Agenda
Board of Trustees
November 7, 2018 | 8:30 a.m.–12:00 p.m. Eastern
(Please note the Schedule may be adjusted real-time should meetings conclude early and/or extend past their scheduled end time.)

Grand Hyatt Atlanta in Buckhead
3300 Peachtree Rd NE
Atlanta, GA 30305

Conference Room: Grand Ballroom – Lower Lobby Level

Call to Order and NERC Antitrust Compliance Guidelines

Introductions and Chair’s Remarks

Consent Agenda - Approve

1. Minutes*
   a. August 16, 2018

2. Committee Membership and Charter Amendments*
   a. Compliance and Certification Committee Charter Amendments
   b. Personnel Certification Governance Committee Membership
   c. Critical Infrastructure Protection Committee Membership and Charter Amendments

Regular Agenda

3. Remarks and Reports
   a. Remarks by Cheryl LaFleur, Commissioner, FERC
   b. Remarks by Katie Jereza, Deputy Assistant Secretary, DOE
   c. Remarks by David Morton, CAMPUT Representative to NERC
   d. President’s Report

4. Report on Semiannual Meeting of NERC Trustees and Regional Entity Boards – Information

5. Report on Board of Trustees November 5, 2018 Closed Session – Information

6. Board Committee Reports
   a. Corporate Governance and Human Resources
   b. Compliance
   c. Finance and Audit
      i. Third Quarter Unaudited Financial Statements – Accept
   d. Enterprise-wide Risk
e. Technology and Security
f. Nominating Committee
g. Report by Vice Chair on Standards Quarterly Activities

7. Standards Quarterly Report and Actions*
   a. Supply Chain Activities – Update
   b. Standards Efficiency Review – Update
   c. TPL-001-5 – Transmission System Planning Performance Requirements – Adopt
   d. IRO-006-TRE - IROL and SOL Mitigation in the ERCOT Region – Retire
   e. 2019-2021 Reliability Standards Development Plan – Approve

8. Other Matters and Reports
   a. Policy Input and Member Representatives Committee Meeting – Discussion
   b. Revisions to the NERC Rules of Procedure (Sections 600, 900, and Appendix 3A)* – Approve
   c. RISC Report on Resilience* – Accept
   d. Manitoba Memorandum of Understanding* – Approve
   e. Reliability Coordinator Function in the Western Interconnection* – Update
   f. Addressing Recommendations from Recent Reliability Assessments* – Update

9. Committee Reports*
   a. Operating Committee
   b. Planning Committee
   c. Critical Infrastructure Protection Committee
   d. Member Representatives Committee
   e. Personnel Certification Governance Committee
   f. Standards Committee
   g. Reliability Issues Steering Committee
   h. Compliance and Certification Committee
   i. Electricity Subsector Coordinating Council

10. Forum and Group Reports*
    c. North American Generator Forum

*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.
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”) in Calgary, Alberta on August 16, 2018, at 8:30 a.m. Mountain, 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, Jr., Vice Chair
Janice B. Case
Robert G. Clarke
Frederick W. Gorbet
David Goulding
George S. Hawkins
Suzanne Keenan
Robin E. Manning
James B. Robb, President and Chief Executive Officer
Jan Schori

NERC Staff
Charles A. Berardesco, Senior Vice President, General Counsel, and Corporate Secretary
Tina Buzzard, Associate Director
Howard Gugel, Senior Director of Standards
Scott Jones, Senior Vice President, Chief Financial and Administrative Officer, and Corporate Treasurer
Ed Kichline, Senior Counsel and Director of Enforcement Oversight
Mark G. Lauby, Senior Vice President and Chief Reliability Officer
Ken McIntyre, Vice President and Director of Standards and Compliance
John Moura, Director of Reliability Assessment and System Analysis
Janet Sena, Senior Vice President and Director of Policy and External Affairs
Michael Walker, Senior Vice President and Chief Enterprise Risk and Strategic Development Officer
NERC Antitrust Compliance Guidelines
Mr. Thilly noted the public nature of the meeting and directed the participants’ attention to the NERC Antitrust Compliance Guidelines included with the advance meeting materials, and stated that any additional questions regarding these guidelines should be directed to Mr. Berardesco.

Welcoming Remarks
Mr. Thilly welcomed all of the attendees, expressing his appreciation of the interest and support of stakeholders through their attendance at meetings. Mr. Thilly remarked that the prior days’ meeting of the Member Representatives Committee went exceptionally well, and he commended the presenters on their outstanding presentations.

Consent Agenda
Upon motion duly made and seconded, the Board approved the amended consent agenda, reflecting an additional item to appoint a NERC officer, as follows:

Minutes
The draft minutes for the June 12, 2018 and May 10, 2018 meetings were approved as presented to the Board at this meeting.

Appointment of NERC Officer

RESOLVED, that the Board, upon the recommendation of the President and the CGHRC, hereby appoints the following individual as an officer of the Corporation for 2018:

- Bill Lawrence, Vice President and Chief Security Officer

Committee Membership Appointments and Charter Revisions

Critical Infrastructure Protection Committee

RESOLVED, that the Board hereby approves the appointment of the following individuals to the Critical Infrastructure Protection Committee, representing the SERC Region, each to serve for an unexpired term:

- Tony Hall of LGE-KU, to replace Cynthia Hill-Watson, of TVA.

Planning Committee

RESOLVED, that the Board hereby approves the following appointments, for a term of two years.
### Planning Committee Annual Election Results: 2018–2020 Term

<table>
<thead>
<tr>
<th>Sector</th>
<th>Elected Members</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Investor-Owned Utility</td>
<td>Jason Spitzkoff</td>
<td>Arizona Public Service Company</td>
</tr>
<tr>
<td>3. Cooperative Utility</td>
<td>Joseph Sowell</td>
<td>Georgia Transmission Corporation</td>
</tr>
<tr>
<td>4. Federal or Provincial Utility/Federal Power</td>
<td>Wayne Guttormson</td>
<td>SaskPower</td>
</tr>
<tr>
<td>Marketing Administration</td>
<td>Steve Blackburn</td>
<td>Hydro-Quebec</td>
</tr>
<tr>
<td>5. Transmission Dependent Utility</td>
<td>Brian Zavesky</td>
<td>Missouri River Energy Services</td>
</tr>
<tr>
<td>6. Merchant Electricity Generator</td>
<td>Michael Goggin</td>
<td>Grid Strategies LLC</td>
</tr>
<tr>
<td>7. Electricity Marketer</td>
<td>Kyle Vander Helm</td>
<td>Tenaska</td>
</tr>
<tr>
<td>8. Large End-Use Electricity Customer</td>
<td>No nominations received</td>
<td>N/A</td>
</tr>
<tr>
<td>9. Small End-Use Electricity Customer</td>
<td>No nominations received</td>
<td>N/A</td>
</tr>
<tr>
<td>10. Independent System Operator/Regional</td>
<td>Dana Walters</td>
<td>NYISO</td>
</tr>
<tr>
<td>Transmission Organization</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. State Government</td>
<td>Cezar Panait</td>
<td>Minnesota Public Utilities Commission</td>
</tr>
</tbody>
</table>

**Operating Committee**

**RESOLVED**, that the Board hereby approves the following appointments, for a term of two years.
Operating Committee Annual Election Results – 2018-2020 Term

<table>
<thead>
<tr>
<th>Sector</th>
<th>Elected Member</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Investor-Owned Utility</td>
<td>Doug Hils</td>
<td>Duke Energy</td>
</tr>
<tr>
<td>2. State/Municipal Utility</td>
<td>Sidney Jackson</td>
<td>Rochester Public Utilities (Minnesota)</td>
</tr>
<tr>
<td>3. Cooperative Utility</td>
<td>Jeff Harrison</td>
<td>AECI</td>
</tr>
<tr>
<td>4. Federal or Provincial Utility/Federal Power</td>
<td>Michelle Rheault</td>
<td>Manitoba Hydro</td>
</tr>
<tr>
<td>Marketing Administration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Transmission Dependent Utility</td>
<td>Brian Robinson</td>
<td>Utility Services, Inc.</td>
</tr>
<tr>
<td>7. Electricity Marketer</td>
<td>JT Thompson</td>
<td>NIPPC</td>
</tr>
<tr>
<td>8. Large End-Use Electricity Customer</td>
<td>Tom Siegrist</td>
<td>Stone, Mattheis, Xenopoulos and Brew, PC</td>
</tr>
<tr>
<td>9. Small End-Use Electricity Customer</td>
<td>No nominations received</td>
<td>N/A</td>
</tr>
<tr>
<td>10. Independent System Operator/ Regional</td>
<td>Peter Brandien</td>
<td>ISO New England</td>
</tr>
<tr>
<td>Transmission Organization</td>
<td></td>
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</tr>
</tbody>
</table>

**Compliance and Certification Committee**

**RESOLVED,** that the Board hereby approves the appointment of a new CCC representative for the State/Municipal Utility sector, for a three-year term effective upon the date of Board approval.

