

Agenda

Board of Trustees

February 4, 2021 | 2:00-5:00 p.m. Eastern
Virtual Meeting

Attendee Webex: [Join Meeting](#)

Call to Order

NERC Antitrust Compliance Guidelines*

Introduction and Chair's Remarks

Consent Agenda – Approve

1. **Minutes***
 - a. December 10, 2020 Meeting
 - b. November 5, 2020 Meeting
2. **Committee Membership and Charter Amendments***
 - a. Reliability Issues Steering Committee Membership

Regular Agenda

3. **Remarks and Reports**
 - a. Remarks by Maria Pope, President and CEO, Portland General Electric
 - b. Remarks by Richard Glick, Chairman, FERC
 - c. Remarks by Patricia Hoffman, Principal Deputy Assistant Secretary, DOE
 - d. President's Report
 - e. Report on the January 19 and February 1, 2021 Closed Meetings – **Information**
4. **Election and Appointment of Board Chair and Vice Chair, Board of Trustees Committee Assignments and NERC Officers – Approve**
5. **Board Self-Assessment and MRC Assessment of Board of Trustees Effectiveness Survey – Discussion**
6. **Board Committee Reports**
 - a. Corporate Governance and Human Resources
 - i. Proposed Amendments to Corporate Governance and Human Resources, Technology and Security, Finance and Audit, and Enterprise-wide Risk Committees Mandates – **Approve**

- ii. Policy on Internal Audit and Corporate Risk Management – **Approve**
- b. Compliance
- c. Finance and Audit
 - i. 2020 Year-End Unaudited Statement of Activities – **Accept**
- d. Enterprise-wide Risk
- e. Technology and Security
- f. Nominating
- g. Report by Rob Manning on Standards Quarterly Activities

7. Standards Quarterly Report and Actions*

- a. Project 2018-03 Standards Efficiency Review Retirements – **Adopt**
- b. Withdrawal of Proposed Reliability Standard CIP-002-6 – **Withdraw**
- c. SERC Regional Reliability Standards Development Procedure – **Approve**
- d. Supply Chain Activities - **Information**

BREAK – 15 MINS

8. Other Matters and Reports*

- a. Policy Input and Member Representatives Committee Meeting – **Discussion**
- b. Framework to Address Known and Emerging Reliability and Security Risks* – **Accept**
- c. Texas RE Bylaws Amendments* – **Approve**
- d. 2020 Year-End Review and 2021 ERO Enterprise Reliability Indicators* – **Update**

9. Committee Reports*

- a. Member Representatives Committee
- b. Personnel Certification Governance Committee
- c. Standards Committee
 - i. 2021 Work Plan – **Approve**
- d. Compliance and Certification Committee
 - i. 2021 Work Plan – **Approve**
- e. Reliability and Security Technical Committee
- f. Reliability Issues Steering Committee
- g. Electricity Subsector Coordinating Council

10. Forum and Group Reports*

- a. North American Energy Standards Board
- b. North American Transmission Forum
- c. North American Generator Forum

11. Other Matters and Adjournment

*Background materials included.

Antitrust Compliance Guidelines

I. General

It is NERC'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 that violates, or that 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 NERC participant and employee who may in any way affect NERC's compliance with the antitrust laws to carry out this commitment.

Antitrust laws are complex and subject to court interpretation that can vary over time and from one court to another. The purpose of these guidelines is to alert NERC participants and employees to potential antitrust problems and to set forth policies to be followed with respect to activities that may involve antitrust considerations. In some instances, the NERC policy contained in these guidelines is stricter than the applicable antitrust laws. Any NERC participant or employee who is uncertain about the legal ramifications of a particular course of conduct or who has doubts or concerns about whether NERC's antitrust compliance policy is implicated in any situation should consult NERC's General Counsel immediately.

II. Prohibited Activities

Participants in NERC activities (including those of its committees and subgroups) should refrain from the following when acting in their capacity as participants in NERC activities (e.g., at NERC meetings, conference calls and in informal discussions):

- Discussions involving pricing information, especially margin (profit) and internal cost information and participants' expectations as to their future prices or internal costs.
- Discussions of a participant's marketing strategies.
- Discussions regarding how customers and geographical areas are to be divided among competitors.
- Discussions concerning the exclusion of competitors from markets.
- Discussions concerning boycotting or group refusals to deal with competitors, vendors or suppliers.

- Any other matters that do not clearly fall within these guidelines should be reviewed with NERC's General Counsel before being discussed.

III. Activities That Are Permitted

From time to time decisions or actions of NERC (including those of its committees and subgroups) may have a negative impact on particular entities and thus in that sense adversely impact competition. Decisions and actions by NERC (including its committees and subgroups) should only be undertaken for the purpose of promoting and maintaining the reliability and adequacy of the bulk power system. If you do not have a legitimate purpose consistent with this objective for discussing a matter, please refrain from discussing the matter during NERC meetings and in other NERC-related communications.

You should also ensure that NERC procedures, including those set forth in NERC's Certificate of Incorporation, Bylaws, and Rules of Procedure are followed in conducting NERC business.

In addition, all discussions in NERC meetings and other NERC-related communications should be within the scope of the mandate for or assignment to the particular NERC committee or subgroup, as well as within the scope of the published agenda for the meeting.

No decisions should be made nor any actions taken in NERC activities for the purpose of giving an industry participant or group of participants a competitive advantage over other participants. In particular, decisions with respect to setting, revising, or assessing compliance with NERC reliability standards should not be influenced by anti-competitive motivations.

Subject to the foregoing restrictions, participants in NERC activities may discuss:

- Reliability matters relating to the bulk power system, including operation and planning matters such as establishing or revising reliability standards, special operating procedures, operating transfer capabilities, and plans for new facilities.
- Matters relating to the impact of reliability standards for the bulk power system on electricity markets, and the impact of electricity market operations on the reliability of the bulk power system.
- Proposed filings or other communications with state or federal regulatory authorities or other governmental entities.
- Matters relating to the internal governance, management and operation of NERC, such as nominations for vacant committee positions, budgeting and assessments, and employment matters; and procedural matters such as planning and scheduling meetings.

DRAFT Minutes Board of Trustees

December 10, 2020 | 2:00 – 3:00 p.m. Eastern

Conference Call

Roy Thilly, Chair, called to order the duly noticed open meeting of the Board of Trustees (Board) of the North American Electric Reliability Corporation (NERC) on December 10, 2020, at 2:00 p.m. Eastern, and a quorum was declared present. The agenda is attached as Exhibit A.

Present at the meeting were:

Board of Trustees Members

Roy Thilly, Chair
Kenneth W. DeFontes, Chair-Elect and Vice Chair
Jane Allen
Robert G. Clarke
George S. Hawkins
Suzanne Keenan
Robin E. Manning
Jim Piro
James B. Robb, President and Chief Executive Officer
Jan Schori
Colleen Sidford

NERC Staff

Tina Buzzard, Assistant Corporate Secretary
Manny Cancel, Senior Vice President and Chief Executive Officer of the E-ISAC
Kelly Hanson, Senior Vice President and Chief Administrative Officer
Mark G. Lauby, Senior Vice President and Chief Engineer
Sônia Mendonça, Senior Vice President, General Counsel, Corporate Secretary
Mark Olson, Senior Engineer of Reliability Assessment and Technical Committees
Janet Sena, Senior Vice President, External Affairs

NERC Antitrust Compliance Guidelines

Mr. Thilly directed the participants' attention to the NERC Antitrust Compliance Guidelines included with the advance meeting materials, and directed that any questions regarding antitrust compliance or other related matters be directed to Ms. Mendonça.

Introduction and Chair’s Remarks

Mr. Thilly welcomed the attendees to the meeting and provided an overview of the agenda topics.

2020 Long-Term Reliability Assessment

Mr. Olson introduced the 2020 Long-Term Reliability Assessment (LTRA), referencing the material provided in the advance agenda package. He highlighted that the LTRA includes key findings based on NERC’s independent assessment of resource adequacy projections for the 2021-2030 assessment period. Mr. Olson provided an overview of the LTRA, outlining the key findings and reviewing the recommendations. The Board discussed the LTRA, including the recommendations and overall body of the report. The Board discussed the process for monitoring the recommendations raised in the LTRA.

After discussion, and upon motion duly made and seconded, the Board accepted the LTRA, endorsed the recommendations contained therein, and authorized its publication.

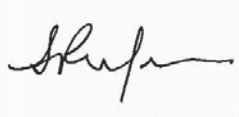
Compliance and Certification Committee Membership

Upon motion duly made and seconded, the Board approved the appointment of Steve McElhaney, Cooperative Energy, At-large, to the Compliance and Certification Committee for a three year term of January 1, 2021 to December 31, 2023.

Adjournment

There being no further business, and upon motion duly made and seconded, the meeting was adjourned.

Submitted by,



Sônia Mendonça
Corporate Secretary

DRAFT Minutes

Board of Trustees

November 5, 2020 | 2:00-4:00 p.m. Eastern

Conference Call

Call to Order

Mr. Roy Thilly, Chair, called to order the duly noticed open meeting of the Board of Trustees (the “Board”) of the North American Electric Reliability Corporation (“NERC” or the “Corporation”) on November 5, 2020, at 2:00 p.m. Eastern, and a quorum was declared present. The agenda is attached as **Exhibit A**.

Present at the meeting were:

Board Members

Roy Thilly, Chair
Kenneth W. DeFontes, Chair-Elect and Vice Chair
Jane Allen
Robert G. Clarke
George S. Hawkins
Suzanne Keenan
Robin E. Manning
Jim Piro
James B. Robb, President and Chief Executive Officer
Jan Schori
Colleen Sidford

NERC Staff

Tina Buzzard, Assistant Corporate Secretary
Manny Cancel, Senior Vice President and Chief Executive Officer of the E-ISAC
Stephen Coterillo, Engineer, Reliability Assessment
Howard Gugel, Vice President, Engineering and Standards
Kelly Hanson, Senior Vice President and Chief Administrative Officer
Mark Lauby, Senior Vice President and Chief Engineer
Sônia Mendonça, Senior Vice President, General Counsel, and Corporate Secretary
Mark Olson, Sr. Engineer of Reliability Assessment and Technical Committees
Janet Sena, Senior Vice President, External Affairs

NERC Antitrust Compliance Guidelines

Ms. Buzzard noted the public nature of the meeting and directed the participants’ attention to the NERC Antitrust Compliance Guidelines included in the advance meeting materials. She stated that any additional questions regarding these guidelines should be directed to Ms. Mendonça.

Introduction and Chair’s Remarks

Mr. Thilly welcomed all of the attendees to the meeting, acknowledging the presence of Ms. Patricia Hoffman, from the Department of Energy (DOE), and Mr. John McAvoy, Chairman and CEO of Consolidated Edison of New York. He thanked Mr. Robb and NERC staff for their work amid COVID-19 and reported that the February 2021 Board meetings will be held online. Mr. Thilly noted that the Reliability and Security Technical Committee (RSTC) and Reliability Issues Steering Committee (RISC) Joint Presentation would immediately follow Mr. Manning's report on standards quarterly activities.

Consent Agenda

Upon motion duly made and seconded, the Board approved the consent agenda as follows:

Minutes

The draft minutes for the August 20, 2020 meeting was approved as presented to the Board at this meeting.

Committee Membership and Charter Amendments

Compliance and Certification Committee Membership

RESOLVED, that the Board hereby appoints the following individuals to the Compliance and Certification Committee (CCC), each for a term of three years effective January 1, 2021:

- Jodirah (Jody) Green, ACES, Electricity Marketer
- Jennifer Flandermeyer, Evergy, Investor-Owned Utility
- Patricia (Patti) Metro, NRECA, Transmission-dependent Utility
- Scott Tomashefsky, Northern California Power Agency, State/Municipal Utility
- Matthew F. Goldberg, ISO New England, ISO/RTO
- Patricia Robertson, BC Hydro, Federal Or Provincial Utility/Power Marketing Administration
- Kristine Bienert, CAMPUT, Canadian Provincial
- Anna Le, Canada Energy Regulator (CER), Canadian Federal
- Zachary Heidemann, Michigan Public Service Commission, U.S. State
- William H. Chambliss, Virginia State Corporation Commission, U.S. State

FURTHER RESOLVED, that the Board hereby appoints the following individuals to the CCC, each for a term of three years effective January 1, 2021, contingent on the Federal Energy Regulatory Commission's approval of the revised CCC Charter:

- Mark E. Buchholz, Western Area Power Administration, At-large
- Mahmood Safi, Omaha Public Power District (OPPD), At-large

- Rene' L. Free, South Carolina Public Service Authority, At-large
- Ellen Watkins, Sunflower Electric Power Corporation, At-large
- Tim Self, Southern Company, At-large

Personnel Certification Governance Committee Membership

RESOLVED, that the Board hereby appoints Mike Hoke (PJM) as vice chair of the Personnel Certification Governance Committee (PCGC), for a two-year term effective December 31, 2020.

FURTHER RESOLVED, that the Board hereby appoints Steven Rainwater (ERCOT) to the PCGC, for a two-year term effective December 31, 2020.

FURTHER RESOLVED, that the Board hereby re-appoints Don Urban (ReliabilityFirst) to the PCGC, for a one-year term effective December 31, 2020.

FURTHER RESOLVED, that the Board hereby re-appoints the following members to the PCGC, for a for a two-year term effective December 31, 2020:

- Cory Danson, Western Area Power Administration;
- Mark Thomas, Entergy; and
- Marty Sas, SERC Reliability Corporation.

Regular Agenda

Remarks and Reports

Remarks by Patricia Hoffman, Principal Deputy Assistant Secretary, DOE

Mr. Thilly introduced Ms. Hoffman of DOE. Ms. Hoffman expressed her appreciation for the work done in supporting DOE and consumers through the restoration of power amid inclement weather and COVID-19. She remarked on DOE's continued work on energy storage, Federal Emergency Management Agency and U.S. Department of Housing and Urban Development funding, resilience modeling, and critical defense facilities.

Remarks by Remarks by John McAvoy, Chairman and CEO, Consolidated Edison of New York

Mr. Robb and Mr. Cancel introduced Mr. McAvoy of Consolidated Edison of New York. Mr. Robb noted Mr. McAvoy's retirement at the end of 2020. Mr. Robb and Mr. Cancel presented Mr. McAvoy with gifts to commemorate his illustrious career in the electric sector. Mr. McAvoy remarked on cyber and physical security, emphasizing the importance of collaboration and innovation.

President's Report

Mr. Robb noted the 55 year anniversary of the 1965 blackout that affected 30 million people. He discussed how reliability performance of the grid has improved, noting that the ERO Enterprise has

continued to accomplish its goals despite COVID-19 and weather events. Mr. Robb acknowledged Mr. Lane Lanford's retirement and contributions to the ERO Enterprise, and congratulated Mr. Jim Albright, who will start his new role as Texas RE President and CEO starting January 1, 2021.

Ms. Sara Patrick remarked on the continuing transformation of the ERO Enterprise. She noted the importance of leveraging their knowledge and resources and increased communication and outreach to mitigate emerging risks to the grid.

Report on the October 30, 2020 NERC Trustees and Regional Entity Board Officers Annual Meeting and Board of Trustees Closed Meeting

Mr. Thilly reported that the NERC Board of Trustees met with Regional Entity board officers and executives on October 30, 2020. He remarked that SERC will move to a hybrid board in January 2021, noting that all Regional Entity boards will then have independent directors.

Mr. Thilly also reported that before the open meeting, as is its custom, the Board met in closed session with NERC management to review NERC management activities. The Board discussed confidential matters, including security and legal issues.

Board Committee Reports

Corporate Governance and Human Resources

Mr. Hawkins, Committee Chair, reported on the Committee's closed meeting on October 30, 2020 and open meeting on November 4, 2020. At the closed meeting, the Committee received a management update and reviewed the Board of Trustees 2021 Master Calendar of Activities. At the open meeting, the Committee received an update on the 2020 ERO Work Plan Priorities and approved the annual Board and Board Committee Self-Assessment and the Member Representatives Committee Assessment questions.

Compliance

Ms. Shori, Committee Chair, reported on the Committee's executive meetings on September 17, 2020 and October 26, 2020 and open meeting on November 4, 2020. At the September 17, 2020 executive meeting, the Committee approved two Full Notices of Penalty. At the October 26, 2020 executive meeting, the Committee approved two Full Notice of Penalty and discussed the 2019-2020 Compliance Committee Work Plan. At the open meeting, the Committee received updates on facility ratings activities and the 2021 Compliance Monitoring and Enforcement Program Implementation Plan.

Finance and Audit

Mr. Clarke, Committee Chair, reported on the Committee's closed meeting on October 26, 2020 and open meeting on November 4, 2020. He reported that in the closed meeting, the Committee met with representatives with Grant Thornton to discuss the audit plan. Mr. Clarke reported that in the open meeting, the Committee reviewed the Third Quarter 2020 Statements of Activities and the 2022 Business Plan and Budget Schedule, and received an update on the 2021 Business Plan and Budget Status.

Mr. Clarke presented the third quarter financial results for the Board's acceptance. Upon motion duly made and seconded, the Board approved the following resolution:

RESOLVED, that the Board, upon recommendation of the Finance and Audit Committee, hereby accepts the Third Quarter 2020 NERC, Combined ERO Enterprise, and Regional Entity Unaudited Results, as presented to the Board at this meeting.

Enterprise-Wide Risk

Ms. Sidford, Committee Chair, reported on the Committee's closed meeting on October 26, 2020. At its meeting, the Committee: (i) reviewed the status of the 2020 Audit Plan; (ii) reviewed the annual assessment of corporate risks; (iii) approved the 2021 Annual Audit Plan; and (iv) received an update on Compliance and Certification Committee ("CCC") activities.

Technology and Security

Ms. Keenan, Committee Chair, reported on the Committee's closed meeting on October 13, 2020 and open meeting on November 4, 2020. In the closed meeting, the Committee received an update on NERC's cyber security posture and a Regional Entity cyber security update. In the open meeting, the Committee received an update on: (i) ERO Enterprise Business Technology projects; (ii) the ERO Enterprise Align project; and, (iii) the ERO Enterprise Secure Evidence Locker.

Nominating

Mr. DeFontes, Committee Chair, reported on the Trustee search.

Report by Rob Manning on Standards Quarterly Activities

Mr. Manning reported on the recent Standards Committee meeting, including the acceptance of the cold weather Standards Authorization Request (SAR) and work related to inverter-based resources.

Reliability and Security Technical Committee and Reliability Issues Steering Committee Joint Presentation

Mr. Peeler, Chair of the Reliability Issues Steering Committee (RISC), and Mr. Ford, Chair of the Reliability and Security Technical Committee (RSTC), presented on their respective Committee. They provided background information on their Committee and detailed coordination between the RISC and RSTC in addressing known and emerging reliability and security risks.

Standards Quarterly Report and Actions

Project 2019-03 Cyber Security Supply Chain Risks

Mr. Gugel presented the proposed Reliability Standards. Upon motion duly made and seconded, the Board approved the following resolutions:

Proposed Reliability Standards

CIP-005-7 – Cyber Security – Electronic Security Perimeter(s)

RESOLVED, that the Board hereby adopts the proposed Reliability Standard CIP-005-7, as presented to the Board at this meeting.

FURTHER RESOLVED, that the Board hereby approves the Violation Risk Factors and Violation Severity Levels for the proposed Reliability Standard, as presented to the Board at this meeting.

FURTHER RESOLVED, that the Board hereby approves the proposed retirement of Reliability Standard CIP-005-6, as presented to the Board at this meeting.

CIP-010-4 – Cyber Security – Configuration Change Management and Vulnerability Assessments

RESOLVED, that the Board hereby adopts the proposed Reliability Standard CIP-010-4, as presented to the Board at this meeting.

FURTHER RESOLVED, that the Board hereby approves the Violation Risk Factors and Violation Severity Levels for the proposed Reliability Standard, as presented to the Board at this meeting.

FURTHER RESOLVED, that the Board hereby approves the proposed retirement of Reliability Standard CIP-010-3, as presented to the Board at this meeting.

CIP-013-2 – Cyber Security – Supply Chain Risk Management

RESOLVED, that the Board hereby adopts the proposed Reliability Standard CIP-013-2, as presented to the Board at this meeting.

FURTHER RESOLVED, that the Board hereby approves the Violation Risk Factors and Violation Severity Levels for the proposed Reliability Standard, as presented to the Board at this meeting.

FURTHER RESOLVED, that the Board hereby approves the proposed retirement of Reliability Standard CIP-013-1, as presented to the Board at this meeting.

Implementation Plan for Project 2019-03 Cyber Security Supply Chain Risks

FURTHER RESOLVED, that the Board hereby approves the associated implementation plan for the proposed Reliability Standards, as presented to the Board at this meeting.

Authorization

FURTHER RESOLVED, that NERC management is hereby authorized to make the appropriate filings with ERO governmental authorities and take such further actions and make such further filings as are necessary and appropriate to effectuate the intent of the foregoing resolutions.

2021-2023 Reliability Standards Development Plan

Mr. Gugel presented the 2021-2023 Reliability Standards Development Plan, noting that the Standards Committee endorsed the plan on September 24, 2020. Upon motion duly made and seconded, the Board approved the following resolutions:

RESOLVED, that the Board hereby approves the 2021-2023 Reliability Standards Development Plan, substantially in the form presented to the Board at this meeting.

FURTHER RESOLVED, that NERC management is hereby authorized to make the appropriate filings with ERO governmental authorities and take such further actions and make such further filings as are necessary and appropriate to effectuate the intent of the foregoing resolution.

Other Matters and Reports

Policy Input and Member Representatives Committee Meeting

Mr. Thilly referred to the discussion of policy input items and technical updates at the MRC meeting.

2021 ERO Enterprise Work Plan Priorities

Mr. Lauby presented the proposed 2021 ERO Enterprise Work Plan Priorities. Upon motion duly made and seconded, the Board approved the following resolution:

RESOLVED, that the Board hereby approves the 2021 ERO Enterprise Work Plan Priorities, substantially in the form presented to the Board at this meeting.

Cold Weather Preparedness

Mr. Gugel provided an update on cold weather preparedness, referencing the material provided in the advance agenda package. He noted NERC's multi-faceted approach to address the reliability risks presented by cold weather. Mr. Gugel highlighted NERC's dissemination of information on cold weather preparedness through webinars, Special Reports, Lessons Learned, and Failure Modes and Mechanisms. He noted that a standard drafting team was appointed and authorized to commence standard drafting for the cold weather Reliability Standard development project.

2020/21 Winter Reliability Assessment Preview

Mr. Cotterillo presented the 2020-2021 Winter Reliability Assessment (WRA) preview, referencing the material provided in the advance agenda package. He noted that the 2020-2021 WRA will be released on November 13, 2020 and will identify, assess, and report on areas of concern regarding the reliability of the North American bulk power system (BPS) for the upcoming winter season. Mr. Cotterillo reviewed the 2020-2021 WRA key findings.

2020 Long-Term Reliability Assessment Preview

Mr. Olson presented the 2020 Long-Term Reliability Assessment (LTRA) preview, referencing the material provided in the advance agenda package. He noted that the 2020 LTRA will be released on December 17, 2020 and will include key findings based on NERC's independent assessment of resource adequacy projections for the 2021-2030 assessment period. Mr. Olson reviewed the 2020 LTRA key findings.

Committee Reports

Representatives of the Standing Committees provided reports to the Board, highlighting items from their written reports, which had been included with the advance meeting materials.

Member Representatives Committee

Ms. Jennifer Sterling, Committee Chair, summarized the topics discussed at the November 5, 2020 meeting, including the election of MRC Officers for 2021.

Personnel Certification Governance Committee

Mr. Cory Danson, Committee Chair, provided an update on the activities of the Committee, referencing the material provided in the advance agenda package. He highlighted the continued research on the cybersecurity safety of remote proctoring for System Operator exams.

Standards Committee

Ms. Amy Casuscelli, Committee Chair, referenced the written report and highlighted the work on inverter-based resources and cold weather events and the Committee's endorsement of the 2021-2023 Reliability Standards Development Plan.

Compliance and Certification Committee

Ms. Jennifer Flandermeyer, Committee Chair, referred to the written report included in the advance agenda package, highlighting the Committee's third quarter meeting, which included a joint session with the Standards Committee. She presented the proposed amendments to CCC Monitoring Program Procedure CCCPP-0011-2: Procedure to Become a Prequalified Organization for Board approval. Upon motion duly made and seconded, the Board approved CCC Monitoring Program – CCCPP-0011-3, as presented to the Board at this meeting.

Electricity Subsector Coordinating Council

Mr. Robb reported on recent Electricity Subsector Coordinating Council activities, including an unclassified briefing on the current threat landscape.

Forum and Group Reports

North American Energy Standards Board

Mr. Michael Desselle, Chair of the NAESB Board of Directors, discussed NAESB's continued collaboration with NERC in the development of business practices and Reliability Standards.

North American Transmission Forum

Mr. Tom Galloway, Forum President and Chief Executive Officer, referenced the written report and highlighted certain items, including the Forum's response to COVID-19 challenges; the NATF and NERC October 9, 2020 leadership meeting; and collaboration with NERC, ReliabilityFirst, and SERC on mitigation practices to reduce risk introduced via the supply chain.

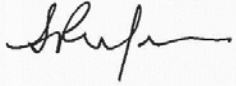
North American Generator Forum

Mr. Allen D. Schriver, Forum Chief Operating Officer, referenced the written report included in the advance agenda package. He discussed the NAGF's participation and support of the NERC Inverter-Based Resource Performance Working Group and collaboration with the NATF.

Adjournment

There being no further business, and upon motion duly made and seconded, the meeting was adjourned.

Submitted by,



Sônia Mendonça
Corporate Secretary

Reliability Issues Steering Committee Membership

Action

Approve

Background

As required by the Reliability Issues Steering Committee (RISC) [charter](#), the RISC Nominating Committee (RISCNC) solicited a pool of candidates to fill open stakeholder-based positions (At-Large and MRC) on the RISC. The RISC nomination period was held November 15-December 13, 2020. All submitted nominations can be found here: [RISC 2020 Nominations](#). The current [roster](#) for the RISC has six (6) At-Large members and two (2) MRC members whose terms expire January 31, 2020. The RISC Roster requires:

1. At least six (6) stakeholder-based— four (4) from the MRC and at least two (2) At-Large members (not members of the MRC);
2. Three (3) committee-based—one (1) from each of the standing committees: Standards (SC), Reliability and Security Technical Committee and Compliance and Certification (CCC). The Board will be responsible for appointing the committee-based members to the RISC. These members will be the chair or vice chair unless otherwise recommended by the standing committee and be subject to NERC Board approval.

Summary

The RISCNC recommends that the Board of Trustees approve the appointment of the following representatives for the terms listed.

Name	Member	Company	Term Ending
Nelson Peeler , Proposed Chair	At-Large	Duke Energy	January 31, 2023
Adrienne Collins	At-Large	Southern Company	January 31, 2023
David Robitaille	At-Large	IESO	January 31, 2023
JoAnn Thompson	At-Large	Otter Tail Power Company	January 31, 2023
John Stephens	At-Large	City Utilities of Springfield	January 31, 2023
Kip Morison	At-Large	BC Hyrdo	January 31, 2023
Robert Bradish	At-Large	AEP	January 31, 2023
Teresa Mogensen	At-Large	Xcel Energy	January 31, 2023
Tom Galloway	At-Large	NATF	January 31, 2023
Carol Chinn	MRC	FMPA	January 31, 2023
Edison Elizeh	MRC	BPA	January 31, 2023
Jason Marshall	MRC	WAPA	January 31, 2022 (completing the term for Jennifer Sterling)
David Zwergel , Reliability and Security Technical Committee Vice Chair	Standing Committee		January 31, 2022
Amy Casuscelli , Standards Committee Chair	Standing Committee		January 31, 2022
Patti Metro , Compliance & Certification Committee Member	Standing Committee		January 31, 2022

Project 2018-03 Standards Efficiency Review Retirements

Action

Adopt the following standards documents and authorize staff to file with applicable regulatory authorities:

- Reliability Standard – FAC-008-5 – Facility Ratings
[\[FAC-008-5 – Clean\]](#) [\[FAC-008 – Redline\]](#)
- Implementation Plan
[\[Implementation Plan\]](#)
- Violation Risk Factors (VRFs) and Violation Severity Levels (VSLs)
[\[VRFs and VSLs\]](#)
- Retirement
Reliability Standard – FAC-008-3 – Facility Ratings

Background

In 2017, NERC initiated the Standards Efficiency Review (SER). The scope of this project was to use a risk-based approach to identify potential efficiencies through retirement of Reliability Standard Requirements. Following the completion of the first phase of work, the SER Standard Drafting Team (SDT) submitted a Standard Authorization Request (SAR) to the NERC Standards Committee. Project 2018-03 Standards Efficiency Review Retirements was initiated to consider and implement the recommendations for Reliability Standard retirements contained in the SAR. Among other things, the SER SDT proposed retiring Requirements R7 and R8 in Reliability Standard FAC-008-3 as redundant and not needed for reliability. Proposed Reliability Standard FAC-008-4 passed final ballot at 95.74 percent on May 2, 2019; was adopted by the Board of Trustees on May 9, 2019; and was filed with the Federal Energy Regulatory Commission (FERC) on June 7, 2019 for approval.

On September 17, 2020, FERC issued Order No. 873¹. With respect to proposed Reliability Standard FAC-008-4, FERC determined that the retirement of Requirement R7 would be appropriate, but rejected the retirement of Requirement R8, concluding that “... Requirement R8 is needed to ensure that limiting and next limiting equipment is identified and communicated” (P 40). FERC remanded proposed Reliability Standard FAC-008-4 to NERC for further consideration.

Summary

The SER SDT considered the issues contained in FERC’s Order No. 873 and has developed proposed Reliability Standard FAC-008-5. Proposed Reliability Standard FAC-008-5 retains Requirement R8 and retires Requirement R7 of FAC-008-3.

¹ Order No. 873, Electric Reliability Organization Proposal to Retire Requirements in Reliability Standards under the NERC Standards Efficiency Review, 172 FERC ¶ 61,225 (2020), <https://www.nerc.com/FilingsOrders/us/FERCOrdersRules/Order%20on%20SER%20Retirements.pdf>.

Standards Development Process

Proposed Reliability Standard FAC-008-5 was posted for a 45-day formal comment and ballot from November 30, 2020 through January 13, 2021. The initial ballot received a 95.91 percent approval rating with 89.93 percent quorum. The VRF/VSL non-binding poll received a 100 percent approval rating with 86.61 percent quorum. The proposed standard was posted for a final ballot from January 19, 2021 through January 28, 2021. The results of the final ballot will be reviewed at the meeting.

Minority Issues

None

Pertinent FERC Directives

Proposed Reliability Standard FAC-008-5 addresses the Commission's concerns from Order No. 873 remanding proposed Reliability Standard FAC-008-4 by retaining Requirement R8 of the standard.

Cost Effectiveness

The proposed standard removes a requirement that is no longer needed for reliability.

Additional Information

A link to the project history and files is included here for reference:

[\[Project 2018-03 Standards Efficiency Review\]](#)

Withdrawal of Proposed Reliability Standard CIP-002-6

Action

Withdraw the following Reliability Standard and authorize staff to make the necessary filings with applicable regulatory authorities:

- Reliability Standard – CIP-002-6 – Cyber Security – BES Cyber System Categorization [[CIP-002-6 Standard](#)]

Background

On May 14, 2020, the NERC Board of Trustees (Board) adopted proposed Reliability Standard CIP-002-6.¹ The proposed Reliability Standard CIP-002-6 addressed the recommendation from the Version 5 Transition Advisory Group² to clarify the phrase “used to perform the functional obligations of the Transmission Operator (TOP)” in CIP-002-5.1a, Attachment 1, Criterion 2.12.

On June 12, 2020, NERC Staff filed with the Federal Energy Regulatory Commission (FERC) a petition for approval of proposed CIP-002-6. On June 23, 2020, the proposed standard was filed with the applicable regulatory authorities in Canada.

FERC has not yet issued a Notice of Proposed Rulemaking or an order approving CIP-002-6.

Summary

In proposed Reliability Standard CIP-002-6, NERC proposed to revise criterion 2.12 that designates Bulk Electric System (BES) Cyber Systems associated with certain Control Centers as medium impact. Specifically, the revisions addressed the applicability of requirements to a Control Center owned by a Transmission Owner (TO) that performs the functional obligations of a TOP. The proposed criterion established an average MVA line loading based on voltage class for BES Transmission Lines operated between 100 and 499 kV. The aggregate weighted value of the BES Transmission Lines must exceed 6,000 to meet the minimum threshold established in Criterion 2.12. In meeting that threshold, associated BES Cyber Systems would be categorized as medium; those Control Centers that did not meet the threshold would have low impact BES Cyber Systems (if not already identified as high).

In light of recent cybersecurity events and the evolving threat landscape, NERC Staff believes that additional caution is warranted regarding any criteria that may permit more entities to categorize BES Cyber Systems as low impact and recommends further study. NERC Staff further recommends withdrawing proposed Reliability Standard CIP-002-6 until NERC has had the opportunity to reevaluate the criterion based on additional data and studies.

¹ See Minutes of the NERC Board of Trustees May 14, 2020 Meeting at 5 (item 5.a), https://www.nerc.com/gov/bot/Agenda%20highlights%20and%20minutes%202013/FINAL_Minutes_Board_Open_Meeting-May-14-2020.pdf.

² This group, which consisted of representatives from NERC, Regional Entities, and industry stakeholders, was formed to issue guidance regarding possible methods to achieve compliance with the CIP Version 5 standards and to support industry's implementation activities.

The effect of withdrawing proposed Reliability Standard CIP-002-6 is that currently effective version CIP-002-5.1a would remain in place.

Standards Development Process

Section 4.17 of the NERC Standard Processes Manual, Appendix 3A of the NERC Rules of Procedure provides that the Board has an independent right to withdraw a Reliability Standard. “Withdrawal” refers to the discontinuation of a Reliability Standard, Interpretation, Variance or definition that has been approved by the Board and (1) has not been filed with Applicable Governmental Authorities, or (2) has been filed with, but not yet approved by, Applicable Governmental Authorities.

Pertinent FERC Directives

None.

Unresolved Minority Issues

Not applicable.

Cost Effectiveness

Not applicable.

Additional Information

Links to the project page and FERC filing is included here for reference:

[\[Project 2016-02 Modifications to CIP Standards\]](#)

[\[NERC Petition for Approval of Proposed Reliability Standard CIP-002-6\]](#)

SERC Regional Reliability Standards Development Procedure

Action

Approve the following documents and authorize staff to file with the applicable regulatory authorities:

- SERC Regional Reliability Standards Development Procedure
[\[SERC Regional Reliability Standards Development Procedure-Clean\]](#)

[\[SERC Regional Reliability Standards Development Procedure -Redline\]](#)

Background

SERC Reliability Corporation (SERC) completed a revision to its Reliability Standards Development Procedure (RSDP). The revisions to the document include updates to SERC Committee titles, SERC Board of Directors references to reflect the FERC approved Bylaws and Governance structure changes effective January 1, 2021, and abbreviations for Standards Committee, Registered Ballot Body, and Bulk Electric System throughout the procedure. The SERC Board Executive Committee approved the revised RSDP on September 9, 2020.

As required by the Section 311 of the NERC Rules of Procedure, NERC Staff reviewed SERC RSDP and concluded the document met all of the evaluation criteria. The RSDP was posted on the NERC website for a 45-day industry stakeholder comment period from October 7 – November 20, 2020. One set of comments was received. The commenter agreed that SERC's revised RSDP continues to meet the criteria for being open, inclusive, balanced, and transparent, and for providing due process in the development of regional standards.

Additional Information

A link to the project history and files is included for reference:

[NERC - Regional Reliability Standards under Development](#)

Supply Chain Activities

Action

None

Background

In 2017, NERC developed new and revised CIP Reliability Standards to help mitigate cyber security risks associated with the supply chain for high and medium impact BES Cyber Systems. These standards, collectively referred to as Supply Chain Standards, consist of new Reliability Standard CIP-013-1 and revised Reliability Standards CIP-010-3 and CIP-005-6. Consistent with the risk-based framework of the NERC CIP Reliability Standards, the Supply Chain Standards are applicable to the highest-risk systems that have the greatest impact to the grid. The Supply Chain Standards require entities that possess high and medium impact BES Cyber Systems to develop processes to ensure responsible entities manage supply chain risks to those systems through the procurement process, thereby reducing the risk that supply chain compromise will negatively affect the bulk power system. The Supply Chain Standards became effective on October 1, 2020. The Supply Chain standards were modified to address Electronic Access Control or Monitoring Systems (EACMS) that provide electronic access control and Physical Access Control Systems (PACS) that provide physical access control to high and medium impact BES Cyber Systems. The Board adopted those modifications at its November 5, 2020 meeting and are pending regulatory approval.

When adopting the Supply Chain Standards in August 2017, the NERC Board directed NERC to undertake further action on supply chain issues. Among other things, the Board directed NERC to study the nature and complexity of cyber security supply chain risks, including those associated with low impact assets not currently subject to the Supply Chain Standards and develop recommendations for follow-up actions that will best address identified risks. To understand these risks better, NERC collected data from registered entities pursuant to a request for data or information under Section 1600 of the NERC Rules of Procedure.

