PRC-005	2
CIP-009	2



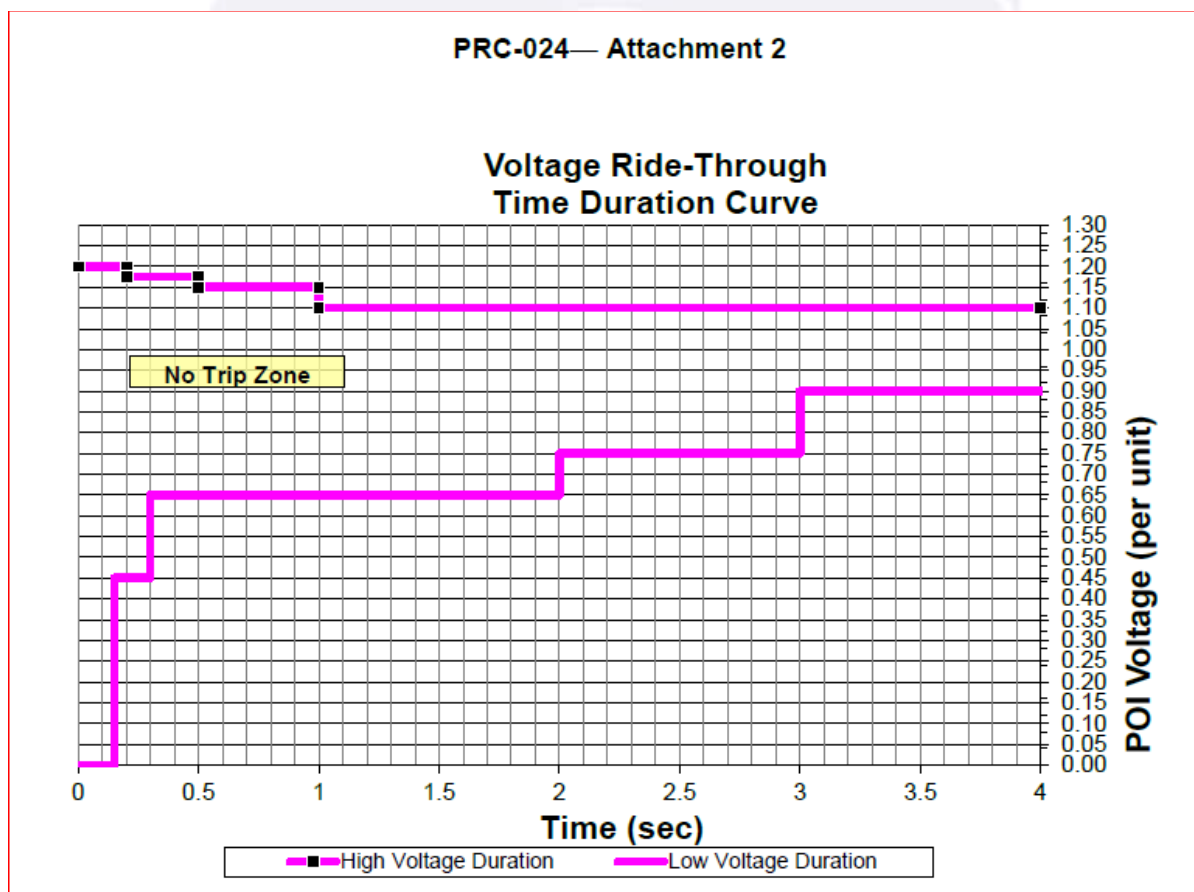
Real World

- March: \$2.5 million penalty in WECC for CIP
 - Saved by a White Hat
- FAC-003-4 penalties
- IRO-009-2. IROL.

PRC-024 Frequency



PRC-024 Voltage



Events

- Inverter Events
 - August 2016 Blue Cut Fire. 1200 MW.
 - Freq, Voltage
 - Design issue, Manuf, Cessation
 - October 2017 Canyon 2 Fire. 900 MW.
 - Freq ok, Voltage still not met
 - NERC Alerts

NERC Alert May 1, 2018

NERC

NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

Industry Recommendation

Loss of Solar Resources during Transmission Disturbances due
to Inverter Settings - II

Initial Distribution: May 1, 2018

NERC has identified adverse characteristics of inverter-based resource performance during grid faults that could present potential risks to reliability of the BPS. As the penetration of inverter-based resources (particularly solar PV resources) continues to increase in North America, these adverse characteristics need to be widely communicated. This Level 2 Industry Recommendation alerts industry to these adverse characteristics observed with BPS-connected solar PV resources, and provides recommended actions to address fault ride-through and timely restoration of current injection by all inverter-based resources connected to the BPS.

(See Background section for more information.)

One Stop Shop



NERC
NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

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One-Stop-Shop (Status, Purpose, Implementation Plans, FERC Orders RSAWS)

Reliability Standards

- US Effective Dates
- US Effective Date Status/Functional Applicability
- Complete Set of Reliability Standards
- Glossary of Terms
- VRF Matrix
- VSL Matrix
- Functional Model

Balloting & Commenting

Reliability Standards Under Development

Archived Reliability Standards Under Development

- Projected Posting Schedule
- Project Tracking Spreadsheet
- Regional Standards Development
- Reliability Standards Development Plan
- Standard and Project Cross References
- Standard Drafting Team Vacancies
- Single Portal

Standards Committee

Webinars

Workshops

Resources

Home > Program Areas & Departments > Standards

Standards

NERC Reliability Standards are developed using an industry-driven, ANSI-accredited process that ensures the process is open to all persons who are directly and materially affected by the reliability of the North American bulk power system; transparent to the public; demonstrates the consensus for each standard; fairly balances the interests of all stakeholders; provides for reasonable notice and opportunity for comment; and enables the development of standards in a timely manner. NERC's ANSI-accredited standards development process is defined in the Standard Processes Manual and guided by [reliability and market interface principles](#).

NERC Reliability Standards define the reliability requirements for planning and operating the North American bulk power system and are developed using a [results-based approach](#) that focuses on performance, risk management, and entity capabilities. The Reliability Functional Model defines the functions that need to be performed to ensure the Bulk Electric System operates reliably and is the foundation upon which the Reliability Standards are based.

The Standards Committee (SC) oversees and prioritizes NERC's standards development activities. The Standards Committee also coordinates NERC's development of Reliability Standards with the North American Energy Standards Board's (NAESB) wholesale electric business practices. Standards drafting teams, which are made up of industry volunteers and supported by NERC staff, work collaboratively to develop requirements using results-based principles that focus on three areas: measurable performance, risk mitigation strategies, and entity capabilities.



Program Contacts

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Program Links

- > [ANSI Accreditation](#)
- > [BES Notification and Exception Process](#)
- > [CIP V5 Transition](#)
- > [NAESB Coordination Efforts](#)
- > [Standard Processes Manual](#)
- > [Quality Review](#)

Calendar

[View Standards Events](#)

Standards, Compliance, and Enforcement Bulletins

▶ [Standards, Compliance, and Enforcement Bulletin - May 14-20, 2018](#)

Extras

- NERC Site
- NPCC Site
- Other Discussion