- John Allen, City Utilities of Springfield, MO.
Regular Agenda

Remarks by Dave Erikson, Chief Executive Officer, Alberta Electric System Operator ("AESO").
Mr. Thilly introduced Mr. Erikson of AESO. Mr. Erikson welcomed the attendees to Calgary. He stressed value of infrastructure, including electricity, in making Calgary the most livable city in North America. Mr. Erikson also discussed the transformation in the Alberta system, including initiatives to expand renewables and to phase out coal-fired generation. Mr. Erikson stated that NERC has an enormous role to play as the industry transforms, helping industry tackle challenges in a risk-based manner. He encouraged continued collaboration to face emerging challenges.

Remarks by Catherine Jereza, Deputy Assistant Secretary, U.S. Department of Energy ("DOE")
Mr. Thilly introduced Ms. Jereza of DOE. Ms. Jereza discussed DOE priorities, focusing on the North American grid modeling project. She explained that this project will provide a tool allowing for better study of the grid and potential recovery strategies, addressing issues such as resilience. She also discussed work that is underway at DOE to develop a procedure for the collection, storage, and dissemination of Critical Energy Infrastructure Information under the Fixing America’s Surface Transportation ("FAST") Act of 2015.

Remarks by Murray Doehler, Past Chair, CAMPUT and David Morton, Incoming CAMPUT Representative to NERC
Mr. Thilly introduced Mr. Doehler, noting his retirement and thanking him for his work with NERC and the enhancement of relationships between NERC and Canadian regulators. Mr. Thilly commended Mr. Doehler’s dedication to public service.

Mr. Morton was welcomed as the new CAMPUT representative to NERC. Mr. Morton remarked that the August 14, 2018 meeting between NERC and the Canadian regulators went well, as did the meetings held the prior day. He emphasized the need for ongoing monitoring of evolving issues, such as distributed resources. Mr. Morton thanked Mr. Doehler for his service, and he noted that he looks forward to serving in his new role.

Remarks by Sergio Marchi, President and CEO, Canadian Electricity Association ("CEA")
Mr. Thilly introduced Mr. Marchi of CEA. Mr. Marchi welcomed the attendees to Canada and congratulated Mr. Lawrence on his appointment as chief security officer. He noted the positive role of NERC since the August 2003 blackout and the importance of NERC as an international reliability organization. Mr. Marchi noted NERC’s continuing work and stated that it should be done in a cost-effective and efficient manner. He noted the ongoing discussions around the E-ISAC and the value it may provide to Canadian entities, given the ongoing efforts of the Canadian governmental authorities in the area of cyber security. He stated that CEA and its members do not support the 25 percent budget increase for the E-ISAC, due to the perceived lack of value. He noted his support of continued work to enhance the value of the E-ISAC for Canadian entities.

Mr. Thilly responded that the Board is very focused on the execution of the E-ISAC strategic plan and enhancing the value of the E-ISAC for Canadian entities. He encouraged Canadian entities to increase their participation in the E-ISAC.
President’s Report
Mr. Robb delivered the president’s report. He noted that 2018 is a year of anniversaries for NERC, and he noted the blackouts, including the August 2003 blackout, that led to formation of NERC and its designation as the Electric Reliability Organization. Mr. Robb provided an update on his four areas of focus: (1) security, including the E-ISAC; (2) Reliability Coordinator issues in the West; (3) integration of new technologies; and (4) the changing resource mix.

With respect to the first priority, Mr. Robb stated that he was very pleased that NERC has completed its chief security officer search. He noted Mr. Lawrence’s service orientation and the role of the E-ISAC, stating that much work remains to execute the E-ISAC strategic plan. He also thanked Mr. Roxey for his service as interim chief security officer.

With respect to the second priority, Mr. Robb noted that NERC and WECC are working in full lockstep to address Reliability Coordinator issues in the West and emphasized the need to remove uncertainty.

With respect to the third priority, Mr. Robb emphasized the need to focus on the effect of new resources, such as inverters and electric storage resources, and noted the great work and collaboration with industry and vendors to address potential issues. He noted the development of a guideline, currently out for comment and scheduled for technical committee review in September, as well as a potential standards development project to address inverter-based resources. He also noted the work of the Institute of Electrical and Electronic Engineers (IEEE) on vendor standards.

With respect to the fourth priority, Mr. Robb stated that NERC conducted a successful workshop in July 2018 addressing issues surrounding the changing resource mix. The focus, he noted, will be to encourage the development of solutions to address issues. Mr. Robb noted that work was currently underway on a guideline for contingency studies. He also noted the need to consider whether a standards-based approach could be used to address some of these issues.

Mr. Robb thanked industry and the NERC team for their support in his early months as NERC president and CEO. He introduced Tim Gallagher, President and CEO of ReliabilityFirst, as the new vice-chair of the ERO Executive Management Group. Mr. Robb congratulated Sara Patrick in her new role as CEO of MRO and Melanie Frye in her new role as CEO of WECC, and he noted the possibilities for continued growth and improvement that have been made possible through new ERO Enterprise leadership. He thanked Mr. Lauby for his leadership during the transition period. He also congratulated SERC and MRO, along with the SPP team, for their excellent work completing the transition of the former SPP RE registered entities to their new Regional Entities.

Report on Board of Trustees and Canadian Regulators Meeting
Mr. Thilly reported that the NERC Board of Trustees and the Canadian regulators met on August 14, 2018.

Report on Board of Trustees August 16, 2018 Closed Session
Mr. Thilly reported that before the open meeting, as is its custom, the Board met in closed session with NERC management, and subsequently in executive session without NERC management, to review NERC
management activities. In these sessions, the Board discussed confidential matters, including contract, personnel and security issues. The Board also discussed legal issues.

Board Committee Reports

Corporate Governance and Human Resources Committee

Mr. Clarke, Committee Chair, reported on the Committee’s meeting the prior day to discuss, among other things, trustee compensation. He noted the process that was used to study trustee compensation, the requirements of the governance guidelines, the workload of trustees, and the Board’s prior determination to increase compensation less than suggested by the study results. Mr. Thilly noted the work of the Committee and staff regarding metrics, which will be presented for further discussion in November.

Upon motion duly made and seconded, the Board adopted the following resolution:

WHEREAS, the Board’s Corporate Governance and Human Resources Committee (the “CGHRC”) is required to review annually the compensation program for independent Trustees and to make recommendations to the Board, as appropriate.

WHEREAS, the CGHRC engaged the compensation consulting firm of Willis Towers Watson (“WTW”), to conduct an update to the market study of Board compensation completed in 2015, to aid in its determination of whether to recommend any changes to the Board’s compensation program.

WHEREAS, WTW compared current Trustee compensation and the structure of the Board’s current compensation structure to the market perspectives used in 2015, also updating its view of overall compensation trends, and prepared a report, which has been reviewed and accepted by the CGHRC.

WHEREAS, the CGHRC considered the findings and recommendations in the WTW report, as well as (i) the fact that Regional Entity and RTO/ISO data is from 2016 and in limited cases, 2017 and IOU and general industry data is from 2017, and that it is reasonable to assume from the trends shown in the report, that compensation has continued to increase, (ii) the need to consider any compensation adjustment in light of NERC’s overall budget, (iii) that the workload for all Trustees has continued to be at a level higher than any of the peer groups, (iv) the Board Chair, Vice Chair and Committee chairs have substantial additional responsibilities and time commitments, as a member of the Board, currently the Vice Chair, serves as a liaison to the Standards Committee, (v) that the current compensation structure, utilizing fixed retainers, is consistent with best practice trends in director compensation, (vi) that it remains important for NERC to be able to recruit and retain qualified and quality individuals to board service, and that NERC competes directly with Regional Entities, ISOs and RTOs, IOUs, and even private sector companies in attempting to attract such individuals to NERC, and (vii) that the conflict of interest requirements at NERC for Trustees, which include financial interest and investment prohibitions, employment/consulting prohibitions, and industry board service prohibitions, and the fact that NERC is non-profit and offers no stock options or benefits, reinforce the need for NERC to offer competitive compensation to Trustees, understanding the limits NERC places on what might be other opportunities for financial reward.
WHEREAS, based on its review of the WTW report and its deliberations in open session, the CGHRC has recommended Board approval of modifications to the Trustee compensation program.

NOW, THEREFORE, BE IT RESOLVED, that the Board hereby approves the following compensation program for independent Trustees:

- Annual Retainer: The Board hereby establishes a target annual retainer for each Trustee of $127,500. The new retainer will be implemented in three annual installments of $5,000, beginning in 2019, and be fully implemented by January 1, 2021.

- Committee Chair: The Board hereby retains the current Committee Chairs annual retainer of $10,000.

- Vice Chair Retainer: The Board hereby establishes an annual retainer of $5,000 for the Board Vice Chair, with a separate retainer of $5,000 for the Trustee who is designated as the liaison to the Standards Committee, beginning on January 1, 2019.

- Chair Retainer: The Board hereby establishes a target annual retainer for the Board Chair of $175,000. The new retainer will be implemented in three annual installments of $5,000, beginning in 2019 and be fully implemented by January 1, 2021.