Based on the analysis of the data request, NERC staff recommended to the NERC Board at its February 6, 2020 meeting that Reliability Standard CIP-003-8 be modified to include policies for low impact BES Cyber Systems to: (1) detect known or suspected malicious communications for both inbound and outbound communications; (2) determine when active vendor remote access sessions are initiated; and (3) disable active vendor remote access when necessary. The NERC Board approved a [resolution](#) at this meeting endorsing this action. Additionally, the NERC Board directed NERC staff, working with stakeholders, to carefully evaluate the effectiveness and sufficiency of the supply chain standards and related actions and report to the Board every six months on this assignment, including identification of further actions, if any, needed to better address the risks identified on a cost-effective basis in light of the complexity and seriousness to the supply chain cyber threat environment as it evolves. NERC staff will report on actions taken in response to the resolution.

Framework to Address Known and Emerging Reliability and Security Risks

Action

Accept

Summary

The ERO's mission requires establishing a consistent framework to identify, prioritize, and address known and emerging reliability and security risks. The *Framework to Address Known and Emerging Reliability and Security Risks* (Whitepaper), which has been reviewed by the Reliability and Security Technical Committee (RSTC) and Reliability Issues Steering Committee (RISC), identifies the policies, procedures, and programs developed by the ERO to support its mission and incorporates them into an iterative six-step risk management framework. The mitigation of risks to Bulk Electric System (BES) reliability and security are classified according to the likelihood of the risk occurring and the severity of its impact. The ERO's policies, procedures, and programs are mapped to target risk mitigation against severity and likelihood. Further, the Whitepaper reviews how resilience is an important component of reliability risk management. Finally, the whitepaper considers the application of ERO policies, procedures, and programs, within time required to apply the mitigation and the likelihood and severity.

The Framework was issued as part of the Policy Input letter for the NERC Board of Trustees (Board) in October 2020 and comments were reviewed and incorporated as applicable.

NERC management will seek Board acceptance of the Whitepaper at the February 4, 2021 Board meeting.

Attachment

1. *Framework to Address Known and Emerging Reliability and Security Risks*

Framework to Address Known and Emerging Reliability and Security Risks

November 2020

This document outlines a risk framework for the ERO and details how such a framework provides an important extension of the ERO's core activities. The ERO mission¹ requires establishing a consistent framework to identify, prioritize and address known and emerging reliability and security risks. To support its mission the ERO has developed policies, procedures and programs, which are identified and briefly described in Section I. These policies, procedures and programs have been incorporated into an iterative six-step risk management framework outlined in Section II. Mitigation of risks to Bulk Electric System (BES) reliability can be classified according to the likelihood of the risk occurring and the severity of its impact. Section III addresses how the ERO's policies, procedures and programs identified in Section II map into the risk likelihood and severity space. Resilience is an important component of reliability risk management and is discussed in Section IV. Section V cover the application of ERO Policies, Procedures and Programs, within time required to apply the mitigation and the likelihood and severity.

I. ERO Policies, Procedures and Programs

The ERO's mission ultimately exists to serve the public interest, and it must serve that interest by developing and using the ERO Policies, Procedures and Programs to monitor and mitigate risks to the BES, balancing their use by considering what is possible against what is reasonable and necessary. Further, ensuring reliability and security also require improving the resilience of the BES by building the robustness to withstand unexpected events, supporting controlled degradation when an event is beyond design basis (providing an [Adequate Level of Reliability](#)), and supporting restoration following an event.

The ERO identifies risk both in a leading and lagging manner. The ERO scans the horizon for emerging risks such as grid transformation and critical infrastructure interdependencies (leading). At the same time, the ERO is gathering data and information on the performance of the existing bulk power system to uncover unexpected risks such as large quantities of photovoltaic generation ceasing to operate under certain system conditions (lagging). In addition, the ERO annually releases its State of Reliability Report that documents the annual system performance in a comparative fashion. The ERO's Policies, Procedures and Programs are then used to address mitigation of these identified risks.

Five of NERC's most significant reliability risk mitigation activities are Reliability Standards, Assurance and Enforcement activities; Reliability Guidelines; Technical Engagement; Reliability and Risk Assessments; and Alerts:

- 1. Reliability Standards, Assurance, and Enforcement** processes are the common way to address reliability and security risks when addressing sustained risks with moderate impacts which are

¹ Electric Reliability Organization (ERO) consists of NERC and the 6 Regional Reliability Organizations. The ERO's mission is to assure the reliability and security of the North American bulk electric system (BES). The ERO is supported by subject matter expertise from the owners and operators of the bulk electric system. In the United States the ERO is authorized the Energy Policy Act of 2003 and overseen by FERC.

likely (e.g., inaccurate planning models), and high impacts, whether likely or unlikely (e.g., vegetation management and geomagnetic disturbances). Standards provide the greatest degree of certainty for risk mitigation. Following NERC and Regional Reliability Standards should not be seen as a burden but rather an outcome of good reliability performance, with that desired outcome on each individual system contributing to the reliability of the entire interconnection, and ultimately, the North American BES.

As a matter of public policy, Reliability Standards should credibly address primary risks that are sustained, high impact and likely. Establishing a baseline of Reliability Standards assures accountability for the public's benefit when minimum expectations of performance or behavior are not met. The public expects a regulator to enforce accountability on at least those actions related to sustained, high impact, and likely risks within its scope of oversight.

A key factor in the success of compliance monitoring and enforcement of mandatory standards rests on a common understanding among industry and the ERO as set forth in the ERO's Compliance Monitoring and Enforcement Program (CMEP) which details how compliance will be monitored and enforced. Implementation Guidance is developed by industry and/or vetted through pre-qualified organizations to show examples of compliant implementations. These vetted examples can then be submitted to the ERO for endorsement, and, if endorsed, the ERO would give the example deference during CMEP activities with consideration of facts and circumstances.

Risk elements associated with the Reliability Standards are documented annually in the ERO CMEP Implementation Plan, which provides guidance to industry on North American-wide and regional risks that the ERO's Reliability Assurance and Enforcement staff will be focusing on addressing in the coming year. Regional Entities review the risks each individual registered entity may have, and identify which Reliability Standards they wish to focus on based on these risks. This risk-based approach enables focus on the most important risks to reliability, and review of the controls in place to address them for each individual organization.

Information and data gathered as a result of compliance monitoring and enforcement activities can inform about the effectiveness of a Reliability Standard or the need for enhancements. At a high level, this recommendation can be passed on through the Standards Development process for consideration.

2. Reliability Guidelines are the common approach to use when addressing moderate impact sustained risks that are unlikely, and low impact sustained risks that are unlikely or likely (such as reduced or lack of equipment maintenance resulting in the loss of an individual element which is a low impact to BPS reliability, while the probability of failure increases over time). Reliability Guidelines are also used for those issues that are or are not in the ERO's jurisdiction, but are practices that improve reliability. Guidelines provide three advantages:

- Together with a strong minimum baseline fabric of standards, guidelines can be a strong and timely way to address risk.
- Reliability Guidelines enable the ERO to highlight expectations or priorities on appropriate practices for a given subject area.

- Reliability Guidelines may also be used to establish performance expectations for emerging risks rather than or prior to codifying those expectations into Reliability Standards.
3. **Technical Engagement** can be used to address sustained risks or one-and-done activities with low impacts, whether likely or unlikely. Activities here include webinars, site visits, presentation and reports, workshops, conferences and technical meetings. This includes not only activities of the ERO, but the ERO supporting industry engagement through the reliability ecosystem, such as the North American Transmission and Generation Forums, professional organizations, researchers, and government. Technical engagement also serves to promote future sustained risk mitigation and support for using Reliability Guidelines, industry notices, newsletters, bulletins, or Reliability Standards.
 4. **Reliability and Risk Assessments** coupled with the biennial report outlining the Reliability Issues Steering Committee’s (RISC) findings identifies risks, whether likely or unlikely.² Generally, these activities are used to inform and influence policymakers, industry leaders, and the general public about the impact of important public and energy policy issues impacting BPS reliability.
 5. **Alerts** are used for sharing information, especially time-sensitive information, to request action or direct action. They can also serve as a more nimble, foundational activity for other ERO Policies, Procedures and Programs. As part of its normal course of business, NERC often either discovers, identifies, or is provided with information that is critical to ensuring the reliability of the bulk power system in North America. In order to effectively disseminate this information, NERC utilizes email-based “alerts” designed to provide concise, actionable information to the electricity industry. As defined in its Rules of Procedure, NERC alerts are divided into three distinct levels, as follows:
 - **Level 1 Industry Advisory:** Purely informational, intended to alert registered entities to issues or potential problems. A response to NERC is not necessary.
 - **Level 2 Recommendation to Industry:** Recommends specific action be taken by registered entities. A response from recipients, as defined in the alert, is required.
 - **Level 3 Essential Action:** Identifies actions deemed to be “essential” to bulk power system reliability and requires NERC Board of Trustees’ approval prior to issuance. Like recommendations, essential actions also require recipients to respond as defined in the alert.

Since Level 2 and Level 3 alerts require acknowledgement of receipt and response to the alerts, they are used in higher risk impact situations than Level 1 alerts, which are purely informational.

II. ERO Iterative Risk Management Framework

During the last ten years, the ERO has expanded its implementation of risk-based approaches across its program areas. During this transition, the ERO has continued to lead industry in reliability, resilience, and security initiatives to identify known and emerging risks, and to engage industry in a collaborative approach to mitigating that risk. The primary reliability, resilience, and security activity for risk mitigation the ERO currently deploys includes, but is not limited to: outreach events such as webinars and conferences, Reliability Guidelines, Alerts, Reliability Standard development, registration and certification, and compliance monitoring and enforcement. In addition, the ERO can engage Forums

² Instead of using “mitigating risks,” the RISC uses “managing risks.” These terms are used interchangeably and mean the same thing in this whitepaper.

such as the North American Transmission Forum (NATF) and the North American Generator Forum (NAGF), as well as the industry trade associations, industry groups such as the Energy Systems Integration Group (ESIG), and research organizations such as the Electric Power Research Institute and the Power Systems Engineering Research Center (PSERC) to assist with development of best practices, increased awareness, Implementation Guidance, and other solutions used to address identified risks.

Additionally, a set of industry indicators has been developed to measure reliability and security. These indicators need further refinement, maturation and linkage to industry performance, as they are key to evaluating the effectiveness of mitigation efforts, identifying the residual risk that remains, and considering whether the remaining risk is at acceptable levels.

This framework is meant to guide the ERO in the prioritization of risks and provide guidance on the application of ERO Policies, Procedures, and Programs, to inform resource allocation and project prioritization in the mitigation of those risks. Additionally, the framework accommodates measuring residual risk after mitigation is in place, enabling the ERO to evaluate the success of its efforts in mitigating risk, which provides a necessary feedback for future prioritization, mitigation efforts, and program improvements.

The successful reduction of risk is a collaborative process between the ERO, industry, and the technical committees including the Reliability and Security Technical Committee (RSTC) and RISC. The framework provides a transparent process using industry experts in parallel with ERO experts throughout the process, from risk identification, deployment of mitigation strategies, to monitoring the success of these mitigations.

Six specific steps have been identified, consistent with risk management frameworks used by other organizations and industries: 1) Risk Identification; 2) Risk Prioritization; 3) Mitigation Identification and Evaluation; 4) Deployment; 5) Measurement of Success; and 6) Monitoring. Each of these steps will require process development, including stakeholder engagement, validation/triage approaches, residual risk monitoring, ERO's level of purview over a risk, etc. These processes will be developed once the framework has been finalized.

- 1. Risk Identification and Validation:** As mentioned above, the ERO identifies risks using both leading and lagging approaches. The RISC biennial report and Long-Term and Seasonal Reliability Assessments (leading) have successfully brought together industry experts to identify and prioritize emerging risks, as well as suggest mitigation activities. A partnership between the ERO leadership and both the RISC and RSTC enables input from the ERO program areas, industry Forums and trade associations to provide additional context in risk identification.

Once the ERO, NERC Committees, Forums, or industry subject matter experts identify and validate a risk, it is critical that the corresponding recommendation for mitigation describe, explain, and provide support for the basis for selecting the particular approach to mitigation. A template will be created, that mirrors the Standards Authorization Request template, that requires an explanation of the risk, approach(es) for mitigation, and estimate of residual risk.

Risk Identification: The ERO has a number of ways that it identifies risks:

- ERO stakeholder supported technical organizations, industry forums, and associated subject matter experts

- Focused Compliance monitoring activities
- Reliability and Risk Assessments
- Events Analysis
- State of Reliability Report, including the analysis of Availability Data Systems (BASS, TADS, GADS, DADS, MIDAS, etc.)
- Frequency Response, Inertia, and other essential reliability service measurements
- Interconnection simulation base case quality and fidelity metrics
- Reliability Issues Steering Committee (RISC) Biennial Risk Report
- Regional Risk Assessments
- Communication with external parties, such as DOE, DHS, Natural Resources Canada, CEA and EPRI
- Shared public and/or government intelligence with special emphasis on cyber security

Risk Validation: The ERO and industry subject matter experts continuously work together validating risks to the reliable and secure operation of the bulk power system based on analysis of ongoing performance of the system (lagging). Validation of the magnitude and priority of the risks includes analysis from the ERO databases of system performance and Events Analysis. These outputs are generally covered in NERC's State of Reliability Report. In addition, the risks are further validated through working with NERC Committees, and socializing them with Forums, government, and research organizations. Leading risk validation requires analysis of system simulations, forecasts, and performance projections.

- 2. Risk Prioritization:** Prioritizing risks is accomplished through an analysis of their exposure, scope, and duration as well as impact and likelihood. The primary sources of data used to support this analysis come from the Risk Identification step. Deciding if the risk requires near-term mitigation or continued monitoring is informed by technical expertise. Depending on the complexity of the risk, new models, algorithms and processes may need to be developed to better understand the potential impacts of the risk, which is necessary to develop risk mitigation tactics. The process would be consistent with other risk management frameworks used by other industries, and was recently successfully tested in collaboration with industry through a survey issued by the RISC, based upon the risks that group prioritized in early 2019.

A ERO risk registry and heat maps will be developed encompassing prior RISC report findings, ongoing technical committee activities, and risks being monitored. This registry would be developed by the end of the second quarter of 2021. Work plans of the technical committees will then be periodically reviewed to ensure that ongoing activities are tied to identified risks in the risk registry. Further, if new risks emerge they can be added to the registry, and if it is deemed that the risks are sufficiently mitigated, they will be moved to the monitored portion of the risk registry. As the RSTC develops its annual work plan and following the publication of the biennial ERO Reliability Risk Priorities Report, the risk registry is reviewed by the RISC and the RSTC to evaluate how completed work addressed these identified risks, whether any new risks have been identified by either committee that need to be added to the risk register, and documenting monitored risks which require no additional mitigation.

3. Remediation and Mitigation Identification and Evaluation: The right mix of mitigation activities is balanced against both the effective and efficient use of resources and the potential risk impact and likelihood. Further, the risk tolerances needs to be balanced against potential impacts so that the remediation/mitigation plans can be developed accordingly. Determining the best mix depends on a number of factors, such as:

- What is the potential impact or severity of the risk?
- How probable is the risk? Is it sustained, decreasing or growing?
- Is the risk here today or anticipated in the next 3-5 years?
- How pervasive is the risk?
- Is mitigation expected to be a one-time action, or ongoing?
- Have we had experience with events being exacerbated by the risks, or there is no experience, but the probability is growing (i.e. cyber or physical security)?
- Have previous mitigation efforts been deployed? If so, were they effective? Why or why not?
- What is an acceptable residual risk level after mitigating activities have been deployed?
- Is the risk man-made or by natural causes?
- Does the mix of mitigations vary based on jurisdictional or regional differences?
- Is the risk fully or partially within the purview of the ERO?

Input from, and allocation of, subject matter expertise through multiple sources is part of this consideration, including resources within the ERO and its stakeholders (such as standing technical committees and their subgroups, or standard drafting teams). External parties are important sources as well, such as the North American Transmission and Generation Forums (NATF and NAGF), North American Energy Standards Board (NAESB), the Institute of Electrical and Electronic Engineers (IEEE), and EPRI, to name a few.

Once a risk to the BES has been prioritized according to its impact and likelihood, the ERO, NERC Committees, Forums, and industry subject matter experts recommend and can take on potential mitigation activities and assess their anticipated effectiveness. Coordination is key to avoid duplication and provide supportive, rather than conflicting actions.

The ERO remains responsible for risks to the reliable and secure operation of the BES. Risk mitigation should still be followed by the ERO no matter which organization takes on activities. Examples of mitigation efforts include, but not limited to:

- Reliability Standards, with Compliance and Enforcement for risks that are:
 - Sustained, moderate to severe impact, and likely
 - Sustained, severe impact, and unlikely
 - Focused monitoring based on risk, and in response to major events
- Reliability Guidelines for risks that are:
 - Sustained, low to moderate impact, and likely

- Lessons Learned for risks that are:
 - Sustained, low impact, and likely
- Assist Visits for risks that are:
 - Compliance-related
 - Focused on a very specific situation or configuration
 - Generally on specific industry or entity practices or conditions
- Analysis of Major Events for risks that are:
 - Identified after a Major Event (e.g., Category 3 or higher)
 - Discreet/one-time, severe impact, unlikely
 - identified through recommended reliability improvements or best practices and lessons learned
- Analysis of “Off-Normal” Events for risks that are
 - Identified after an unusual operational condition has occurred and likely not a categorized event.
 - Discreet/one-time, moderate impact, unlikely
 - Identified through recommended reliability improvements or best practices and lessons learned
- Advisories, Recommendations or Essential Actions³
- Alerts⁴
- Technical Conferences and Workshops

When reviewing the type and/or depth of remediation and mitigation, a form of cost-effectiveness analysis may be considered to understand impacts and potential burdens. This analysis can then be compared to potential impacts of the risk.

³ LEVEL 1 (Advisories) – purely informational, intended to advise certain segments of the owners, operators and users of the Bulk Power System of findings and lessons learned; LEVEL 2 (Recommendations) – specific actions that NERC is recommending be considered on a particular topic by certain segments of owners, operators, and users of the Bulk Power System according to each entity’s facts and circumstances; LEVEL 3 (Essential Actions) – specific actions that NERC has determined are essential for certain segments of owners, operators, or users of the Bulk Power System to take to ensure the reliability of the Bulk Power System. Such Essential Actions require NERC Board approval before issuance.

⁴ ALERT 1: Industry Action Requested: Fast moving or recently detected, impacts moderate, ALERT 2: Industry Action Required: Fast moving or recently detected, impacts moderate to severe, ALERT 3: Industry Action Mandatory: Fast moving or recently detected, impacts moderate to severe.

- 4. Mitigation Deployment:** Mitigation projects will be deployed by the ERO and/or industry stakeholder groups, as determined by the “Mitigation Identification and Evaluation” step. A specific mitigation plan would involve a suitable mix of the ERO policies, procedures and programs discussed in Section I. These mitigations would be coordinated with Canadian, industry partners and stakeholders.

From time-to-time, the Federal Energy Regulatory Commission (FERC) may order the development of Reliability Standards, which can occur in this step.

- 5. Measurement of Success:** Once a set of solutions has been deployed, the effectiveness of the mitigation must be measured to determine if the residual risk has been reduced to an acceptable level. Effectively, if the desired level of risk mitigation is not met, the risk is fed back to Step 1, enabling a new prioritization of risks, factoring in historic mitigation, ensuring resource allocation is adapted to the changing risk landscape. This step also informs future mitigation efforts, as industry and the ERO learn from the effectiveness of mitigation mixes for reducing risk. A partnership between the ERO leadership and both the RISC/RSTC will enable input from the ERO program areas, industry Forums and trade associations to provide additional context in the measurement of success. That said, criteria and other related processes should be developed for determining risk severity, likelihood, and mitigation activity effectiveness.
- 6. Monitor Residual Risk:** Once the level of residual risk is at an acceptable level, the risk is monitored through ongoing performance measures to ensure that risk remains at acceptable risk levels. The residual risk should be monitored for progress and to ensure that the mitigations that are in place continue to address the risk (Step 5). At times, mitigations need to be deployed on a periodic basis (e.g. annual workshops, Reliability Guideline updates, etc.) to ensure continued success (Step 4). If the risk levels heighten, or increased mitigation efforts are necessary due to the changing nature of the bulk power system, the risk can be fed back (Step 1) for prioritization and the development of additional mitigation approaches. The ERO, working with its industry partners, technical committees, stakeholders and forums, would determine if the residual risk was acceptable or if additional mitigations required.

From-time-to-time risks are identified and validated which require an accelerated industry attention. The ERO risk framework can support quick implementation of industry awareness and mitigation activities. Figure 1 provides a pictorial flow chart of the ERO’s risk management process.

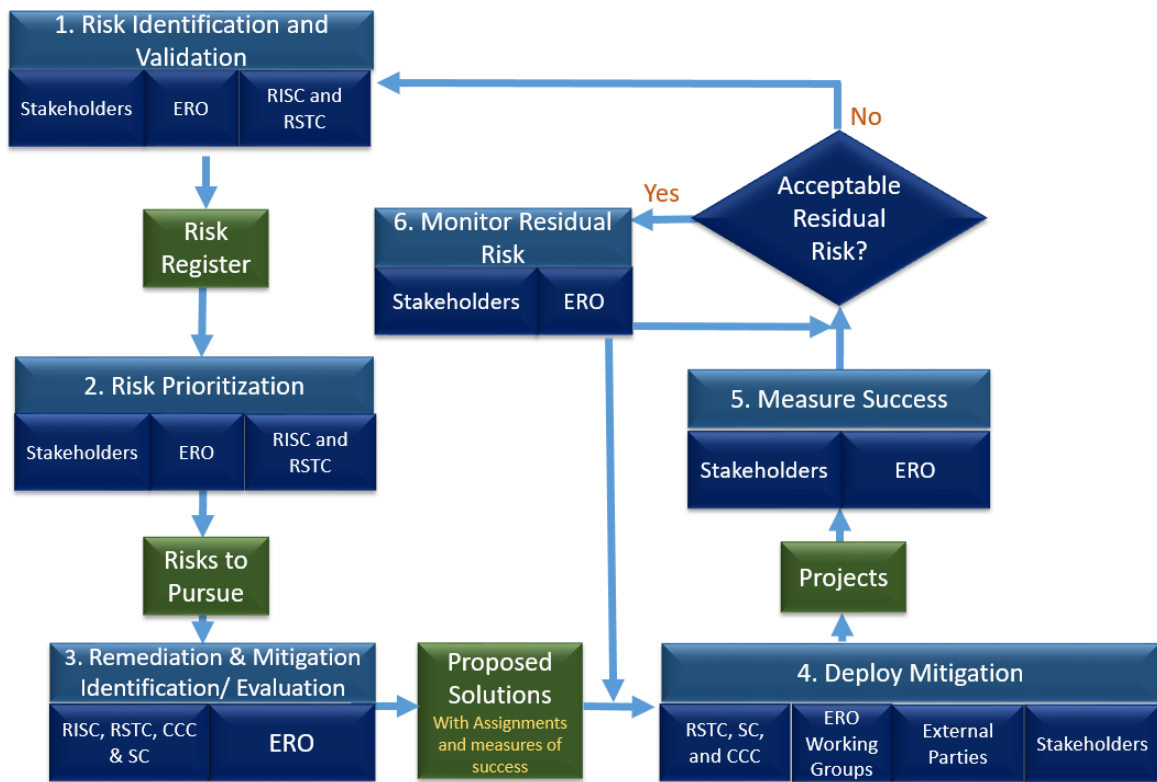


Figure 1: ERO Risk Management Process

In order to coordinate risk mitigation, the RISC and RSTC triage risk mitigations together as called for in the iterative RISC Framework process. The Standards Committee (SC) and the Compliance and Certification Committee (CCC) are key stakeholder groups that are part of this iterative process. Further, the Standing Committee Coordination Group (SCCG) is a group made up of the leadership (Chair and Vice Chair) of each Standing Committee. This group coordinates and aligns the Standing Committees activities. The touch points are shown in Figure 2.

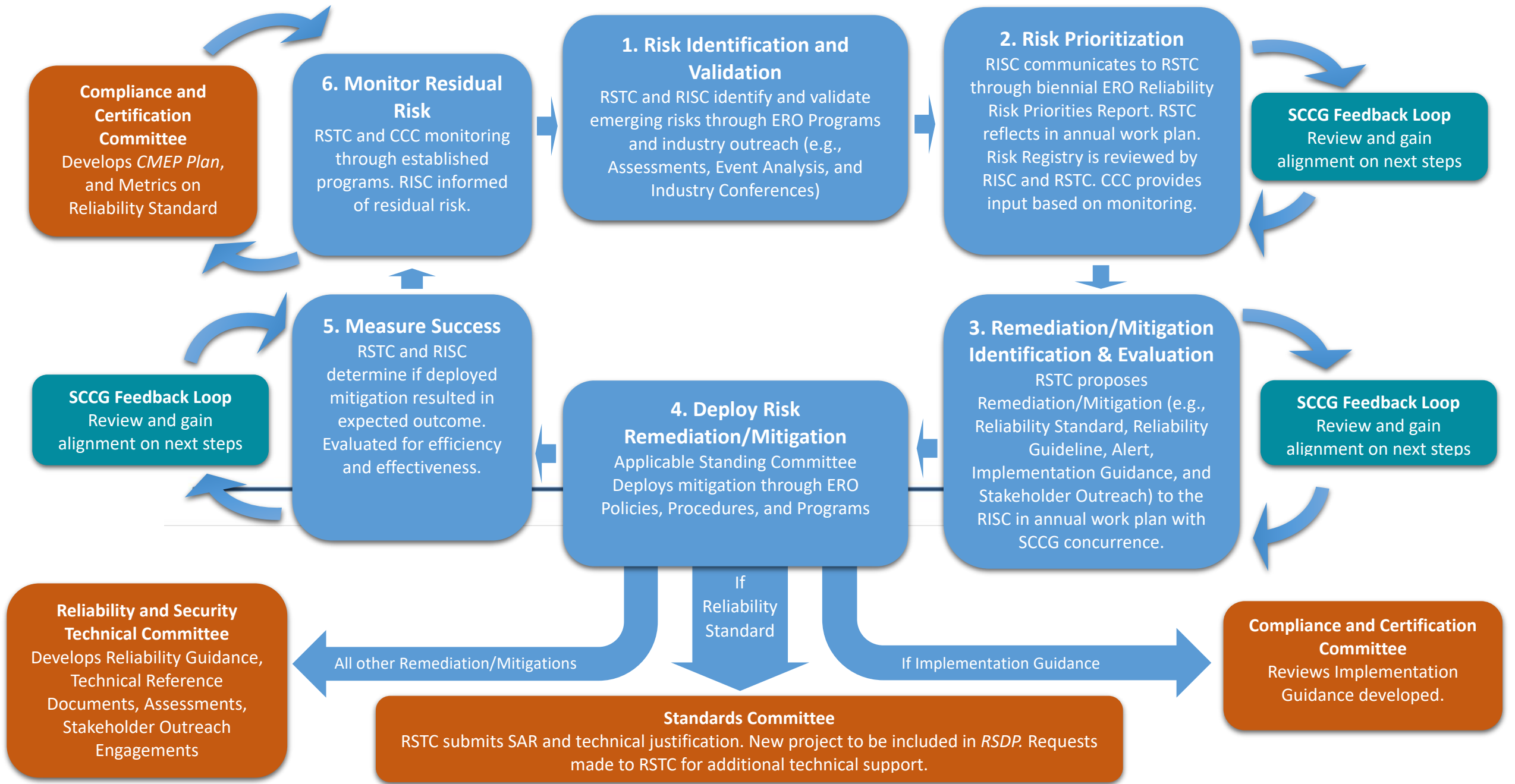


Figure 2: RSTC, RISC, SC, and CCC Coordination within the Risk Framework

- 1. Risk Identification and Validation** is completed by the RSTC and RISC as they review the annual State of Reliability Report, Long-Term and Seasonal Reliability Assessments, Event Analysis records and with a joint review the biennial RISC Report incorporating prioritized risks into the RSTC's subgroup's work plans. Further, the RSTC coordinates with the RISC on long-term risks and mitigations. In this way, risks determined by monitoring the ongoing performance of the bulk power system and those identified by scanning the horizon. The risk registry will be maintained by the RISC and RSTC to determine if an inherent nature of a risk changes over time, and consider removing risks or adding others.
- 2. Reliability Risk Prioritization** is completed collaboratively between the RSTC and RISC on an annual basis. Ongoing activities are calibrated, and newly identified risks are prioritized. The SCCG will serve as a coordination point to ensure broad alignment across the Standing Committees.
- 3. Remediation & Mitigation Identification & Evaluation** activities to address the risks are assigned to the appropriate RSTC subgroups accounting for changing needs across the BPS. They create the ERO Policies, Procedures and Programs to address the risks. Frequent communications ensures coordination of ongoing risk prioritization. RSTC will provide updates to the RISC on the subgroup activities being taken on a quarterly basis. The SCCG will serve as a coordination point to ensure broad alignment across the Standing Committees.
- 4. Deploy Mitigations** by putting ERO Policies, Procedures and Programs into effect. Depending on the Risk Remediation/Mitigation activities selected, the RSTC, SC, and CCC will be assigned certain activities. If Implementation Guidance is identified, the CCC will be assigned to review the developed guidance. If a Reliability Standard is identified, the RSTC (or identified stakeholder) will need to submit a SAR to the SC and that project is to be included in the annual Reliability Standards Development Plan. For all other mitigation/remediation activities, the RSTC will be responsible for developing remediation/mitigation.
- 5. Measure Success** of the strategies/plans which are jointly evaluated for effectiveness, highlighting next steps. RSTC will measure success using its annual performance measurement activities (e.g., State of Reliability Report, Long-Term Reliability Assessment, and Event Analysis). RSTC will provide updates to the RISC on the actions being taken on a quarterly basis.
- 6. Residual Risk** is monitored in coordination between the RSTC coordinates and RISC towards maintaining an acceptable level of residual risk. The CCC will be responsible for measuring the effectiveness of Reliability Standard developed, as well as residual risk, and report back to the RISC through its Compliance and Enforcement Implementation Plan and specific metrics used to measure effectiveness. The SCCG will serve as a coordination point to ensure broad alignment across the Standing Committees.

III. Risk Mitigation from Likelihood and Severity Perspective

From a likelihood and impact perspective, the ERO Policies, Procedures, and Programs above overlap based on the specifics of each risk being mitigated. In addition, there are a host of additional activities that work together to manage risks, such as engagement with the reliability ecosystem, (e.g. Forums, professional organizations (IEEE-PES, CIGRE, etc.), and government). A combination can be used towards

gaining industry action, setting the stage for standards as well as addressing a risk while a standard is being developed. Likelihood and impact have a bearing when a Reliability Standard is required. Figure 3 provides an illustration that is representative of the principles:

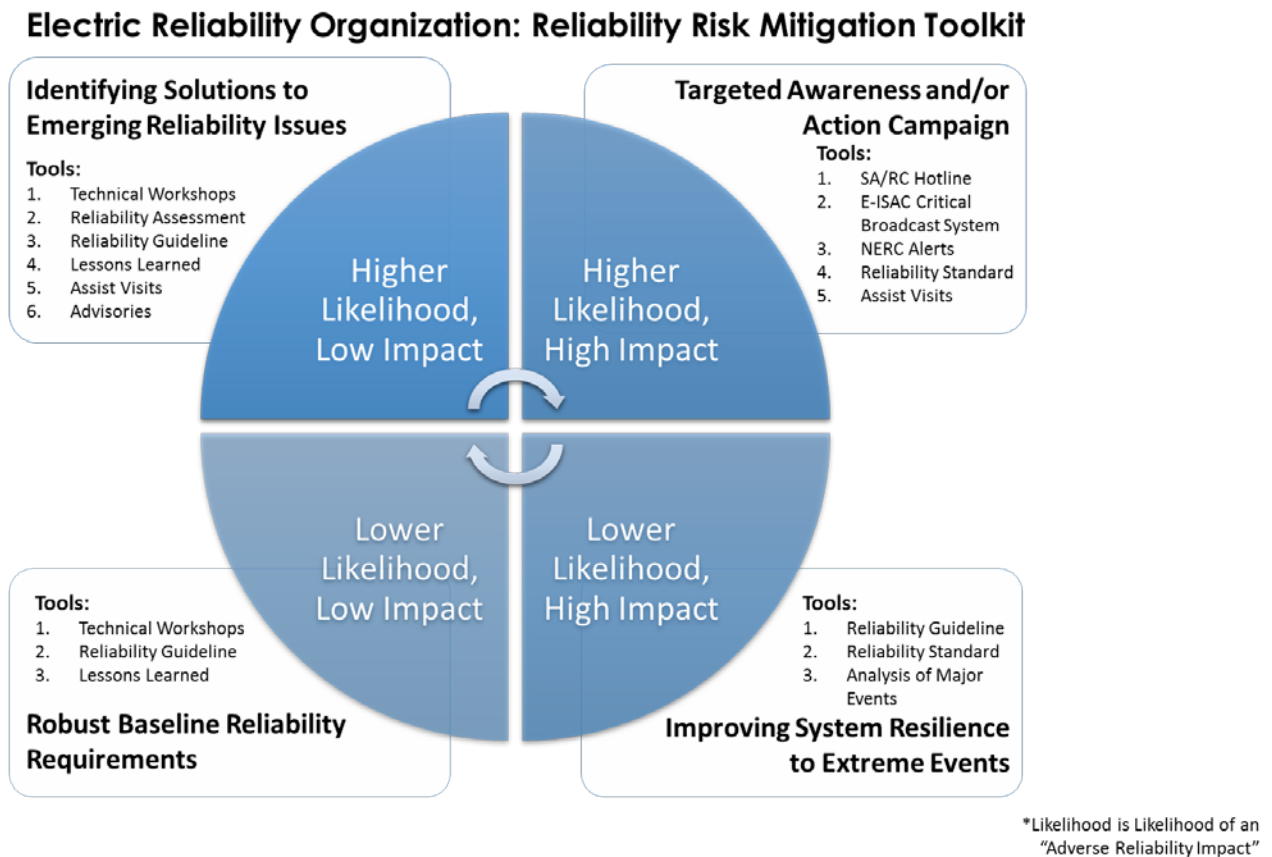


Figure 3: ERO Reliability Risk Mitigation Portfolio

IV. Resilience Impact on Risk Management

In August 2017, the Department of Energy (DOE) issued a Staff Report to the Secretary on Electricity Markets and Reliability ([DOE Grid Report](#)) regarding reliability and resilience in light of the changing energy environment. One recommendation in the DOE Grid Report stated that NERC should consider adding resilience to its mission and broadening its scope to address resilience. In response to the DOE report and NERC assessments, the NERC Board of Trustees (NERC Board) directed the Reliability Issues Steering Committee (RISC) to develop a model for resilience and examine resilience in today’s environment.

In accordance with the NERC Board’s directive, the RISC worked with NERC stakeholders to reexamine the meaning of resilience in today’s changing environment and how resilience impacts NERC activities. Meanwhile, the DOE and FERC have continued evaluating the relationship of resilience and reliability.

In November of 2018, the NERC Board accepted the RISC’s Report, titled [“Reliability Issues Steering Committee Resilience Report.”](#) This report summarizes the results of the RISC’s examination of resilience, including the RISC Resilience Model.

NERC has developed, filed with FERC, and later updated a [definition of the adequate level of reliability](#) (ALR) along with a [technical report](#) to guide Reliability Standards development, Reliability Assessments, guideline development, data collection, system analysis and standing committee work. In particular, the ALR, or design basis of the system, is defined as the state that design, planning, and operation the BES will achieve when five ALR performance objectives are met.⁵ Each objective addresses Reliable Operation of the BES over four time frames:

1. **Steady state:** the period before a disturbance and after restoration has achieved normal operating conditions
2. **Transient:** the transitional period after a disturbance and during high-speed automatic actions in response
3. **Operations response:** the period after the disturbance where some automatic actions occur and operators act to respond
4. **Recovery and system restoration:** the time period after a widespread outage through initial restoration rebounding to a sustainable operating state and recovery to a new steady state

Further, there is a need to development of additional metrics that measure impacts from emerging risks (e.g. energy sufficiency and transmission/generation operating technology security). These metrics can inform industry on the extent of the condition, level of risk, and relative success of their mitigation.

V. Incorporating Risk Adds a Critical Dimension to the ERO's Mission

Application of ERO Policies, Procedures and Programs provides a multi-dimensional approach to address risks. Namely, some of these approaches can be put in place swiftly, while others require industry collaborative action which can take more time. Further, there are time considerations on the speed of the ERO Policies, Procedures and Programs deployment, as well as the speed at which a risk should be addressed. Figure 4 provides a risk time horizon perspective. The application of mitigation approaches in this Framework are not meant to be static. There are risks, however, that include dynamic forces outside the ERO or risks may not be fully within the ERO's purview. This can and will influence the timing and impact of risks.