Compliance Committee
Ms. Case, Committee Chair, reported on the executive and open meetings of the Committee held earlier in the week. She observed that the BOTCC meetings have evolved over time to provide for dialogue. She noted that the BOTCC discussed at its open meeting the prior day higher-risk operations and planning violations involving the vegetation management and facility ratings standards.

Finance and Audit Committee
Ms. Schori, Committee Chair, reported on the open meeting of the Committee held the prior day. She presented the second 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 Second Quarter Unaudited Financial Statements, as presented to the Board at this meeting.

Ms. Schori then presented the NERC and Regional Entity Proposed 2019 Business Plans and Budgets and Associated Assessments to the Board. She noted that the budget process continues to improve and thanked NERC staff, the Regional Entities, and the MRC for their work. Upon motion duly made and seconded, the Board approved the following resolutions:

**RESOLVED,** that the Board hereby approves the following, substantially in the form presented to the Board at this meeting:
i. The proposed 2019 NERC Business Plan and Budget, including the additions to, and use of, the Assessment Stabilization Reserve;

ii. The proposed 2019 Business Plans and Budgets of the Regional Entities and the Western Interconnection Regional Advisory Board; and

iii. The proposed 2019 assessments to recover the costs of the approved 2019 budgets, subject to adjustments to reflect final Net Energy for Load numbers, together with such other adjustments as may be necessary.

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.

**Enterprise-wide Risk Committee**

Mr. Goulding, Committee Chair, reported the Committee met in closed session by telephone on August 7, 2018. At its meeting, the Committee reviewed the 2018 audit plan, which he reported was proceeding according to schedule, and the status of remediation activities to address prior audit findings and recommendations. The Committee also reviewed the risk register and heat map, which focuses on risks to NERC and the ERO Enterprise, as well as the activities of the Compliance and Certification Committee.

**Technology and Security Committee**

Mr. Hawkins, Committee Chair, reported that the Committee held its quarterly meeting by telephone on August 9, 2018. He noted the Committee’s role on ERO technology efforts, including the Compliance Monitoring and Enforcement Program (“CMEP”) technology project and the situational awareness tool (“SAFNR”), and its work with the E-ISAC Member Executive Committee on the E-ISAC strategic plan. He also noted his pleasure with the selection of Mr. Lawrence as chief security officer.

**Nominating Committee**

Mr. Gorbet, Committee Chair, reported that the Committee met in closed session on August 14, 2018. He reviewed the composition of the committee and discussed its work on selecting a Canadian trustee. Mr. Gorbet reported that the Committee has reviewed an initial list of potential candidates and is working to identify a potential slate of candidates for interviews. Mr. Gorbet explained that the Committee intends to recommend a candidate to the MRC in December and conduct a vote in February.

**Report by Vice Chair on Standards Quarterly Activities**

Mr. DeFontes reported on the recent Standards Committee conference calls and meetings. He remarked upon the excellent leadership of the Committee and discussed upcoming standards activity, including Standard Authorization Requests that will be considered by the Standards Committee within the next month. He also noted the ongoing work on studying supply chain issues.

**Standards**

Mr. Gugel provided an update on activities related to supply chain management. He reviewed the findings of the interim report on supply chain issues developed with EPRI, highlighting: (1) the distribution of vendors supplying remote terminal units, operating systems, and energy management systems to industry; (2) current vendor practices to mitigate supply chain risks, such as third party accreditation; and
(3) the applicability of the CIP standards, observing the need for additional information on low impact assets. He discussed next steps and thanked industry groups for their work on this issue.

Mr. Gugel provided an update regarding the Standards Efficiency Review, including the development of a draft Standard Authorization Request and the plan to use a phased approach for addressing the recommendations. He stated that the CIP standards would not be included in the first phase of the project, but recommendations have been made to the existing CIP standards drafting team.

Mr. Gugel then presented on the following Reliability Standards-related projects. After discussion, and upon motions duly made and seconded, the Board approved the following resolutions:

**Reliability Standard BAL-002-3 Disturbance Control Standard**

**RESOLVED**, that the Board hereby adopts the proposed Reliability Standard BAL-002-3, as presented to the Board at this meeting.

**FURTHER RESOLVED**, that the Board hereby approves the associated implementation plan, as presented to the Board at this meeting.

**FURTHER RESOLVED**, that the Board hereby approves the proposed retirement of Reliability Standards BAL-002-2, as 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 resolutions.

**Reliability Standard CIP-012-1 – Cyber Security – Communications between Control Centers**

**RESOLVED**, that the Board hereby adopts the proposed Reliability Standard CIP-012-1, as presented to the Board at this meeting.

**FURTHER RESOLVED**, that the Board hereby approves the associated implementation plan, 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 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.
**Reliability Standard VAR-001-5 – Voltage and Reactive Control**

**RESOLVED,** that the Board hereby adopts the proposed Reliability Standard VAR-001-5 and related effective date, 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 Standards VAR-001-4.2, as 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 resolutions.

**Other Matters and Reports**

*Reliability Coordinator Function in the Western Interconnection*

Ms. Frye provided an update on recent developments regarding the Reliability Coordinator function in the Western Interconnection, including the recent decision by Peak Reliability to wind down operations at the end of 2019, a joint WECC-NERC letter providing a September 4 deadline for entities to tell WECC of plans of Reliability Coordinator service, and a potential project to develop a regional variance to the IRO-002-5 standard. She also noted the Reliability Coordinator certification timelines. Ms. Frye indicated that updates will continue to be provided during the transition.

*NERC Rules of Procedure Section 1208 Registration Transfer Request of Wisconsin Public Service Corporation and Upper Michigan Energy Resources*

Mr. McIntyre presented on a request to transfer the registration of two entities from MRO to ReliabilityFirst under Section 1208 of the NERC Rules of Procedure. Upon motion duly made and seconded, the Board approved the following resolutions:

**WHEREAS,** consistent with Section 1208.3 of the NERC Rules of Procedure (ROP), ReliabilityFirst Corporation (RF) submitted a written request to NERC on May 1, 2018 to transfer the registration of Wisconsin Public Service Corporation (WPSC) and Upper Michigan Energy Resources Corporation (UMERC) from the Midwest Reliability Organization (MRO) to RF and MRO has informed NERC and RF that it does not oppose the request and will support NERC’s decision determining the appropriate registration for WPSC and UMERC.

**WHEREAS,** on May 2, 2018, NERC posted information concerning the proposed transfer on its website for 21 days and received one comment in support of the registration transfer request.

**WHEREAS,** NERC staff analyzed the request and supporting materials submitted by RF and adopted the analysis, as presented to the Board at this meeting, as consistent with Section 1208 of the ROP.
WHEREAS, NERC management recommended that the NERC Board of Trustees approve the transfer.

RESOLVED, that the Board hereby approves the proposed reassignment of the registration of WPSC and UMERC from MRO to RF.

FURTHER RESOLVED, that the Board hereby approves the amendments to the Regional Delegation Agreement between NERC and MRO, substantially as presented to the Board at this meeting.

FURTHER RESOLVED, that the Board hereby approves the amendments to the Regional Delegation Agreement between NERC and RF, substantially as 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 resolutions.

Revisions to Appendix 4E of the NERC Rules of Procedure
Mr. Kichline presented on proposed revisions to Appendix 4E to the NERC Rules of Procedure, Compliance and Certification Committee Hearing Procedures, Hearing Procedures for Use in Appeals, and Mediation Procedures. Upon motion duly made and seconded, the Board approved the following resolutions:

RESOLVED, that the Board hereby approves the proposed amendments to Appendix 4E to the NERC Rules of Procedure, as 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.

Section 1600 Geomagnetic Disturbance Data Request
Mr. Moura presented a proposed request for data or information under Section 1600 of the NERC Rules of Procedure relating to the collection of geomagnetic disturbance ("GMD") data. Mr. Moura thanked the GMD Task Force for its work and noted that all procedural steps, including public comment periods, were followed in the development of the request. Mr. Moura also reported that the Planning Committee endorsed the proposed request. Mr. Moura reviewed the information being requested and noted that requests for Confidential Treatment of data would be handled in accordance with Section 1500 of the NERC Rules of Procedure. After discussion, and upon motion duly made and seconded, the Board approved the following resolution:

RESOLVED, that the Board, hereby approves the collection of geomagnetic disturbance data from Transmission Owners and Generator Owners in the United States that possess geomagnetically-induced current monitoring and magnetometer data, pursuant to NERC’s authority under Section 1600 of the NERC Rules of Procedure, as presented to the Board at this meeting.
Proposed Amendments to the Western Electricity Coordinating Council Bylaws
Mr. Berardesco presented on proposed amendments to the WECC Bylaws. Upon motion duly made and seconded, the Board approved the following resolutions:

**RESOLVED,** that the Board hereby approves the amendments to the Bylaws of the Western Electricity Coordinating Council, substantially as 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 resolutions.

FERC Technical Conference Report
Ms. Sena and Mr. David Ortiz, Acting Director of the FERC Office of Electric Reliability, provided an overview of the FERC Reliability Technical Conference regarding the Bulk-Power System held on July 31, 2018 at FERC’s Washington, DC office. Ms. Sena and Mr. Ortiz discussed the panels and focus areas, including NERC Reliability Standards and NERC priorities, resilience, managing new technologies, and addressing cybersecurity threats. Mr. Ortiz discussed each of the panels and the presentations made at the technical conference.

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.

Operating Committee
Lloyd Linke, Committee Chair, referenced the written report and highlighted certain items, including work surrounding Reliability Coordinator reliability plans, the upcoming Annual Monitoring and Situational Awareness Technical Conference planned for October 2-3, 2018, and a presentation on lessons learned from Hurricane Irma. Mr. Linke also reported that, with its work having been completed, the Essential Reliability Services Working Group was disbanded.

Planning Committee
Brian Evans-Mongeon, Committee Chair, referenced the written report, highlighting its work on GMD issues and protection system single points of failure. Mr. Evans-Mongeon also reported that, with its work having been completed, the Distributed Energy Resources Task Force was disbanded.

Critical Infrastructure Protection Committee
Marc Child, Committee Chair, referenced the written report. He highlighted the Committee’s work on physical security deliverables, including guidelines addressing physical security considerations for high-impact control enters and security conditions during extreme events.

Member Representatives Committee
Greg Ford, MRC Vice Chair, summarized issues that had been discussed at the August 15, 2018 MRC meeting. He noted the key role for the MRC to provide policy input to the Board and various ways it undertakes that role.
**Personnel Certification Governance Committee**
Michael Anderson, Committee Chair, provided an update on the activities of the Committee and noted the positive effects of transitioning to a new platform for System Operator Certification Continuing Education Database (SOCCED). He also noted the recent increase in fees for System Operator Certification exams and renewals, as referenced in the written report.

**Standards Committee**
Andrew Gallo, Committee Chair, referenced the written report and summarized recent Committee activities, including Standard Authorization Requests, creation of standard drafting teams, and an ongoing project to revise the Standard Processes Manual, Appendix 3A to the NERC Rules of Procedure.

**Reliability Issues Steering Committee**
Peter Brandien, Committee Chair, provided an update on the activities of the Committee, highlighting the status of the resilience report and its ongoing work on the agenda for the 2019 Reliability Leadership Summit to be held in Washington, DC on March 14, 2019.

**Compliance and Certification Committee**
Jennifer Flandermeyer, Committee Chair, referred to the written report and expressed her appreciation for positive collaboration with NERC staff, including on the CMEP technology project and the standards efficiency review project.

**Electricity Subsector Coordinating Council**
Mr. Robb discussed a recent meeting at the Idaho National Laboratory, where topics such as communications issues and physical security defense approaches were discussed. Mr. Robb also reported on a meeting with the U.S. Department of Homeland Security and DOE on the government/private sector partnership, addressing how to improve the integration of Canadian partners in information sharing with the U.S. government.

**Forum and Group Reports**

**North American Energy Standards Board (NAESB)**
Michael Desselle, NAESB Chair, referenced the written report and noted that NERC and NAESB continue to collaborate on items of mutual interest.

**North American Transmission Forum**
Tom Galloway, Forum CEO, referenced the newsletter included in its written report, and highlighted how it describes the work the Forum is undertaking to address key reliability issues. He also highlighted the Forum’s work on supply chain issues, including the development of its cyber security supply chain risk management white paper.

**North American Generator Forum**
Allen Shriver, Forum chief operating officer, referenced the written report and summarized the recent workshops on frequency response and energy storage and gas infrastructure risks.
Adjournment
There being no further business, and upon motion duly made and seconded, the meeting was adjourned.

Submitted by,

Charles A. Berardesco
Corporate Secretary
Agenda
Board of Trustees
August 16, 2018 | 8:30 a.m.–12:00 p.m. Mountain
(Please note the Schedule may be adjusted real-time should meetings conclude early and/or extend past their scheduled end time.)

The Westin Calgary
320 4th Avenue SW
Calgary, AB T2P 2S6, Canada

Conference Room: Britannia/Belaire/Mayfair – Conference Level

Call to Order and NERC Antitrust Compliance Guidelines

Introductions and Chair’s Remarks

Consent Agenda - Approve

1. Minutes*
   a. June 12, 2018 Meeting
   b. May 10, 2018 Meeting

2. Committee Membership and Charter Amendments*
   a. Critical Infrastructure Protection Committee Membership
   b. Planning Committee Membership
   c. Operating Committee Membership
   d. Compliance and Certification Committee Membership

Regular Agenda

3. Remarks and Reports
   a. Remarks by Dave Erickson, CEO, AESO
   b. Remarks by Catherine Jereza, Deputy Assistant Secretary, DOE
   c. Remarks by Murray Doehler, Past Chair, CAMPUT and Incoming CAMPUT Representative to NERC, David Morton
   d. Remarks by Sergio Marchi, President and CEO, CEA
   e. President’s Report

4. Report on Board of Trustees and Canadian Regulators Meeting – Information

5. Report on Board of Trustees August 14, 2018 Closed Session – Information
6. **Board Committee Reports**
   a. Corporate Governance and Human Resources
      i. Trustee Compensation – **Approve**
   b. Compliance
   c. Finance and Audit
      i. Second Quarter Unaudited Financial Statements – **Accept**
      ii. NERC and Regional Entity Proposed 2019 Business Plans and Budgets and Associated Assessments – **Approve**
   d. Enterprise-wide Risk
   e. Technology and Security
   f. Nominating Committee
   g. Report by Vice Chair on Standards Quarterly Activities

7. **Standards Quarterly Report and Actions***
   a. Supply Chain Activities – **Update**
   b. Standards Efficiency Review – **Update**
   c. BAL-002-3 – Disturbance Control Standard – **Adopt**
   d. CIP-012-1 – Cyber Security – Communications between Control Centers – **Adopt**
   e. VAR-001-5 Voltage and Reactive Control – **Adopt**

8. **Other Matters and Reports**
   a. Reliability Coordinator Function in the Western Interconnection* – **Update**
   b. NERC Rules of Procedure Section 1208 Registration Transfer Request of Wisconsin Public Service Corporation and Upper Michigan Energy Resources* – **Approve**
   c. Revisions to Appendix 4E of the NERC Rules of Procedure* – **Approve**
   d. Section 1600 Geomagnetic Disturbance Data Request * – **Approve**
   e. Proposed Amendments to the Western Electricity Coordinating Council Bylaws* – **Approve**
   f. FERC Technical Conference Report – **Information**

9. **Committee Reports***
   a. Operating Committee
   b. Planning Committee
   c. Critical Infrastructure Protection Committee
   d. Member Representatives Committee
   e. Personnel Certification Governance Committee
   f. Standards Committee
g. Reliability Issues Steering Committee

h. Compliance and Certification Committee

i. Electricity Subsector Coordinating Council

10. Forum and Group Reports*
   c. North American Generator Forum

*Background materials included.
Compliance and Certification Committee Charter Amendments

**Action**
Approve

**Summary**
The Compliance and Certification Committee (CCC), because of the SPP RE dissolution, approved changes to the CCC Charter, “Attachment A CCC Membership Structure” to reflect the removal of SPP RE from CCC membership. The revised Charter submission is for Board of Trustees’ approval.

**Attachment 1:** Redline Changes to CCC Charter, “Attachment A CCC Membership Structure”
Compliance and Certification Committee Charter

Approved by FERC on June 28 XXXXX, 2018, in Docket No. RR198-4XX-000.

February 8 XXXXX, 2018
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Mission

In the capacity of a North American Electric Reliability Corporation (NERC) Board of Trustees (Board)-appointed stakeholder committee serving and reporting directly to the NERC Board, the Compliance and Certification Committee (CCC) will engage with, support, and advise the NERC Board and NERC regarding all facets of the NERC Compliance Monitoring and Enforcement Program (Compliance and Enforcement program), Organization Registration program (Registration program), and Organization Certification program (Certification program). As a committee providing support and advice but otherwise independent of the execution of these programs, the CCC will monitor NERC’s adherence to the Rules of Procedure (ROP) for these programs. Also and in a similar manner, as a committee independent of the Reliability Standards development process, the CCC will be the body responsible for monitoring NERC’s adherence to the (ROP) regarding the Reliability Standards development process 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. The CCC is also responsible for establishing and implementing a program to monitor NERC’s compliance with the Reliability Standards that apply to NERC.
Compliance and Certification Committee Functions

To fulfill its mission, the CCC performs the following functions:

1. Organizes and conducts committee meetings directly with NERC staff regarding all facets of the Compliance and Enforcement, Registration, and Certification programs;¹

2. Provides comments and recommendations to the NERC Board and NERC staff;

3. Provides comments to NERC with respect to stakeholders’ perception of the policies, practices, and effectiveness of the Compliance and Enforcement program, Registration program, and Certification program;

4. Recommends revisions of the electric reliability organization (ERO) ROP related to the Compliance and Enforcement program, Registration program, and Certification program to the NERC Board;

5. Establishes and implements programs to monitor:²
   a. NERC’s adherence to Section 405 for Compliance Monitoring and Enforcement, including but not limited to the uniform CMEP (Appendix 4C) and the Sanction Guidelines (Appendix 4B).
   b. NERC’s adherence to Section 506 for Organization Registration and Certification, including but not limited to the Organization Registration and Certification Manual (Appendix 5A).
   c. NERC’s adherence to Section 300 of the ROP regarding the Reliability Standards development process with the exception of appeals of substantive or procedural action or inaction associated with a Reliability Standard or the Reliability Standards process as defined in the appeals section of the Reliability Standards Development Procedure. Committee members who have participated in the development process for a particular Reliability Standard shall not participate in the committee’s monitoring of that process.
   d. NERC’s compliance with the Reliability Standards that apply to NERC.