The ERO Policies, Procedures and Programs deployed are largely dependent on the likelihood that a given risk would impact reliability. For example, reliability issues that have occurred are generally more

⁵ The ALR Performance Objectives are as follows:

1. The BES does not experience instability, uncontrolled separation, Cascading, or voltage collapse under normal operating conditions and when subject to predefined Disturbances.
2. BES frequency is maintained within defined parameters under normal operating conditions and when subject to predefined Disturbances.
3. BES voltage is maintained within defined parameters under normal operating conditions and when subject to predefined Disturbances.
4. Adverse Reliability Impacts on the BES following low probability Disturbances (e.g., multiple contingences, unplanned and uncontrolled equipment outages, cyber security events, and malicious acts) are managed.
5. Restoration of the BES after major system Disturbances that result in blackouts and widespread outages of BES elements is performed in a coordinated and controlled manner.

The ALR also lists two assessment objectives for purposes of assessing risks to reliability:

1. BES transmission capability is assessed to determine availability to meet anticipated BES demands during normal operating conditions and when subject to predefined Disturbances.
2. Resource capability is assessed to determine availability to the Bulk Electric System to meet anticipated BES demands during normal operating conditions and when subject to predefined Disturbances.

likely than those that have not occurred, and risks/issues that have occurred are generally more likely to occur again.

Therefore, the ERO Policies, Procedures and Programs used to mitigate risks that have occurred may be different than those used to mitigate longer-term issue that haven't impacted reliability yet. For instance, after analysis of major and/or off-normal events, depending on the potential impacts and reoccurrence likelihood, strong action can be taken by the ERO with nearly immediate response by issuing up to three levels of NERC Alerts, Assist Visits, followed by Reliability Guidelines, technical conferences, and enhancement of Reliability Standards.

Generally, industry action to address medium to high impact and likelihood risks employs Reliability Standards which provide the highest certainty of risk mitigation. Following Reliability Standards is mandatory and provides a high value by creating comfort and certainty for interconnected organizations of expectations and roles, ensuring that the adequate level of reliability will be maintained. In the end, following the Reliability Standards is an outcome of good industry reliability performance.

High-Impact, Low-Frequency-type risks generally do not have a historical record of technical information. Longer-term risks can be difficult to quantify—therefore, much of the work the ERO can do is to assemble industry experts and stakeholders to agree on and validate what the reliability risk is and how it should be considered and addressed within the ERO Policies, Procedures and Programs, including the full reliability ecosystem. These risks require more collaborative effort and more time towards developing technical references, convening industry stakeholders, and conducting independent reliability assessments to determine the best way to mitigate the risk.

The ERO's risk-based approach is fundamental to the success of its mission to ensure the reliability and security of the BES in North America.



Reliability Guideline

Suggested approaches or behavior in a given technical area for the purpose of improving reliability. Guidelines are not enforceable, but may be adopted by a responsible entity in accordance with its own policies, practices, and conditions.



NERC Alert: Level 2-3

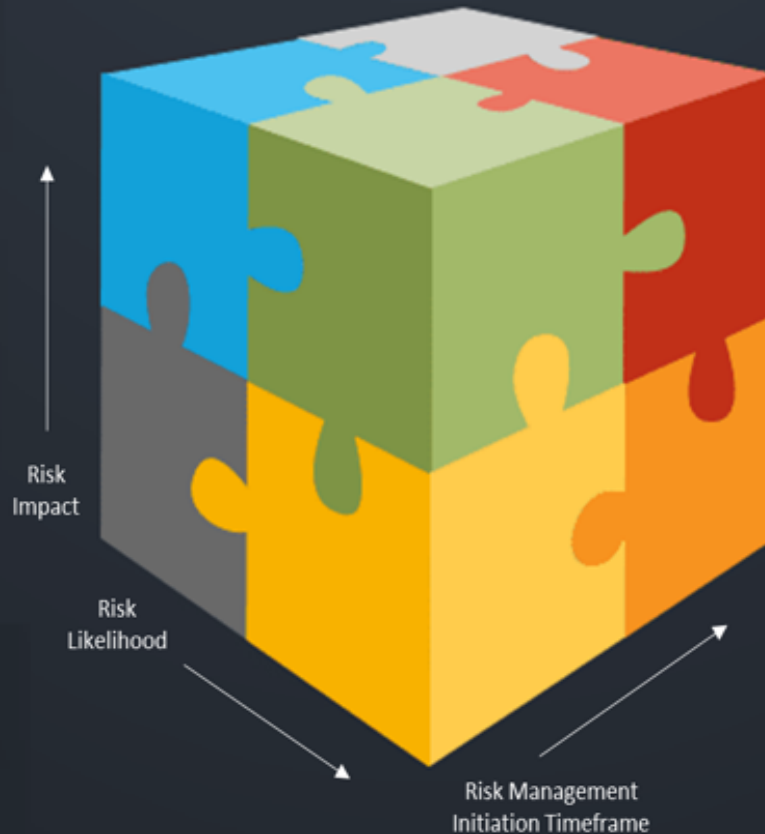
NERC alerts are divided into three distinct levels, 1) Industry Advisory, 2) Recommendation to Industry, and 3) Essential Action, which identifies actions to be taken and require the industry to respond to the ERO.



Technical Engagement

Technical Engagement is a catch-all for a variety of technical activity that is conducted between the ERO and entities. This includes, technical committee activities, technical reference documents, workshops and conferences, assist visits, joint and special studies, etc.

Electric Reliability Organization: Reliability Risk Mitigation Toolkit



Reliability Standards



NERC Reliability Standards define the mandatory reliability requirements for planning and operating the North American BPS and are developed using a results-based approach focusing on performance, risk management, and entity capabilities.

Reliability Assessment



NERC independently assesses and reports on the overall reliability, adequacy, and associated risks that could impact BPS reliability. Long-term assessments identify emerging reliability issues that support public policy input, improved planning and operations, and general public awareness.

NERC Alert: Level 1



NERC Alerts are divided into three distinct levels, 1) Industry Advisory, 2) Recommendation to Industry, and 3) Essential Action, which identifies actions to be taken and require the industry to respond to the ERO.

Figure 4: Risk Time Horizon

Texas RE Bylaws Amendments

Action

Approve amendments to the Texas Regional Entity Bylaws.

Attachment A: REDLINE – Texas RE Bylaws

Attachment B: CLEAN – Texas RE Bylaws

Background

The Texas Reliability Entity, Inc. (Texas RE) Board of Directors met via teleconference on September 2, 2020, and voted to approve proposed revisions to the Bylaws. Texas RE Membership voted to approve the revisions to the Bylaws on October 3, 2020.

The proposed Bylaw revisions accomplish the following objectives:

- Provide the Board flexibility in scheduling;
- Clarify member voting; and,
- Add an Emergency Governance section, allowing for a smaller quorum of voting Directors during an emergency.

Summary of Proposed Revisions to the Texas RE Bylaws

Article V: Meetings of Members of the Corporation

- Texas RE proposes to amend the Section 1, Subsection (a) requirement for the annual membership meeting cadence from an annual meeting in December, to an annual meeting “at a time and place determined by the Board.”
- Texas RE also proposes to broaden the purpose of the annual membership meeting to “conducting any necessary corporate business” in Section 1, Subsection (a).
- Texas RE proposes to add language in Section 2, Subsection (c) to indicate that membership votes conducted electronically can include votes to elect Directors and to revise Texas RE Bylaws.

Article VI: Meetings of the Board of Directors

- Texas RE proposes to add a new section (**Section 8. Emergency Governance Provisions**), to address the possibility of a catastrophic event that results in a majority of the voting Directors being unable to readily participate in a meeting to conduct business necessary and to ensure the continuity of the Corporation (an “Emergency”).

- In Section 8, Subsection (a), Texas RE proposes the ability to change the quorum requirements from a majority of the voting Directors of which at least three must be Independent,¹ to three voting Directors, of which at least two shall be Independent Directors. Any actions of the Board in an Emergency shall be deemed approved by a simple majority vote.
- In Section 8, Subsection (b), Texas RE proposes that any meeting called under these provisions in an Emergency situation need not follow notice and posting requirements under Section 4 of Article VI. Furthermore, the results of any action taken at a meeting shall be posted on the Texas RE website.
- In Section 8, Subsection (c), Texas RE proposes a restriction that the Emergency governance provisions cease once the Emergency ends.

Summary of Proposed Revisions to the Texas RE Bylaws

Upon approval of the NERC Board of Trustees, NERC will file a joint petition with Texas RE seeking approval of the proposed revisions to the Texas RE Bylaws with the Federal Energy Regulatory Commission.

¹ "The quorum necessary for the transaction of business at meetings of the Board shall be a majority of the voting Directors in person (including by means of any communications system by which all persons participating in the meeting are able to hear each other), of which at least three must be Independent Directors", Texas RE Bylaws, Article VI. Meetings of the Board of Directors, Section 3. Quorum and Voting Requirements for Meetings of the Board.

AMENDED AND RESTATED BYLAWS
OF
TEXAS RELIABILITY ENTITY, INC.

(A Texas Non-Profit Corporation)

Approved by Membership – ~~December 17, 2018~~ October 3, 2020
Approved by Federal Energy Regulatory Commission – May 24, 2019

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ARTICLE I. DEFINITIONS

Section 1. Definitions. The capitalized terms used in these Bylaws of Texas Reliability Entity, Inc. (the “Corporation” or “Texas RE”), shall have the meanings set forth below, or if not set forth below, shall have the meanings given them in the NERC Rules of Procedure.

(a) “Affiliate” means any entity controlling, controlled by or under common control with the entity under consideration, and includes any entity (i.e., any commercial enterprise) in any of the following relationships: (i) an entity that directly or indirectly owns or holds at least five percent of the voting securities of another entity, (ii) an entity in a chain of successive ownership of at least five percent of the voting securities of another entity, (iii) an entity which shares a common parent with or is under common influence or control with another entity or (iv) an entity that actually exercises substantial influence or control over the policies and actions of another entity. Evidence of influence or control shall include the possession, directly or indirectly, of the power to direct or cause the direction of the management and/or policies and procedures of another, whether that power is established through ownership or voting of at least five percent of the voting securities or by any other direct or indirect means. In cases where the level of control or influence is disputed, the Board shall have discretion to determine whether or not the entities are Affiliates of one another. Membership in Texas RE shall not create an affiliation with Texas RE.

(b) “Board” means the Board of Directors of the Corporation.

(c) “Bulk Power System” or “BPS” means facilities and control systems necessary for operating an interconnected electric energy transmission network (or any portion thereof) and facilities generating electric energy as needed to maintain transmission system reliability, but does not include facilities used in the local distribution of electricity.

(d) “Delegated Authority” means the authority delegated by NERC to the Corporation to propose and enforce NERC Reliability Standards and perform other reliability-related activities in the ERCOT region under the Delegation Agreement executed by NERC and the Corporation and approved by the Federal Energy Regulatory Commission, pursuant to Section 215 of the Federal Power Act (16 U.S.C. §824o).

(e) “Delegation Agreement” means the agreement between the Corporation and NERC and approved by FERC, which describes the Delegated Authority and may be amended from time to time.

(f) “Electric Reliability Organization” or “ERO” means the organization that is certified by FERC pursuant to Section 39.3 of its regulations, and has received recognition by appropriate regulatory authorities in Canada and Mexico, as applicable, to establish and enforce Reliability Standards for the Bulk Power Systems of the respective countries and that has entered into a delegation agreement with the Corporation pursuant to which the Electric Reliability Organization delegates enforcement authority for Reliability Standards for the Bulk Power System in the ERCOT region. NERC was certified as the ERO on July 20, 2006.

(g) “ERCOT region” means the geographic area and associated transmission and distribution facilities that are not synchronously interconnected with electric utilities operating outside the jurisdiction of the Public Utility Commission of Texas.

(h) “FERC” means the Federal Energy Regulatory Commission.

(i) “Independent Director” means a person who is not (a) an officer or employee of the Corporation; (b) a NERC Registered Entity or Member or an officer, director, or employee of a Member of the Corporation; or (c) an officer, director, or employee of any company or entity that would reasonably be perceived as having a direct financial interest in the outcome of Board decisions or having a relationship that would interfere with the exercise of independent judgment in carrying out the responsibilities of a Director, as more specifically described in Article IV of these Bylaws.

(j) “Member” means a member of the Corporation pursuant to Article III of these Bylaws.

(k) “NERC” means North American Electric Reliability Corporation, the entity certified by FERC as the ERO on July 20, 2006.

(l) “NERC Rules of Procedure” means the Rules of Procedure that are adopted by NERC and approved by FERC.

(m) “PUCT” means the Public Utility Commission of Texas.

(n) “OPUC” means the Texas Office of Public Utility Counsel.

(o) “Originally Elected Independent Director” means a Director approved by the membership on June 2, 2010, in the first election of Texas Reliability Entity, Inc. Independent Directors.

(p) “Regional Entity” means an entity with a Delegation Agreement with NERC, as ERO.

(q) “Regional Reliability Standard” means a standard or variance for the ERCOT region that is proposed and approved in accordance with the Texas RE Standards Development Process and either, (i) sets more stringent reliability requirements than a national Reliability Standard, or (ii) covers matters not covered by a national Reliability Standard.

(r) “Registered Entity” means an entity that is registered with NERC and listed on the NERC Compliance Registry (available at www.nerc.com).

(s) “Reliability Standard” means a requirement to provide for Reliable Operation of the Bulk Power System, which is approved by NERC and FERC, pursuant to Section 215 of the Federal Power Act and all amendments thereto. This term includes requirements for the operation of existing Bulk Power System facilities, including cybersecurity protection, and the design of planned additions or modifications to such facilities to the extent necessary to provide for Reliable Operation of the Bulk Power System.

(t) “Reliable Operation” means operating the elements of the Bulk Power System within equipment and electric system thermal, voltage, and stability limits so that instability, uncontrolled separation, or cascading failures of the Bulk Power System will not occur as a result of a sudden disturbance, including a cybersecurity incident, or unanticipated failure of system elements.

(u) “Sector” means a group of Members of the Corporation that are Bulk Power System owners, operators, or users, as defined in Article III, Section 4 of these Bylaws. Each

Sector shall constitute a class of Members for purposes of Chapter 22 (Nonprofit Corporations) of the Texas Business Organizations Code.

ARTICLE II. PURPOSE

Section 1. General Purpose. The purpose of the Corporation is to preserve and enhance electric reliability in the ERCOT region. In furtherance of this goal, the Corporation will:

(a) Perform Reliability Standards development, compliance monitoring, compliance enforcement, and other related activities as a Regional Entity, pursuant to 16 U.S.C. §824o, in accordance with the Corporation's Delegation Agreement with NERC;

(b) Carry out other activities as set forth in the Delegation Agreement, the NERC Rules of Procedure, or as otherwise required or requested by NERC, in support of the Delegated Authority, including but not limited to organization registration and certification, reliability assessment and performance analysis, training and education, and situational awareness and infrastructure security; and

(c) Engage in any other lawful act or activity that is not in conflict with the Corporation's duties as a Regional Entity and for which non-profit corporations may be organized under the Texas Business Organizations Code.

Section 2. Non-Profit Corporation. The Corporation is a Texas non-profit corporation.

Section 3. Geographic Area. The Corporation will perform its operations primarily within the ERCOT region.

ARTICLE III. MEMBERSHIP

Section 1. Members. The Corporation is a membership corporation. Membership in the Corporation is voluntary and is open only to any entity that is a user, owner or operator of the ERCOT region Bulk Power System, registers with the Corporation as a Member, maintains its registration in accordance with this Article III, and complies with the other conditions and obligations of membership specified in these Bylaws. All Members must qualify and be registered in one of the Sectors defined in Article III, Section 4. Membership in the Corporation is not a condition to participating in the development or consideration of proposed Regional Standards.

Section 2. Registration as a Member. Any entity that is eligible to be a Member of the Corporation in accordance with Article III, Section 1 may become a Member by completing and submitting to the Corporation a membership registration on a form prescribed by the Corporation. The Member shall designate one representative and an alternative representative with authority to receive notices, cast votes, and execute waivers and consents on behalf of the Member. The Corporate Secretary shall maintain a current roster of the Members of the Corporation including each Member's designated representative and alternative representative. All Members shall be required to renew or reaffirm their registrations annually. The Corporate Secretary may remove any Member from the roster that has not submitted a registration renewal or reaffirmation by a date established by the Corporation.

Section 3. Obligations and Conditions of Membership.

(a) Members must agree to promote, support, and comply with Reliability Standards, and assist the Corporation in its compliance with the terms and provisions of the Corporation's Delegation Agreement with NERC. Each Member shall agree, in writing, to accept the responsibility to comply with policies of NERC and the Corporation as set forth in their respective certificates of formation, bylaws, rules of procedure, and Reliability Standards, as applicable, as from time to time adopted, approved, or amended.

(b) As an additional condition of membership in the Corporation, each Member shall be required to execute an agreement with the Corporation, in a form to be specified by the Corporation, that such entity will hold all Directors, officers, employees, and agents of the Corporation, as well as volunteers participating in good faith in the activities of the Corporation, harmless for any injury or damage caused by any act or omission of any director, officer, employee, agent, or volunteer in the course of performance of his or her duties on behalf of the Corporation, other than for willful acts of misconduct.

(c) Consistent with applicable laws and regulations, Members must share nonproprietary information at the Corporation's request as necessary for the furtherance of the Corporation's activities and consistent with NERC, PUCT, or any other applicable rules relating to confidentiality.

Section 4. Membership Sectors. Each Member shall elect to be assigned to one of the following membership Sectors:

(a) **System Coordination and Planning:** An entity that is registered with NERC as a Reliability Coordinator (RC), Balancing Authority (BA), Planning Authority (PA), or Resource Planner (RP).

(b) **Transmission and Distribution:** An entity that is registered with NERC as a Transmission Owner (TO), Transmission Planner (TP), Transmission Service Provider (TSP), Distribution Provider (DP), and/or Transmission Operator (TOP) and is not a Cooperative or Municipal Utility.

(c) **Cooperative Utility:** An entity that is (a) a corporation organized under Chapter 161 of the Texas Utilities Code or a predecessor statute to Chapter 161 and operating under that chapter; or (b) a corporation organized as an electric cooperative in a state other than Texas that has obtained a certificate of authority to conduct affairs in the State of Texas or (c) a cooperative association organized under Chapter 251 of the Texas Business Organizations Code and is registered with NERC for at least one reliability function.

(d) **Municipal Utility:** A municipally owned utility as defined in Public Utility Regulatory Act, Tex. Util. Code §11.003 and is registered with NERC for at least one reliability function.

(e) **Generation:** An entity that is registered with NERC as a Generator Owner (GO) or Generator Operator (GOP).

(f) **Load-Serving and Marketing:** An entity that secures wholesale transmission service or is engaged in the activity of buying and selling of wholesale electric power in the ERCOT region on a physical or financial basis, or qualifies under any newly defined NERC reliability function for demand response.

Section 5. Participation.

(a) There is only one level of Membership, and no company or entity may simultaneously hold more than one Membership.

(b) Members must qualify in and join a Sector.

(c) A Member that is eligible for more than one Sector may join only one Sector and it must be the most appropriate Sector for its business. Any disputes regarding appropriateness of a Member's Sector will be decided by a majority vote of the Board.

(d) A company or entity that is an Affiliate of a Member may hold a separate membership in a different Sector if the companies are separate legal entities.

(e) A Member must continue to vote in the same Sector for a minimum of the remainder of the membership year in which it becomes a Member or until it is no longer eligible to remain in such Sector, and it must give notice to the Corporate Secretary when it elects or is required to change Sectors.

(f) The Corporate Secretary may review the Sector qualification of any Member and upon a determination that a Member does not qualify for membership in a particular Sector, may require the Member to change Sectors or may terminate their membership.

(g) A Member that is no longer eligible or that is not in good standing may not vote on any matters that require membership.

Section 6. Membership Fees. There is no Membership Fee to join the Corporation.

Section 7. Term of Membership. Membership in the Corporation must be renewed or reaffirmed on an annual basis and will only be retained as long as a Member meets its respective qualifications, obligations, and conditions of membership as set forth in these Bylaws.

Section 8. Disciplinary Action. A Member or Member representative may be sanctioned, suspended, or expelled pursuant to a procedure that is fair and reasonable and is carried out in good faith. The Board will establish a procedure to sanction, suspend, or expel a Member that includes notice to the Member and exercise of appropriate due process procedures, and allows for a determination by the Board in its sole discretion that in its judgment the Member has violated its obligations and responsibilities to the Corporation.

Section 9. Resignation. Any other provision of these Bylaws notwithstanding, any Member may withdraw from participation in the activities of the Corporation at any time upon written notice to the Secretary of the Corporation, whereupon it shall cease to be a Member, and its representatives shall cease to be entitled or obligated to participate in the activities of the Board or any activities requiring membership.

Section 10. Reinstatement. A former Member, except a Member subject to Disciplinary Action under Section 8, may submit a membership application form to rejoin the Corporation as a Member. A Member disciplined under Section 8 may submit a written request for reinstatement of Membership. The request for reinstatement will be considered by the Board, and will be granted or denied within the sole discretion of the Board.

ARTICLE IV. BOARD OF DIRECTORS

Section 1. Board of Directors. The business and affairs of the Corporation shall be managed by the Board. The Board shall consist of (i) four (4) Independent Directors who are nominated and elected in accordance with the requirements and procedures specified in this Article IV (the “Independent Directors”); (ii) the Chairman of the PUCT or another PUCT Commissioner designated by the Chairman, as an *ex officio* non-voting member; (iii) Texas Public Counsel, from OPUC as an *ex officio* non-voting member, representing the interests of residential and small commercial electricity consumers; (iv) the CEO of the Corporation as a voting member (the “Management Director”); (v) the chair of the Member Representatives Committee as a voting member; and (vi) the vice chair of the Member Representatives Committee as a voting member. The Directors who are the chair and vice chair of the Member Representatives Committee will be collectively referred to herein as “Affiliated Directors.” All Directors are expected to serve the public interest and to represent the reliability concerns of the entire ERCOT region Bulk Power System.

Section 2. Independent Directors. The Independent Directors shall be elected, shall have the qualifications specified, and shall serve in the manner provided in this Section.

(a) Qualifications:

(1) Experience in one or more of these fields: senior corporate leadership; professional disciplines of finance, accounting, engineering, bulk power systems, or law; regulation of utilities; and/or risk management.

(2) Independence of any NERC Registered Entity. Requirements of independence include but are not limited to the following:

(i) Independent Directors and the spouse, mother, father, sibling, or dependent, and any spouse of mother, father, or sibling and including any step and adoptive parents, siblings or children, and household members of Independent Directors and their spouses shall not have current or recent status (within the last two years) as a director, officer, or employee of an ERCOT region NERC Registered Entity.

(ii) Independent Directors and immediate family (any spouse or dependent) and household members of Independent Directors shall not have current status as a director, officer, or employee of a non-ERCOT region NERC Registered Entity.

(iii) Independent Directors and immediate family and household members of Independent Directors shall not have direct business relationships, other than retail customer relationships, with any NERC Registered Entity.

(iv) Independent Directors and immediate family and household members of Independent Directors shall not own stocks or bonds of NERC Registered Entities or their affiliates. To the extent that an Independent Director or his or her spouse, dependent child, or any other household member owns stocks or bonds of NERC Registered Entities, these must be divested or placed in a blind trust prior to being seated on the Board. Ownership in broadly diversified

mutual funds or similar funds, which may include stocks or bonds of NERC Registered Entities or their affiliates, is not prohibited.

(v) Independent Directors shall not have any relationship that would interfere with the exercise of independent judgment in carrying out the responsibilities of a Board member, including the Delegated Authority.

(vi) Other criteria as approved by the Board.

(b) Term. The term for Independent Directors shall be staggered three year terms. An Independent Director may be elected for up to three consecutive terms. For the Originally Elected Independent Directors, two positions will have three-year terms, one position will have a two-year term, and one position will have a one-year term, and these terms shall not be counted for purposes of term limits. The term for the Affiliated Directors shall coincide with their terms as chair and vice chair of the Member Representatives Committee. The terms of the *ex officio* Directors terminate when the individual ceases to be Chairman of the PUCT (or the PUCT Chairman designates another Commissioner) or ceases to be Texas Public Counsel. If an Independent Director is elected to fill an unexpired term in the event of a vacancy, that term shall not be counted for purposes of term limits.

(c) Selection.

(1) The Board shall appoint, on an annual basis, or more frequently if needed in the event of a special election pursuant to this subsection, a nominating committee (the "Nominating Committee") to recommend candidates (i) to succeed the Independent Directors whose terms expire during the current year; (ii) to serve the remainder of the term of any Independent Director who ceased to serve as a Director subsequent to the last annual election of Directors; (iii) to serve as the Chair and Vice Chair on an annual basis; and (iv) to serve as CEO in the event of a vacancy. The Nominating Committee shall consist of two (2) Independent Directors whose terms do not expire during the current year and are not seeking re-election and one (1) Affiliated Director. The PUCT Chairman (or the PUCT Commissioner designated by the Chairman) may choose to participate on the Nominating Committee. The Board Chair shall appoint the Chair of the Nominating Committee. The Nominating Committee may retain an executive search firm to locate and present candidates to serve as Independent Directors with the required qualifications, as set forth in Article IV, Section 2(a) or to locate and present candidates to serve as CEO. Meetings of the Nominating Committee are not required to be publicly posted.

(2) The Nominating Committee shall select and nominate, by at least a two-thirds majority, qualified candidate(s) to serve as Independent Directors to present to the Membership for its approval. The Nominating Committee shall strive to ensure that the Board as a whole reflects expertise in the areas of technical electric operations and reliability, legal, senior corporate leadership, financial, risk management, and regulatory matters, and familiarity with regional system operation issues in the ERCOT region.

(3) The Membership shall vote by Sector as described in Article V in favor or against the proposed Independent Director(s). A proposed Independent Director who is approved by a majority of the Sectors shall become an Independent Director.

(4) The Nominating Committee shall select and recommend to the Board, by at least a two-thirds majority, a qualified candidate to serve as CEO. The Directors may choose to participate in interviewing CEO candidates.

(d) Director Voting Weights. All voting Directors shall have a single vote each.

(e) Alternates and Proxies. Independent Directors may designate another Independent Director as a proxy if unable to attend a Board meeting. *Ex officio* Directors may designate an alternate representative who may attend public meetings in the absence of such Director. The chair and vice chair of the Member Representatives Committee may designate each other or may designate an Independent Director as their proxy if unable to attend a Board meeting. The CEO may designate an Independent Director as a proxy if unable to attend a Board meeting.

Section 3. Appointment of Management Director. The president and chief executive officer (CEO) of the Corporation shall serve as the Management Director of the Corporation, effective as of the date of his or her appointment by the Board as CEO of the Corporation in accordance with these Bylaws, to serve until such time that he or she ceases to hold the position of CEO. No action of the Members of the Corporation shall be required in connection with the appointment of the CEO as the Management Director of the Corporation.

Section 4. Chair and Vice Chair. Annually, the Board shall elect from the Board's membership, by resolution of the Board, a Chair and a Vice Chair. The Chair and Vice Chair shall each be one of the Independent Directors.

Section 5. Vacancies and Removal.

(a) Should any vacancy on the Board arise from the death, resignation, retirement, disqualification, or removal from office of any Director, or from any other cause, such vacancy shall be filled as follows:

(1) For an Independent Director, by the election of a new Independent Director at the next annual election of Directors to fill the remainder, if any, of the term of the departed Independent Director; provided, that the Board by resolution may in its discretion call a special election to fill any such vacancy for the remainder, if any, of the term of the departed Independent Director.

(2) For the Management Director, by the appointment of a new CEO or interim CEO to fill the vacancy.

(3) For an *ex officio* Director, by the appointment of a new PUCT Chair (or the Chair's designee) or the appointment of a new Texas Public Counsel.

(4) For an Affiliated Director, by the election of a new chair or vice chair, as applicable, by the Member Representatives Committee.

(b) An Independent Director may be removed by an affirmative vote of sixty percent (60%) of the Members. In addition, the Board may remove any voting Director for cause, upon at least seventy-five percent (75%) affirmative votes of the eligible, remaining voting Directors, not counting any Director whose removal is under consideration.

Section 6. Committees of the Board. The Board shall by resolution create and appoint all committees of the Board as the Board deems necessary to perform its responsibilities. All committees of the Board shall have such duties as are prescribed and delegated by the Board. Committees to which any of the authority of the Board to manage the Corporation is delegated must have at least two Directors, and a majority of the members of the committee must be Directors.

ARTICLE V. MEETINGS OF MEMBERS OF THE CORPORATION

Section 1. Annual and Other Meetings of Members.

(a) An annual meeting of the Members ~~to elect Directors, announce election results from electronic elections, and to~~ conduct ~~such other~~any necessary corporate business ~~as may come before the meeting,~~ shall be held annually at a time and place determined by the Board in December each year, or as soon as practicable thereafter.

(b) Meetings of Members of the Corporation may be called for any purpose or purposes by resolution of the Board, by the chair of the Board, the CEO or the Corporate Secretary, or by a number of Members constituting at least ten percent (10%) of all Members on the roster of Members maintained by the Corporate Secretary. Meetings of Members shall be held at the principal office of the Corporation or at such other place fixed by the Board as shall be specified in the notice of meeting. Meetings shall be called upon written notice of the time, date, place, and purposes of the meeting given to all Members on the roster of Members maintained by the Corporate Secretary not less than ten (10) nor more than sixty (60) days prior to the date of the meeting. Only Members in good standing with the Corporation, as determined by the Board, have the right to vote at any meeting of the Members.

Section 2. Quorum and Voting Requirements for Meetings of Members.

(a) At any meeting of the Members of the Corporation, attendance in person or by proxy by a majority of the Members in each of at least two-thirds of the Sectors on the roster of Members maintained by the Corporate Secretary shall constitute a quorum.

(b) Except as otherwise expressly provided in the Corporation's Certificate of Formation, these Bylaws, or applicable law, Members shall vote by Sector and each Sector shall have one vote.

(c) To the extent practicable, membership votes, including but not limited to votes to elect Directors and to revise these Bylaws, will be conducted electronically ~~and prior to annual membership meetings,~~ and will generally be open for a ten (10) day period unless good cause exists to shorten the period.

(d) Except as otherwise expressly provided in the Corporation's Certificate of Formation, these Bylaws or applicable law, actions by the Members of the Corporation shall be approved upon receipt of the affirmative vote of a majority of the Sectors of the Corporation at (1) a meeting at which a quorum is present, in person or by proxy, or (2) an electronic vote which has participation by a quorum. Each Sector's vote shall be determined by the affirmative vote of a majority of the members of the Sector voting at the meeting or in the electronic election.

Section 3. Waivers of Notice of Meetings of Members and Member Meeting Adjournments. Notice of a meeting of Members need not be given to any Member who waives

notice in writing, whether before, during, or after the meeting. The attendance of any Member at a meeting, in person or by proxy, without protesting prior to the conclusion of the meeting the lack of proper notice of such meeting, shall constitute a waiver of notice of the meeting by such Member. When any meeting of Members is adjourned to another time or place, it shall not be necessary to give notice of the adjourned meeting if the time and place to which the meeting is adjourned are announced at the meeting at which the adjournment is taken, and if at the adjourned meeting only such business is transacted as might have been transacted at the original meeting.

Section 4. Action Without a Meeting of Members. Any action, required or permitted to be taken at a meeting of Members, may be taken without a meeting if the proposed action is posted to all Members (via direct email or email to an email distribution list to which Members may subscribe and by posting on the Corporation website) and consented to in writing by the minimum number of Members that would be required to approve the action at a meeting of the Members at which all Members were present. The voting in such a circumstance shall be performed in writing, including via email or other electronic means. The Members shall receive written notice of the results within ten (10) days of the action vote, and all written responses of the Members shall be filed with the Corporate records. The results of such voting will be posted on the Corporation's website.

Section 5. Meetings of the Members to be Open. Notice to the public of the dates, places, and times of meetings of the Members, and all non-confidential material provided to the Members, shall be posted on the Corporation's website at approximately the same time that notice is given to the Members. Meetings of the Members shall be open to the public, subject to reasonable limitations due to the availability and size of meeting facilities; provided, that the meeting may be held in or adjourned to closed session to discuss matters of a confidential nature, including but not limited to compliance and enforcement matters, personnel matters, litigation, or commercially sensitive or critical infrastructure information of the Corporation or any other entity.

ARTICLE VI. MEETINGS OF THE BOARD OF DIRECTORS

Section 1. Regular Meetings of the Board. Regular meetings of the Board shall be held at least quarterly. By resolution adopted at any meeting of the Board, the Board may provide for additional regular meetings that may be held as needed.

Section 2. Special Meetings of the Board. Special meetings of the Board for any purpose or purposes may be called at any time by the chair or by any two Directors. Such meetings may be held upon notice given to all Directors not less than three (3) days prior to the date of the meeting. Such notice shall specify the time, date, place, and purpose or purposes of the meeting and may be given by telephone, email, or other electronic media, or by express delivery.

Section 3. Quorum and Voting Requirements for Meetings of the Board. Unless otherwise expressly provided in the Corporation's Certificate of Formation, these Bylaws or applicable law, (i) the quorum necessary for the transaction of business at meetings of the Board shall be a majority of the voting Directors in person (including by means of any communications system by which all persons participating in the meeting are able to hear each other), of which at least three must be Independent Directors, and (ii) actions by the Board shall be deemed approved upon receipt of the affirmative vote of a majority of the Directors present and voting in person (including by means of any communications system by which all persons

participating in the meeting are able to hear each other) or by proxy at a meeting at which a quorum is present but in no case less than four votes.

Section 4. Meetings of the Board to be Open. Notice to the public of the dates, places, and times of meetings of the Board, and all non-confidential material provided to the Board, shall be posted on the Corporation's website at approximately the same time that notice or such material is given to the Directors and at least five (5) business days prior to the scheduled meeting. Meetings of the Board shall be open to the public, subject to reasonable limitations due to the availability and size of meeting facilities; provided, that the Board may meet in or adjourn to closed session to discuss matters of a confidential nature, including but not limited to compliance and enforcement matters, personnel matters, litigation, or commercially sensitive or critical infrastructure information of the Corporation or any other entity. Any or all of the Directors or members of a Board committee, may participate in a meeting of the Board, or a meeting of a committee, in person or by proxy, by means of any communications system by which all persons participating in the meeting are able to hear each other.

Section 5. Waivers of Notice of Board Meetings and Board Meeting Adjournments. Notice of a meeting of the Board need not be given to any Director who waives notice in writing, whether before, during, or after the meeting. The attendance of any Director at a meeting, in person or by proxy, without protesting prior to the conclusion of the meeting the lack of proper notice of such meeting, shall constitute a waiver of notice of the meeting by such Director. When a meeting of the Board is adjourned to another time or place, it shall not be necessary to give notice of the adjourned meeting if the time and place to which the meeting is adjourned are announced at the meeting at which the adjournment is taken and if at the adjourned meeting, only such business is transacted as might have been transacted at the original meeting.

Section 6. Action Without a Meeting. Any action required or permitted to be taken at a meeting of the Board, or of any committee thereof, may be taken by the Board or by the committee without a meeting if the action is consented to in writing by the number of Directors or members of the committee, as the case may be, entitled to vote on the action that would be required to approve the action at a meeting of the Board or committee with all members of the Board or committee present. The call for action without a meeting of the Board may be initiated by the chair or by any two voting Directors. Notice of the proposed call for action without a meeting, and all non-confidential material provided to the Board in connection with the call for action without a meeting, shall be posted on the Corporation's website and shall be sent via email to an email distribution list to which Members and the public may subscribe at approximately the same time notice of the call for action without a meeting or such material is provided to the Board. The call for action without a meeting of a committee of the Board may be initiated by the chair of the committee or by any two members of the committee. The Directors or members of the committee shall receive written notice of the results of such action within seven (7) days of the action vote. All written responses of the Directors shall be filed with the minutes of the Corporation, and all written responses of members of a committee shall be filed with the minutes of such committee.

Section 7. Emergency Meetings. The Board may meet on urgent matters with not less than two (2) hours' public notice, as necessary or appropriate for emergency conditions threatening health or safety or a reasonably unforeseen situation.

Section 8. Emergency Governance Provisions. In the event of a catastrophic event that results in a majority of the voting Board-Directors unable to readily participate in a meeting to ensure conduct business necessary to ensure the continuity of the Corporation (an "Emergency"), the following emergency governance provisions will apply:

(a) If the quorum requirements under Section 3 of this Article cannot be met in an Emergency, and it is necessary for the Board to hold a meeting to conduct business necessary to ensure the continuity of the Corporation, the quorum necessary for the transaction of business at meetings of the Board shall be three voting Directors, of which at least two shall be Independent Directors. Actions of the Board in an Emergency shall be deemed approved by a simple majority vote.

(b) Other provisions of these Bylaws notwithstanding, meetings called under this Section may be called as soon as circumstances permit for the purpose of taking action as may be appropriate to ensure business continuity of the Corporation. Meetings held under this Section need not follow notice and posting requirements under Section 4 of this Article. The results of any action taken at a meeting shall be posted on the Corporation's website.

(a)(c) The emergency governance provisions cease to be effective once the Emergency ends.