6. Serves as the hearing body for any contest regarding findings of or penalties or sanctions for violation(s) of Reliability Standard(s) where NERC is directly monitoring the entity for compliance with those standards (registered entity by agreement with a Regional Entity or absent a delegation agreement; the Region itself where approved standards are applicable to the Region) as described in Section 408 of the NERC ROP;

7. As directed by the NERC Board, serves as the mediator for any disagreements between NERC and the Regional Entities concerning NERC performance audits of Regional Entities’ compliance programs. When directed by the Board to serve as mediator, the committee chair will appoint three disinterested members of the committee to meet with representatives of NERC and the Regional Entity to attempt to resolve the matter.

8. At the discretion of the CCC, participates as an observer in Regional Entity Compliance Program audits executed by NERC’s Internal Audit and Corporate Risk Management function, consistent with Appendix 4A of the ROP.

9. Actively supports the Standards Committee in the development of new and revised standards by providing a pool of qualified compliance oriented personnel for participation in the compliance administration element phase of the standards development process;

¹ Meetings are conducted under Section 4 of this Charter.
² Monitoring by the CCC is ongoing and does not preclude, interfere with or replace, in whole or in part, the NERC Board’s responsibility to conduct and provide such reviews of these programs as required by Federal Energy Regulatory Commission (the Commission) regulations, 18 C.F.R. § 39.3.c: “The Electric Reliability Organization shall submit an assessment of its performance audits three years from the date of certification by the Commission, and every five years thereafter.”
10. Provides assistance to NERC and the Regional Entities to implement the Compliance and Enforcement, Registration, and Certification programs; and

11. Undertakes assignments from the Board or the Board’s Compliance Committee related to compliance and enforcement, organization registration, organization certification, and standards development.
Membership

Goals
The CCC provides for balanced discussion, commentary, and recommendations on compliance issues by bringing together a wide diversity of opinions and perspectives from NERC member sector experts who have particular familiarity, knowledge, and experience in the area of compliance and NERC Standards and Regional Standards.

Appointment and Terms of Service
Members are appointed to the committee by the NERC Board and serve on the committee at the pleasure of the Board. Member terms are the lesser of three years from appointment or interim approval (Section 5.b), replacement, or removal by the Board. Members may be reappointed at the conclusion of a term. There is no limitation on the number of times a member may be reappointed. A member may be recommended to the Board for reappointment by the Nominating Subcommittee by self-nomination. To the extent practicable, member terms will be staggered such that approximately one-third of the committee is subject to reappointment or replacement each year.

Qualifications
Individuals deemed qualified to serve on the committee will generally include senior-level industry experts who have particular familiarity, knowledge, and experience in the area of compliance, compliance enforcement, compliance administration and management, organization responsibilities and registration, organization certification, and NERC Standards and Regional Standards. These individuals should be involved with internal compliance programs within their respective organizations.

Expectations
Committee members are expected to represent the interests of the sector they represent to the best of their ability and judgment. In addition to the duties, rights, and privileges described elsewhere in this charter, committee members will:

1. Act consistently during meetings with the procedures in this manual and Robert’s Rules of Order;
2. Demonstrate and provide knowledge and expertise in support of committee activities;
3. Adjudicate in a fair and unbiased manner that meets applicable legal and due process requirements when participating in hearing procedures conducted under the NERC ROP Section 408;
4. Solicit comments and opinions from constituents and groups of constituents or trade organizations represented by the member and convey them to the committee;
5. Respond promptly to all committee requests, including requests for reviews, comments, and votes on issues before the committee;
6. Arrange for a proxy to attend and vote at committee meetings in the member’s absence; and
7. Respond promptly to all requests to register for committee meetings.

Representation
The membership structure of the CCC will be modeled upon the membership structure of the NERC Member Representatives Committee (MRC) as described in NERC’s Bylaws (the Bylaws) Article VIII Section 2 [see Attachment A]. This should produce a committee that has an appropriate balance of entities subject to compliance with the NERC Reliability Standards and NERC’s Compliance and Enforcement program, and others affected by the Standards and the Compliance and Enforcement program.
Regional Entities
Each Regional Entity, or the applicable regional organization if no Regional Entity exists for the geographic area, may nominate one member to the committee. In aggregate, the sector will have voting strength equivalent to two members. The voting weight of each Regional member’s vote will be set such that the sum of the weight of all available Regional members’ votes is two votes.

Canadian Representation
The committee structure will include representation by Canadians as laid out in Article VIII Section 4 of the Bylaws.

NERC Membership
Users, owners, and operators of the bulk power system are subject to the Compliance, Registration, and Certification programs regardless of whether they are NERC members. It is expected that committee members will generally be from organizations who are NERC members; however, committee members may be non-members of NERC who are subject to the qualifications identified herein and meeting requirements laid out in the Bylaws for non-NERC-member participation in the MRC.

Selection
The CCC will conduct open nominations processes to receive nominations to fill any membership vacancies. Prospective members of the committee may be identified to the CCC via any means the committee finds acceptable, including solicited or unsolicited nomination by a recognized industry group or association, general open solicitation by the committee for nomination(s), individuals’ self-nomination, directed solicitation by the committee to an individual or individuals, or referral by the Board or other NERC body or committee.

Nominating Subcommittee
The CCC will annually appoint a Nominating Subcommittee to identify, qualify, and recommend individuals to fill sector representative vacancies on the committee or, when required, to serve as the chair or vice chair of the committee. The subcommittee will identify the individuals they are recommending to the full CCC for review. Individuals recommended by the subcommittee for appointment to the committee must be approved by the Board.

Interim Approval
Upon approval of the committee, individuals identified and selected by the Nominating Subcommittee for membership on the committee may serve as members on an interim basis pending their appointment by the Board.

Expertise
When selecting individuals to recommend for committee membership, the Nominating Subcommittee will seek to engage individuals who, in aggregate, provide the committee with a level and breadth of expertise sufficient to achieve its goals and fulfill its scope and responsibilities while respecting other important factors such as industry sector, Region, interconnection, and country.

Regional Entity Members
Each Regional Entity, or the applicable regional organization if no Regional Entity exists for the geographic area, may nominate an individual to serve as a member representing their organization. The Nominating Subcommittee will defer to these nominations. The nomination is non-binding upon the Board. Vacancies on the committee will exist where the Regional Reliability Organization or Regional Entity has not provided a nomination.

Canadian Members
The Nominating Subcommittee will endeavor to attract and engage Canadians with suitable qualifications and expertise in adequate numbers to satisfy Article VIII Section 4 of the Bylaws. Recognized Canadian organizations
such as the Canadian Electricity Association and Canada’s Energy and Utility Regulators will be consulted and solicited for assistance in recruiting Canadians to serve on the committee. All members considered to be serving as Canadians on the committee will be expected to have an endorsement, as appropriate, of such an organization. Canadian representatives should be capable of representing Canadian viewpoints in committee activities, in addition to the sector that they otherwise represent. Consistent with practice regarding the MRC, the Board may appoint additional Canadian individuals to the committee towards satisfying Article VIII Section 4 of the Bylaws.

**Industry Sector Members**

The Nominating Subcommittee will assess the qualifications of nominees and select individuals to recommend to the NERC Board for appointment to the committee. The subcommittee may give preference to candidates nominated by organizations generally considered by the industry as representative of a broad cross-section of the industry sector in question, such as an industry trade association. A NERC Member sector may elect to identify sector representatives for nomination to the Nominating Subcommittee through a process approved by the NERC Board.

**General Nominations and Appointment Process**

The committee’s secretary administers the general nominations process.

**Requesting Nominations**

The NERC staff will request nominations and will forward all nominations received to the Nominating Subcommittee. The Nominating Subcommittee will then prepare its recommended slate of members. The recommended slate will be reviewed by the whole committee for information purposes before it is submitted to the Board. The committee may approve the slate to serve as members on an interim basis, pending appointment by the Board at the Board’s earliest convenience, but will not otherwise act on the slate.

**Board Approval**

The Nominating Subcommittee will present the recommended committee membership slate to the Board for approval. If the Board approves the recommended committee slate, each member on the slate is appointed. The Board may also appoint members individually as needed to meet membership balance and fill vacancies.