ARTICLE VII. OFFICERS

Section 1. Selection of Officers. The Board shall elect a CEO and shall ratify the selection of the officers of the Corporation (collectively, the "Officers"). The Management Director shall not participate in votes electing or ratifying Officers. The Corporation shall maintain a list of current Officers ratified by the Board. The duties and authority of the Officers shall be determined from time to time by the Board. Subject to any such determination, the Officers shall have the following duties and authority:

Section 2. Chief Executive Officer ("CEO"). The CEO shall be the chief executive officer of the Corporation. He or she shall be responsible for the day-to-day ongoing activities of the Corporation and shall have such other duties as may be delegated or assigned to him or her by the chair. The CEO may enter into and execute in the name of the Corporation contracts or other instruments not in the regular course of business that are authorized, either generally or specifically, by the Board.

Section 3. Corporate Secretary. The Secretary shall maintain the roster of Members of the Corporation, shall cause notices of all meetings to be served as prescribed in these Bylaws, shall keep or cause to be kept the minutes of all meetings of the Members and the Board, and shall have charge of the seal of the Corporation. The Secretary shall perform such other duties and possess such other powers as are incident to his or her office or as shall be assigned to him or her by the CEO. The CEO may select an Assistant Corporate Secretary at his or her discretion. The Assistant Corporate Secretary is not an Officer of the Corporation.

Section 4. Chief Financial Officer. A Chief Financial Officer shall have custody of the funds and securities of the Corporation, shall keep or cause to be kept regular books of account for the Corporation and shall have the duties normally assigned to a treasurer of a corporation. The Chief Financial officer shall perform such other duties and possess such other powers as are incident to his or her office or as shall be assigned to him or her by the CEO.

Section 5. Other Officers. The CEO may select such other Officers as he or she deems appropriate, subject to ratification by the Board. Any such Officer shall perform such other duties and possess such powers as are incident to his or her office or as shall be assigned to him or her by the CEO.

**ARTICLE VIII.
MEMBER REPRESENTATIVES COMMITTEE**

Section 1. Purpose of Member Representatives Committee. The Corporation shall have a “Member Representatives Committee” that shall provide advice and recommendations to the Board with respect to: annual budgets, business plans and funding mechanisms of the Corporation; the development of Regional Reliability Standards and Regional Variances in accordance with Texas RE’s process; other matters relevant to reliability of the ERCOT Bulk Power System; and other matters pertinent to the purpose and operations of the Corporation. The Member Representatives Committee shall provide its advice and recommendation to the Board through its chair and the vice chair, who also serve as the Affiliated Directors on the Board. The Member Representatives Committee may create subcommittees, task forces, or working groups (“subcommittees”) as it deems appropriate to study or discuss selected technical or compliance matters, provide a forum for the review and discussion of current and proposed Reliability Standards, and to make recommendations to the Board as requested or required by the Board or as deemed appropriate to its purpose by the Member Representatives Committee. Because it is elected by the Members of the Corporation and not appointed by the Board, the Member Representatives Committee shall not be a standing committee of the Board of Directors of the Corporation, but is authorized to provide advice and recommendations directly to the Board, through its elected chair and vice chair.

Section 2. Composition of the Member Representatives Committee. The Member Representatives Committee shall consist of two representatives from each Sector to serve two-year terms and will select a chair and vice chair for the Member Representatives Committee to serve two-year terms. The representatives of each Sector shall be officers, employees, or directors of Members in that Sector (or the Member’s parent, subsidiary, or other Affiliate); provided however, except for a Sector that has only one Member, only one officer, employee, or director of a Member in a Sector (or the Member’s parent, subsidiary, or other Affiliate) may be a representative from that Sector. The Board may by resolution create additional non-voting positions on the Member Representatives Committee on its own initiative or at the written request of any group of Members of the Corporation that believes its interests are not adequately represented on the Member Representatives Committee. There shall be no limit on the number of terms that an officer, employee, or director of a Member (or the Member’s parent, subsidiary, or other Affiliate), may serve on the Member Representatives Committee.

Section 3. Election of Representatives of the Member Representatives Committee. Unless a Sector adopts an alternative election procedure, the election of representatives from each Sector to the Member Representatives Committee, and any election to fill a vacancy, shall be conducted in accordance with the following process, which shall be administered by the Secretary of the Corporation:

(a) During the period beginning no more than ninety (90) days and ending no less than fifteen (15) days prior to an annual meeting, or beginning no more than forty-five (45) days and ending no less than fifteen (15) days prior to a special election to fill a vacancy on the Member Representatives Committee, nominations may be submitted for candidates for election to the Member Representatives Committee. A nominee for election as a Sector representative must be an officer, employee, or director of a Member in that Sector (or the Member’s parent, subsidiary, or other Affiliate). No more than one nominee who is an officer, employee, or director of a Member (or the Member’s parent, subsidiary, or other Affiliate) may stand for election in any single Sector; if more than one officer, employee, or director of a Member (or the Member’s parent, subsidiary, or other Affiliate) is nominated for election from a Sector, the Member shall designate

which such nominee shall stand for election. The election of representatives shall be conducted over a period of ten (10) days using an electronic process approved by the Corporate Secretary.

(b) Each Member in a Sector shall have one vote for each Representative to be elected from the Sector in that election and may cast no more than one vote for any nominee. The nominee receiving the highest number of votes in each Sector shall be elected to one Representative position to be filled from that Sector and the nominee receiving the second highest number of votes shall be elected as the second Representative position for that Sector. To be elected on the first ballot, a nominee must receive a number of votes equal to a simple majority of the Members in the Sector casting votes in the election. If no nominee in a Sector receives a simple majority of votes cast in the first ballot, a second ballot shall be conducted which shall be limited to the number of candidates receiving the three (3) highest vote totals on the first ballot. The nominees receiving the two highest totals of votes on the second ballot shall be elected to the Representative positions for the Sector.

(c) A Sector may adopt an alternative procedure to the foregoing to nominate and elect its Representatives to the Member Representatives Committee if the alternative procedure is approved by vote of at least two-thirds of the Members in the Sector, provided, however that any alternative procedure must be reviewed and approved by the Board.

(d) A Sector may elect an Alternate to serve in place and at the convenience of the Sector's Member Representatives Committee Representative(s) in the event a Member Representatives Committee Representative cannot attend a Member Representatives Committee meeting.

Section 4. Chair and Vice Chair of the Member Representatives Committee.

After the selection of its Representatives, the Member Representatives Committee shall select a chair and vice chair from among its voting Representatives by majority vote to serve during the upcoming two-year term and be the Affiliated Directors on the Board. The selected chair and vice chair may not be representatives of the same Sector and may not concurrently serve on the Board of ERCOT ISO. The Board shall be notified of the selection of the chair and vice chair, but the selection will not be subject to approval of the Board. The chair is responsible for ensuring that minutes of the meetings are properly maintained and made available to the public, but the chair may delegate this responsibility to the vice chair or to another Representative of the Member Representatives Committee who may be designated as secretary of the Member Representatives Committee.

Section 5. Vacancies on the Member Representatives Committee.

In the event that any Representative of the Member Representatives Committee ceases to serve as a Representative of the Member Representatives Committee as a result of his or her death, resignation, retirement, disqualification, removal, or other cause, the Members in the Sector of which such Representative was a representative shall elect, as soon thereafter as reasonably practicable, and in accordance with the procedures in this Article VIII, a new Representative to replace the Representative of the Member Representatives Committee who ceased to serve. For those Sectors that have elected an Alternate, the Alternate will fill a vacancy left by the Sector's Member Representative until a new Sector Member Representative is elected by the Sector.

Section 6. Meetings of the Member Representatives Committee.

The Member Representatives Committee will plan and hold quarterly meetings, at a time and place determined by the Member Representatives Committee, normally shortly before the regular meetings of the Board, and posted on the Corporation's website. Except for closed session meetings specifically allowed by this Section, all meetings shall be open to the public.

(a) Notice to the public of the dates, places, and times of meetings of the Member Representatives Committee and any subcommittees, and all non-confidential material provided to the Representatives on the Member Representatives Committee or any subcommittees, shall be posted on the Corporation's website at approximately the same time that notice or such material is given to the Member Representatives Committee, which will normally be at least five (5) business days prior to the scheduled meeting. Meetings of the Member Representatives Committee and subcommittees shall be open to the public, subject to reasonable limitations due to the availability and size of meeting facilities; provided, that the Member Representatives Committee and subcommittees may meet in or adjourn to closed session to discuss matters of a confidential nature, including but not limited to confidential planning information, critical infrastructure information, or commercially sensitive information of the Corporation or any other entity. Participation in a meeting of the Member Representatives Committee or subcommittee may be accomplished through use of a communications system by which all persons participating in the meeting are able to hear each other.

(b) Special meetings may be called for any purpose or purposes by the chair of the Member Representatives Committee or by any three (3) Representatives of the Member Representatives Committee, which number shall include representatives from at least three Sectors, and require notice given to all Representatives of the Member Representatives Committee not less than seven (7) days prior to the date of the meeting. Such notice shall specify the time, date, place, and purpose or purposes of the meeting and may be given by telephone, email, or other electronic media, or by express delivery.

(c) The Member Representatives Committee shall effectively coordinate with the employees of the Corporation and adopt procedural rules for the voting for Representatives, scheduling of meetings, and public posting of required meeting information and minutes. The chair or vice chair of the Member Representatives Committee shall provide all meeting agendas, material, minutes and other information required or desired to be posted on the Corporation's website to appropriate Corporation employees at least one (1) business day prior to the time such information should be posted.

Section 7. Action Without a Meeting of Members. Any action, required or permitted to be taken at a meeting of the Member Representatives Committee, may be taken without a meeting if the proposed action is posted to all Committee Members via direct email and consented to in writing by a majority of the Representatives. The voting in such a circumstance shall be performed in writing, including via email or other electronic means. The Representatives shall receive written notice of the results within ten (10) days of the action vote, and all written responses of the Representatives shall be retained as a corporate record. The results of such voting will be reported at the next in-person Member Representatives Committee meeting.

Section 8. Waivers of Notice of Meetings of the Member Representatives Committee and Meeting Adjournments. Notice of a meeting of the Member Representatives Committee need not be given to any member of the Member Representatives Committee who waives notice, in writing, before, during, or after the meeting. The attendance of any Committee member at a meeting, in person or by proxy, without protesting prior to the conclusion of the meeting the lack of proper notice of such meeting, shall constitute waiver of notice of the meeting by such Committee Member. When a meeting of the Member Representatives Committee is adjourned to another time or place, it shall not be necessary to give notice of the adjourned meeting if the time and place to which the meeting is adjourned are announced at the meeting at which the adjournment is taken, and if at the adjourned meeting only such business is transacted as might have transacted at the original meeting.

Section 9. Quorums and Voting for Meetings of the Member Representatives Committee. The quorum necessary for the transaction of business at meetings of the Member Representatives Committee shall be the presence, in person or by proxy, of two-thirds of the voting Representatives on the Member Representatives Committee entitled to attend. Each voting member of the Member Representatives Committee shall have one (1) vote on any matter coming before the Member Representatives Committee that requires a vote. Except as otherwise expressly provided in the Corporation's Certificate of Formation, these Bylaws or applicable law, actions by members of the Member Representatives Committee shall be approved upon receipt of the affirmative vote of a majority of the voting members of the Member Representatives Committee present (by means of any communications system by which all persons participating in the meeting are able to hear each other) and voting at any meeting at which a quorum is present.

Section 10. Alternates and Proxies. Member Representatives may designate another Member Representative or an employee of the Member Representative's organization (or the Member's parent, subsidiary, or other Affiliate) as a proxy if both the Member Representative and the Sector Alternate are unable to attend a Member Representatives Committee meeting. A member of the Member Representatives Committee may give a proxy only to a person who is an officer, employee, or director of a Member, registered in the same Sector (or the Member's parent, subsidiary, or other Affiliate).

Section 11. Other Procedures of the Member Representatives Committee. Except as to any matter as to which the procedure to be followed by the Member Representatives Committee is expressly set forth in these Bylaws, the Member Representatives Committee may adopt such additional procedures, not inconsistent with these Bylaws, as it deems appropriate, subject to review and approval by the Board.

ARTICLE IX. OTHER COMMITTEES AND SUBCOMMITTEES

Section 1. Other Committees and Subcommittees of the Corporation. The Board may by resolution create committees and subcommittees of the Corporation to provide advice to the Board. The Board will appoint the members of such committees, subcommittees, and task forces that are representative of Members, and other interested parties, as appropriate, that provide for balanced decision-making and that include persons with sufficient technical knowledge and experience. All committees and subcommittees shall have such scope and duties as determined by the Board.

ARTICLE X. BUDGETS AND FUNDING

Section 1. Compensation of the Board and Member Representatives Committee.

(a) The Board shall have a Director compensation committee (the "Director Compensation Committee") to have the right to evaluate and fix from time to time, by simple majority vote, the amount of the annual retainer fee or other compensation to be paid to the Independent Directors for their services to the Corporation, including any fees to be paid for each meeting of the Board or any Board committee attended by an Independent Director. The Director Compensation Committee will evaluate the fee or other compensation annually to ensure that Director compensation is appropriate. The Director Compensation Committee shall consist of two (2) Independent Directors that are not currently serving as Board Chair and Vice Chair (unless

there is an Independent Director vacancy, in which case the Board Vice Chair will serve on the Committee until the vacancy is filled), two (2) Affiliated Directors, and the CEO. The Board Chair shall appoint an Independent Director as the Chair of the Director Compensation Committee. Meetings of the Director Compensation Committee are not required to be publicly posted.

(b) No compensation shall be paid to any Management Director, Affiliated Director, or *ex officio* Director for his or her services on the Board, other than the compensation paid to the Management Director for services as CEO of the Corporation. No compensation shall be paid by the Corporation to any member of the Member Representatives Committee for his or her services on the Member Representatives Committee.

(c) Independent Directors shall be entitled to be reimbursed their reasonable out-of-pocket expenditures for attending meetings and conducting the business of the Corporation.

Section 2. Preparation and Adoption of Annual Budget, Business Plan, and Funding Mechanism. The Board shall require the CEO to prepare for Board approval an annual business plan and budget for the administrative and other expenses of the Corporation, including the expenditures for the fiscal year for any material special projects undertaken by the Corporation and reasonable and proper reserves and provisions for contingencies, in accordance with all NERC and FERC requirements. The annual business plan, budget and funding mechanism of the Corporation shall be for a fiscal year commencing on January 1 and ending on December 31. Each annual business plan, budget, and funding mechanism shall be approved by the Board at a regular meeting or a special meeting of the Board duly called for that purpose. The Board shall approve each annual business plan, budget, and funding mechanism at a time that allows for timely submittal of the approved annual business plan, budget, and funding mechanism to the applicable regulatory authorities.

Section 3. Comments During Preparation of Annual Business Plan and Budget. In preparing the annual business plan and budget, the Board shall require that the CEO post a draft business plan and budget for review and comment by the Members of the Corporation, the Member Representatives Committee, and the standing committees of the Corporation for at least five (5) business days prior to the date of the meeting of the Board at which the annual business plan and budget is to be adopted.

Section 4. Modified or Supplemental Budgets. During the course of a fiscal year, the Board may modify any approved budget or develop and approve a supplemental budget if determined by the Board to be necessary due to such factors as a shortfall in revenues of the Corporation from projected levels, incurred or anticipated expenditures, duties, or new projects not provided for in the annual budget, or such other factors as in the judgment of the Board warrant modification of the budget for the fiscal year or development of a supplemental budget. In preparing a modified or supplemental budget, the Board shall follow the provisions of this Article X, Section 4 to the extent practicable in the judgment of the Board in light of the urgency of the circumstances necessitating preparation and approval of the modified or supplemental budget. Each modified or supplemental budget shall be approved by the Board at a regular meeting or a special meeting of the Board duly called for that purpose.

Section 5. Submission of Annual Business Plans and Budgets to the Regulatory Authorities. Each annual budget, annual business plan, and annual, modified, or supplemental budget approved by the Board shall be submitted by the Corporation to the ERO and any applicable regulatory authorities for approval in accordance with its regulations, and shall not be effective until approved by the applicable regulatory authorities. If ordered to modify or

remand an annual budget, business plan, or annual, modified, or supplemental funding mechanism, the Board shall promptly following such order adopt such modifications to the business plan, budget, or funding mechanism as are required or directed by the order of the ERO and any applicable regulatory authority.

ARTICLE XI. AMENDMENTS TO THE BYLAWS

Section 1. Amendments to the Bylaws. These Bylaws may be altered, amended, or repealed by action of the Membership, as set forth below. Any alteration, amendment, repeal or adoption of Bylaws shall be subject to any applicable requirements for filing with or approval by the ERO or any other applicable regulatory authority. These Bylaws may be altered, amended, or repealed as follows:

(a) Suggested amendments to these Bylaws may be made through the submission of the proposed amendments, including any necessary supporting documents, to the Corporate Secretary.

(b) The Corporate Secretary shall place the proposal on the agenda for a Board meeting, or if the Board has designated a standing committee with authority to review proposed amendments and make a recommendation to the Board, the Corporate Secretary shall place the proposal on that committee's next scheduled meeting agenda.

(c) If the proposal is approved by an act of the Board as set forth in Article VI, Section 3, the Board shall place the proposal on the agenda of the next Annual Meeting of the Corporate Members unless the Board in its discretion calls a Special Meeting of the Corporate Members to vote on the proposal or determines to seek Membership approval without a meeting as provided in Article V, Section 4.

(d) If the proposal is not approved by the Board, the Members of the Corporation may call a meeting, pursuant to Article V, Section 1(b), for the purpose of voting on a proposal not approved by the Board. Any such proposal must be approved by a vote of five of the six Sectors at a meeting of Members called for that purpose or by written consent of five of the Sectors, where the number of votes for and against the proposed alteration, amendment, repeal or adoption of Bylaws shall be determined in accordance with Article V, Section 2.

ARTICLE XII. INDEMNIFICATION; PROCEDURE; DISSOLUTION

Section 1. Indemnification. The Corporation shall indemnify each person who at any time shall serve, or shall have served, as an officer, Director, employee, or other corporate agent of the Corporation, is or was serving at its request as a director, officer, partner, venturer, proprietor, employee, agent or similar functionary of another foreign or domestic corporation, partnership, joint venture, sole proprietorship, trust, employee benefit plan or other enterprise ("Indemnified Parties"), to the full extent from time to time permitted by the Texas Business Organizations Code and other applicable law. Such right of indemnification shall inure to the benefit of the legal representative of any such Indemnified Party. The foregoing indemnification shall be in addition to, and not in restriction or limitation of, any privilege or power that the Corporation may have with respect to the indemnification or reimbursement of its Indemnified Parties. The Corporation shall also pay or advance reasonable expenses incurred by an Indemnified Party in connection with a proceeding in advance of the final disposition of the proceeding upon receipt of a written affirmation by the Indemnified Party of a good faith belief that

the standard of conduct necessary for indemnification under this Article XII and the Texas Business Organizations Code has been met and a written undertaking by or on behalf of the officer, Director, or other corporate agent to repay the amount if it shall be ultimately determined that the Indemnified Party was not entitled to be indemnified by the Corporation.

Section 2. Parliamentary Rules. In the absence of and to the extent not inconsistent with specific provisions in these Bylaws, meetings or other actions pursuant to these Bylaws shall be governed by procedures that the Board may, from time to time, establish by resolution.

Section 3. Dissolution. Upon dissolution of the Corporation, in accordance with the Certificate of Formation, the remaining assets of the Corporation after payment of debts shall be distributed in the manner determined by the Board, provided that, (i) no part of the assets shall be distributed to any Director of the Corporation, and (ii) the distribution of assets shall be consistent with the requirements of Section 501(c)(3) of the United States Internal Revenue Code of 1986, as amended.

ARTICLE XIII. CONFLICTS OF INTEREST

Section 1. Conflicts of Interest.

(a) Each Director shall have an affirmative duty to disclose to the Board or committee (as the case may be) any actual or potential conflicts of interest of the Director that arise during his or her tenure as a Director where, and to the extent that, such conflicts or potential conflicts directly or indirectly affect any matter that comes before the Board. A Director with a direct or potentially conflicting interest in a matter shall recuse himself from deliberations and actions on the matter in which the conflict arises and shall abstain on any vote on the matter and not otherwise participate in a decision on the matter. Any disclosure of a potential conflict of interest by a Director shall be noted in the minutes of the Board meeting at which the direct interest is disclosed. Mere attendance at the meeting, without participating in discussion of the issue raising the potential conflict, shall not constitute participation.

(b) The Corporation may not make any loan to a Director, committee member or officer of the Corporation. A Member, Director, officer, or committee member of the Corporation may not lend money to, or otherwise transact business with, the Corporation except as otherwise provided by these Bylaws, the Certificate of Formation, and applicable law. A related party transacting business with the Corporation has the same rights and obligations relating to those matters as other persons transacting business with the Corporation, provided the related party nature of the transaction is known to the Board. The Corporation may not borrow money from, or otherwise transact business with, a Member, Director, officer, or committee member of the Corporation unless the transaction is described fully in a legally binding instrument, is in the Corporation's best interests, and is on terms no less favorable to the Corporation than could be obtained in an arms-length transaction. The Corporation may not borrow money from, or otherwise transact business with, a Member, Director, officer, or committee member of the Corporation without full disclosure of all relevant facts and without the Board's approval, not including the vote of any person having a personal interest in the transaction.

Section 2. Prohibited Acts. No Member, Director, officer, or committee member of the Corporation may do any of the below-listed prohibited acts. Engaging in these prohibited acts may lead to sanction, suspension, expulsion or termination after a hearing as described in these Bylaws. The prohibited acts include the following:

- (a) Do any act in violation of these Bylaws.
- (b) Do any act in violation of a binding obligation of the Corporation except with the Board's prior approval.
- (c) Do any act with the intention of harming the Corporation or any of its operations.
- (d) Receive an improper personal benefit from the operation of the Corporation.
- (e) Use the Corporation's assets, directly or indirectly, for any purpose other than carrying on the Corporation's business.
- (f) Wrongfully transfer or dispose of Corporation property, including intangible property such as goodwill.
- (g) Use the Corporation's name (or any substantially similar name) or any trademark or trade name adopted by the Corporation, except on behalf of Corporation in the ordinary course of its business or as a reference to the Corporation or its region.
- (h) Disclose any of Corporation's or Members' business practices, trade secrets, or any other confidential or proprietary information not generally known to the business community to any person not authorized to receive it.

Section 3. Loans and Guarantees. Neither participation in the activities of the Corporation nor any provision of these Bylaws or of the Certificate of Formation shall be deemed to constitute a pledge or loan of the credit of any Member for the benefit of the Corporation or a guarantee by any Member of any obligation of the Corporation.

ARTICLE XIV. BOOKS AND RECORDS; AUDIT; FISCAL YEAR

Section 1. Access to Books and Records. All Members of the Corporation will have access to the books and records of the Corporation, including financial statements and budgets; however, the Board shall establish procedures by which a Member, upon written demand stating the purpose of the demand may examine and copy the books and records of the Corporation. If necessary to protect the confidential information of the Corporation, a Member requesting examination of any of the Corporation's non-public books and records will be required to sign a confidentiality and non-disclosure agreement before viewing such information. The procedures shall include policies that provide reasonable protection against the unnecessary disclosure of information related to individual employees, including their compensation.

Section 2. Audit. At least annually, an audit of the financial statements of the Corporation shall be performed by the Auditor approved by the Board. The Auditor's opinion and the audited financial statements will be made available to all Members as described in Article XIV, Section 1.

Section 3. Fiscal Year. The fiscal year of the Corporation shall be from January 1 through the following December 31, unless otherwise established by resolution of the Board.

AMENDED AND RESTATED BYLAWS
OF
TEXAS RELIABILITY ENTITY, INC.

(A Texas Non-Profit Corporation)

Approved by Membership – October 3, 2020

Approved by Federal Energy Regulatory Commission – _____

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ARTICLE I. DEFINITIONS

Section 1. Definitions. The capitalized terms used in these Bylaws of Texas Reliability Entity, Inc. (the “Corporation” or “Texas RE”), shall have the meanings set forth below, or if not set forth below, shall have the meanings given them in the NERC Rules of Procedure.

(a) “Affiliate” means any entity controlling, controlled by or under common control with the entity under consideration, and includes any entity (i.e., any commercial enterprise) in any of the following relationships: (i) an entity that directly or indirectly owns or holds at least five percent of the voting securities of another entity, (ii) an entity in a chain of successive ownership of at least five percent of the voting securities of another entity, (iii) an entity which shares a common parent with or is under common influence or control with another entity or (iv) an entity that actually exercises substantial influence or control over the policies and actions of another entity. Evidence of influence or control shall include the possession, directly or indirectly, of the power to direct or cause the direction of the management and/or policies and procedures of another, whether that power is established through ownership or voting of at least five percent of the voting securities or by any other direct or indirect means. In cases where the level of control or influence is disputed, the Board shall have discretion to determine whether or not the entities are Affiliates of one another. Membership in Texas RE shall not create an affiliation with Texas RE.

(b) “Board” means the Board of Directors of the Corporation.

(c) “Bulk Power System” or “BPS” means facilities and control systems necessary for operating an interconnected electric energy transmission network (or any portion thereof) and facilities generating electric energy as needed to maintain transmission system reliability, but does not include facilities used in the local distribution of electricity.

(d) “Delegated Authority” means the authority delegated by NERC to the Corporation to propose and enforce NERC Reliability Standards and perform other reliability-related activities in the ERCOT region under the Delegation Agreement executed by NERC and the Corporation and approved by the Federal Energy Regulatory Commission, pursuant to Section 215 of the Federal Power Act (16 U.S.C. §824o).

(e) “Delegation Agreement” means the agreement between the Corporation and NERC and approved by FERC, which describes the Delegated Authority and may be amended from time to time.

(f) “Electric Reliability Organization” or “ERO” means the organization that is certified by FERC pursuant to Section 39.3 of its regulations, and has received recognition by appropriate regulatory authorities in Canada and Mexico, as applicable, to establish and enforce Reliability Standards for the Bulk Power Systems of the respective countries and that has entered into a delegation agreement with the Corporation pursuant to which the Electric Reliability Organization delegates enforcement authority for Reliability Standards for the Bulk Power System in the ERCOT region. NERC was certified as the ERO on July 20, 2006.

(g) “ERCOT region” means the geographic area and associated transmission and distribution facilities that are not synchronously interconnected with electric utilities operating outside the jurisdiction of the Public Utility Commission of Texas.

(h) “FERC” means the Federal Energy Regulatory Commission.

(i) "Independent Director" means a person who is not (a) an officer or employee of the Corporation; (b) a NERC Registered Entity or Member or an officer, director, or employee of a Member of the Corporation; or (c) an officer, director, or employee of any company or entity that would reasonably be perceived as having a direct financial interest in the outcome of Board decisions or having a relationship that would interfere with the exercise of independent judgment in carrying out the responsibilities of a Director, as more specifically described in Article IV of these Bylaws.

(j) "Member" means a member of the Corporation pursuant to Article III of these Bylaws.

(k) "NERC" means North American Electric Reliability Corporation, the entity certified by FERC as the ERO on July 20, 2006.

(l) "NERC Rules of Procedure" means the Rules of Procedure that are adopted by NERC and approved by FERC.

(m) "PUCT" means the Public Utility Commission of Texas.

(n) "OPUC" means the Texas Office of Public Utility Counsel.

(o) "Originally Elected Independent Director" means a Director approved by the membership on June 2, 2010, in the first election of Texas Reliability Entity, Inc. Independent Directors.

(p) "Regional Entity" means an entity with a Delegation Agreement with NERC, as ERO.

(q) "Regional Reliability Standard" means a standard or variance for the ERCOT region that is proposed and approved in accordance with the Texas RE Standards Development Process and either, (i) sets more stringent reliability requirements than a national Reliability Standard, or (ii) covers matters not covered by a national Reliability Standard.

(r) "Registered Entity" means an entity that is registered with NERC and listed on the NERC Compliance Registry (available at www.nerc.com).

(s) "Reliability Standard" means a requirement to provide for Reliable Operation of the Bulk Power System, which is approved by NERC and FERC, pursuant to Section 215 of the Federal Power Act and all amendments thereto. This term includes requirements for the operation of existing Bulk Power System facilities, including cybersecurity protection, and the design of planned additions or modifications to such facilities to the extent necessary to provide for Reliable Operation of the Bulk Power System.

(t) "Reliable Operation" means operating the elements of the Bulk Power System within equipment and electric system thermal, voltage, and stability limits so that instability, uncontrolled separation, or cascading failures of the Bulk Power System will not occur as a result of a sudden disturbance, including a cybersecurity incident, or unanticipated failure of system elements.

(u) "Sector" means a group of Members of the Corporation that are Bulk Power System owners, operators, or users, as defined in Article III, Section 4 of these Bylaws. Each

Sector shall constitute a class of Members for purposes of Chapter 22 (Nonprofit Corporations) of the Texas Business Organizations Code.

ARTICLE II. PURPOSE

Section 1. General Purpose. The purpose of the Corporation is to preserve and enhance electric reliability in the ERCOT region. In furtherance of this goal, the Corporation will:

(a) Perform Reliability Standards development, compliance monitoring, compliance enforcement, and other related activities as a Regional Entity, pursuant to 16 U.S.C. §824o, in accordance with the Corporation's Delegation Agreement with NERC;

(b) Carry out other activities as set forth in the Delegation Agreement, the NERC Rules of Procedure, or as otherwise required or requested by NERC, in support of the Delegated Authority, including but not limited to organization registration and certification, reliability assessment and performance analysis, training and education, and situational awareness and infrastructure security; and

(c) Engage in any other lawful act or activity that is not in conflict with the Corporation's duties as a Regional Entity and for which non-profit corporations may be organized under the Texas Business Organizations Code.

Section 2. Non-Profit Corporation. The Corporation is a Texas non-profit corporation.

Section 3. Geographic Area. The Corporation will perform its operations primarily within the ERCOT region.

ARTICLE III. MEMBERSHIP

Section 1. Members. The Corporation is a membership corporation. Membership in the Corporation is voluntary and is open only to any entity that is a user, owner or operator of the ERCOT region Bulk Power System, registers with the Corporation as a Member, maintains its registration in accordance with this Article III, and complies with the other conditions and obligations of membership specified in these Bylaws. All Members must qualify and be registered in one of the Sectors defined in Article III, Section 4. Membership in the Corporation is not a condition to participating in the development or consideration of proposed Regional Standards.

Section 2. Registration as a Member. Any entity that is eligible to be a Member of the Corporation in accordance with Article III, Section 1 may become a Member by completing and submitting to the Corporation a membership registration on a form prescribed by the Corporation. The Member shall designate one representative and an alternative representative with authority to receive notices, cast votes, and execute waivers and consents on behalf of the Member. The Corporate Secretary shall maintain a current roster of the Members of the Corporation including each Member's designated representative and alternative representative. All Members shall be required to renew or reaffirm their registrations annually. The Corporate Secretary may remove any Member from the roster that has not submitted a registration renewal or reaffirmation by a date established by the Corporation.

Section 3. Obligations and Conditions of Membership.

(a) Members must agree to promote, support, and comply with Reliability Standards, and assist the Corporation in its compliance with the terms and provisions of the Corporation's Delegation Agreement with NERC. Each Member shall agree, in writing, to accept the responsibility to comply with policies of NERC and the Corporation as set forth in their respective certificates of formation, bylaws, rules of procedure, and Reliability Standards, as applicable, as from time to time adopted, approved, or amended.

(b) As an additional condition of membership in the Corporation, each Member shall be required to execute an agreement with the Corporation, in a form to be specified by the Corporation, that such entity will hold all Directors, officers, employees, and agents of the Corporation, as well as volunteers participating in good faith in the activities of the Corporation, harmless for any injury or damage caused by any act or omission of any director, officer, employee, agent, or volunteer in the course of performance of his or her duties on behalf of the Corporation, other than for willful acts of misconduct.

(c) Consistent with applicable laws and regulations, Members must share nonproprietary information at the Corporation's request as necessary for the furtherance of the Corporation's activities and consistent with NERC, PUCT, or any other applicable rules relating to confidentiality.

Section 4. Membership Sectors. Each Member shall elect to be assigned to one of the following membership Sectors:

(a) **System Coordination and Planning:** An entity that is registered with NERC as a Reliability Coordinator (RC), Balancing Authority (BA), Planning Authority (PA), or Resource Planner (RP).

(b) **Transmission and Distribution:** An entity that is registered with NERC as a Transmission Owner (TO), Transmission Planner (TP), Transmission Service Provider (TSP), Distribution Provider (DP), and/or Transmission Operator (TOP) and is not a Cooperative or Municipal Utility.

(c) **Cooperative Utility:** An entity that is (a) a corporation organized under Chapter 161 of the Texas Utilities Code or a predecessor statute to Chapter 161 and operating under that chapter; or (b) a corporation organized as an electric cooperative in a state other than Texas that has obtained a certificate of authority to conduct affairs in the State of Texas or (c) a cooperative association organized under Chapter 251 of the Texas Business Organizations Code and is registered with NERC for at least one reliability function.

(d) **Municipal Utility:** A municipally owned utility as defined in Public Utility Regulatory Act, Tex. Util. Code §11.003 and is registered with NERC for at least one reliability function.

(e) **Generation:** An entity that is registered with NERC as a Generator Owner (GO) or Generator Operator (GOP).

(f) **Load-Serving and Marketing:** An entity that secures wholesale transmission service or is engaged in the activity of buying and selling of wholesale electric power in the ERCOT region on a physical or financial basis, or qualifies under any newly defined NERC reliability function for demand response.

Section 5. Participation.

(a) There is only one level of Membership, and no company or entity may simultaneously hold more than one Membership.

(b) Members must qualify in and join a Sector.

(c) A Member that is eligible for more than one Sector may join only one Sector and it must be the most appropriate Sector for its business. Any disputes regarding appropriateness of a Member's Sector will be decided by a majority vote of the Board.

(d) A company or entity that is an Affiliate of a Member may hold a separate membership in a different Sector if the companies are separate legal entities.

(e) A Member must continue to vote in the same Sector for a minimum of the remainder of the membership year in which it becomes a Member or until it is no longer eligible to remain in such Sector, and it must give notice to the Corporate Secretary when it elects or is required to change Sectors.

(f) The Corporate Secretary may review the Sector qualification of any Member and upon a determination that a Member does not qualify for membership in a particular Sector, may require the Member to change Sectors or may terminate their membership.

(g) A Member that is no longer eligible or that is not in good standing may not vote on any matters that require membership.

Section 6. Membership Fees. There is no Membership Fee to join the Corporation.

Section 7. Term of Membership. Membership in the Corporation must be renewed or reaffirmed on an annual basis and will only be retained as long as a Member meets its respective qualifications, obligations, and conditions of membership as set forth in these Bylaws.

Section 8. Disciplinary Action. A Member or Member representative may be sanctioned, suspended, or expelled pursuant to a procedure that is fair and reasonable and is carried out in good faith. The Board will establish a procedure to sanction, suspend, or expel a Member that includes notice to the Member and exercise of appropriate due process procedures, and allows for a determination by the Board in its sole discretion that in its judgment the Member has violated its obligations and responsibilities to the Corporation.

Section 9. Resignation. Any other provision of these Bylaws notwithstanding, any Member may withdraw from participation in the activities of the Corporation at any time upon written notice to the Secretary of the Corporation, whereupon it shall cease to be a Member, and its representatives shall cease to be entitled or obligated to participate in the activities of the Board or any activities requiring membership.

Section 10. Reinstatement. A former Member, except a Member subject to Disciplinary Action under Section 8, may submit a membership application form to rejoin the Corporation as a Member. A Member disciplined under Section 8 may submit a written request for reinstatement of Membership. The request for reinstatement will be considered by the Board, and will be granted or denied within the sole discretion of the Board.

**ARTICLE IV.
BOARD OF DIRECTORS**

Section 1. Board of Directors. The business and affairs of the Corporation shall be managed by the Board. The Board shall consist of (i) four (4) Independent Directors who are nominated and elected in accordance with the requirements and procedures specified in this Article IV (the “Independent Directors”); (ii) the Chairman of the PUCT or another PUCT Commissioner designated by the Chairman, as an *ex officio* non-voting member; (iii) Texas Public Counsel, from OPUC as an *ex officio* non-voting member, representing the interests of residential and small commercial electricity consumers; (iv) the CEO of the Corporation as a voting member (the “Management Director”); (v) the chair of the Member Representatives Committee as a voting member; and (vi) the vice chair of the Member Representatives Committee as a voting member. The Directors who are the chair and vice chair of the Member Representatives Committee will be collectively referred to herein as “Affiliated Directors.” All Directors are expected to serve the public interest and to represent the reliability concerns of the entire ERCOT region Bulk Power System.

Section 2. Independent Directors. The Independent Directors shall be elected, shall have the qualifications specified, and shall serve in the manner provided in this Section.

(a) Qualifications:

(1) Experience in one or more of these fields: senior corporate leadership; professional disciplines of finance, accounting, engineering, bulk power systems, or law; regulation of utilities; and/or risk management.

(2) Independence of any NERC Registered Entity. Requirements of independence include but are not limited to the following:

(i) Independent Directors and the spouse, mother, father, sibling, or dependent, and any spouse of mother, father, or sibling and including any step and adoptive parents, siblings or children, and household members of Independent Directors and their spouses shall not have current or recent status (within the last two years) as a director, officer, or employee of an ERCOT region NERC Registered Entity.