**Vacancies and Non-participation**

The committee’s secretary will administer the nominations process for vacancies on the committee.

**Addressed on an Ongoing Basis**

Vacancies on the committee can be addressed on an ongoing basis through receipt and consideration of both solicited and unsolicited nominations for the vacant positions.

**Role of the Nominating Subcommittee**

Nominations received for vacancies will be vetted by the Nominating Subcommittee in the same manner as general nominations. The subcommittee may subsequently and individually recommend nominees they deem qualified to the NERC Board for consideration for appointment to the committee. Existing committee members may also approve such individuals to serve as members on an interim basis pending full appointment by the Board.

**Resignations**

**By the Member**

In the event a member can no longer serve on the committee, that member will submit a written resignation to the committee chair or the secretary.
Requested by the Chair
The chair may request any committee member who ceases to participate in the committee, as indicated by not attending or sending a proxy for two consecutive meetings, to submit a resignation or to request continuation of membership with an explanation of extenuating circumstances. If a written response is not received within 30 days of the chair’s request, the lack of response will be considered a resignation.

Referral to the Nominating Subcommittee
The committee chair will refer the vacancy resulting from a resignation to the Nominating Subcommittee of the committee. If a recent list of nominations is available to the Nominating Subcommittee that it deems to be valid, the subcommittee will recommend a replacement nominee; otherwise, the subcommittee will request NERC staff prepare a new solicitation for nominations to fill that position. The Nominating Subcommittee will follow the previously stated criteria in recommending a replacement.

By the Board
Committee members serve at the pleasure of the Board who may request resignation from, remove, or replace a member from the committee, as the Board deems appropriate.

Interim Approval
The committee chair may seek a vote of the committee to allow the proposed replacement member to be seated, pending appointment of the replacement at the Board’s next scheduled meeting.

Proxies
A substitute representative, or proxy, may attend and vote during all or a portion of a committee meeting in lieu of a voting member provided the absent member notifies the committee chair, vice chair, or secretary of the proxy.

Notification
Such notification will be in writing (electronic medium is acceptable). The proxy representatives and their affiliation will be named in the correspondence.

Serving as Proxy
A voting member of a committee may not serve as a proxy for another voting member on the same committee (i.e. a member may not cast more than their own vote).

Exclusions
Regional Entity Staff
Regional Entity staff members who administer any portion of the Compliance and Enforcement program, Registration program, or Certification program for that Regional Entity, or for any other Regional Entity, may not serve as a member of the CCC.

Organizations
No two individuals from the same organization, or affiliated organizations, may serve concurrently on the committee. Any committee member who has a membership conflict of this nature is obligated to notify the committee secretary, who shall inform the committee chair. Members impacted by such a conflict, such as through a merger of organizations, may confer between themselves to determine which member should resign from the committee and notify the committee secretary and chair; however, if both members are within the same industry sector and cannot reach an amicable solution by determining the member to remain, the Nominating Subcommittee will review the qualifications of each member and propose the member to remain to the full committee who will determine which member shall continue to serve, subject to Board approval. If the conflict is not resolved in a timely manner by the impacted members, the committee chair shall notify all members of the
affected industry sectors recommending actions to resolve the conflict. If the membership conflict is still unresolved, the committee chair shall take the conflict to the NERC Board for resolution.

**NERC Staff**

The Director of Compliance Assurance shall not be a member of the committee or vote on committee business. The Director of Compliance Assurance and the secretary shall be recused from participating in any committee activity that involves monitoring of NERC’s adherence to ROP or activity that the Director of Compliance Assurance oversees. If the NERC staff coordinator has been recused from participating in a Committee activity, the chair shall appoint another member of the committee as acting secretary for any meetings or other activities from which the NERC staff coordinator is recused.

**Changes in Member Affiliation**

A committee member whose affiliation has changed may retain the membership position under these circumstances:

1. The new organization is in the same industry sector, and
2. The member meets all other membership requirements.

**Conflict of Interest**

No committee member may have a conflict of interest that would impair his or her ability to fulfill obligations under this charter. Any committee member who knows of any form of membership conflict, such as working for an entity affiliated with that of another committee member, will notify the committee chair within 10 business days of obtaining that knowledge.
Meetings

In the absence of specific provisions in this manual, all committee meetings will follow Roberts Rules of Order.

Quorum

Two-thirds Requirement
The quorum necessary for transacting business at meetings of the committee is two-thirds of the voting members currently on the committee’s roster.

Interim Basis
Voting members approved by the committee on an interim basis, pending appointment by the Board, will be counted in the determination of a quorum.

Lack of Quorum
If a quorum is not present at the beginning of the meeting, the committee may not take any actions requiring a vote by the committee; however, the chair may, with the consent of the members present, elect to allow discussion of the agenda items.

Voting
Actions by members of the committee will be approved upon receipt of the affirmative vote of two-thirds of the votes present (including proportional votes by Regional Representatives) at any meeting at which a quorum is present.

Antitrust Guidelines
All persons attending or otherwise participating in a NERC committee meeting will act in accordance with NERC’s Antitrust Compliance Guidelines at all times during the meeting.

Open Meetings
NERC committee meetings will be open to the public, except as noted below under Confidential Information.

Confidential Sessions
At the discretion of the CCC chair, a meeting or portion of a meeting may have attendance limited based on confidentiality of the information to be disclosed at the meeting. Such limitations should be applied sparingly and on a non-discriminatory basis as needed to protect information that is sensitive information or confidential information to one or more parties. All hearings of compliance matters will be confidential sessions. Confidential information will only be disclosed as provided by NERC ROP 1500. Confidentiality agreements may also be applied, as necessary, to protect sensitive information or confidential information.

Types of Meetings
Meetings may be conducted in person, by conference call, or by other means. The procedures contained in this manual will apply to all meetings regardless of how they are conducted.

Majority and Minority Views
All members of a committee will be given the opportunity to provide alternative views on an issue. The results of committee actions, including recorded minutes, will reflect the majority as well as any minority views of the committee members. The chair will communicate both the majority and any minority views in presenting results to the Board.
**Action Without a Meeting**

**Two-thirds Majority**
Any action required or permitted at a meeting of the committee may be taken without a meeting if two-thirds of the total votes available to the members of the CCC (including the proportional votes available to Regional Representatives) approve taking the action outside of a meeting.

**Procedure**
Such action without a meeting will be performed by mail or electronic ballot (e.g., telephone, fax, email, or Internet) and will be recorded in the minutes as a roll call ballot. The secretary will announce the action required at least 10 days before the date on which the action is to be voted. As time permits, members should be allowed a window of 10 business days to vote. The secretary will provide the results of such an action within 10 business days of the close of the voting period.
Officers and Staff

General

Number of Positions
The committee will have two officers and one secretary.

Officers
The committee officers will be one chair and one vice chair.

Executive
The committee shall retain an Executive Committee consisting of the committee officers, subcommittee chairs, secretaries, and the Director of Compliance Assurance.

Secretary
The NERC staff coordinator will serve as the committee’s secretary.

Voting of Officers
The committee chair and vice chair are voting members of the committee.

Officers Nominated by the Nominating Subcommittee
The CCC Nominating Subcommittee will recommend a chair and a vice chair who are then appointed by the NERC Board for a two-year term. The term of the chair and the vice chair, except for the first year, will begin on July 1 and end on June 30.

Officers as Sector Representatives
The chair and vice chair are selected from the membership of the committee and, in addition to their chair or vice chair responsibilities, will continue to serve as a member for the sector for which they were appointed to the committee.

Chair
The chair will direct and provide general supervision of committee activities, including the following:

1. Coordinate the schedule of all committee meetings, including approval of meeting duration and location;
2. Develop committee agendas and rule on any deviation, addition, or deletion from a published agenda;
3. Preside at and manage committee meetings, including the nature and length of discussion, recognition of speakers and proxies, motions, and voting;
4. Will lead or direct the conduct of any hearings and the preparation of any adjudicatory documents by the committee under Section 408 of the NERC ROP;
5. Will ensure actions and undertakings by the committee under the NERC ROP Section 408 meet all applicable legal and due process requirements;
6. Will act as spokesperson for the committee at forums inside and outside of NERC; and
7. May attend meetings of the NERC Board when necessary to report to the Board on committee activities.

Vice Chair
The vice chair will assume the responsibilities of the chair under the following conditions:

1. At the discretion of the chair (for brief periods of time);
2. When the chair is absent or temporarily unable to perform the chair’s duties; or
3. When the chair is permanently unavailable or unable to perform the chair’s duties. In the case of a permanent change, the vice chair will continue to serve until a new chair is nominated and selected by the Board.

**Staff Coordinator**
A member of the NERC staff will be selected by NERC’s Director of Compliance Assurance to serve as the staff coordinator and secretary of the committee. The staff coordinator is not a committee member and does not have a vote. Under the direction of the committee executive and applicable NERC bylaws, guidelines, and ROP, the staff coordinator will do the following:

1. Manage the day-to-day operation and business of the committee;
2. Prepare and distribute the notices of the committee meetings, prepare the meeting agenda, and prepare and distribute the minutes of the committee meetings; and
3. Act as the committee’s parliamentarian.
Nominating Subcommittee

Appointment
The CCC will annually appoint a Nominating Subcommittee.

Five Members
The subcommittee will consist of five members nominated by the committee chair and approved by the committee. The chair of the subcommittee will be selected by the CCC chair from among the five subcommittee members.

Appointed Annually
The chair will appoint the subcommittee members at the first regular meeting of the committee of the calendar year.

Length of term
The subcommittee members will serve for up to 14 months or until a new Nominating Subcommittee is authorized, whichever is earlier.

Duties
In addition to the duties, rights, and privileges described elsewhere in this manual, members of the Nominating Subcommittee will:

1. Prepare a slate of committee officer candidates for submission to the NERC Board for approval, and
2. Prepare a slate of recommended individuals to fill designated committee vacancies as required.
Subordinate Groups

Committee Organization
The CCC organizational structure will be arranged as allowed in the NERC Bylaws to support a superior-subordinate hierarchy that is ordered as follows: a committee, a subcommittee, a working group, and a task force, with a committee being primary and a task force being quaternary.

Subgroups
The committee may establish subcommittees, working groups, and task forces as necessary. The committee chair may also form any of these subordinate groups on behalf of the committee. The committee will be the responsible sponsor of all subordinate subcommittees, working groups, or task forces it may create, or that its subordinate subcommittees and working groups may create. The committee will keep the Board informed of all groups subordinate to the committee.

Subcommittees
The committee may establish subcommittees to which the committee may delegate some of the committee’s broadly defined continuing functions. The committee will approve the scope of each subcommittee it forms. The committee chair will appoint the subcommittee officers (typically a chair and a vice chair) for a specific term (generally two years). The subcommittee officers may be reappointed for up to two additional terms. The subcommittee will work within its assigned scope and be accountable for the responsibilities assigned to it by the committee. The formation of a subcommittee, due to the permanency of the subcommittee, will be approved by the Board.

Working Groups
The committee or any of its subcommittees may delegate specific continuing functions to a working group. The sponsoring committee or subcommittee will approve the scope of each working group it forms. The chair of the sponsoring committee or subcommittee will appoint the working group officers (typically a chair and a vice chair) for a specific term (generally two years). The working group officers may be reappointed for up to two additional terms. The sponsoring committee or subcommittee will conduct a “sunset” review of each working group every two years. The working group will be accountable for the responsibilities assigned to it by the committee or subcommittee and will, at all times, work within its assigned scope.

Task Forces
The committee, subcommittee, or working group may assign specific work of a finite duration to a task force. The sponsoring committee, subcommittee, or working group will approve the scope of each task force it forms. The chair of the sponsoring committee, subcommittee, or working group will appoint the task force officers (typically a chair and a vice chair). Each task force will have a finite duration, normally less than one year. The sponsoring group will review the task force scope at the end of the expected duration and at each subsequent meeting of the sponsoring group after that until the task force is retired. Action of the task force sponsoring group is required to continue the task force past its defined duration. The sponsoring group should consider promoting to a working group any task force that is required to work longer than one year.

Membership and Representation
The membership of each subcommittee, working group, and task force should be established to address the need for expertise and balance of interests. Each group’s membership requirements will be defined within the group’s approved scope.

As a general guide, the broader the group’s scope, the more emphasis there should be on balancing of interests. Therefore, subcommittees would be expected to have the broadest representation of appropriate industry
sectors, while a task force may be more focused on simply having the necessary expertise, and a working group may be somewhere between.

Each member of a subordinate group, and its officers, will be appointed by the chair of the sponsoring committee or group.

To the extent subgroup membership is of a representative nature, recommendations for staffing of the group should be provided in a manner consistent with the principles outlined in the staffing of a committee, including the use of an open nominations process. Regional Entity representatives should be recommended by the Regional Entity and Canadian representatives by the Canadian Electricity Association.

Preference may also be given to representatives recommended by broadly-based industry associations.

To the extent that subgroup membership is based on providing requisite expertise, the chair of the sponsoring committee or group may appoint members based on the relevant technical qualifications.

**Procedures**

Subcommittees, working groups, and taskforces will conduct business in a manner consistent with all applicable sections of this manual and Robert’s Rules of Order.
Hearings

General
The CCC will conduct hearings, as necessary, to fulfill its function of serving as the hearing body for any contest between NERC and a Regional Entity regarding NERC findings, penalties, or sanctions for violation(s) of Reliability Standard(s) by the Regional Entity as described in Section 408 of the NERC ROP.

Hearing Procedure
Unless specifically identified otherwise elsewhere in this charter, the CCC’s hearing procedure shall follow the hearing procedure mandated and approved by jurisdictional authorities for use by NERC and the Regional Entities in the Compliance and Enforcement program.

Hearing Panel
The committee shall not have a standing hearing panel. When a hearing is to be conducted, the CCC shall select five members to serve as the adjudicatory panel for that hearing. Members to serve on the panel shall be selected by vote of a valid quorum of the committee. Voting members of the committee at arm’s length from parties to the hearing may be nominated or volunteer to stand for selection to the hearing panel. One or more alternates may also be selected, as the committee deems appropriate for the circumstances. A member may serve on more than one panel concurrently. A panel is disbanded upon conclusion of the hearing proceedings for which it was formed.
## Attachment A

### CCC Membership Structure

<table>
<thead>
<tr>
<th>Primary Sector</th>
<th>Sub-Sector</th>
<th>Number of Members</th>
<th>Full Voting</th>
<th>Proportional Voting</th>
<th>Non-Voting</th>
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<tr>
<td>Investor-Owned Utility</td>
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<td>State/Municipal Utility</td>
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<td>Transmission Dependent Utility</td>
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<td>U.S. State</td>
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Personnel Certification Governance Committee Membership

Action
Approve

Background
The Personnel Certification Governance Committee (PCGC) is recommending that the Board of Trustees (Board) approve the following appointments to the PCGC. The appointments are for a two-year term effective upon Board approval.

Members with terms ending December 31, 2018:

- Martin Sas, Sr. Manager, South Reliability Coordination and Engineering, MISO (Filling Vacancy)
- Margaret Adams, Lead Functional Coordinator, Southwest Power Pool
- Cory Danson, Operations Compliance & Technical Writer, Western Area Power Administration
- Mark Thomas, Manager, NERC Compliance – Standards & Implementation, Entergy
- Don Urban, Principal Analyst, ReliabilityFirst

Slate for Officers:

- Chair: Michael Anderson
- Vice Chair: Margaret Adams
Critical Infrastructure Protection Committee Membership and Charter Amendments

Action
Approve

Summary
CIPC Membership
The CIPC revised its membership for the FRCC and WECC Regions and for one CEA representative. The list below details those changes:

FRCC
- Dawn Hamdorf (Seminole) has replaced Joe Garmon (Seminole)

WECC
- Brian Irish (Salt River Project) has replaced Mike Mertz (PNM Resources)
- Jodi Jensen (WAPA) has replaced Lisa Carrington (APS)

CEA
- Pierre Janse van Rensburg (ENMAX) has replaced David Dunn (IESO)

CIPC Charter
The CIPC, because of the SPP RE dissolution, approved changes to the CIPC Charter to reflect the removal of references to and membership representation by SPP RE entities.

Attachment 1: Redline Changes to the CIPC Charter
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<td>Confidential Matters</td>
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Preface

The vision for the Electric Reliability Organization (ERO) Enterprise, which is comprised of the North American Electric Reliability Corporation (NERC) and the seven 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.

The North American BPS is divided into seven 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.

![Map of the North American BPS with RE boundaries]

<table>
<thead>
<tr>
<th>FRCC</th>
<th>Florida Reliability Coordinating Council</th>
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<tr>
<td>MRO</td>
<td>Midwest Reliability Organization</td>
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<td>NPCC</td>
<td>Northeast Power Coordinating Council</td>
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<tr>
<td>RF</td>
<td>ReliabilityFirst</td>
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<td>SERC</td>
<td>SERC Reliability Corporation</td>
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<td>Texas RE</td>
<td>Texas Reliability Entity</td>
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<tr>
<td>WECC</td>
<td>Western Electricity Coordinating Council</td>
</tr>
</tbody>
</table>
Chapter 1: General Functions of the CIPC

Advisory Panel to the NERC Board
The Critical Infrastructure Protection Committee (CIPC) will support the objectives of the North American Electric Reliability Corporation (NERC) Board of Trustees (Board) and standing committees by serving as an expert advisory panel on physical and cyber security, focusing on operations, compliance, and policy matters. The CIPC will advance the reliability of the critical bulk electricity infrastructure of North America by addressing the technical and organizational dimensions of security through collaboration and sharing of best practices and by identifying and quantifying emerging risks.