(ii) Independent Directors and immediate family (any spouse or dependent) and household members of Independent Directors shall not have current status as a director, officer, or employee of a non-ERCOT region NERC Registered Entity.

(iii) Independent Directors and immediate family and household members of Independent Directors shall not have direct business relationships, other than retail customer relationships, with any NERC Registered Entity.

(iv) Independent Directors and immediate family and household members of Independent Directors shall not own stocks or bonds of NERC Registered Entities or their affiliates. To the extent that an Independent Director or his or her spouse, dependent child, or any other household member owns stocks or bonds of NERC Registered Entities, these must be divested or placed in a blind trust prior to being seated on the Board. Ownership in broadly diversified

mutual funds or similar funds, which may include stocks or bonds of NERC Registered Entities or their affiliates, is not prohibited.

(v) Independent Directors shall not have any relationship that would interfere with the exercise of independent judgment in carrying out the responsibilities of a Board member, including the Delegated Authority.

(vi) Other criteria as approved by the Board.

(b) Term. The term for Independent Directors shall be staggered three year terms. An Independent Director may be elected for up to three consecutive terms. For the Originally Elected Independent Directors, two positions will have three-year terms, one position will have a two-year term, and one position will have a one-year term, and these terms shall not be counted for purposes of term limits. The term for the Affiliated Directors shall coincide with their terms as chair and vice chair of the Member Representatives Committee. The terms of the *ex officio* Directors terminate when the individual ceases to be Chairman of the PUCT (or the PUCT Chairman designates another Commissioner) or ceases to be Texas Public Counsel. If an Independent Director is elected to fill an unexpired term in the event of a vacancy, that term shall not be counted for purposes of term limits.

(c) Selection.

(1) The Board shall appoint, on an annual basis, or more frequently if needed in the event of a special election pursuant to this subsection, a nominating committee (the "Nominating Committee") to recommend candidates (i) to succeed the Independent Directors whose terms expire during the current year; (ii) to serve the remainder of the term of any Independent Director who ceased to serve as a Director subsequent to the last annual election of Directors; (iii) to serve as the Chair and Vice Chair on an annual basis; and (iv) to serve as CEO in the event of a vacancy. The Nominating Committee shall consist of two (2) Independent Directors whose terms do not expire during the current year and are not seeking re-election and one (1) Affiliated Director. The PUCT Chairman (or the PUCT Commissioner designated by the Chairman) may choose to participate on the Nominating Committee. The Board Chair shall appoint the Chair of the Nominating Committee. The Nominating Committee may retain an executive search firm to locate and present candidates to serve as Independent Directors with the required qualifications, as set forth in Article IV, Section 2(a) or to locate and present candidates to serve as CEO. Meetings of the Nominating Committee are not required to be publicly posted.

(2) The Nominating Committee shall select and nominate, by at least a two-thirds majority, qualified candidate(s) to serve as Independent Directors to present to the Membership for its approval. The Nominating Committee shall strive to ensure that the Board as a whole reflects expertise in the areas of technical electric operations and reliability, legal, senior corporate leadership, financial, risk management, and regulatory matters, and familiarity with regional system operation issues in the ERCOT region.

(3) The Membership shall vote by Sector as described in Article V in favor or against the proposed Independent Director(s). A proposed Independent Director who is approved by a majority of the Sectors shall become an Independent Director.

(4) The Nominating Committee shall select and recommend to the Board, by at least a two-thirds majority, a qualified candidate to serve as CEO. The Directors may choose to participate in interviewing CEO candidates.

(d) Director Voting Weights. All voting Directors shall have a single vote each.

(e) Alternates and Proxies. Independent Directors may designate another Independent Director as a proxy if unable to attend a Board meeting. *Ex officio* Directors may designate an alternate representative who may attend public meetings in the absence of such Director. The chair and vice chair of the Member Representatives Committee may designate each other or may designate an Independent Director as their proxy if unable to attend a Board meeting. The CEO may designate an Independent Director as a proxy if unable to attend a Board meeting.

Section 3. Appointment of Management Director. The president and chief executive officer (CEO) of the Corporation shall serve as the Management Director of the Corporation, effective as of the date of his or her appointment by the Board as CEO of the Corporation in accordance with these Bylaws, to serve until such time that he or she ceases to hold the position of CEO. No action of the Members of the Corporation shall be required in connection with the appointment of the CEO as the Management Director of the Corporation.

Section 4. Chair and Vice Chair. Annually, the Board shall elect from the Board's membership, by resolution of the Board, a Chair and a Vice Chair. The Chair and Vice Chair shall each be one of the Independent Directors.

Section 5. Vacancies and Removal.

(a) Should any vacancy on the Board arise from the death, resignation, retirement, disqualification, or removal from office of any Director, or from any other cause, such vacancy shall be filled as follows:

(1) For an Independent Director, by the election of a new Independent Director at the next annual election of Directors to fill the remainder, if any, of the term of the departed Independent Director; provided, that the Board by resolution may in its discretion call a special election to fill any such vacancy for the remainder, if any, of the term of the departed Independent Director.

(2) For the Management Director, by the appointment of a new CEO or interim CEO to fill the vacancy.

(3) For an *ex officio* Director, by the appointment of a new PUCT Chair (or the Chair's designee) or the appointment of a new Texas Public Counsel.

(4) For an Affiliated Director, by the election of a new chair or vice chair, as applicable, by the Member Representatives Committee.

(b) An Independent Director may be removed by an affirmative vote of sixty percent (60%) of the Members. In addition, the Board may remove any voting Director for cause, upon at least seventy-five percent (75%) affirmative votes of the eligible, remaining voting Directors, not counting any Director whose removal is under consideration.

Section 6. Committees of the Board. The Board shall by resolution create and appoint all committees of the Board as the Board deems necessary to perform its responsibilities. All committees of the Board shall have such duties as are prescribed and delegated by the Board. Committees to which any of the authority of the Board to manage the Corporation is delegated must have at least two Directors, and a majority of the members of the committee must be Directors.

ARTICLE V. MEETINGS OF MEMBERS OF THE CORPORATION

Section 1. Annual and Other Meetings of Members.

(a) An annual meeting of the Members to conduct any necessary corporate business shall be held annually at a time and place determined by the Board.

(b) Meetings of Members of the Corporation may be called for any purpose or purposes by resolution of the Board, by the chair of the Board, the CEO or the Corporate Secretary, or by a number of Members constituting at least ten percent (10%) of all Members on the roster of Members maintained by the Corporate Secretary. Meetings of Members shall be held at the principal office of the Corporation or at such other place fixed by the Board as shall be specified in the notice of meeting. Meetings shall be called upon written notice of the time, date, place, and purposes of the meeting given to all Members on the roster of Members maintained by the Corporate Secretary not less than ten (10) nor more than sixty (60) days prior to the date of the meeting. Only Members in good standing with the Corporation, as determined by the Board, have the right to vote at any meeting of the Members.

Section 2. Quorum and Voting Requirements for Meetings of Members.

(a) At any meeting of the Members of the Corporation, attendance in person or by proxy by a majority of the Members in each of at least two-thirds of the Sectors on the roster of Members maintained by the Corporate Secretary shall constitute a quorum.

(b) Except as otherwise expressly provided in the Corporation's Certificate of Formation, these Bylaws, or applicable law, Members shall vote by Sector and each Sector shall have one vote.

(c) To the extent practicable, membership votes, including but not limited to votes to elect Directors and to revise these Bylaws, will be conducted electronically, and will generally be open for a ten (10) day period unless good cause exists to shorten the period.

(d) Except as otherwise expressly provided in the Corporation's Certificate of Formation, these Bylaws or applicable law, actions by the Members of the Corporation shall be approved upon receipt of the affirmative vote of a majority of the Sectors of the Corporation at (1) a meeting at which a quorum is present, in person or by proxy, or (2) an electronic vote which has participation by a quorum. Each Sector's vote shall be determined by the affirmative vote of a majority of the members of the Sector voting at the meeting or in the electronic election.

Section 3. Waivers of Notice of Meetings of Members and Member Meeting Adjournments. Notice of a meeting of Members need not be given to any Member who waives notice in writing, whether before, during, or after the meeting. The attendance of any Member at a meeting, in person or by proxy, without protesting prior to the conclusion of the meeting the lack of proper notice of such meeting, shall constitute a waiver of notice of the meeting by such

Member. When any meeting of Members is adjourned to another time or place, it shall not be necessary to give notice of the adjourned meeting if the time and place to which the meeting is adjourned are announced at the meeting at which the adjournment is taken, and if at the adjourned meeting only such business is transacted as might have been transacted at the original meeting.

Section 4. Action Without a Meeting of Members. Any action, required or permitted to be taken at a meeting of Members, may be taken without a meeting if the proposed action is posted to all Members (via direct email or email to an email distribution list to which Members may subscribe and by posting on the Corporation website) and consented to in writing by the minimum number of Members that would be required to approve the action at a meeting of the Members at which all Members were present. The voting in such a circumstance shall be performed in writing, including via email or other electronic means. The Members shall receive written notice of the results within ten (10) days of the action vote, and all written responses of the Members shall be filed with the Corporate records. The results of such voting will be posted on the Corporation's website.

Section 5. Meetings of the Members to be Open. Notice to the public of the dates, places, and times of meetings of the Members, and all non-confidential material provided to the Members, shall be posted on the Corporation's website at approximately the same time that notice is given to the Members. Meetings of the Members shall be open to the public, subject to reasonable limitations due to the availability and size of meeting facilities; provided, that the meeting may be held in or adjourned to closed session to discuss matters of a confidential nature, including but not limited to compliance and enforcement matters, personnel matters, litigation, or commercially sensitive or critical infrastructure information of the Corporation or any other entity.

ARTICLE VI. MEETINGS OF THE BOARD OF DIRECTORS

Section 1. Regular Meetings of the Board. Regular meetings of the Board shall be held at least quarterly. By resolution adopted at any meeting of the Board, the Board may provide for additional regular meetings that may be held as needed.

Section 2. Special Meetings of the Board. Special meetings of the Board for any purpose or purposes may be called at any time by the chair or by any two Directors. Such meetings may be held upon notice given to all Directors not less than three (3) days prior to the date of the meeting. Such notice shall specify the time, date, place, and purpose or purposes of the meeting and may be given by telephone, email, or other electronic media, or by express delivery.

Section 3. Quorum and Voting Requirements for Meetings of the Board. Unless otherwise expressly provided in the Corporation's Certificate of Formation, these Bylaws or applicable law, (i) the quorum necessary for the transaction of business at meetings of the Board shall be a majority of the voting Directors in person (including by means of any communications system by which all persons participating in the meeting are able to hear each other), of which at least three must be Independent Directors, and (ii) actions by the Board shall be deemed approved upon receipt of the affirmative vote of a majority of the Directors present and voting in person (including by means of any communications system by which all persons participating in the meeting are able to hear each other) or by proxy at a meeting at which a quorum is present but in no case less than four votes.

Section 4. Meetings of the Board to be Open. Notice to the public of the dates, places, and times of meetings of the Board, and all non-confidential material provided to the Board, shall be posted on the Corporation's website at approximately the same time that notice or such material is given to the Directors and at least five (5) business days prior to the scheduled meeting. Meetings of the Board shall be open to the public, subject to reasonable limitations due to the availability and size of meeting facilities; provided, that the Board may meet in or adjourn to closed session to discuss matters of a confidential nature, including but not limited to compliance and enforcement matters, personnel matters, litigation, or commercially sensitive or critical infrastructure information of the Corporation or any other entity. Any or all of the Directors or members of a Board committee, may participate in a meeting of the Board, or a meeting of a committee, in person or by proxy, by means of any communications system by which all persons participating in the meeting are able to hear each other.

Section 5. Waivers of Notice of Board Meetings and Board Meeting Adjournments. Notice of a meeting of the Board need not be given to any Director who waives notice in writing, whether before, during, or after the meeting. The attendance of any Director at a meeting, in person or by proxy, without protesting prior to the conclusion of the meeting the lack of proper notice of such meeting, shall constitute a waiver of notice of the meeting by such Director. When a meeting of the Board is adjourned to another time or place, it shall not be necessary to give notice of the adjourned meeting if the time and place to which the meeting is adjourned are announced at the meeting at which the adjournment is taken and if at the adjourned meeting, only such business is transacted as might have been transacted at the original meeting.

Section 6. Action Without a Meeting. Any action required or permitted to be taken at a meeting of the Board, or of any committee thereof, may be taken by the Board or by the committee without a meeting if the action is consented to in writing by the number of Directors or members of the committee, as the case may be, entitled to vote on the action that would be required to approve the action at a meeting of the Board or committee with all members of the Board or committee present. The call for action without a meeting of the Board may be initiated by the chair or by any two voting Directors. Notice of the proposed call for action without a meeting, and all non-confidential material provided to the Board in connection with the call for action without a meeting, shall be posted on the Corporation's website and shall be sent via email to an email distribution list to which Members and the public may subscribe at approximately the same time notice of the call for action without a meeting or such material is provided to the Board. The call for action without a meeting of a committee of the Board may be initiated by the chair of the committee or by any two members of the committee. The Directors or members of the committee shall receive written notice of the results of such action within seven (7) days of the action vote. All written responses of the Directors shall be filed with the minutes of the Corporation, and all written responses of members of a committee shall be filed with the minutes of such committee.

Section 7. Emergency Meetings. The Board may meet on urgent matters with not less than two (2) hours' public notice, as necessary or appropriate for emergency conditions threatening health or safety or a reasonably unforeseen situation.

Section 8. Emergency Governance Provisions. In the event of a catastrophic event that results in a majority of the voting Directors unable to readily participate in a meeting to conduct business necessary to ensure the continuity of the Corporation (an "Emergency"), the following emergency governance provisions will apply:

(a) If the quorum requirements under Section 3 of this Article cannot be met in an Emergency, and it is necessary for the Board to hold a meeting to conduct business necessary

to ensure the continuity of the Corporation, the quorum necessary for the transaction of business at meetings of the Board shall be three voting Directors, of which at least two shall be Independent Directors. Actions of the Board in an Emergency shall be deemed approved by a simple majority vote.

(b) Other provisions of these Bylaws notwithstanding, meetings called under this Section may be called as soon as circumstances permit for the purpose of taking action as may be appropriate to ensure business continuity of the Corporation. Meetings held under this Section need not follow notice and posting requirements under Section 4 of this Article. The results of any action taken at a meeting shall be posted on the Corporation's website.

(c) The emergency governance provisions cease to be effective once the Emergency ends.

ARTICLE VII. OFFICERS

Section 1. Selection of Officers. The Board shall elect a CEO and shall ratify the selection of the officers of the Corporation (collectively, the "Officers"). The Management Director shall not participate in votes electing or ratifying Officers. The Corporation shall maintain a list of current Officers ratified by the Board. The duties and authority of the Officers shall be determined from time to time by the Board. Subject to any such determination, the Officers shall have the following duties and authority:

Section 2. Chief Executive Officer ("CEO"). The CEO shall be the chief executive officer of the Corporation. He or she shall be responsible for the day-to-day ongoing activities of the Corporation and shall have such other duties as may be delegated or assigned to him or her by the chair. The CEO may enter into and execute in the name of the Corporation contracts or other instruments not in the regular course of business that are authorized, either generally or specifically, by the Board.

Section 3. Corporate Secretary. The Secretary shall maintain the roster of Members of the Corporation, shall cause notices of all meetings to be served as prescribed in these Bylaws, shall keep or cause to be kept the minutes of all meetings of the Members and the Board, and shall have charge of the seal of the Corporation. The Secretary shall perform such other duties and possess such other powers as are incident to his or her office or as shall be assigned to him or her by the CEO. The CEO may select an Assistant Corporate Secretary at his or her discretion. The Assistant Corporate Secretary is not an Officer of the Corporation.

Section 4. Chief Financial Officer. A Chief Financial Officer shall have custody of the funds and securities of the Corporation, shall keep or cause to be kept regular books of account for the Corporation and shall have the duties normally assigned to a treasurer of a corporation. The Chief Financial officer shall perform such other duties and possess such other powers as are incident to his or her office or as shall be assigned to him or her by the CEO.

Section 5. Other Officers. The CEO may select such other Officers as he or she deems appropriate, subject to ratification by the Board. Any such Officer shall perform such other duties and possess such powers as are incident to his or her office or as shall be assigned to him or her by the CEO.

ARTICLE VIII.
MEMBER REPRESENTATIVES COMMITTEE

Section 1. Purpose of Member Representatives Committee. The Corporation shall have a “Member Representatives Committee” that shall provide advice and recommendations to the Board with respect to: annual budgets, business plans and funding mechanisms of the Corporation; the development of Regional Reliability Standards and Regional Variances in accordance with Texas RE’s process; other matters relevant to reliability of the ERCOT Bulk Power System; and other matters pertinent to the purpose and operations of the Corporation. The Member Representatives Committee shall provide its advice and recommendation to the Board through its chair and the vice chair, who also serve as the Affiliated Directors on the Board. The Member Representatives Committee may create subcommittees, task forces, or working groups (“subcommittees”) as it deems appropriate to study or discuss selected technical or compliance matters, provide a forum for the review and discussion of current and proposed Reliability Standards, and to make recommendations to the Board as requested or required by the Board or as deemed appropriate to its purpose by the Member Representatives Committee. Because it is elected by the Members of the Corporation and not appointed by the Board, the Member Representatives Committee shall not be a standing committee of the Board of Directors of the Corporation, but is authorized to provide advice and recommendations directly to the Board, through its elected chair and vice chair.

Section 2. Composition of the Member Representatives Committee. The Member Representatives Committee shall consist of two representatives from each Sector to serve two-year terms and will select a chair and vice chair for the Member Representatives Committee to serve two-year terms. The representatives of each Sector shall be officers, employees, or directors of Members in that Sector (or the Member’s parent, subsidiary, or other Affiliate); provided however, except for a Sector that has only one Member, only one officer, employee, or director of a Member in a Sector (or the Member’s parent, subsidiary, or other Affiliate) may be a representative from that Sector. The Board may by resolution create additional non-voting positions on the Member Representatives Committee on its own initiative or at the written request of any group of Members of the Corporation that believes its interests are not adequately represented on the Member Representatives Committee. There shall be no limit on the number of terms that an officer, employee, or director of a Member (or the Member’s parent, subsidiary, or other Affiliate), may serve on the Member Representatives Committee.

Section 3. Election of Representatives of the Member Representatives Committee. Unless a Sector adopts an alternative election procedure, the election of representatives from each Sector to the Member Representatives Committee, and any election to fill a vacancy, shall be conducted in accordance with the following process, which shall be administered by the Secretary of the Corporation:

(a) During the period beginning no more than ninety (90) days and ending no less than fifteen (15) days prior to an annual meeting, or beginning no more than forty-five (45) days and ending no less than fifteen (15) days prior to a special election to fill a vacancy on the Member Representatives Committee, nominations may be submitted for candidates for election to the Member Representatives Committee. A nominee for election as a Sector representative must be an officer, employee, or director of a Member in that Sector (or the Member’s parent, subsidiary, or other Affiliate). No more than one nominee who is an officer, employee, or director of a Member (or the Member’s parent, subsidiary, or other Affiliate) may stand for election in any single Sector; if more than one officer, employee, or director of a Member (or the Member’s parent, subsidiary, or other Affiliate) is nominated for election from a Sector, the Member shall designate

which such nominee shall stand for election. The election of representatives shall be conducted over a period of ten (10) days using an electronic process approved by the Corporate Secretary.

(b) Each Member in a Sector shall have one vote for each Representative to be elected from the Sector in that election and may cast no more than one vote for any nominee. The nominee receiving the highest number of votes in each Sector shall be elected to one Representative position to be filled from that Sector and the nominee receiving the second highest number of votes shall be elected as the second Representative position for that Sector. To be elected on the first ballot, a nominee must receive a number of votes equal to a simple majority of the Members in the Sector casting votes in the election. If no nominee in a Sector receives a simple majority of votes cast in the first ballot, a second ballot shall be conducted which shall be limited to the number of candidates receiving the three (3) highest vote totals on the first ballot. The nominees receiving the two highest totals of votes on the second ballot shall be elected to the Representative positions for the Sector.

(c) A Sector may adopt an alternative procedure to the foregoing to nominate and elect its Representatives to the Member Representatives Committee if the alternative procedure is approved by vote of at least two-thirds of the Members in the Sector, provided, however that any alternative procedure must be reviewed and approved by the Board.

(d) A Sector may elect an Alternate to serve in place and at the convenience of the Sector's Member Representatives Committee Representative(s) in the event a Member Representatives Committee Representative cannot attend a Member Representatives Committee meeting.

Section 4. Chair and Vice Chair of the Member Representatives Committee.

After the selection of its Representatives, the Member Representatives Committee shall select a chair and vice chair from among its voting Representatives by majority vote to serve during the upcoming two-year term and be the Affiliated Directors on the Board. The selected chair and vice chair may not be representatives of the same Sector and may not concurrently serve on the Board of ERCOT ISO. The Board shall be notified of the selection of the chair and vice chair, but the selection will not be subject to approval of the Board. The chair is responsible for ensuring that minutes of the meetings are properly maintained and made available to the public, but the chair may delegate this responsibility to the vice chair or to another Representative of the Member Representatives Committee who may be designated as secretary of the Member Representatives Committee.

Section 5. Vacancies on the Member Representatives Committee. In the event that any Representative of the Member Representatives Committee ceases to serve as a Representative of the Member Representatives Committee as a result of his or her death, resignation, retirement, disqualification, removal, or other cause, the Members in the Sector of which such Representative was a representative shall elect, as soon thereafter as reasonably practicable, and in accordance with the procedures in this Article VIII, a new Representative to replace the Representative of the Member Representatives Committee who ceased to serve. For those Sectors that have elected an Alternate, the Alternate will fill a vacancy left by the Sector's Member Representative until a new Sector Member Representative is elected by the Sector.

Section 6. Meetings of the Member Representatives Committee. The Member Representatives Committee will plan and hold quarterly meetings, at a time and place determined by the Member Representatives Committee, normally shortly before the regular meetings of the Board, and posted on the Corporation's website. Except for closed session meetings specifically allowed by this Section, all meetings shall be open to the public.

(a) Notice to the public of the dates, places, and times of meetings of the Member Representatives Committee and any subcommittees, and all non-confidential material provided to the Representatives on the Member Representatives Committee or any subcommittees, shall be posted on the Corporation's website at approximately the same time that notice or such material is given to the Member Representatives Committee, which will normally be at least five (5) business days prior to the scheduled meeting. Meetings of the Member Representatives Committee and subcommittees shall be open to the public, subject to reasonable limitations due to the availability and size of meeting facilities; provided, that the Member Representatives Committee and subcommittees may meet in or adjourn to closed session to discuss matters of a confidential nature, including but not limited to confidential planning information, critical infrastructure information, or commercially sensitive information of the Corporation or any other entity. Participation in a meeting of the Member Representatives Committee or subcommittee may be accomplished through use of a communications system by which all persons participating in the meeting are able to hear each other.

(b) Special meetings may be called for any purpose or purposes by the chair of the Member Representatives Committee or by any three (3) Representatives of the Member Representatives Committee, which number shall include representatives from at least three Sectors, and require notice given to all Representatives of the Member Representatives Committee not less than seven (7) days prior to the date of the meeting. Such notice shall specify the time, date, place, and purpose or purposes of the meeting and may be given by telephone, email, or other electronic media, or by express delivery.

(c) The Member Representatives Committee shall effectively coordinate with the employees of the Corporation and adopt procedural rules for the voting for Representatives, scheduling of meetings, and public posting of required meeting information and minutes. The chair or vice chair of the Member Representatives Committee shall provide all meeting agendas, material, minutes and other information required or desired to be posted on the Corporation's website to appropriate Corporation employees at least one (1) business day prior to the time such information should be posted.

Section 7. Action Without a Meeting of Members. Any action, required or permitted to be taken at a meeting of the Member Representatives Committee, may be taken without a meeting if the proposed action is posted to all Committee Members via direct email and consented to in writing by a majority of the Representatives. The voting in such a circumstance shall be performed in writing, including via email or other electronic means. The Representatives shall receive written notice of the results within ten (10) days of the action vote, and all written responses of the Representatives shall be retained as a corporate record. The results of such voting will be reported at the next in-person Member Representatives Committee meeting.

Section 8. Waivers of Notice of Meetings of the Member Representatives Committee and Meeting Adjournments. Notice of a meeting of the Member Representatives Committee need not be given to any member of the Member Representatives Committee who waives notice, in writing, before, during, or after the meeting. The attendance of any Committee member at a meeting, in person or by proxy, without protesting prior to the conclusion of the meeting the lack of proper notice of such meeting, shall constitute waiver of notice of the meeting by such Committee Member. When a meeting of the Member Representatives Committee is adjourned to another time or place, it shall not be necessary to give notice of the adjourned meeting if the time and place to which the meeting is adjourned are announced at the meeting at which the adjournment is taken, and if at the adjourned meeting only such business is transacted as might have transacted at the original meeting.

Section 9. Quorums and Voting for Meetings of the Member Representatives Committee. The quorum necessary for the transaction of business at meetings of the Member Representatives Committee shall be the presence, in person or by proxy, of two-thirds of the voting Representatives on the Member Representatives Committee entitled to attend. Each voting member of the Member Representatives Committee shall have one (1) vote on any matter coming before the Member Representatives Committee that requires a vote. Except as otherwise expressly provided in the Corporation's Certificate of Formation, these Bylaws or applicable law, actions by members of the Member Representatives Committee shall be approved upon receipt of the affirmative vote of a majority of the voting members of the Member Representatives Committee present (by means of any communications system by which all persons participating in the meeting are able to hear each other) and voting at any meeting at which a quorum is present.

Section 10. Alternates and Proxies. Member Representatives may designate another Member Representative or an employee of the Member Representative's organization (or the Member's parent, subsidiary, or other Affiliate) as a proxy if both the Member Representative and the Sector Alternate are unable to attend a Member Representatives Committee meeting. A member of the Member Representatives Committee may give a proxy only to a person who is an officer, employee, or director of a Member, registered in the same Sector (or the Member's parent, subsidiary, or other Affiliate).

Section 11. Other Procedures of the Member Representatives Committee. Except as to any matter as to which the procedure to be followed by the Member Representatives Committee is expressly set forth in these Bylaws, the Member Representatives Committee may adopt such additional procedures, not inconsistent with these Bylaws, as it deems appropriate, subject to review and approval by the Board.

ARTICLE IX. OTHER COMMITTEES AND SUBCOMMITTEES

Section 1. Other Committees and Subcommittees of the Corporation. The Board may by resolution create committees and subcommittees of the Corporation to provide advice to the Board. The Board will appoint the members of such committees, subcommittees, and task forces that are representative of Members, and other interested parties, as appropriate, that provide for balanced decision-making and that include persons with sufficient technical knowledge and experience. All committees and subcommittees shall have such scope and duties as determined by the Board.

ARTICLE X. BUDGETS AND FUNDING

Section 1. Compensation of the Board and Member Representatives Committee.

(a) The Board shall have a Director compensation committee (the "Director Compensation Committee") to have the right to evaluate and fix from time to time, by simple majority vote, the amount of the annual retainer fee or other compensation to be paid to the Independent Directors for their services to the Corporation, including any fees to be paid for each meeting of the Board or any Board committee attended by an Independent Director. The Director Compensation Committee will evaluate the fee or other compensation annually to ensure that Director compensation is appropriate. The Director Compensation Committee shall consist of two (2) Independent Directors that are not currently serving as Board Chair and Vice Chair (unless

there is an Independent Director vacancy, in which case the Board Vice Chair will serve on the Committee until the vacancy is filled), two (2) Affiliated Directors, and the CEO. The Board Chair shall appoint an Independent Director as the Chair of the Director Compensation Committee. Meetings of the Director Compensation Committee are not required to be publicly posted.

(b) No compensation shall be paid to any Management Director, Affiliated Director, or *ex officio* Director for his or her services on the Board, other than the compensation paid to the Management Director for services as CEO of the Corporation. No compensation shall be paid by the Corporation to any member of the Member Representatives Committee for his or her services on the Member Representatives Committee.

(c) Independent Directors shall be entitled to be reimbursed their reasonable out-of-pocket expenditures for attending meetings and conducting the business of the Corporation.

Section 2. Preparation and Adoption of Annual Budget, Business Plan, and Funding Mechanism. The Board shall require the CEO to prepare for Board approval an annual business plan and budget for the administrative and other expenses of the Corporation, including the expenditures for the fiscal year for any material special projects undertaken by the Corporation and reasonable and proper reserves and provisions for contingencies, in accordance with all NERC and FERC requirements. The annual business plan, budget and funding mechanism of the Corporation shall be for a fiscal year commencing on January 1 and ending on December 31. Each annual business plan, budget, and funding mechanism shall be approved by the Board at a regular meeting or a special meeting of the Board duly called for that purpose. The Board shall approve each annual business plan, budget, and funding mechanism at a time that allows for timely submittal of the approved annual business plan, budget, and funding mechanism to the applicable regulatory authorities.

Section 3. Comments During Preparation of Annual Business Plan and Budget. In preparing the annual business plan and budget, the Board shall require that the CEO post a draft business plan and budget for review and comment by the Members of the Corporation, the Member Representatives Committee, and the standing committees of the Corporation for at least five (5) business days prior to the date of the meeting of the Board at which the annual business plan and budget is to be adopted.

Section 4. Modified or Supplemental Budgets. During the course of a fiscal year, the Board may modify any approved budget or develop and approve a supplemental budget if determined by the Board to be necessary due to such factors as a shortfall in revenues of the Corporation from projected levels, incurred or anticipated expenditures, duties, or new projects not provided for in the annual budget, or such other factors as in the judgment of the Board warrant modification of the budget for the fiscal year or development of a supplemental budget. In preparing a modified or supplemental budget, the Board shall follow the provisions of this Article X, Section 4 to the extent practicable in the judgment of the Board in light of the urgency of the circumstances necessitating preparation and approval of the modified or supplemental budget. Each modified or supplemental budget shall be approved by the Board at a regular meeting or a special meeting of the Board duly called for that purpose.

Section 5. Submission of Annual Business Plans and Budgets to the Regulatory Authorities. Each annual budget, annual business plan, and annual, modified, or supplemental budget approved by the Board shall be submitted by the Corporation to the ERO and any applicable regulatory authorities for approval in accordance with its regulations, and shall not be effective until approved by the applicable regulatory authorities. If ordered to modify or

remand an annual budget, business plan, or annual, modified, or supplemental funding mechanism, the Board shall promptly following such order adopt such modifications to the business plan, budget, or funding mechanism as are required or directed by the order of the ERO and any applicable regulatory authority.

ARTICLE XI. AMENDMENTS TO THE BYLAWS

Section 1. Amendments to the Bylaws. These Bylaws may be altered, amended, or repealed by action of the Membership, as set forth below. Any alteration, amendment, repeal or adoption of Bylaws shall be subject to any applicable requirements for filing with or approval by the ERO or any other applicable regulatory authority. These Bylaws may be altered, amended, or repealed as follows:

(a) Suggested amendments to these Bylaws may be made through the submission of the proposed amendments, including any necessary supporting documents, to the Corporate Secretary.

(b) The Corporate Secretary shall place the proposal on the agenda for a Board meeting, or if the Board has designated a standing committee with authority to review proposed amendments and make a recommendation to the Board, the Corporate Secretary shall place the proposal on that committee's next scheduled meeting agenda.

(c) If the proposal is approved by an act of the Board as set forth in Article VI, Section 3, the Board shall place the proposal on the agenda of the next Annual Meeting of the Corporate Members unless the Board in its discretion calls a Special Meeting of the Corporate Members to vote on the proposal or determines to seek Membership approval without a meeting as provided in Article V, Section 4.

(d) If the proposal is not approved by the Board, the Members of the Corporation may call a meeting, pursuant to Article V, Section 1(b), for the purpose of voting on a proposal not approved by the Board. Any such proposal must be approved by a vote of five of the six Sectors at a meeting of Members called for that purpose or by written consent of five of the Sectors, where the number of votes for and against the proposed alteration, amendment, repeal or adoption of Bylaws shall be determined in accordance with Article V, Section 2.

ARTICLE XII. INDEMNIFICATION; PROCEDURE; DISSOLUTION

Section 1. Indemnification. The Corporation shall indemnify each person who at any time shall serve, or shall have served, as an officer, Director, employee, or other corporate agent of the Corporation, is or was serving at its request as a director, officer, partner, venturer, proprietor, employee, agent or similar functionary of another foreign or domestic corporation, partnership, joint venture, sole proprietorship, trust, employee benefit plan or other enterprise ("Indemnified Parties"), to the full extent from time to time permitted by the Texas Business Organizations Code and other applicable law. Such right of indemnification shall inure to the benefit of the legal representative of any such Indemnified Party. The foregoing indemnification shall be in addition to, and not in restriction or limitation of, any privilege or power that the Corporation may have with respect to the indemnification or reimbursement of its Indemnified Parties. The Corporation shall also pay or advance reasonable expenses incurred by an Indemnified Party in connection with a proceeding in advance of the final disposition of the proceeding upon receipt of a written affirmation by the Indemnified Party of a good faith belief that

the standard of conduct necessary for indemnification under this Article XII and the Texas Business Organizations Code has been met and a written undertaking by or on behalf of the officer, Director, or other corporate agent to repay the amount if it shall be ultimately determined that the Indemnified Party was not entitled to be indemnified by the Corporation.

Section 2. Parliamentary Rules. In the absence of and to the extent not inconsistent with specific provisions in these Bylaws, meetings or other actions pursuant to these Bylaws shall be governed by procedures that the Board may, from time to time, establish by resolution.

Section 3. Dissolution. Upon dissolution of the Corporation, in accordance with the Certificate of Formation, the remaining assets of the Corporation after payment of debts shall be distributed in the manner determined by the Board, provided that, (i) no part of the assets shall be distributed to any Director of the Corporation, and (ii) the distribution of assets shall be consistent with the requirements of Section 501(c)(3) of the United States Internal Revenue Code of 1986, as amended.

ARTICLE XIII. CONFLICTS OF INTEREST

Section 1. Conflicts of Interest.

(a) Each Director shall have an affirmative duty to disclose to the Board or committee (as the case may be) any actual or potential conflicts of interest of the Director that arise during his or her tenure as a Director where, and to the extent that, such conflicts or potential conflicts directly or indirectly affect any matter that comes before the Board. A Director with a direct or potentially conflicting interest in a matter shall recuse himself from deliberations and actions on the matter in which the conflict arises and shall abstain on any vote on the matter and not otherwise participate in a decision on the matter. Any disclosure of a potential conflict of interest by a Director shall be noted in the minutes of the Board meeting at which the direct interest is disclosed. Mere attendance at the meeting, without participating in discussion of the issue raising the potential conflict, shall not constitute participation.

(b) The Corporation may not make any loan to a Director, committee member or officer of the Corporation. A Member, Director, officer, or committee member of the Corporation may not lend money to, or otherwise transact business with, the Corporation except as otherwise provided by these Bylaws, the Certificate of Formation, and applicable law. A related party transacting business with the Corporation has the same rights and obligations relating to those matters as other persons transacting business with the Corporation, provided the related party nature of the transaction is known to the Board. The Corporation may not borrow money from, or otherwise transact business with, a Member, Director, officer, or committee member of the Corporation unless the transaction is described fully in a legally binding instrument, is in the Corporation's best interests, and is on terms no less favorable to the Corporation than could be obtained in an arms-length transaction. The Corporation may not borrow money from, or otherwise transact business with, a Member, Director, officer, or committee member of the Corporation without full disclosure of all relevant facts and without the Board's approval, not including the vote of any person having a personal interest in the transaction.

Section 2. Prohibited Acts. No Member, Director, officer, or committee member of the Corporation may do any of the below-listed prohibited acts. Engaging in these prohibited acts may lead to sanction, suspension, expulsion or termination after a hearing as described in these Bylaws. The prohibited acts include the following:

- (a) Do any act in violation of these Bylaws.
- (b) Do any act in violation of a binding obligation of the Corporation except with the Board's prior approval.
- (c) Do any act with the intention of harming the Corporation or any of its operations.
- (d) Receive an improper personal benefit from the operation of the Corporation.
- (e) Use the Corporation's assets, directly or indirectly, for any purpose other than carrying on the Corporation's business.
- (f) Wrongfully transfer or dispose of Corporation property, including intangible property such as goodwill.
- (g) Use the Corporation's name (or any substantially similar name) or any trademark or trade name adopted by the Corporation, except on behalf of Corporation in the ordinary course of its business or as a reference to the Corporation or its region.
- (h) Disclose any of Corporation's or Members' business practices, trade secrets, or any other confidential or proprietary information not generally known to the business community to any person not authorized to receive it.

Section 3. Loans and Guarantees. Neither participation in the activities of the Corporation nor any provision of these Bylaws or of the Certificate of Formation shall be deemed to constitute a pledge or loan of the credit of any Member for the benefit of the Corporation or a guarantee by any Member of any obligation of the Corporation.

ARTICLE XIV. BOOKS AND RECORDS; AUDIT; FISCAL YEAR

Section 1. Access to Books and Records. All Members of the Corporation will have access to the books and records of the Corporation, including financial statements and budgets; however, the Board shall establish procedures by which a Member, upon written demand stating the purpose of the demand may examine and copy the books and records of the Corporation. If necessary to protect the confidential information of the Corporation, a Member requesting examination of any of the Corporation's non-public books and records will be required to sign a confidentiality and non-disclosure agreement before viewing such information. The procedures shall include policies that provide reasonable protection against the unnecessary disclosure of information related to individual employees, including their compensation.

Section 2. Audit. At least annually, an audit of the financial statements of the Corporation shall be performed by the Auditor approved by the Board. The Auditor's opinion and the audited financial statements will be made available to all Members as described in Article XIV, Section 1.

Section 3. Fiscal Year. The fiscal year of the Corporation shall be from January 1 through the following December 31, unless otherwise established by resolution of the Board.

2020 Year-End Review and 2021 ERO Enterprise Reliability Indicators

Action

Update

Summary

The ERO Enterprise Dashboard identifies key reliability indicators that provide insight into performance of the bulk power system as well as emerging trends that may indicate potential opportunities or challenges prospectively. Each quarter, NERC staff provides a summary of the status of these reliability indicators. The Reliability Issues Steering Committee (RISC) committee recently reviewed the existing reliability indicators and as a result has recommended several modifications to these indicators for 2021. These modifications will provide an enhancement to the existing indicators and as a result will more accurately identify potentials trends that may pose challenges to the Bulk Power System. The proposed 2021 indicators will also provide several more forward - looking indicators that can illuminate areas that may require further analysis. NERC staff has compiled a primer that describes each proposed reliability indicator and the key inputs of data that derive the results as well as potential mechanisms for improving those results.

NERC

NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

Reliability Indicators Primers

Proposed November 2020

RELIABILITY | RESILIENCE | SECURITY



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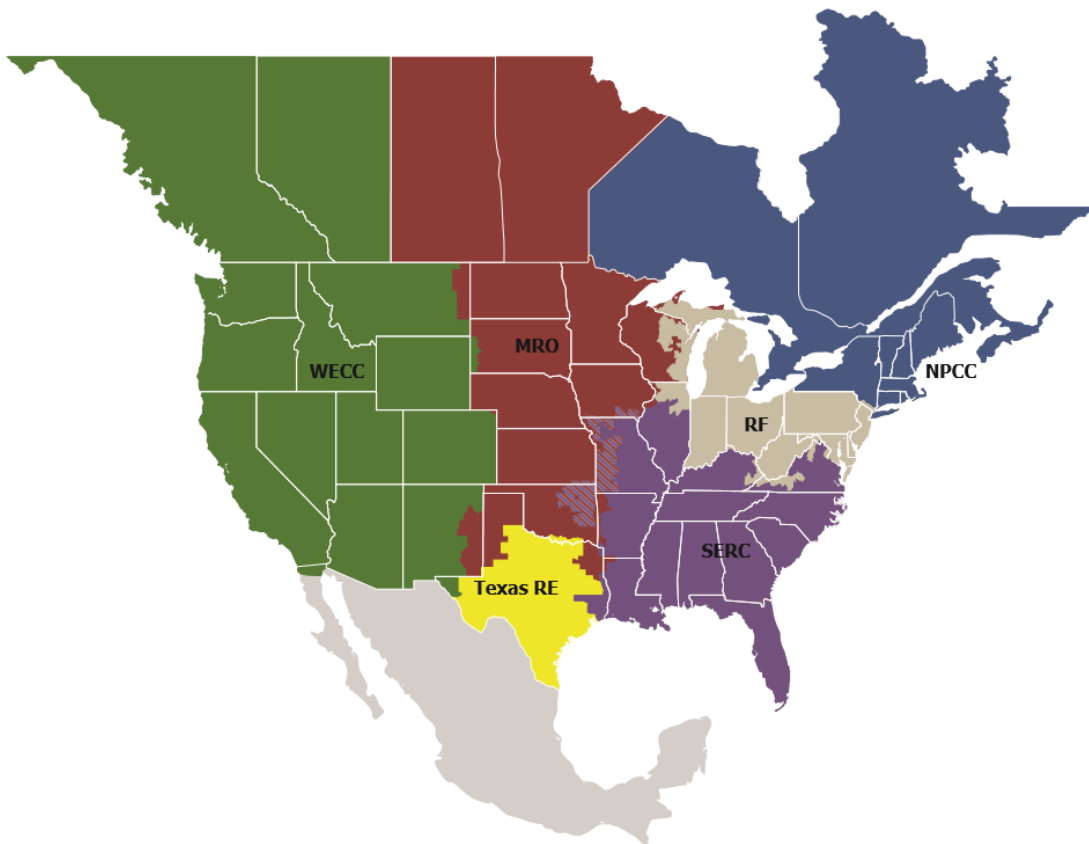
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Preface

Electricity is a key component of the fabric of modern society and the Electric Reliability Organization (ERO) Enterprise serves to strengthen that fabric. The vision for the ERO Enterprise, which is comprised of the North American Electric Reliability Corporation (NERC) and the six Regional Entities (REs), is a highly reliable and secure North American bulk power system (BPS). Our mission is to assure the effective and efficient reduction of risks to the reliability and security of the grid.

Reliability | Resilience | Security
Because nearly 400 million citizens in North America are counting on us

The North American BPS is divided into six RE boundaries as shown in the map and corresponding table below. The multicolored area denotes overlap as some load-serving entities participate in one RE while associated Transmission Owners/Operators participate in another.



MRO	Midwest Reliability Organization
NPCC	Northeast Power Coordinating Council
RF	ReliabilityFirst
SERC	SERC Reliability Corporation
Texas RE	Texas Reliability Entity
WECC	WECC

Indicator 1: (Fewer, Less Severe Events) Primer

The ERO Event Analysis Process (EAP) defines certain categories of events that meet a threshold considered significant enough to capture lessons learned that can inform risk monitoring and mitigation of daily operations on the BPS. Quantifying the potential impact of these events improves the global risk picture of BPS operation. This indicator is one way to acknowledge proportional contributions from generation and transmission to loss of load.

The daily event severity risk index (eSRI) is a composite daily measure of the load loss due to transmission and/or generation resources on the BPS. It is calculated for each event on a given day with a cumulative value of all events assigned to that day. The index uses weighted load loss, transmission loss, and generation loss based on importance to risk. The eSRI equation is as follows:

$$eSRI=1000 * (RPL * w_L * (MW_L) + w_T * (N_T)+ w_G * N_G)$$

Where

w_L = 60%, weighting factor load loss

w_T = 30%, weighting factor transmission lines lost

w_G = 10%, weighting factor generators lost

MW_L = normalized MW of Load Loss in percent,

N_T = normalized number of transmission lines lost in percent,

N_G = normalized number of generators lost in percent,

RPL = load Restoration Promptness Level:

RPL = 1/3, if restoration < 4 hours,

RPL = 2/3, if $4 \leq$ restoration < 12 hours,

RPL = 3/3, if restoration \geq 12 hours

A linear regression is performed by using a rolling five-year period of daily eSRI calculations in an effort to describe the correlation of event occurrence with any given day on the operating the system. The regression line provides a means to predict the average value for a chosen date of the eSRI. A lower eSRI is considered more favorable, so it is best to maintain a flat to negative slope of the regression line, meaning there are fewer events with less overall severity occur. Confidence intervals (95%) are calculated in an effort to provide assurance that event occurrence based on the sample defined by the EAP category definitions statistically characterizes the true population of event occurrences associated with operating the BPS. Statistically significant changes to the sample are identified and evaluated if the regression line and bounding confidence intervals all become positive.

The direction of the regression line drives the status modification of the risk indicator as follows:

- A falling slope indicates increasing performance (green).
- A flat slope indicates neutral (white).
- A rising slope indicates decreasing performance (red).

The EAP provides a mechanism to influence the improvement of system performance as well as captures lessons learned and system performance trending. Performance trending supports identifying the need for potential action(s) (e.g., a NERC alert), provides data for reports (e.g., the annual State of Reliability report), or may initiate the need for the development/revision of Reliability Standards. The outcomes from event analysis and cause coding assignment help to inform the industry in a way that facilitates improved reliability of daily operations and thus the maintenance of a falling slope for the eSRI curve.

Indicator 1 supports the following RISC identified risk profiles:

- Changing Resource Mix
- Bulk-Power System Planning
- Resource Adequacy and Performance
- Human Performance and Skilled Workforce
- Loss of Situational Awareness
- Physical Security Vulnerabilities
- Cybersecurity Vulnerabilities

Data Source: The Event Analysis Management System

Indicator 2: Compliance Violations

Maintaining compliance with NERC Reliability Standards is one of the key components of risk management. Indicator 2 reflects the registered entities' efforts to maintain compliance with these standards as a means to reduce risk to BPS reliability. In the majority of reported violations, there has been no actual harm to the reliability of the BPS.

The three subsets of Indicator 2 are the following:

- Moderate and serious risk noncompliance with a relevant history of similar past conduct¹ and measured as the percentage of moderate and serious risk violations with a relevant compliance history of similar past conduct compared with total noncompliance filed with FERC²
- The number of violations discovered through self-reports and measured as the percentage of noncompliance self-reports³
- The risk to the BPS based on the severity of standard violations and measured as a three-year rolling average of the percentage of serious risk violations filed compared to the total noncompliance field with FERC in a given year⁴

The Compliance Monitoring and Enforcement Program (CMEP) quarterly report provides more insight about these three subsets of Indicator 2 and includes additional information for clarity and context.

The 2020 ERO Enterprise Compliance Monitoring and Enforcement Program Implementation Plan⁵ also describes how identified risks from various resources, including the ERO Reliability Risk Priorities Report (Board Accepted November 5, 2019)⁶ are translated into risk elements that are used in the reshaping of registered entities' compliance oversight plan. In that respect, this indicator supports three of the four high-level risks: grid transformation, extreme natural events, and security risks.⁷ This indicator supports all of the RISC profiles identified in the *Reliability Risk Report*.

¹ To measure the effectiveness of the risk-based CMEP in reducing noncompliance, NERC reviews moderate and serious risk violations and includes them in one of three categories: noncompliance with no prior compliance history, noncompliance with prior compliance history that does not involve similar conduct, and noncompliance with compliance history that includes similar conduct.

² Enforcement filings and postings <https://www.nerc.com/pa/comp/CE/Pages/Enforcement-and-Mitigation.aspx>

³ Data source: NERC Compliance Reporting and Tracking System

⁴ *Supra fn 1*

⁵ [2020 ERO Enterprise Compliance Monitoring and Enforcement Program Implementation Plan](#)

⁶ [ERO Reliability Risk Priorities Report \(Board Accepted November 5, 2019\)](#)

⁷ The four high-level risks from the *ERO Reliability Risk Priorities* report are grid transformation, extreme natural events, security risks, and critical infrastructure interdependencies.

Indicator 3: Protection System Misoperations Rate Primer

Sub indicator 3a: Annual Misoperations Rate

The protection systems misoperations rate indicator provides the performance of protection systems for both generation and transmission on the BPS. The Misoperations Information Data Analysis System collects counts of protection system operations and details on the misoperation events of protection systems from registered entities. The data for this indicator is reported quarterly (60 days after the end of each quarter) and requires all four quarters to compute. This indicator will only be updated in the Q3 dashboard each year.

Calculation: The indicator is calculated as the ratio of misoperations to total protection system operations both at the Regional Entity level and overall for NERC.

Regional Entities work with registered entities to analyze misoperations events and provide valuable lessons learned to the industry. The results of such analyses have also informed the development of detailed data reporting instructions and other reference materials to improve clarity and consistency in reporting misoperations; the data reporting instructions are available on the Protection System Misoperations page of the NERC website.⁸

This indicator supports Focus Area 2 of *the ERO Long-Term Strategy*⁹ and the *ERO 2020 Work Plan Priorities*.¹⁰

Key Objective 1: Identify performance trends and develop lessons learned, recommendations, and/or implement mitigations

Data Source: Misoperation Information Data Analysis System

⁸ <https://www.nerc.com/pa/RAPA/Pages/Misoperations.aspx>

⁹ [https://www.nerc.com/AboutNERC/StrategicDocuments/ERO%20Enterprise%20Long-Term%20Strategy%20\(Appeared%20December%2012,%202019\).pdf](https://www.nerc.com/AboutNERC/StrategicDocuments/ERO%20Enterprise%20Long-Term%20Strategy%20(Appeared%20December%2012,%202019).pdf)

¹⁰ https://www.nerc.com/AboutNERC/StrategicDocuments/FINAL_ERO%20Performance%20Objectives_Board_Approved_Feb_6_2020.pdf

Indicator 4: Forced Outage Rate during Cold Weather Months and Potential Production MWH Loss Due to Lack of Fuel

Sub Indicator 4a: No Firm Load Loss Due to Natural-Gas-Fired Unit Outages during Cold Weather

The annual measurement for no firm load loss due to natural-gas-fired unit outages during cold weather will be captured for immediate forced outages that occur during the months of January, February, March, and December of the same calendar year.

This indicator captures immediate firm load loss on forced unit outages for natural-gas-fired units during cold weather months. This indicator will be captured using energy emergency alerts (EEA3) as well as the OE-417 and EOP-004 reports and will be reported on a quarterly basis for the annual report.

Sub indicator 4b: No Firm Load Loss Due to Natural Gas Unavailability

This sub indicator is the annual measurement for no firm load loss on natural-gas-fired generation units due to natural gas unavailability indicator. It captures natural-gas-fired unit unavailability for the entire calendar year.

This indicator captures immediate firm load loss on forced natural gas units due to natural gas unavailability across the entire year. This indicator will be captured with EEA3s, OE-417, and EOP-004 reports and will be reported on a quarterly basis for the annual report.

Situation awareness allows for an opportunity to analyze information on system disturbances and other incidents that impact the North American BPS. Situation awareness also allows for the dissemination of information to internal departments, registered entities, regional organizations, and other stakeholders within the industry as necessary. Trending and early detection of events within the first 24–48 hours allows for sustained events to be shared with the Events Analysis team for further monitoring and analysis to ensure safe and reliable BES operation. Early detection of events is also shared with the RA group for input into the State of Reliability report and NERC alerts if deemed necessary. The outcome of increased situation awareness helps inform the industry of potential trends and impacts on the BES and provides improved reliability of the daily operation of the BES during extreme weather and other impactful events maintaining the green status on the indicator (see [Figure 4.1](#)).



Figure 4.1: Indicator

Sub Indicator 4c: Weighted Equivalent Forced Outage Rate by Fuel Type during Cold Weather Season (December–March)

The weighted equivalent forced outage rate (WEFOR) shows outage rates by cold weather season. The WEFOR is a holistic availability indicator that includes forced outages and derates during the evaluation period; the lowest available granularity is monthly. This indicator shows a comparison of the WEFOR chronologically for the past five cold weather seasons for major fuel types.

Due to the seasonal nature of this indicator, it will only be updated in the Q1 and Q2 dashboards each year.

Calculation: The WEFOR is calculated, as shown below for each cold weather season, includes the consecutive months of December, January, February, and March.

$$\text{WEFOR} = \frac{\sum ((\text{FOH} + \text{EFDH}) \times \text{NMC})}{\sum ((\text{FOH} + \text{SH} + \text{Synchronous Condensing Hours} + \text{Pumping Hours} + \text{EFDHRS}) \times \text{NMC})} \times 100\%$$

Training materials and data reporting instructions provide details to increase quality of the causes of forced outages due to cold weather. The ERO Enterprise conducts training, outreach, and education annually to support generation in combating cold weather outages.

Sub Indicator 4d: Quarterly Potential Production MWH Lost by Fuel Type Due to Lack of Fuel Over a Five-Year Period

This indicator shows the percentage of potential production MWH lost for periods when production was needed, but the unit was unavailable due to lack of fuel. It is the sum of each unit's net maximum capacity multiplied by the duration of each outage by fuel type caused by the two lack of fuel cause codes divided by the sum of each unit's net maximum capacity multiplied by the unit service hours by fuel type. Unit service hours include hours when the units were needed.

The following cause codes are included in this indicator:

- 9130 LACK OF FUEL: physical supply failures, or where the operator is not in control of contracts or interruption of fuel delivery
- 9131 LACK OF FUEL: contract or tariff allows for interruption
- SUM: $(\text{NMC} \times [\text{Lack of Fuel Outages}]) / \text{SUM}(\text{NMC} \times [\text{Unit Service Hours}])$
- Calculation: $\text{SUM}(\text{NMC} \times [\text{Lack of Fuel Outages}]) / \text{SUM}(\text{NMC} \times [\text{Unit Service Hours}])$

Improved descriptions and examples of cause codes associated with fuel availability have been added to the data reporting instructions to provide clarification on the appropriate use of these cause codes.

This indicator supports Focus Area 1 of the *ERO Long-Term Strategy*¹¹ and the *ERO 2020 Work Plan Priorities*.¹²

- Key Objective 1: Implement strategy for fuel assurance standards (including cold weather)
- Data Source: EOP-004, OE-417 and Energy Emergency Alerts (EEA3) (4a, 4b)
- Data Source: Generating Availability Data System (GADS) (4c, 4d)

¹¹[https://www.nerc.com/AboutNERC/StrategicDocuments/ERO%20Enterprise%20Long-Term%20Strategy%20\(April%202012,%202019\).pdf](https://www.nerc.com/AboutNERC/StrategicDocuments/ERO%20Enterprise%20Long-Term%20Strategy%20(April%202012,%202019).pdf)

¹²https://www.nerc.com/AboutNERC/StrategicDocuments/FINAL_ERO%20Performance%20Objectives_Board_April_6_2020.pdf

Indicator 5a–5b: Reduce AC Transmission Line Forced Outages

Sub Indicator 5a: Operator or Other Human Performance Issues

Calculations:

- **Outages Per Circuit:** This indicator is calculated as the number of transmission line outages caused by human error divided by the total inventory of circuits, resulting in the number of outages per circuit. The indicator year number of outages per circuit is compared to a five-year rolling average.
- **Statistical Significance:** Changes over the five-year period will be evaluated for statistical significance.

The data for this indicator is reported quarterly (45 days after the end of each quarter) and requires a complete year of data. This indicator will only be updated on the Q3 dashboard each year.

Improved descriptions and scenarios associated with human performance are included in the data reporting instructions and training materials to provide clarification on the appropriate use of these cause codes. The ERO Enterprise conducts training, outreach, and education annually to support the industry in the area of human performance and human and organizational error reduction.

This sub indicator supports the following RISC identified risk profiles (ERO Reliability Risk Priorities, February 2018):

- Risk Profile #5: Human Performance and Skilled Workforce
- Risk Profile #7: Extreme Natural Events
- Data Source: Transmission Availability (TADS)

Sub Indicator 5b: Substation Equipment Failures or Failed AC Circuit Equipment

Calculations:

- **Outages Per Circuit:** This indicator is calculated as the number of transmission line outages caused by ac substation equipment failures (such as transformers) and failed ac circuit equipment divided by the total inventory of circuits, resulting in the number of outages per circuit. The number of outages per circuit for the indicator year is compared to a three-year rolling average.
- **Statistical Significance:** Changes over the three-year period will be evaluated for statistical significance.

The data for this indicator is reported quarterly, 45 days after the end of each quarter, and this indicator requires a complete year of data. This indicator will only be updated on the Q3 dashboard each year.

Improved descriptions and scenarios associated with equipment failures are included in the data reporting instructions and training materials to provide clarification on appropriate use of these cause codes. Additionally, valuable lessons learned are published from events that occur on the system involving equipment failure and associated shortcomings.

This sub indicator supports the following RISC identified risk profiles (ERO Reliability Risk Priorities, February 2018):

- Risk Profile #4: Increasing Complexity in Protection and Control Systems
- Risk Profile #5: Human Performance and Skilled Workforce
- Risk Profile #7: Extreme Natural Events
- Data Source: Transmission Availability Data System (TADS)

Indicator 5c: Vegetation Encroachment

Ineffective vegetation management was identified as a major cause of the August 14, 2003, blackout and was cited as a major causal factor in other large-scale North American outages. The ERO Enterprise has observed an increase in encroachments into the minimum vegetation clearance distance (MCVD) that result in FAC-003 R2 violations. These violations result from vegetation management programs that have less than adequate procedures to address identified problems or that fail to adapt to changing conditions (e.g., increased precipitation that accelerates vegetation growth).

Indicator 5c monitors the number of sustained outages from vegetation fall-ins into the transmission right-of-way (this is not a violation of the FAC-003 Reliability Standard but is required periodic data reporting per FAC-003) and vegetation encroachments into the MVCD observed, including those in real time and absent a sustained outage (i.e., a violation of the FAC-003 Reliability Standard).¹³

FAC-003 is one of the standards included in the ERO Enterprise's current and past CMEP annual implementation plans that is also related to two of the four high-level risks in the *ERO Reliability Risk Priorities Report*:¹⁴ Extreme Natural Events and Grid Transformation (Human Performance and Skilled Workforce, and Bulk Power System Planning).

The CMEP quarterly report also includes a section that discusses reported vegetation-related sustained outages.

The number of vegetation-related outages from encroachments into the MVCD has been very small, and the outage duration has been very short in all cases.

NERC monitors both vegetation-related sustained outages from inside and outside of the right-of-way. A five-year rolling average is used as monitoring indicator for the number of vegetation contacts or encroachments from inside the right-of-way.¹⁵

¹³ Vegetation Management Reports: <https://www.nerc.com/pa/comp/CE/Pages/vegetation-management-reports.aspx>

¹⁴ [ERO Reliability Risk Priorities Report](#)

¹⁵ While the goal is to have no vegetation encroachments into the MVCD, it is expected that both vegetation-related sustained outages from inside and outside of the right-of-way to stay within or below one standard deviation of their respective five-year averages.

Indicator 6: (Disruptions due to Unauthorized Physical or Electronic Access) Primer

This indicator measures the risk and impact on the BPS from cyber or physical security attacks. The measurement is based on industry submissions of the mandatory NERC Event Reporting (EOP-004) and Department of Energy Electric Emergency Incident and Disturbance Reporting (OE-417) forms. The measurement variable is the number of disruptions of BES facilities due to cyber attacks or physical attacks. For the purposes of this indicator, disruption means that a BES facility was removed from service as a result of the cyber or physical incident.

The term “cyber and physical attacks” is not defined for the purpose of this indicator but is understood to broadly include any reported occurrences generally involving cyber or physical security. The indicator’s clarification of the term “disruption” still leaves room for interpretation but is understood here to be limited to a BES facility removed from service by automatic or manual means either as a direct result of the attack or as an immediate operational mitigation of the attack’s effects. Future controlled or planned outages for inspection or repairs are not considered to be a disruption for the purpose of this indicator since, by definition, the system can be operated appropriately around constraints imposed by planned outages.

While the indicator’s meaning is inconsistent with how many security professionals define “attack,” this larger aperture allows the Electricity Information Sharing and Analysis Center (E-ISAC) to review all submissions of the reports to understand the reported issue and the impact to the BES while working in close coordination with NERC’s BPS Awareness group. The E-ISAC also receives and reviews voluntary event reports, but these voluntary reports are not included in this indicator.

This indicator supports the following RISC identified risk profiles:

- Physical Security Vulnerabilities
- Cyber Security Vulnerabilities

Indicator 7: Real Power Balancing Control Performance

The NERC Reliability Standard BAL-001-3 states that each Balancing Authority (BA) shall operate such that its clock-minute average of reporting area control error (ACE) does not exceed its clock-minute BA ACE limit (BAAL) for more than 30 consecutive clock-minutes. The purpose of this metric is to measure risk to the BPS by monitoring the trend in the number of clock minutes in which BAs return their ACE to within their BAAL after an exceedance has occurred.

Indicator performance is determined by the statistical significance of the slope of a linear regression line and tested at the significance level of 5% for the number of BAAL exceedances greater than or equal to 15 minutes as reported by BAs on a quarterly basis for a rolling 16 quarters (i.e., four years).

The BAAL exceedance data used for evaluation of Indicator 7 is obtained from BAs via voluntary quarterly submittals that are requested by the fifteenth day following the end of each quarter. Data collection began in the fourth quarter of 2016 for BAAL excursions that occurred in the third quarter of 2016. The data is reviewed and compiled by the NERC Resources Subcommittee (RS) and presented at their quarterly meetings that occur in the third week following the end of each quarter. When BAs fail to submit data on time, the RS representatives perform outreach to those BAs. Due to the timing in BA data submittals and compilation by the RS, the indicator is updated one quarter in arrears.

Indicator 7 is evaluated on a quarterly basis to determine an annual result by using the aforementioned measurement method. An example is shown in [Figure 7.1](#).

Success (**green**) is achieved when the linear regression line of the most recent four years of quarterly BAAL exceedances greater than or equal to 15 clock minutes has a statistically significant negative slope or when the slope of the time trend is statistically neither increasing nor decreasing. This equates to either improvement or no decline in performance. Failure (**red**) occurs if slope of the time trend is increasing with statistical significance.



Figure 7.1: Real Power Balancing Control Performance

Indicator 8: Interconnection Frequency Response

Indicator 8 measures risk and impact to the BPS by evaluating the trend in the magnitude of the decline in Interconnection frequency experienced in each Interconnection during low frequency events selected for BAL-003-1 compliance. This metric will evaluate whether the risk of activating under frequency load shed devices is increasing or decreasing in each Interconnection.

The magnitude of the decline will be calculated as the mean difference between the Value A starting frequency and the Point C frequency nadir. As defined in the *2012 Frequency Response Initiative Report* and NERC Standard BAL-003-1, Value A represents predisturbance frequency, the mean frequency from $t = -16$ seconds to $t = -1$ seconds, and Value C represents the lowest frequency experienced during the arresting period, $t = 0$ seconds to $t = +12$ seconds. The mean difference between Value A and Value C for each Interconnection is reported each year in the *Frequency Response Annual Analysis (FRAA)* report.

Figure 8.1 is a frequency graph that shows the typical low frequency event that results from the loss of a generation resource.

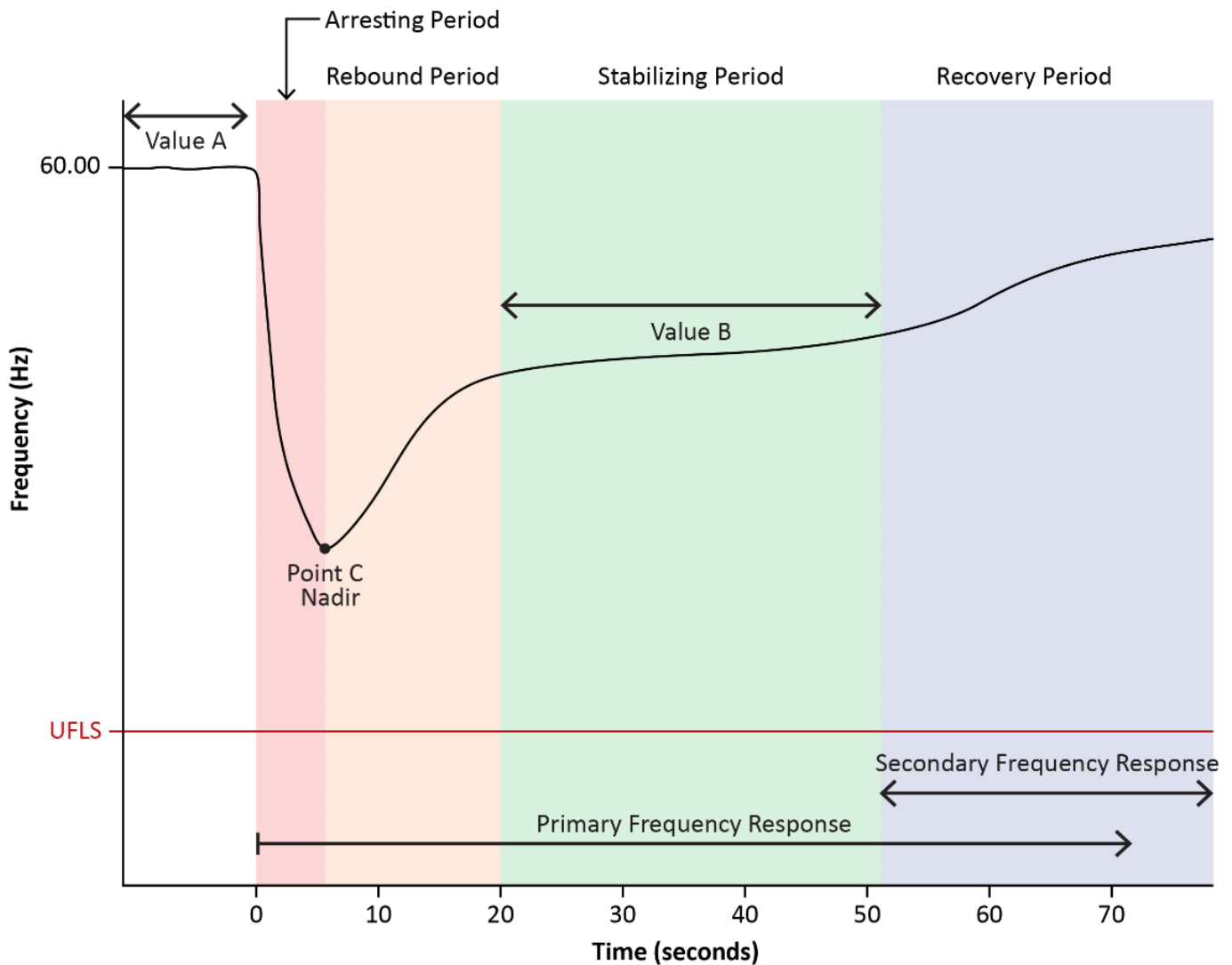


Figure 8.1: Frequency Response

Candidate frequency events are reviewed quarterly by the NERC Frequency Working Group, and events are selected based on Interconnection-specific criteria defined in the BAL-003-1.1 Reliability Standard and supporting documents.

Indicator 8 is evaluated on a quarterly basis to determine an annual result. Due to the timing in selection of events, the indicator is updated one quarter in arrears. An example is shown in [Figure 8.2](#).

Success ([green](#)) is achieved when the linear regression line of the most recent four years of quarterly mean values of Frequency A minus Frequency C has a statistically significant negative slope or when the slope of the time trend is statistically neither increasing nor decreasing. This equates to either improvement or no decline in performance where Interconnection risk has not changed or declined.

Failure ([red](#)) occurs if the slope of the time trend is increasing with statistical significance or if under frequency load shedding is activated for any single BAL-003 frequency event in any Interconnection.



Figure 8.2: Interconnection Frequency Response

Indicator 9: Growth in Distributed Energy Resources

As distributed energy resources (DERs) become more common, they will have a larger effect on BPS reliability. DER trends will provide forward-looking insights into system inertia, frequency response, and the need for ramping requirements. DERs have the potential to be a significant load modifier. As a result, effective forecasting and modeling of DERs becomes critical. This indicator supports the following RISC priorities:

- Changing Resource Mix
- Resource Adequacy and Planning
- Bulk Power System Planning

Data for this indicator comes from the NERC Long-Term Reliability Assessment conducted every year with a ten-year forecast.

An example of what this data might look like is shown in [Figure 9.1](#).

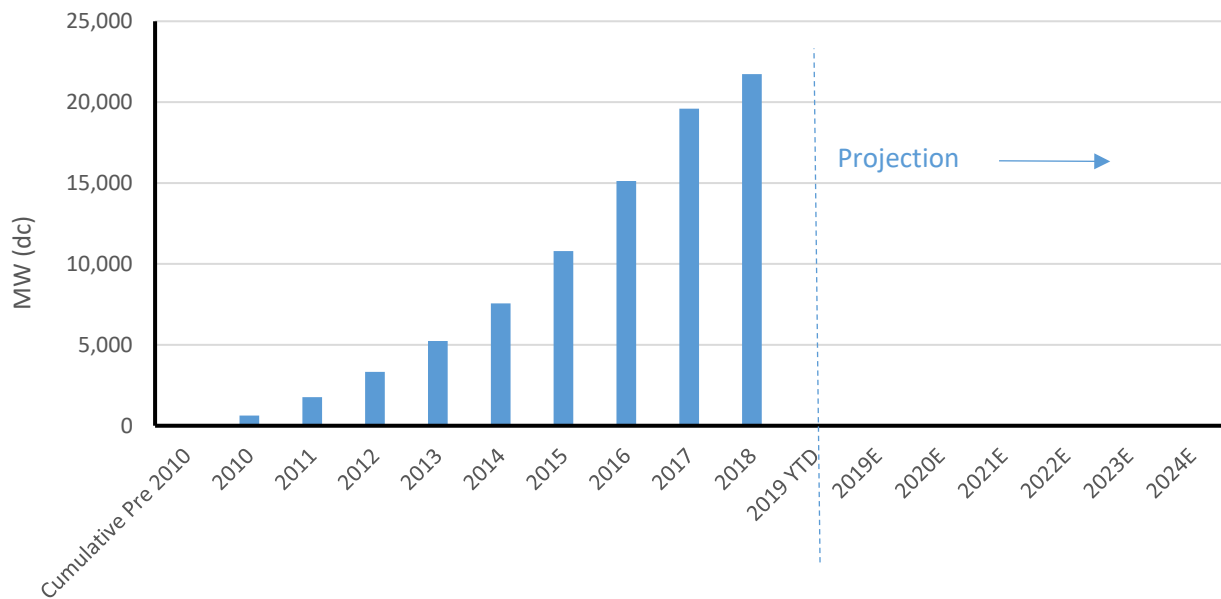


Figure 9.1: U.S. Cumulative Total Amount of Distributed Solar PV 2010–2023

Indicator 10: Monitoring the Change in the Resource Mix

The North American BPS is in the midst of a significant transformation of the resource mix. Emerging technologies (e.g., wind, solar, and battery storage) are increasing their penetrations at a rapid pace. Coal and nuclear continue to retire while natural gas generation continues to grow at unprecedented levels. This transformation in the resource mix poses potential challenges for maintaining essential reliability services, such as frequency response and system inertia. It is important to monitor the change in the resource mix in order to stay informed of potential system challenges. In order to maintain system reliability as a result of a change in the resource mix, NERC continues to evaluate the need for additional reliability guidelines and/or Reliability Standards. This indicator supports the following RISC priorities:

- Changing Resource Mix
- Resource Adequacy and Planning
- Bulk Power System Planning

An example of what this data may look like is shown in [Figures 10.1, 10.2, and 10.3](#) showing the resource mix presently as well as ten years ago and projections for ten years forward.

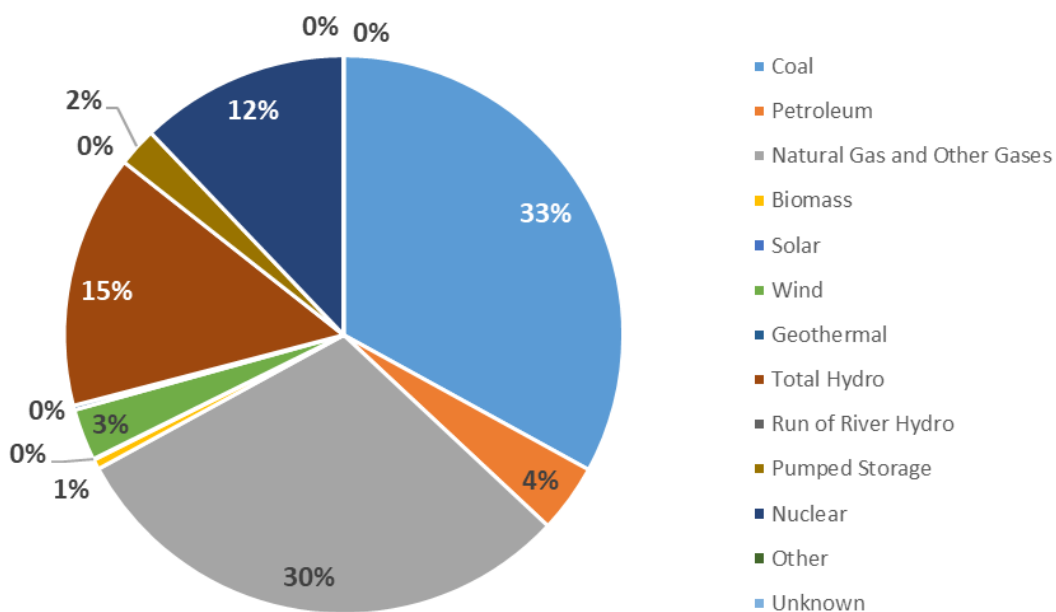


Figure 10.1: Resource Mix 2009

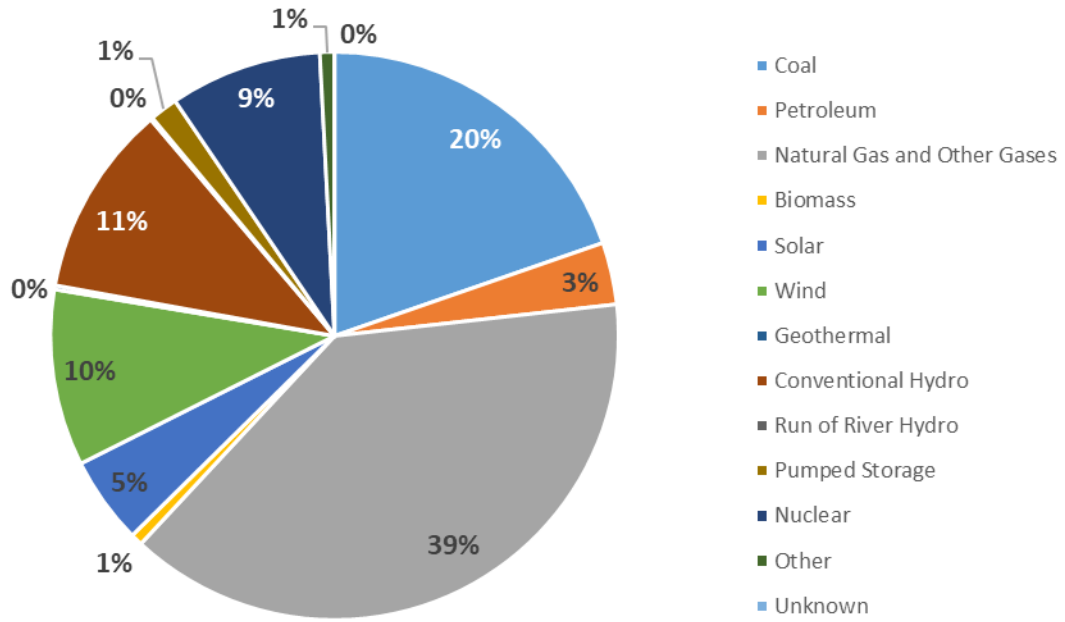


Figure 10.2: Resource Mix 2019

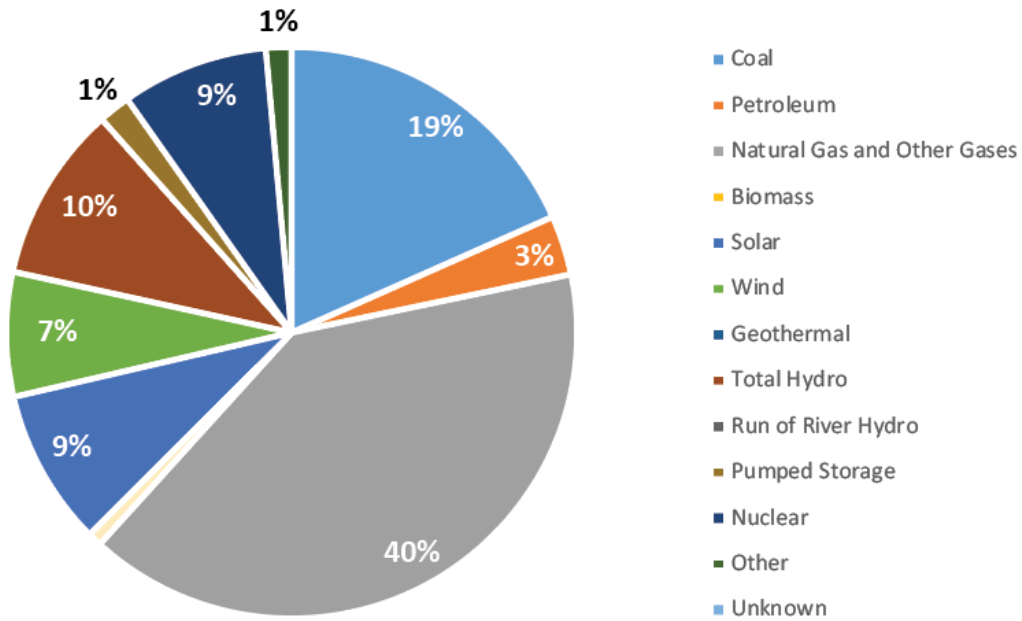


Figure 10.3: Resource Mix 2029

Personnel Certification Governance Committee Report

Action

Information

Background

Personnel Certification Governance Committee (PCGC) regular update to the Board of Trustees.

Summary

PCGC's fourth quarter meeting held on November 2-5, 2020 via WebEx.

Highlights from the November PCGC meeting include the following items:

- Dave Carlson, ComEd, announced he was leaving the group at the end of 2020.
- Posted request for nominations for open position.
- Developed joint PCGC and CMWG Task Force to research the hours and topic areas of training those with an RC credential take in an effort to quantify the current or new hour requirement for renewal.

Future items:

- Ongoing review of the current application and a new platform with Brightlink the System Operator Certification and Continuing Education Database (SOCCED) vendor regarding moving SOCCED to the vendor's main platform in order to gain advantage of the main platform enhancements and additional functionality.

Standards Committee Report

Action

Approve the Standards Committee 2021 Work Plan, and receive information regarding recent activities.

Background

Attached is the Standards Committee (SC) 2021 Work Plan for Board of Trustees consideration and approval. Also included is the Standards Committee Quarterly Report highlighting activities over the last quarter.

The October 21 meeting was cancelled due to lack of time sensitive agenda items.

At its November 19, 2020 meeting, the SC:

1. Appointed two additional team members to the Project 2020-03 Supply Chain Low Impact Revisions Standard Authorization Request (SAR) Drafting Team to supplement the team with additional low impact experience;
2. Authorized initial posting for Project 2018-03 Standards Efficiency Review Retirements for proposed Reliability Standard FAC-008-5;
3. Appointed chair and vice chair of the Project Management and Oversight Subcommittee;
4. Approved revised versions of the *SCPS Scope and Technical Rationale for Reliability Standards* documents; and
5. Received notification that the ballot pool for Project 2015-09 Establish and Communicate System Operating Limits was updated due to merger or entities that were represented in the ballot pool.

At its December 9, meeting, the SC:

1. Rejected the SAR for Project 2020-01 Modifications to MOD-032-1 due to lack of industry support in the comments received during the informal SAR comment period;
2. Accepted the revised SAR for Project 2020-04 Modifications to CIP-012; authorized drafting revisions to the Reliability Standards identified in the SAR; and appointed the SAR Drafting Team as the Standard Drafting Team;
3. Approved revisions to the *PMOS Scope* document; and
4. Endorsed the Standard Efficiency Review recommendations for a comprehensive review of the *Reliability Standards Template, Drafting Team Training Modules, and Drafting Team Reference Manual* to ensure the template and drafting team resources facilitates the development of results based standards.

2021-2023 Standards Committee Strategic Work Plan

Introduction

This Standards Committee (SC) Strategic Work Plan (Plan) focuses Standards development activities on: (1) addressing Federal Energy Regulatory Commission (FERC) directives, (2) continuing Periodic Reviews (PRs), and (3) addressing emerging risks using input from various sources, including the Reliability Issues Steering Committee (RISC). The SC will continue: (1) overseeing standards grading activities (evaluating Standards for quality and content), and (2) prioritizing standards development activities.

Emerging Risks

Through input by a NERC technical committee, the RISC or a governmental authority (such as FERC), the SC authorizes the development new or revised Standards, as appropriate.

Vision, Mission and Guiding Principles

Vision

A comprehensive body of Reliability Standards collectively achieving an adequate level of reliability and promoting reliable operation of the North American bulk power system.

Mission

Manage and oversee development of a comprehensive set of Reliability Standards aligned with NERC's strategic goals through open and inclusive processes and procedures.

Guiding Principles

- Consistent with the 2021-2023 Reliability Standards Development Plan (RSDP), this Plan recognizes the transition of the Standard development process to primarily address a small number of FERC directives, Periodic Reviews, and emerging risks. The details of the goals and objectives for 2021-2023 appear in the RSDP.
- Promote and implement a collaborative working environment with other NERC Standing Committees, NERC Standards staff, stakeholders, and standard drafting teams.
- Execute the Standards development process for effective and efficient use of NERC and industry resources.
- Promote and take a leadership role on consensus-building activities.

Work Plan

Task No. 1 – Periodic Reviews

- The Project Management and Oversight Subcommittee (PMOS) and NERC staff prioritize and schedule Periodic Reviews for SC endorsement. PMOS will use the most recent Periodic Review Standing Review Team’s grading of Standards to prioritize/schedule by the end of February 2021.

Task No. 2 – Standards Grading

- NERC staff and the SC chair or delegate (acting as facilitator) will start the 2021 Standards grading as soon as practicable to provide time to conduct and comment on the grading. NERC staff will present Standards grading to the SC with the RSDP. To be completed by June 2021 if possible, but no later than the end of August 2021 to coordinate with the development of the 2022-2024 RSDP.

Task No. 3 – Transition of Guidelines and Technical Basis to Technical Rationale

- The SC will continue work to review Guidelines and Technical Basis documents for transition to Technical Rationale documents while moving compliance examples to Implementation Guidance.

Task No. 4 – Standards Committee Process Subcommittee (SCPS)

- NERC staff and the SCPS will endeavor to complete all on-going projects and seek SC endorsement by December 2021. NERC staff and the SCPS will identify opportunities for increased efficiency in existing processes and new processes to enhance Standards development.

Task No. 5 – Fourth Quarter Review of 2021-2023 SC Strategic Work Plan

- The SC will review Plan and provide changes for 2022-2024 to the SC for endorsement.

Task No. 6 – Standards Efficiency Review

- The SC will support the evaluation of NERC Reliability Standards to identify potential efficiencies through retirement or modification of specific requirements. This project seeks to identify potential candidate requirements not necessary for reliability to reduce regulatory obligation.

Task No. 7 – Standards Committee Training

- The SC will coordinate with the SCPS to identify and document relevant materials for orientation and/or training for SC members, making recommendations for enhancements as necessary. This initiative will ensure SC succession planning through an improved training process for future SC members.

NERC

NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

Reliability Standards

Quarterly Report

February 4, 2021

RELIABILITY | RESILIENCE | SECURITY



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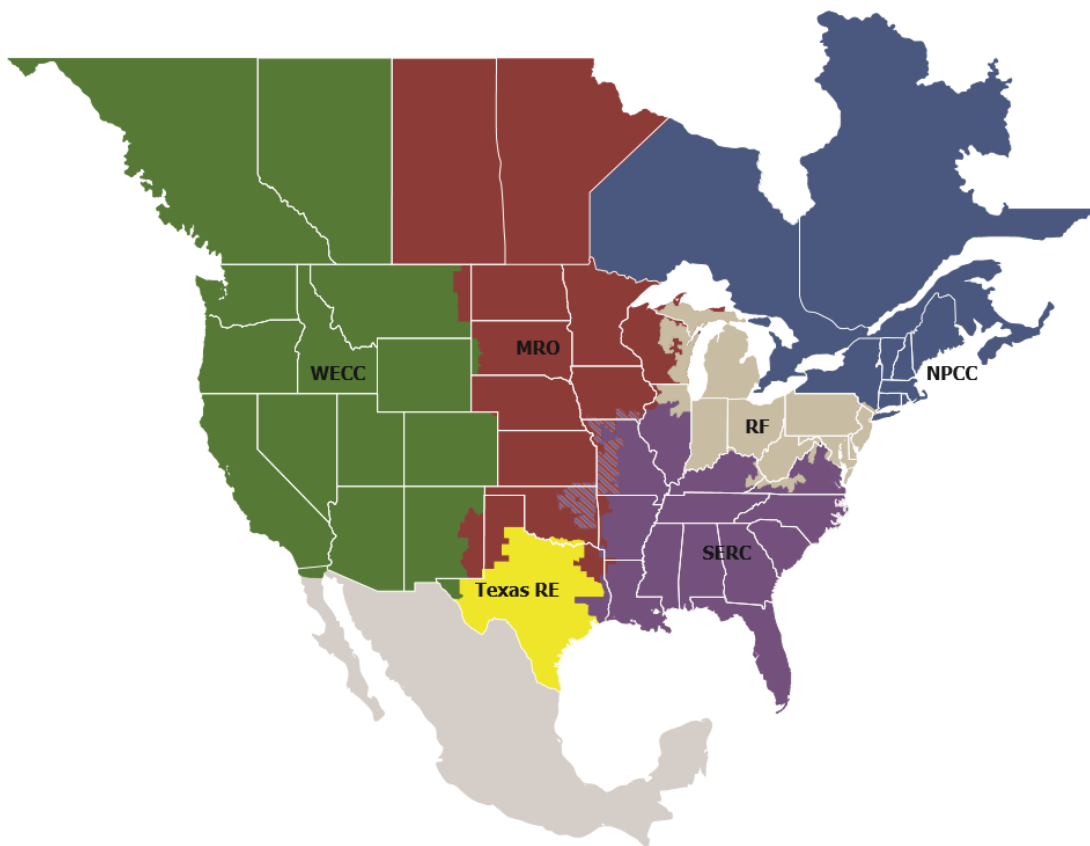
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Preface

Electricity is a key component of the fabric of modern society and the Electric Reliability Organization (ERO) Enterprise serves to strengthen that fabric. The vision for the ERO Enterprise, which is comprised of the North American Electric Reliability Corporation (NERC) and the six Regional Entities (REs), is a highly reliable and secure North American bulk power system (BPS). Our mission is to assure the effective and efficient reduction of risks to the reliability and security of the grid.

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The North American BPS is divided into six RE boundaries as shown in the map and corresponding table below. The multicolored area denotes overlap as some load-serving entities participate in one Region while associated Transmission Owners/Operators participate in another.



MRO	Midwest Reliability Organization
NPCC	Northeast Power Coordinating Council
RF	ReliabilityFirst
SERC	SERC Reliability Corporation
Texas RE	Texas Reliability Entity
WECC	Western Electricity Coordinating Council

Chapter 1: Standards Development Forecast

Board Forecast for Standard Projects in Active Development

The following projections reflect anticipated Board adoption dates for continent-wide Reliability Standards.

February 2021

- Project 2018-03: Standards Efficiency Review

May 2021

- Project 2015-09: Establish and Communicate System Operating Limits

August 2021

- Project 2017-01: Modifications to BAL-003-1.1 (phase 2)

November 2021 or after

- Project 2016- 02: Modifications to CIP Standards (virtualization)
- Project 2019-02: BES Cyber System Information Access Management
- Project 2019-04: Modifications to PRC-005-6
- Project 2019-06: Cold Weather Preparedness
- Project 2020-01: Modifications to MOD-032-1
- Project 2020-02: Transmission-connected Resources
- Project 2020-03: Supply Chain Low Impact Revisions
- Project 2020-04: Modifications to CIP-012-1

ANSI Reaccreditation

NERC filed for reaccreditation as a Standards Developer in accordance with the accreditation processes of the American National Standards Institute (ANSI) on July 1, 2019. NERC's request remains pending at this time.

Projects with Regulatory Directives

Table 1 below lists the current projects with regulatory directives. As of December 31, 2020, there are two standards-related directives to be resolved through standards development activities (not including non-standards related directives).¹

Table 1: Projects with Regulatory Directives		
Project	Regulatory Directives	Regulatory Deadline
Project 2015-09: Establish and Communicate System Operating Limits	1	N/A

¹ A third directive requires NERC to file quarterly updates in the project schedules for Project 2016-02 Modifications to CIP Standards and Project 2019-02 BES Cyber System Information Access Management. A fourth directive requires NERC to begin a formal process to assess the feasibility of voluntarily conducting BES operations in the cloud in a secure manner and to make an informational filing by January 1, 2022.

Table 1: Projects with Regulatory Directives

Project	Regulatory Directives	Regulatory Deadline
Project 2020-04: Modifications to CIP-012-1	1	N/A

Periodic Review of Registered Ballot Body Qualification Guidelines and Rules for Joining Segments

NERC staff intends to present a series of revisions to Section 300 and Appendix 3B and 3D to the Board in 2021, after the proposed changes have been posted for public comment.

Trend in Number of Reliability Requirements

As NERC Reliability Standards continue to mature, NERC analyzes the trend in the total number of requirements in the United States since 2007 when Reliability Standards became enforceable.

The *US Effective Date Status/Functional Applicability*² spreadsheet was used to analyze the number of requirements based on the U.S. Effective Date for each requirement shown in the charts below. Figure 1 displays the Trend in Number of Requirements for Continent-Wide standards, while Figure 2 displays Regional Reliability Standards.³ Standards with variances were not included in the requirement count. Projections from projects that include standards currently under development, board adopted standards and board approved retirements are also included in the total number of requirements based on their projected effective or inactive date.⁴

The trend for total number of requirements indicates a constant flat trend line for the last four years, with a significant decline from 2017 to 2018 for Continent-wide standards, and a significant decline in total number of requirements from 2016 to 2017 for Regional Reliability standards. Figure 1 indicates 445 continent-wide requirements; Figure 2 indicates 69 Regional Reliability standards forecast for 2027.

² Available from the Standards section of the NERC website: <http://www.nerc.com/pa/Stand/Pages/default.aspx>

³ Charts were developed using end of Q4 2020 data.

⁴ These projects include the following: Project 2015-09 (FAC-010-4, FAC-011-4, FAC-014-3), Project 2016-02 (CIP-003-7(i)), Project 2018-03 SER Retirements.

Trend for Number of Requirements

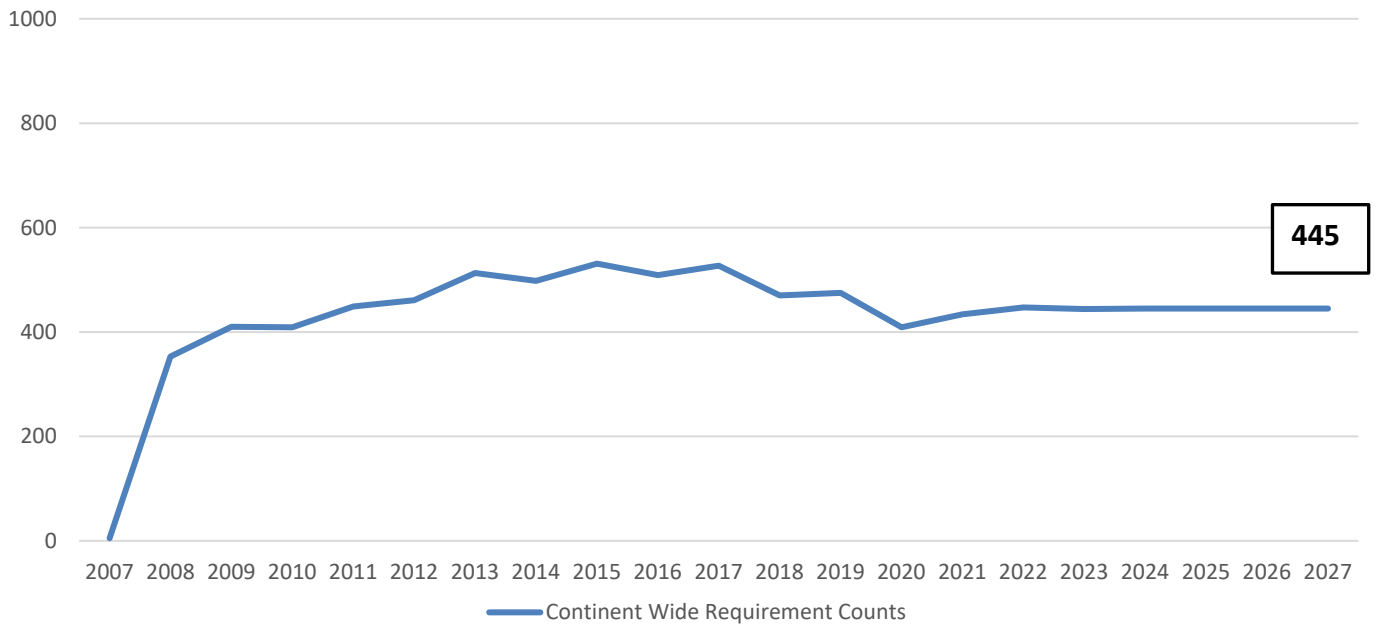
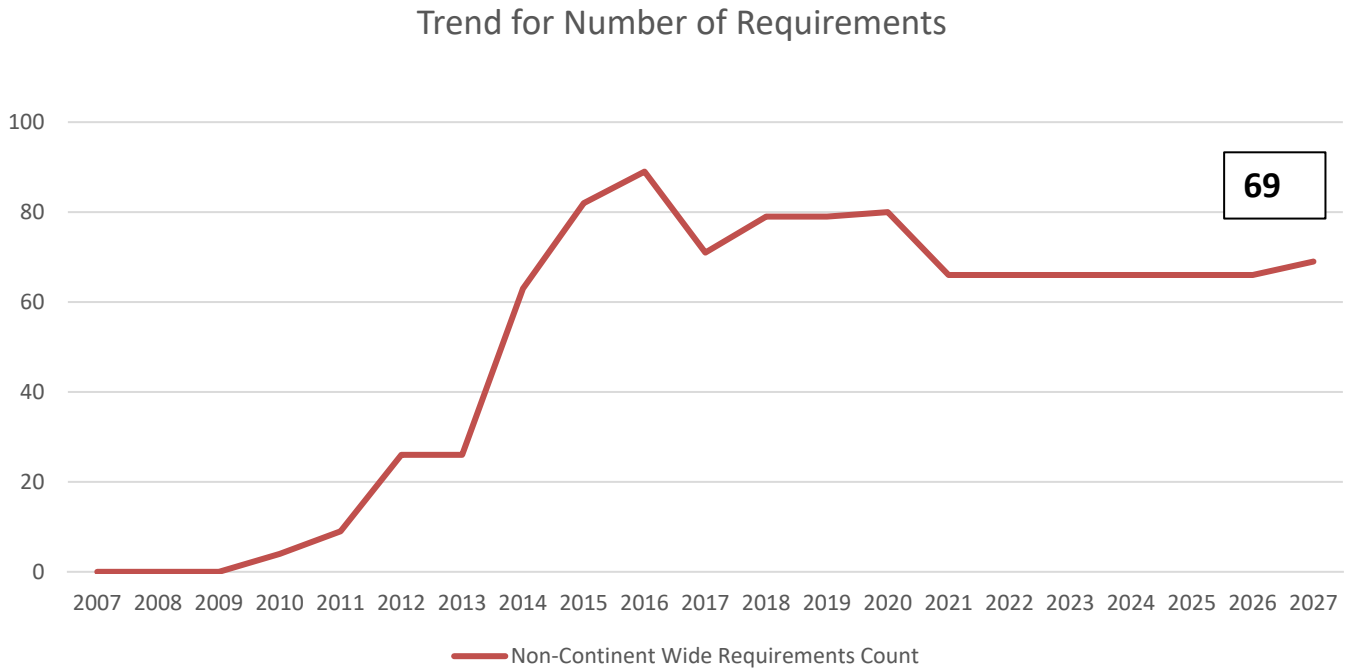


Figure 2: Trend for Number of Requirements for Regional Reliability Standards



Chapter 2: Regulatory Update

NERC FILINGS October 1, 2020 – December 31, 2020

FERC Docket No.	Filing Description	FERC Submittal Date
RD21-1-000	<p>Joint Petition of NERC and WECC for approval of PRC-006-5</p> <p>NERC and WECC submitted to the Federal Energy Regulatory Commission (“FERC”) a petition for approval of proposed Reliability Standard PRC-006-5.</p>	10/27/2020
RD20-2-000	<p>CIP SDT Schedule November Update Supplemental Informational Filing</p> <p>NERC submitted to FERC a supplemental informational compliance filing as directed by FERC in its February 20, 2020 Order. This filing contains a status update on two standards development projects relating to CIP Reliability Standards.</p>	11/13/2020
RM20-19-000	<p>Joint Comments in Response to NOI</p> <p>NERC and the Regional Entities submitted Joint Comments in response to FERC’s Notice of Inquiry regarding Equipment and Services Produced or Provided by Certain Entities Identified as Risks to National Security.</p>	11/23/2020
RM13-11-000	<p>2020 Frequency Response Annual Analysis Report</p> <p>NERC submitted its 2020 Frequency Response Annual Analysis report for the administration and support of Reliability Standard BAL-003-2 – Frequency Response and Frequency Bias Setting.</p>	12/1/2020
RM05-17-000, RM05-25-000, RM06-16-000	<p>2021-2023 Reliability Standards Development Plan</p> <p>NERC submitted its Reliability Standards Development Plan (RSDP) for 2021-2023. This informational filing provides a status update on active development projects and a forecast of future work to be undertaken by NERC and its stakeholders throughout the upcoming year.</p>	12/8/2020

RD21-2-000	<p>NERC Petition for Approval of Proposed Reliability Standards CIP-013-2, CIP-005-7, and CIP-010-4</p> <p>NERC submitted its petition for approval of proposed Reliability Standards CIP-013-2, CIP-005-7, and CIP-010-4 addressing supply chain cybersecurity risk management.</p>	12/14/2020
RD20-2-000	<p>CIP SDT Schedule December Update Informational Filing</p> <p>NERC submitted to FERC an informational compliance filing as directed by FERC in its February 20, 2020 Order. This filing contains a status update on two standards development projects relating to CIP Reliability Standards.</p>	12/15/2020
RM19-20-000	<p>Joint Comments on BAL-002-WECC-3 NOPR</p> <p>NERC and WECC submitted joint comments on FERC's Notice of Proposed Rulemaking regarding proposed Reliability Standard BAL-002-WECC-3.</p>	12/18/2020

FERC ISSUANCES
October 1, 2020 – December 31, 2020

FERC Docket No.	Issuance Description	FERC Issuance Date
EL20-46-000	<p>FERC Order Denying Mabee Complaint</p> <p>FERC issued an order denying a Complaint filed May 12, 2020 related to Reliability Standard CIP-013-1.</p>	10/2/2020
RM19-20-000	<p>WECC Regional Reliability Standard BAL-002-WECC-3 (Contingency Reserve)</p> <p>FERC issued a Notice of Proposed Rulemaking proposing to: (1) approve proposed Regional Reliability Standard BAL-002-WECC-3 (Contingency Reserve); and (2) direct NERC and WECC to submit an informational filing 27 months following its implementation.</p>	10/15/2020
RD20-4-000	<p>Letter order approving revisions to SAR Standards</p> <p>FERC issued a letter order approving revisions to seven Reliability Standards developed under the Standards Alignment with Registration project.</p>	10/30/2020
RR20-7-000	<p>Letter order approving revisions to the NPCC RSPM</p> <p>FERC issued a letter order approving revisions to the Northeast Power Coordinating Council Regional Standard Processes Manual.</p>	11/23/2020
RM20-8-000	<p>FERC Order Directing Informational Filing Regarding Virtualization and Cloud Computing Services</p> <p>FERC issued an order directing NERC to begin a formal process to assess the feasibility of voluntarily conducting BES operations in the cloud in a secure manner and to make an informational filing by January 1, 2022.</p>	12/17/2020
RD21-1-000	<p>Letter order approving Reliability Standard PRC-006-5</p> <p>FERC issued a letter order approving proposed Reliability Standard PRC-006-5.</p>	12/23/2020

Chapter 3: Standards Committee Report

Summary

This report highlights some of the key activities of the Standards Committee (SC) during the fourth quarter of 2020.

The October 21 meeting was cancelled due to lack of time sensitive agenda items.

At its November 19, 2020 meeting, the SC:

- (1) Appointed two additional team members to the Project 2020-03 Supply Chain Low Impact Revisions Standard Authorization Request (SAR) Drafting Team to supplement the team with additional low impact experience;
- (2) Authorized initial posting for Project 2018-03 Standards Efficiency Review Retirements for proposed Reliability Standard FAC-008-5;
- (3) Appointed chair and vice chair of the Project Management and Oversight Subcommittee;
- (4) Approved revised versions of the *SCPS Scope* and *Technical Rationale for Reliability Standards* documents; and
- (5) Received notification that the ballot pool for Project 2015-09 Establish and Communicate System Operating Limits was updated due to merger or entities that were represented in the ballot pool.

At its December 9, meeting, the SC:

- (1) Rejected the SAR for Project 2020-01 Modifications to MOD-032-1 due to lack of industry support in the comments received during the informal SAR comment period;
- (2) Accepted the revised SAR for Project 2020-04 Modifications to CIP-012; authorized drafting revisions to the Reliability Standards identified in the SAR; and appointed the SAR Drafting Team (DT) as the Standard Drafting Team (SDT);
- (3) Approved revisions to the *PMOS Scope* document; and
- (4) Endorsed the Standard Efficiency Review recommendations for a comprehensive review of the *Reliability Standards Template*, *Drafting Team Training Modules*, and *Drafting Team Reference Manual* to ensure the template and drafting team resources facilitates the development of results based standards.

Compliance and Certification Committee (CCC) Board Report

Action

Approve the CCC 2021 Work Plan, and receive information regarding recent activities.

Highlights

The CCC convened its fourth quarter meeting via WebEx on November 17-18, 2020.

- The Committee approved the 2021 Work Plan, which has been submitted for Board consideration. The Plan addresses recurring items from the Committee mandate and has key areas and opportunities for 2021 focused on industry collaboration, CCC program efficiencies, and industry outreach.
- In accordance with the CCC Charter, the Committee seeks and provides stakeholder input and feedback to the NERC Board, associated Board committees, and NERC management with respect to stakeholders' perceptions of the policies, programs, practices, and effectiveness of the Compliance Monitoring and Enforcement Program, Organization Registration and Certification Program, and Reliability Standards Development Program. With the movement away from the ERO Stakeholder Survey as a tool to solicit industry feedback, the Committee is working with NERC management to formulate a revised approach that will enhance the value of information obtained from industry, as well as support ERO continuous improvement efforts more broadly. At the November meeting, the Committee conducted a focused discussion to solicit specific industry sector feedback obtained by CCC members. The new approach is expected to be finalized after the Committee receives feedback from the MRC, which is expected to occur at the February 2021 MRC meeting.
- The CCC collaborates with NERC Internal Audit to fulfill its role of oversight and monitoring. Consistent with CCCPP-001 and CCCPP-007, the self-certification request to NERC management for the Compliance Monitoring and Enforcement, Organization Registration, and Organization Certification Programs has been completed. In addition, consistent with CCCPP-003, the audit of NERC's adherence to the Rules of Procedure in Reliability Standards Development is complete. Per procedure, both reports will be delivered to the EWRC in February.
- The Nominating Subcommittee completed the revisions to Nominating Procedures in accordance with the CCC Charter. The Subcommittee completed the creation of the Committee's onboarding package and materials that will be provided to new members. The Nominations, associated procedure, and supporting materials will be posted to the CCC page on the NERC website to ensure accessibility and transparency for industry participants.
- The Committee received updates from all subcommittees, working groups, and task forces operating on behalf of the full committee in execution of the Committee mandate and ongoing activities.
- In December at the fourth quarter meeting of the Reliability and Security Technical Committee (RSTC), the CCC requested that the CCC and the RSTC formally coordinate

outstanding issues of concern regarding the treatment of facility ratings across the ERO Enterprise. The request was approved by the RSTC and expands the Facility Ratings Task Force to incorporate a collaboration between the RSTC and CCC. Recognizing the ongoing reliability risk discussion related to facility ratings and the NERC continuous improvement model, earlier this year, the CCC established a task force to promote a conversation around risk alignment and potential actions to mitigate reliability risk related to facility ratings. The CCC task force, based on the current participants' expertise, has focused on industry performance, CMEP experience, and industry compliance history. However, congruent with the NERC continuous improvement loop and the task force desire to promote a robust reliability risk conversation –NERC technical committee expertise was missing from the task force's discussions. The industry provides a large volume of reporting information on facility ratings. Finding ways that the collective "we" can use this information to manage reliability risk, develop leading and lagging indicators prompting action (before facility ratings issues lead to events or other operational impacts) would be the ultimate success story. The combined task force includes participation from the North American Transmission Forum (NATF) and works in concert with the efforts previously delivered by the NATF.

- The Committee received updates on several initiatives from NERC management and conducted associated discussions. The status update included the following topics:
 - 2021 Compliance Monitoring and Enforcement Program Implementation Plan,
 - Implementation Guidance Webinar,
 - Compliance Oversight Plan Pre-recorded Industry Webinar,
 - Self-Report and Self-Logging User Guides Reviews,
 - Align Project, and
 - Internal Audit Updates.

The next CCC meeting will be held March 16-18, 2021 via WebEx. We appreciate the continued collaboration with NERC management in support of the Committee's efforts.

NERC

NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

NERC Compliance and Certification Committee 2021 Work Plan

NERC Board Approval: February XX, 2021

Version Approved by CCC: December 28, 2020

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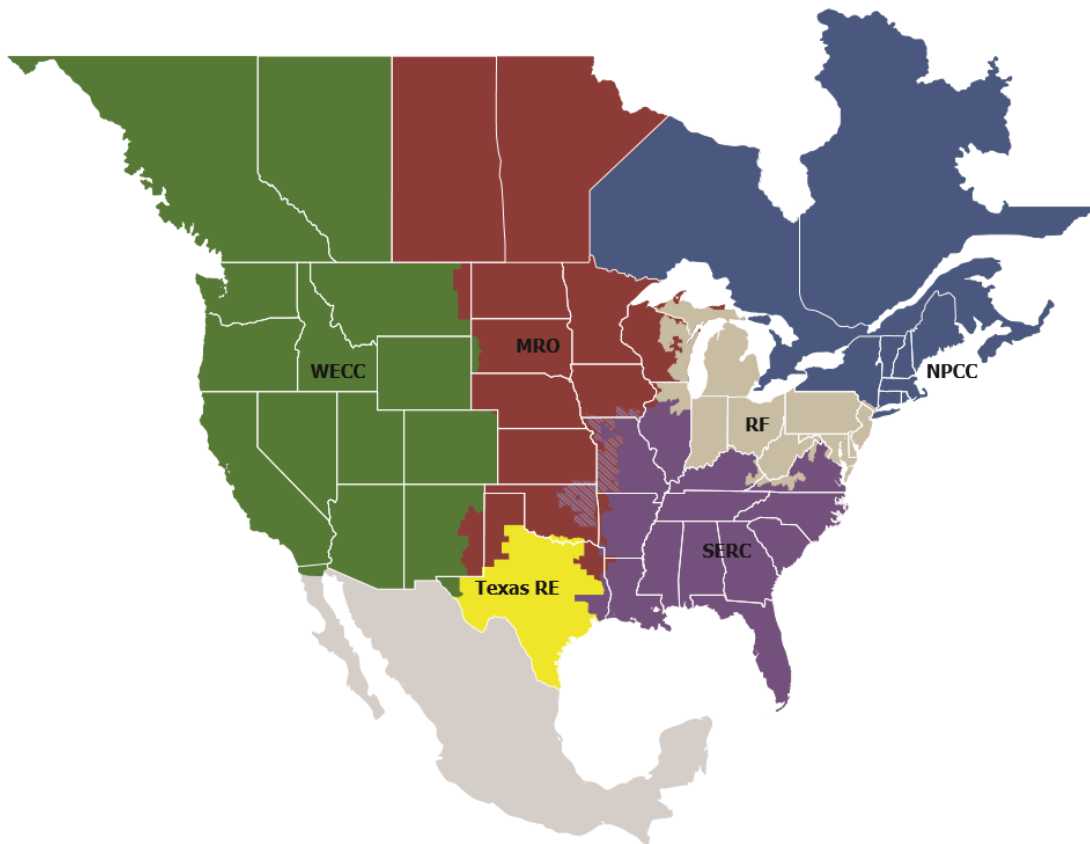
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Preface

Electricity is a key component of the fabric of modern society and the Electric Reliability Organization (ERO) Enterprise serves to strengthen that fabric. The vision for the ERO Enterprise, which is comprised of the North American Electric Reliability Corporation (NERC) and the six Regional Entities (REs), is a highly reliable and secure North American bulk power system (BPS). Our mission is to assure the effective and efficient reduction of risks to the reliability and security of the grid.

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Executive Summary

The purpose of this Work Plan is to identify the anticipated activities and deliverables of the NERC Compliance and Certification Committee (CCC) for 2021. The plan is based on the responsibilities assigned to the CCC by the NERC Board of Trustees (Board) for programs across the ERO Enterprise and tasks identified by the CCC that are required to fulfill these responsibilities.

As a committee providing support and guidance but otherwise independent of the execution of NERC's Compliance Monitoring and Enforcement Program (CMEP) and the Organization Registration and Certification Programs (ORCP), the CCC regularly assesses NERC's adherence to the Rules of Procedure (ROP) for these programs as part of its ongoing work. As a committee independent of Reliability Standards development, the CCC is responsible for establishing and implementing a program as specified in Section 405 of NERC's ROP to monitor NERC's adherence to its Standard Processes Manual (Appendix 3A), with the exception of appeals of substantive or procedural action or inaction associated with a Reliability Standard or the standards process as defined in the Appeals section of the Standard Processes Manual. In 2021, the CCC will continue to work with NERC staff and stakeholders to continue to refine the maturing and ongoing role for the CCC with respect to the ERO's adherence to its processes, procedures, and statutory obligations.

Many of the CCC projects and deliverables included in this Work Plan are intended to support the goals of the ERO Enterprise Operating Plan and the ERO Enterprise Long-term Strategy. There are numerous focus areas in the 2021 ERO Enterprise Work Plan Priorities and key objectives where CCC activities will or may provide extensive support:

- 1. Expand Risk-Based Focus in Standards, Compliance Monitoring, and Enforcement (ERO Enterprise Long-term Strategy Focus Area 1):** The CCC will participate in discussions and outreach opportunities to continue to facilitate opportunities to embed or promote internal control activities into registered entities' compliance efforts through industry relationships and participation in support of key objective #2. Working with ERO Enterprise colleagues and the RSTC colleagues, the expertise of the CCC will support this effort balancing strengthening of controls with prioritization of control implementation based on risk rationalization. Partnership with industry organizations to facilitate additional industry maturity in these areas will support the overall ERO Enterprise priority.
- 2. Assess and Catalyze Steps to Mitigate Known and Emerging Risks to Reliability and Security (ERO Enterprise Long-term Strategy Focus Area 2):** The CCC will participate in discussions with the Reliability Issues Steering Committee and other groups within the ERO Enterprise on the continued development of risk metrics to further evaluate potential emerging issues or threats and trends to facilitate reliability of the bulk power system. The CCC will also identify necessary actions based on stakeholder feedback as inputs to NERC management. In 2021, the CCC will continue its work with NERC staff and stakeholders to identify areas where collaboration with stakeholder committees will assist with the further development and maturation of successful risk mitigation and program administration to support the success of the ERO Enterprise.
- 3. Build a Strong E-ISAC-Based Security Capability (ERO Enterprise Long-term Strategy Focus Area 3):** While the CCC support in this focus area and set of key objectives may be limited, the CCC can encourage, through stakeholder outreach and feedback programs, industry participation and information sharing which ultimately support the objectives to contribute to the overall success of the E-ISAC.
- 4. Strengthen Engagement across the Reliability and Security Ecosystem in North America (ERO Enterprise Long-term Strategy Focus Area 4):** The CCC will serve as a partner to the ERO Enterprise community to facilitate gathering and providing stakeholder feedback. In addition, the CCC will collaborate with ERO Management to deliver outreach to all industry communities to ensure successful implementation of the ERO Enterprise programs (CMEP, ORCP and the SPM).
- 5. Capturing Effectiveness, Efficiency, and Continuous Improvement Opportunities (ERO Enterprise Long-**

term Strategy Focus Area 5): The CCC will provide continued and ongoing input and support into the design of ERO Program development and revision efforts. The CCC will assist in identifying modifications for improvements and associated changes to the NERC ROP and associated documents or processes. In 2021, the CCC will continue to evaluate compliance monitoring and enforcement processes through the strategic use of CCC task forces, including those focused on specific issues (i.e., supply chain, facility ratings, the Functional Model) and emerging issues under consideration during 2021. The CCC serves as a critical partner to evaluate industry feedback on alignment efforts, the Standards Efficiency Review, and support of the Align project through active participation in the Align User Committee.

In addition to these focus areas, the CCC will support the ERO vision to address and prioritize emerging risks to reliability and security through participation in the NERC Standing Committee Coordination Group and as a feedback loop in the ERO Enterprise Framework to Address Known and Emerging Reliability and Security Risks.

The CCC subcommittees and working groups perform certain assigned tasks on behalf of and under the supervision of the CCC. In collaboration with ERO Enterprise Management, the CCC delegates responsibilities to the following subcommittees and working groups for projects and activities:

- Organization Registration and Certification Subcommittee (ORCS)
- ERO Monitoring Subcommittee (EROMS)
- CCC Nominating Subcommittee (NS)
- CCC ERO Alignment Working Group (AWG)

The following pages represent an outline of the work plan deliverables and detailed project information.

Introduction

The CCC is a Board-appointed stakeholder committee serving and reporting directly to the Board. In that capacity under a NERC Board-approved charter,¹ and as approved by FERC² and set forth in NERC's ROP, the CCC will engage with, support, and advise the Board, the NERC Board of Trustees Compliance Committee (BOTCC), and the NERC Board of Trustees Enterprise-wide Risk Committee (EWRC) regarding all facets of the NERC CMEP, Organization Registration program, and Organization Certification program.

The CCC partners with NERC leadership on a variety of key NERC initiatives and criteria for evaluation and assessment of the effectiveness of NERC programs. To support this endeavor, the CCC has developed this work plan to identify the activities that the CCC intends to perform in 2021 to fulfill the responsibilities the Board has established for the CCC.

The CCC provides for balanced discussion, commentary, and recommendations on compliance issues by bringing together a diversity of opinions and perspectives from NERC member sectors. Members are appointed to the CCC by the Board and serve on the committee at the pleasure of the Board.

Individuals deemed qualified to serve on the committee will generally include senior-level industry experts who have familiarity, knowledge, and experience in the areas of compliance, compliance enforcement, compliance administration and management, organization responsibilities and registration, organization certification, and NERC and Regional standards. These individuals are normally involved with internal compliance programs within their respective organizations. Committee members are expected to support the interests of the sector they represent,

to the best of their ability and judgment.

Revision History

Date	Version Number	Comments
October 5, 2020	1	CCC Initial Review
October 27, 2020	2	CCC Executive Committee Version #1
November 9, 2020	3	CCC Executive Committee Version #2

Chapter 1: 2021 CCC Work Plan – Strategic Planning Efforts

The projects included in this category are intended to address succession planning within the CCC as well as clarify the CCC’s role in the broader scope of the maturation of the risk-based approach to reliability and security. Further details on these projects are shown in the following table.

Project #	Project Name	Activities	Resource(s)
1	Industry Collaboration	<ul style="list-style-type: none"> • Participate in Standards Efficiency Review • Continue in leadership role on Standards Efficiency Review Advisory Group • Maintain direct involvement in the Standing Committees Coordination Group and support formalization of this group • Enhance communications and participation with industry groups with a focused plan for coordination • Participate as members of the Align Users Committee 	CCC, CCC Subcommittees
2	Enhancing CCC Program Efficiencies	<ul style="list-style-type: none"> • Continue evaluation of various activities and functions of subcommittees/working groups to determine ways to improve the effectiveness and efficiency of the CCC • Explore opportunities to “cross train” across various CCC subcommittees • Collaborate with NERC Internal Audit team for risk and control maturity opportunities • Hold half-day of CCC hearing training for CCC members • Identify training opportunities for CCC members in collaboration with NERC Standing Committees 	CCC, CCC Subcommittees, NERC Standing Committees, NERC Management

<p>3</p>	<p>Communications</p>	<ul style="list-style-type: none">• Develop materials for onboarding as members join the CCC and to provide to industry stakeholders looking for background information about the CCC• Maintain direct involvement in the Standing Committees Coordination Group• Create feedback loops with the Member Representatives Committee• Formalize the ERO Stakeholder Feedback Program• Create feedback loops with industry organizations in a practical, logical manner	<p>CCC, MRC, NERC Management</p>
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Chapter 2: 2021 CCC Work Plan – Ongoing Responsibilities

The tables below summarize the list of ongoing responsibilities assigned to the CCC. In general, responsibilities are divided into two primary categories: 1) activities that respond to the CCC Charter and the NERC Rules of Procedure, and 2) activities that support the NERC mission. Further details on the deliverables and projects are discussed in the next section by project number identified below.

Project #	Project Name	Activities	Resource(s)
1	Review and Update of CMEP and CCC Programs and Procedures	<ul style="list-style-type: none"> Review and monitor changes to the CMEP and other NERC initiatives that could require updates or changes to CCC programs and procedures Evaluate and review CCC Charter, including functions and responsibilities Evaluate and review potential ROP changes associated with CCC activities Explore opportunities to “cross-train” among subcommittees 	CCC, CCC Subcommittees, NERC Management
2	Program Support Efforts (CMEP, Standards Development)	<ul style="list-style-type: none"> Identify and participate in risk-based compliance assurance outreach and feedback discussions Support outreach on internal controls Support rollout of key activities or program revisions as requested Partner with ERO Enterprise to provide feedback on RSAW development Partner with NERC to provide feedback for CMEP Practice Guides Review stakeholder requests to become a qualified entity to submit compliance implementation guidance Evaluate programs and associated ROP sections for necessary revisions as programs mature Evaluate alignment submissions and work with NERC management on proposed resolutions Actively participate in NERC’s Standards Efficiency Review key objective 	CCC, EROMS, AWG, NERC Management

Project #	Project Name	Activities	Resource(s)
3	Assistance with Review of ERO documentation for ORCP	<ul style="list-style-type: none"> Support review of ERO documentation for ORCP to identify revisions as programs mature 	CCC, ORCS
4	NERC Self-Certifications	<ul style="list-style-type: none"> Support self-certification of CMEP, ORCP, and Standards Development and associated reporting Coordinate with NERC Internal Audit on criteria development, process, and assessment of adherence to NERC ROP as a maturity project for effective ways to conduct risk-based reviews 	CCC, EROMS, NERC Internal Audit
5	NERC Audits	<ul style="list-style-type: none"> In coordination with NERC Internal Audit under Sections 405/406/506 of the NERC ROP, participate in audits of NERC in the areas of CMEP, ORCP, and reliability standards development 	CCC, EROMS, NERC Internal Audit
6	ERO Regional Entity CMEP Audits	<ul style="list-style-type: none"> In accordance with CCCPP-012, support Regional Entity CMEP audits executed by NERC’s Internal Audit and Corporate Risk Management function, consistent with Appendix 4A of the ROP Work to identify process changes to incorporate the reviews from CCCPP-012 into existing reviews associated with other areas (CCCPP-001, 003 and 007) for efficiencies and in accordance with filed ROP changes 	CCC, NERC Internal Audit
7	Enterprise-wide Risk Committee (EWRC) Collaboration	<ul style="list-style-type: none"> Provide input to EWRC as requested Fulfill advisory role to NERC Internal Audits as requested Participate and support EWRC activities and discussions Participate in the annual ERO risk discussions with NERC Management as requested 	CCC Leadership, EWRC and ERO Enterprise Management, NERC Director, Internal Audits, Board Finance and Audit Committee (as needed)

Project #	Project Name	Activities	Resource(s)
8	NERC Reliability Issues Steering Committee Collaboration	<ul style="list-style-type: none"> • Provide input to existing risks, mitigation strategies, and emerging risk identification • Participate and support RISC activities and discussions 	CCC Leadership, NERC Management
9	ERO Enterprise Program Alignment	<ul style="list-style-type: none"> • Address potential ERO program alignment issues to support success of CMEP and ORCP • Assist NERC with screening of information, support further review of reported items, and provide suggested resolutions if warranted 	CCC, Alignment Working Group, NERC Management
10	Support of ERO Effectiveness	<ul style="list-style-type: none"> • Complete development and implementation of stakeholder perception and feedback program • Support development efforts for assessments of ERO effectiveness • Periodically solicit input from the industry, including the Member Representatives Committee • Ensure that information gathered from industry provides insights useful to improve the efficiency and effectiveness of the ERO Enterprise programs • Evaluate results of assessments and provide recommendations for the ERO Enterprise and the BOT 	CCC, EROMS, NERC Management
11	Stakeholder Collaboration	<ul style="list-style-type: none"> • Identify industry stakeholder groups where CCC collaboration will strengthen ERO process and approach • Participate in industry outreach as requested with ERO personnel on designated ERO topics • Lead CCC task forces that are intended to provide guidance to ensure that CMEP impacts are fully considered in technical analyses being undertaken by other technical committees and the ERO Enterprise more generally 	CCC, Stakeholder Committees

Chapter 3: Ongoing Responsibilities - Details

Project 1 – Review and Update of CMEP, CCC Programs and Procedures

- Review CCC programs and procedures in collaboration with NERC management to identify necessary changes and procedural review or approval requirements.
- Update criteria for assessing effectiveness of Regional Entity CMEP activities, considering ERO input, to appropriately reflect program modification, improvements, and prior years' evaluations.
- Continue to assess how CMEP practices change related to risk-based CMEP implementation regarding: (a) monitoring practices (as embodied in CCCPP-010 and also including assisting EROMS in the annual RE evaluation criteria work); (b) enforcement; and (c) Reliability Standards development. Assist NERC with annual evaluation of goals, tools, and procedures of each Regional Entity CMEP to determine effectiveness of each Regional Entity CMEP, using criteria developed by the CCC.
- Per the terms of CCCPP-011, conduct annual review of the criteria for approval to become an organization seeking to be pre-qualified to provide Implementation Guidance to the ERO Enterprise.
- Review the Board Compliance Guidance Policy with the MRC, provide stakeholder feedback on the programs and take associated actions to support improvements working in collaboration with NERC Management.
- Consider ROP changes to Section 500 and associated appendices due to changes with the Functional Model.
- Review and consider changes to Regional Entity Audits (Appendix 4A) and procedure implications to CCCPP-012.
- Continue to improve the CCC Webpage and communication with industry with additional outreach.

Project 2 – Program Support Efforts

- Support CMEP and Standards Development areas in support of ERO Enterprise goals.
- Partner with ERO Enterprise related to review of Reliability Standard Audit Worksheets (RSAWs).
 - CCC comments on RSAWs, as requested.
- Partner with ERO Enterprise in review of CMEP Practice Guides.
 - CCC Alignment Working Group (AWG) comments on CMEP Practice Guides, as requested.
- Monitor and respond to any requests from stakeholders to become pre-qualified organizations that can submit proposed Implementation Guidance.
- Hold “focus group” discussions that are intended to identify opportunities for the ERO Enterprise to drive specific improvements and information sharing across the ERO Enterprise.
- Participate with ERO Enterprise Staff in evaluation of ROP changes and recommend changes as program maturation continues.
- Monitor rollout of Align tool related to program monitoring responsibilities.
- Participate on Align Users Committee (CCC Chair, CCC Vice Chair, AWG Chair)

Project 3 – Assist with Review of ORCP Information Cycle

- Provide additional guidance, as needed, to NERC Staff regarding the entity registration tool: Centralized Organization Registration ERO System (CORES).

- Review and provide suggestions for improvement to the 2021 Organization Certification Program activities.

Project 4 — NERC Self-Certifications

- In years where audits are not conducted, develop and update self-certification forms and request NERC self-certify adherence to the ROP for the following items:
 - Compliance Monitoring and Enforcement Program (CMEP),
 - Organization Registration and Certification Program (ORCP), and
 - Standards Development Program.
- Coordinate with NERC to prepare a summary report of the results of NERC’s assessment to the EWRC.

Project 5 — NERC Audits

- In accordance with applicable CCC monitoring program documents and Sections 405/406/506 of the NERC ROP, work with NERC Internal Audit to execute audits of the following items:
 - Compliance Monitoring and Enforcement Program (CMEP),
 - Organization Registration and Certification Program (ORCP), and
 - Standards Development Program.
- Coordinate with NERC Internal Audit for CCC participation as audit observers.
- Review the final audit report and provide it to the EWRC.

Project 6 — Regional Entity CMEP Audits

- Work with NERC management (Internal Audit and Compliance Assurance) to develop criteria for future audits of Regional Entity CMEPs.
- At the discretion of the CCC, participate as an observer in Regional Entity CMEP audits executed by NERC’s Internal Audit and Corporate Risk Management function, consistent with Appendix 4A of the ROP.
- Incorporate responsibilities captured in CCCPP-012 consistent with Appendix 4A of the ROP into the responsibilities currently captured in CCCPP-001, CCCPP-003 and CCCPP-007 for efficiencies in the processes working with NERC Internal Audit.

Project 7 — Enterprise-Wide Risk Committee Collaboration

- Provide input into NERC’s annual risk assessment, as requested.
- Work with NERC to provide input on the annual EWRC Audit Plan.
- Provide an update of CCC activities at each quarterly EWRC meeting.

Project 8 — NERC Reliability Issues Steering Committee Collaboration

- Perform outreach with stakeholders to gather input for emerging risks.
- Participate in and support Reliability Issues Steering Committee (RISC) updates.
- Participate in evaluation and revisions to the ERO Risk Elements supporting development of the ERO Enterprise Operating Plan and the ERO Enterprise Long-term Strategy.

- Participate and support Reliability Leadership Summit as opportunity occurs.

Project 9 – ERO Program Alignment

- CCC AWG will execute the CCC role within the process to address potential reported concerns related to CMEP and ORCP activities.
 - Gather information regarding potential alignment issues.
 - Evaluate nature and extent of the alignment issue.
 - Develop suggested resolution of the issue.
 - Present suggested resolution to the CCC for review and endorsement.
 - Communicate suggested resolutions of alignment issue to the CCC to communicate to NERC.
 - Provide stakeholder expertise to support the development of Align and CORES.

Project 10 – Support of ERO Enterprise Effectiveness

- Work with NERC Management and the SCCG to formalize the processes between the NERC standing committees to ensure that all NERC committees represent a continuous improvement loop in support of reliability and security.
- Lead efforts to develop a successor to the ERO Effectiveness Survey by soliciting input on objectives, content, and delivery of assessments of ERO effectiveness.
- Ensure that information gathered from industry provides insights that can be used to improve the efficiency and effectiveness of the CMEP.
- Evaluate results of assessments and provide recommendations for the ERO Enterprise and the BOT.

Project 11 – Stakeholder Collaboration

- Identify opportunities where the CCC can provide compliance expertise in collaboration with other industry stakeholder committees.
- Participate in industry outreach as requested by NERC management on designated topics with ERO personnel.
- Strengthen committee collaboration and create joint work products.
- Strengthen partnerships with industry forums to work collaboratively toward consistent understanding of ERO Enterprise Programs and improvements to processes to strengthen reliability and security (NATF, NAGF, Regional Compliance Forums, Councils, Committees, etc.).
- Lead CCC task forces that are intended to provide guidance to ensure that CMEP impacts are fully considered in technical analyses being undertaken by other technical committees and the ERO Enterprise more generally.

Chapter 4: 2021 CCC Work Plan - Deliverables

The tables below summarize the list of CCC work plan deliverables for projects in 2021.

	Project Name	Deliverable	Schedule
1	ERO Program Alignment	<ul style="list-style-type: none"> Periodic reports regarding the effectiveness of the ERO Program Alignment Initiative and Reporting Tool (with NERC management) 	Q2 and Q4 2021 (AWG)
2	Support of ERO Effectiveness	<ul style="list-style-type: none"> Develop and refine package of CCC-related materials that will serve as a replacement to the questions included in previous ERO Effectiveness Surveys 	Q2 2021 (EROMS)
3	NERC Self-Certifications	<ul style="list-style-type: none"> 2021 CMEP/ORCP/SPM Self-Certification Form to NERC, via direct communication from CCC Chair. Assuming no internal audit is conducted in 2021 	Q2 2021 (EROMS)
4a	Review and Update of CMEP and CCC Programs and Procedures	<ul style="list-style-type: none"> Update CCCPP-012 and other procedures identified for review with consideration to ROP changes and congruent with CCCPP-001, 003 and 007 Formalize the process for CCCPP reviews, document management and practices. 	Complete by end of 2021. Subcommittees will develop review schedule.
4b	Review and Update of CMEP and CCC Programs and Procedures	<ul style="list-style-type: none"> Update ORCS Scoping Document 	Q2 2021 (ORCS)
5	Standards Efficiency Review Project	<ul style="list-style-type: none"> Continue to identify projects from Phase II work to be assigned to CCC for further consideration 	Schedule based on timing of feedback from Phase II SER Team

	Project Name	Deliverable	Schedule
6	Stakeholder Collaboration	<ul style="list-style-type: none"> With assistance from the CCC Task Forces, develop recommendations to address potential known or emerging risks considering industry concerns to promote solutions that strengthen reliability and security in a practical manner. Collaborate with NERC Standing Committees and ERO Enterprise leadership to facilitate solutions. 	Q1-Q4 2021

Chapter 5: Logistics and NERC Budget Requirements for CCC Activities

The ongoing COVID-19 pandemic dramatically changed how the CCC performed its work in 2020. Uncertainty will continue in 2021 with respect to the types of meetings and the potential venues for CCC-related meetings. While we expect pandemic conditions to improve in 2021, travel restrictions will likely continue for an undetermined period of time. It is the intent of the CCC to ensure that all CCC members are able to fully participate remotely until health and safety conditions allow for a return to in-person meetings. To that end, CCC meetings and related activities will rely heavily on Webex and conference calls for some portion of 2021.

CCC Quarterly Meetings (Cost to be determined by NERC and industry)

Assumptions: Four CCC meetings per year, via Webex or in-person, depending on COVID-19 conditions

- NERC staff attendance
- NERC travel expenses
- Hotel (Conference rooms if applicable – normally hosted at stakeholder locations or NERC offices)
- Food

CCC Program Audits/Review

Assumptions: Audit/Review using an Independent Contractor

- Audit frequency changes dependent on NERC internal monitoring capability as it continues to mature based upon recommendations of independent reviewer

Webex/Conference Calls (Cost to be determined by NERC)

Assumptions: Conference calls, including CCC/Subcommittees NERC Webex or conference calls quarterly. Until COVID-19 conditions improve, committee will rely exclusively on Webex and conference calls to conduct business.

Training (Cost to be determined by NERC)

Assumptions: Half-day of hearing training appended to regular CCC meeting every other year. CCC members should have the capability to assist with observation and creation of audit criteria to fulfill responsibilities under the CCC charter to conduct audits of NERC's adherence to the ROP. Training is provided, to those new member participants, ahead of the audit activities. This training will be conducted as needed.

Reliability and Security Technical Committee Report

Action

Information

Summary

Chair Greg Ford will report on the Reliability and Security Technical Committee's (RSTC) fourth quarter meetings, some highlights from those meetings are:

September 2020

1. Approved the Subgroup Organization Proposal and announced the RSTC Executive Committee appointed Sponsors for 12 subgroups.
2. Approved the RSTC Notional Work Flow Process document .
3. Approved the Reliability Guideline: DER Data Collection for Modeling in Transmission Planning Studies.
4. Endorsed *Compliance Implementation Guidance: PRC-019-2* for Submittal to the ERO.

October 2020

1. Accepted the Concept Paper: Integrating Security Topics into RSTC Technical Groups
2. Endorsed a SAR for Revisions to MOD-025-2 - Unit Verification and Modeling and a SAR for Revisions to PRC-023-4 – Transmission Relay Loadability for submittal to the Standards Committee
3. Accepted for posting Reliability Guideline: Model Verification of Aggregate DER Models Used in Planning Studies for a 45-day industry comment period.
4. Approved the White Paper on Assessment of DER Impacts on NERC Reliability Standard TPL-001.

December 2020

1. The RSTC was presented information on the NERC/IRC Whitepaper on Ensuring Energy Adequacy. Volunteers are being sought to form a task force to address the issues raised in the whitepaper.
2. Accepted six Reliability Guidelines and Reference Documents to be posted for a 45-day comment period.
3. Approved scope documents for the following subgroups:
 - a. Reliability Assessments Subcommittee (RAS)
 - b. Probabilistic Assessments Working Group (PAWG)
 - c. EMP Working Group (EMPWG)
 - d. Supply Chain Working Group (SCWG) Scope
 - e. Real Time Operating Subcommittee (RTOS)

- f. Inverter-based Resources Performance Working Group (IRPWG)
 - g. Security Integration and Technology Enablement Subcommittee (SITES)
4. Endorsed the Framework to Address Known and Emerging Reliability and Security Risks.
 5. Approved a scope revision of the Facility Ratings Task Force to form it as a joint CCC/RSTC task force and expand its membership to include RSTC members.

Reliability Issues Steering Committee Report

Action

Information

Summary

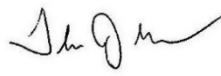
The RISC met via virtually via WebEx on December 9, 2020 to review the progress on the Committee's 2020 Work Plan Priorities. The Committee reviewed and endorsed the Framework to Address Known and Emerging Reliability and Security Risks and recommended it to the Board of Trustees for acceptance at its February 4, 2021 meeting.

In addition, the Committee reviewed the process schedule for the completion of the 2021 ERO Reliability Risk Priorities Report to include the implementation of the Emerging Risks Survey and the 2021 Reliability Leadership Summit. A draft of the updated and refined Emerging Risks Survey was reviewed and minor updates were recommended from the members' discussion. The survey was released on December 14, 2020 and closed on January 15, 2021. Results from the survey will be reviewed and used to populate the 2021 ERO Reliability Risk Priorities Report.

The Committee also reviewed the agenda for the 2021 Reliability Leadership Summit, its confirmed panelists and speakers, and the increased expected audience based on the Summit being conducted virtually via WebEx. The Summit announcement was sent on December 30, 2020, you may click here to register: [2021 RISC Reliability Leadership Summit](#)

Finally, the Committee received an update on the 2021 Reliability Indicators work, as well as the nominations for 2021 RISC Membership.

Chair Peeler will provide further highlights of the Committee's work at the Board of Trustees meeting on February 4.

To: NERC Board of Trustees (BOT)
From: Thomas J. Galloway, NATF President and CEO 
Date: January 13, 2021
Subject: NATF Periodic Report to the NERC BOT (February 2021)
Attachments: NATF External Newsletter (January 2021)

The NATF interfaces with the industry as well as regulatory agencies on key reliability, resiliency, security, and safety topics to promote collaboration, alignment, and continuous improvement, while reducing duplication of effort. Some examples are highlighted below and in the attached NATF external newsletter, which is also available on our public website: www.natf.net/news/newsletters.

Response to COVID-19 Challenges

The NATF continues to work with members and industry partners on responding to the pandemic. A successful ongoing endeavor is collaboration with NERC, the U.S. Department of Energy (DOE), and the Federal Energy Regulatory Commission on an epidemic/pandemic response plan resource. As noted in the newsletter, version 4 of the resource was issued in January.

NERC Alert Regarding Supply Chain Compromises by Advanced Persistent Threat Actor

The NATF conducted a well-attended member webinar on December 29, 2020, to socialize the alert; highlight key points of emphasis as discussed in a meeting of NATF, NERC, and E-ISAC senior leadership; enable member sharing of approaches to address the risk; and solicit questions.

DOE Prohibition Order

The NATF is coordinating with its members regarding the “Prohibition Order Securing Critical Defense Facilities” issued by U.S. Secretary of Energy Dan Brouillette on December 17, 2020.

NATF-NERC Leadership Meetings

NATF and NERC leadership meet periodically to discuss collaborative work and industry topics. A call is scheduled for January 21. Agenda topics include facility ratings, grid security emergencies, and supply chain.

NERC 2021 Reliability Leadership Summit

Representatives from NATF members, including board directors, and the NATF CEO will participate as panelists, moderators, and speakers in this summit. Topics include grid transformation, extreme natural events, security risks, and critical infrastructure dependencies.

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Facility Ratings

NATF staff is communicating with NERC leadership, the Compliance and Certification Committee, and the Reliability and Security Technical Committee regarding facility ratings to help reduce any potential duplication of effort. In addition, as reported in November 2020, the NATF has conducted an initial baseline survey of member implementation status of key practices in the “NATF Facility Ratings Practices Document,” published in June 2020, and is preparing reports for its members. Periodic, high-level summary reports on NATF member overall implementation status will be provided to NERC and the regions (ERO) approximately every six months, with the first report expected towards the end of the first quarter of 2021. See more about NATF work in the attached newsletter.

NATF Supply Chain Efforts

NATF supply chain efforts continue to align industry entities and suppliers on criteria and information needed for entities to assess a supplier’s cyber security risk posture and facilitate mutual risk mitigation, assist entities with methods to conduct supplier risk evaluations, work with other organizations on potential ways to mitigate risk—such as the October 22 webinar on “Managing Compromise of Network Interface Cards,” and align with other supply chain cyber security efforts.

As noted in the attached newsletter, the NATF and the Industry Organizations Team are beginning the annual review process of the NATF Criteria and Questionnaire with inputs from industry, suppliers, third-party assessors, and others (e.g., the World Economic Forum) and hosted a second webinar designed for suppliers (“Suppliers: Responding to Requests for Cyber Security Information”) on January 12.

North American Transmission Forum External Newsletter

January 2021

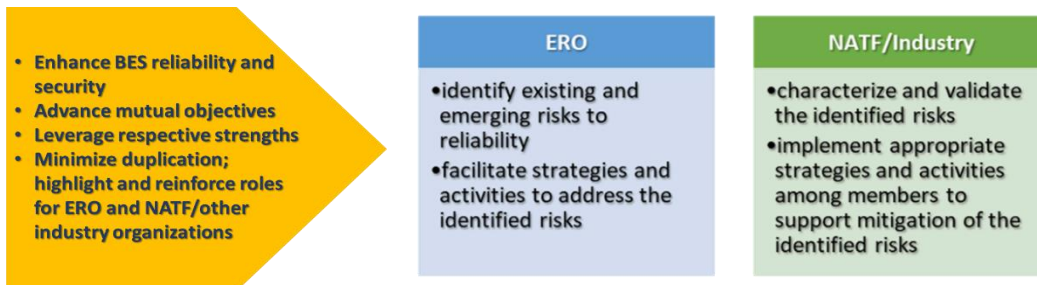
Epidemic/Pandemic Resource Supplemented with Safety and Work-Environment Considerations

The [Epidemic/Pandemic Response Plan Resource](#) has recently been updated to include information on personal protective equipment use, a tertiary control center strategy, and configuration options for control centers and office space.

The resource—which focuses on planning/preparedness, response, and recovery activities for a severe epidemic/pandemic—was jointly developed by the NATF, the North American Electric Reliability Corporation, the U.S. Department of Energy, and the Federal Energy Regulatory Commission to help utilities create, update, or formalize their epidemic/pandemic plans in response to the COVID-19 pandemic.

NATF-SERC-RF Pilot Collaborations on Supply Chain Risk Mitigation and Facility Ratings

In April 2019, the NATF and NERC executed an updated memorandum of understanding to advance mutual objectives, leverage respective strengths, and minimize duplication of effort. Upon agreement among NERC, the NATF, and regional entity CEOs, two initial topics (facility ratings and supply chain risk mitigation) were selected to pilot a collaboration approach with two of the Regional Entities—ReliabilityFirst (RF) and SERC. These pilot collaborations aim to highlight and reinforce the following roles for the ERO and the NATF and other industry organizations, consistent with the NERC-NATF MOU:



The pilot collaborations will also help to develop a repeatable approach for collaboration between the NATF and the ERO Enterprise.

Facility Ratings

A team of subject-matter experts (SMEs) from NATF member companies developed and published the “NATF Facility Ratings Practices Document” in mid-2020. These practices can help ensure that facility ratings are developed using the entity’s facility ratings methodology, equipment and facilities are built and maintained in the field to ensure ratings are accurate, and ratings for equipment and facilities are documented and communicated. The NATF practice document provides a guide to members for establishing a sustainable

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process for developing and maintaining accurate facility ratings. The NATF facility ratings practices were compared against a facility ratings problem statement created by the ERO in November 2019 to ensure the practices developed by the NATF membership address the issues and align with the controls identified by the ERO Enterprise.

The NATF is working with its members to socialize and review member implementation of the NATF facility ratings practices. Periodic, high-level summary reports on NATF member overall implementation status will be provided to NERC and the regions (ERO) approximately every six months, with the first report expected towards the end of the first quarter of 2021.

In addition, NATF staff is communicating with NERC leadership, the Compliance and Certification Committee, and the Reliability and Security Technical Committee regarding facility ratings to help reduce any potential duplication of effort.

Supply Chain Risk Mitigation

For the collaboration on supply chain entity risk mitigation, the NATF, RF, and SERC had planned to develop and conduct a workshop for registered entity security professionals and SMEs in each of the two regions on mitigation practices that entities can employ on their systems, equipment, and networks as an additional line of defense to augment the supply chain risk assessment and procurement practices that are focused on addressing risks at the source. Plans for the face-to-face workshops were postponed due to pandemic restrictions on travel and gatherings. In the interim, the NATF, RF, and SERC collaborated to conduct an industry-wide special webinar on "Identifying and Managing Potential Compromise of Network Interface Cards" on October 22, 2020. The webinar featured presentations from the NATF, RF, SERC, NERC, FERC, and NATF member-company SMEs on the following topics:

- Overview of NATF-ERO Collaboration Pilot
- NATF Supplier Cyber Security Assessment Model – How Entity Mitigation Fits In
- NERC/FERC Joint Staff White Paper on Supply Chain Vendor Identification
- Regional Entity Perspectives on Responding to Supply Chain Compromise Risk
- NATF Member SME Perspectives/Experiences with Supply Chain Compromise Mitigation

Slides from the webinar are posted [here](#) on the NATF public site.

The NATF will continue to work with RF and SERC to explore options for future regional workshops or special webinars on entity mitigation of supply chain risks.

NATF Begins Annual Revision Process for Supply Chain Criteria and Questionnaire

This month, the NATF is beginning the annual revision process for the NATF "Energy Sector Supply Chain Risk Questionnaire" (Questionnaire) and the "NATF Cyber Security Criteria for Suppliers" (Criteria). The Criteria and the Questionnaire are living documents that are being revised pursuant to the "Revision Process for the Energy Sector Supply Chain Risk Questionnaire and NATF Cyber Security Criteria for Suppliers," which is available on the

NATF public website. This process provides for an annual revision cycle as well as for additional revisions throughout the year, as necessary.

For the annual revision process, the Criteria and Questionnaire Revision Team will consider inputs through January and February, and proposed changes will be posted for industry comments in early March. Many inputs have already been received, including inputs from the World Economic Forum.

To facilitate alignment on criteria and questions, however, the review team would benefit from receiving inputs for modifications from across the electric and gas industries, including from suppliers and third-party assessors. Some entities are using a different questionnaire or criteria, and the review team is requesting these entities provide differences so the NATF Criteria and Questionnaire can more closely meet their needs. Entities will always have unique questions for suppliers, but creating significant alignment is enabling industry and suppliers to work together to identify and mitigate potential areas of risk.

Background

The Criteria and Questionnaire are tools that were developed by industry entities, suppliers, and third-party assessors for industry-wide use to drive consistency of information obtained from suppliers of bulk power system hardware, software, and services. They provide criteria to evaluate a supplier's supply chain cyber security posture and specific questions to obtain information on the criteria. The vision for these resources is as follows:

- Align on criteria and information needed to evaluate a supplier's cyber security risks.
- Provide transparency to suppliers to enable suppliers to be prepared to provide entities with information.
- Provide alignment to current security frameworks and other resources to provide assurances for the accuracy of supplier information (e.g., SOC2, ISO27001, etc.).
- Encourage entity/supplier discussions for risk mitigation.
- Align with other industry efforts.

The Criteria and Questionnaire will continue to evolve in response to the current cyber security climate facing industry. The NATF Criteria was first posted in 2019 and revised with inputs from industry organizations and suppliers in 2020, and the Questionnaire was first released in 2020. Since these releases just six months ago, the U.S. Department of Energy issued the "Prohibition Order Securing Critical Defense Facilities" on December 17, 2020, and entities have been evolving cross-functional processes that address not only supply chain cyber security but a supplier's overall cyber security risk posture, including both IT and OT.

Learn more at <https://www.natf.net/industry-initiatives/supply-chain-industry-coordination>.

Protection System Misoperations Analysis Annual Report

The NATF Protection System Misoperations Analysis Initiative began in 2015. The NATF collects Misoperations data, produces metrics the NATF and individual members use to assess improvement efforts, and provides detailed information that the System Protection Practices Group and members can use to address specific causes of Misoperations. The Misoperations Analysis Working Group prepares member-specific protection

system performance metrics that are included in the annual NATF Reliability Performance Reports and prepares a Protection System Misoperation Annual Report to analyze Misoperation categories, causes, and sub-causes and provide recommendations to the System Protection Practices Group and members.

The annual report provides detailed cause analysis protection scheme type. This arrangement, when combined with special analysis of hardware-related and communications-related Misoperations, supports recommendations that are actionable, realistic, effective, and linked to existing NATF practices and Principles of Operating Excellence.

In addition, the 2020 report provides the NATF overall and regional Misoperations rate for three-year time periods, plus assessments of the changes of Misoperation categories and involved relay technologies over the same periods.

Redacted Operating Experience Reports

Since our last newsletter, we have posted two reports to the “[Documents](#)” section of our public site for members and other utilities to use internally and share with their contractors to help improve safety, reliability, and resiliency.

For more information about the NATF, please visit www.natf.net.



North American Generator Forum

**TO: NERC Board of Trustees
James B. Robb, President and CEO**

**FROM: Wayne D. Sipperly Jr, Executive Director, North American
Generator Forum (NAGF)**

DATE: January 15, 2021

SUBJECT: NAGF 2020-2021 Winter Report

The NAGF continues to provide its members with the opportunity to share their plans for business operations in the “new normal” via webinars and the NAGF Groupsite discussion board.

The NAGF 10th Annual Meeting was conducted virtually over October 13, 14 and 15, 2020. Attendance averaged about 90 participants per day and the speaker line up was robust and diverse. Mark Lauby and Jason Blake provided Keynote addresses, Manny Cancel provided an E-ISAC update and representatives from NERC, SERC, ReliabilityFirst, and member companies provided presentations on topics relevant to the generator community.

The NAGF is actively engaged in the following NERC Projects to help ensure the generator sector perspective is heard and understood:

- NERC Project 2019-04: Modifications to PRC-005-6
- NERC Project 2019-06: Cold Weather

The NAGF has quarterly webinars to enhance communication and engage NAGF membership regarding recent NAGF activities, upcoming initiatives, and to acquire feedback regarding activities of interest. The NAGF 4Q2020 Member Webinar was held on December 10, 2020 with over 80 participants.

On December 22, 2020, the NAGF participated in the NERC conference call for Trade Organizations/Forum regarding the *NERC Level 2 Alert – Supply Chain compromises by Advances Persistent Threat Actor*. The NAGF shared this information with membership accordingly.

The NAGF is moving forward with the redesign of its existing NAGF public and members-only websites to provide a single website with the capabilities to support and sustain the future growth of the organization. The public section of the new website is 90% complete; workflow design, discussion board functionality, and content layout for the members-only section along with event registration/on-line payment functions are currently under development. It is anticipated that beta testing will commence in January 2021.