Coordination and Communications
1. Coordinate and communicate with those organizations responsible for both physical and cyber security in all electric industry segments, including, but not limited to, the Electricity Information Sharing and Analysis Center (E-ISAC), American Public Power Association (APPA), Canadian Electricity Association (CEA), Edison Electric Institute (EEI), Electric Power Research Institute (EPRI), Electric Power Supply Association (EPSA), ISO/RTO Council (IRC), National Rural Electric Cooperative Association (NRECA), North American Energy Standards Board (NAESB), the Nuclear Energy Institute (NEI), the Institute of Electrical and Electronic Engineers (IEEE), and the NERC Regional Entities (REs).
2. Coordinate and communicate with the other critical infrastructure sectors as appropriate.
3. Liaise with government agencies on critical infrastructure protection matters.
4. Coordinate with the other NERC committees and working groups to assure the highest degree of collaboration possible.

Information Sharing
Facilitate and advocate information sharing for critical infrastructure protection among industry segments and with governments.

CIPC actions, documents, and recommendations will be distributed to the NERC committees and working groups and posted for industry comments (assuming sensitivity permits), at the discretion of the CIPC. NERC committees, working groups, and industry comments will be considered by the CIPC prior to forwarding actions or documents to the NERC Board for approval, if required.

Security Guidelines
Develop, periodically review, and revise security guidelines and implementation guidance. CIPC shall issue documents in accordance with the process described in Appendix 1.

NERC Reliability Standards
Assist in the development and implementation of NERC Reliability Standards by:
1. Assisting the standards process by providing expert resources in support of the development of NERC Reliability Standard Authorization Requests and Reliability Standards;
2. Providing a forum for education, sharing of views, and informed debate of NERC Reliability Standards; and
3. Facilitating the implementation of NERC Reliability Standards by developing guidance documents, hosting workshops, and performing other activities.
Chapter 2: Membership

 Owners and Operators
The majority of the members of CIPC will be representatives of the registered entities that own and/or operate the Bulk Electric System (BES) infrastructure of North America.

Expectations and Requirements
Voting members of the CIPC are expected to:

1. Bring subject matter expertise to the CIPC;
2. Be knowledgeable about physical and cyber security practices and challenges in the electricity sector;
3. Attend and participate in all CIPC meetings;
4. Express their own opinions at committee meetings, but also represent the interests of their Regions;
5. Discuss and debate interests rather than positions;
6. Voting members must chair or co-chair a CIPC Work Group or Task Force at least once within a two-year term;
7. Complete assigned Committee, Task Force, and Working Group assignments; and
8. Maintain, at a minimum, a Secret Clearance, or to the extent not already obtained, apply for a Secret Clearance.

Terms
Terms are expected to be a minimum of two years.

Selection
1. There will be a minimum total of thirty-two voting members. The maximum will be thirty-two, as described below.

2. A minimum of twenty-one voting members shall be representatives from NERC registered entities. There shall be at least three such members from each of the seven NERC REs selected by the registered entities from that NERC RE. The three members from each NERC RE must collectively have expertise in three technical areas – physical security, cyber security, and operations, as defined below:
   a. Physical Security – Members are primarily focused on the physical protection of electricity sector facilities. Members should have a background in corporate or physical security at an asset owner utility, ISO or RTO.
   b. Cyber Security – Members are technical experts in one or more areas of control systems security, enterprise information security, or systems architecture and design that affect the reliable operation of the BES.
   c. Operations – Members are primarily focused on system operations. Members should have a background in supervisory control and data acquisition (SCADA), Energy Management System (EMS), substation or generating plant control equipment operation and administration.

3. A minimum of two voting members (more if required as stated later in this paragraph) selected by CEA. The CIPC shall contain the number of Canadian voting representatives equal to the percentage of the Net Energy for Load (NEL) of Canada to the total NEL of the United States and Canada, times the total number of voting members on the CIPC, rounded up to the next whole number. The representatives from paragraph two,
above, can fulfill this requirement. If the Canadian representatives from paragraph two are not in sufficient numbers, then NERC will ask the CEA to select sufficient Canadian representatives to meet the requirement.

4. A minimum of four voting members that are policy experts. A policy expert is defined as having had regulatory review responsibility, strategic planning or legislative development, review or advocacy experience positions in a NERC registered entity, or an industry trade association.
   a. Two selected by APPA.
   b. Two selected by NRECA.

**Alternates**
Appointing organizations may appoint non-voting alternates who will have a voice at meetings and can be named as proxies.

**Partner Members**
The committee values collaboration with cross-sector organizations who can contribute to the stated purpose of the CIPC. The following organizations are invited to participate in face-to-face meetings and join workgroups and task forces, subject to the Expectations and Requirements stated above. The following seats are considered non-voting:

1. Federal Energy Regulatory Commission
2. US Department of Homeland Security
3. US Department of Energy
4. US Department of Energy Laboratories
5. Public Safety Canada
6. Natural Resources Canada
7. Oil & Natural Gas subsector
8. Telecomm sector
9. Financial Services sector
10. Critical Manufacturing sector
11. Water sector

**Executive Committee Review**
The Executive Committee (EC) will annually review the membership to ensure sufficient expertise is represented on the CIPC and that the members are meeting the expectations and requirements listed above. The chair will contact any member who has missed two consecutive meetings (even if the member has sent a proxy) to seek a commitment to actively participate, or ask the member to resign from the committee. The chair may remove any member who has missed two consecutive meetings (even with a proxy).
Chapter 3: Officers

Officer Positions
The Committee shall have a chair and two vice-chairs as selected from the voting membership.

Terms
The terms of all officer positions are for two years and shall begin on January 1 following their election and continue through December 31 of the second year following.

Timing of Elections
Elections for the chair and vice-chairs shall take place at the September meeting in odd-numbered years.

Selection Process
The Committee selects officers using the following process:

1. The nominating subcommittee will present its recommended candidate (or candidates if filling the vice chair positions).
2. The secretary will open the floor for nominations.
3. After hearing no further nominations, or upon approval of a motion to close nominations, the secretary will close the nominating process.
4. The committee will then vote on the slate of candidates recommended by the nominating subcommittee. If the slate is approved by a two-thirds majority, the slate shall be deemed elected and the election shall close.
5. If the slate fails, the secretary will distribute paper ballots containing the names of all of the candidates, listed in the order in which they were nominated, on which the committee members shall mark their preference(s).
6. The secretary shall collect and tabulate the ballots. Any ballot containing more votes than the number of open positions shall be deemed invalid. Any candidate(s) to garner a two-thirds majority of the Committee’s votes will be deemed elected.
7. If open positions remain at the conclusion of the balloting process, the chair may, at his/her discretion, open the floor for additional nominations. The secretary shall prepare new ballots listing the names of the remaining and any newly nominated candidates in the order the nominations were made, and the balloting process shall be repeated until all positions have been filled.
8. The elected leadership will be submitted to the NERC Board for approval.

Vacancies
If an officer is unable to complete their term, that person’s replacement will be selected by the EC to serve the remainder of that term.
Chapter 4: Executive Committee

Members

1. The CIPC shall have an EC with the following membership:
   a. Chair
   b. Two vice-chairs
   c. Secretary (non-voting, NERC staff member)
   d. Four additional members elected by the CIPC, who are subject matter experts (SMEs) in one of the following areas: Physical Security, Cyber Security, Operations, and Policy.
      i. The SME members are selected at the December meeting in odd-numbered years, using the selection process defined in the Officers section above.
      ii. The terms of the SME member positions are for two years and shall begin on January 1 following their election and continue through December 31 of the second year following.
      iii. If an SME member is unable to complete their term, a replacement will be selected by the EC to serve the remainder of that term.

Non-Voting Executive Committee Members

In addition, the EC includes, as non-voting participants, the immediate past CIPC Chair who may serve one year, and named representatives from APPA, CEA, EEI, EPSA, IRC and NRECA. Other recognized and well-established trade associations from the electricity sector that are involved in critical infrastructure protection issues will be considered for non-voting membership if they are not already represented. Representatives from NERC are encouraged to participate in and contribute to EC activities.

Additional non-voting members must be approved by the voting members of the EC.

Terms

Terms shall be for two years commencing on January 1 of the year following appointment.

Duties

1. Provide policy direction for the operation of the CIPC and manage task force and working group workload.
2. Review CIPC member candidates for expertise qualifications.
3. Respond to urgent matters by calling conference calls or special meetings.
4. Prepare meeting agendas.
5. Coordinate CIPC activities with other NERC standing committees and other entities.
6. Report to the NERC Board.

Open Meetings

EC meetings are open to CIPC members, alternates, proxies, and invited guests except as noted below under Chapter 5 - Confidential Sessions. Although meetings are open, only voting members may offer and act on motions.
Chapter 5: Meetings

Quorum
A CIPC quorum requires two-thirds of the Committee voting members.

Voting
Voting may take place during regularly scheduled in-person meetings, web meetings, or may take place via email or conference call. All actions by the committee shall be approved upon receipt of the affirmative vote of two-thirds of the members present and voting at a meeting at which quorum is present.

Proxies
A member of the committee is authorized to designate a proxy. Proxy representatives may attend and vote at committee meetings provided the absent committee member notifies in writing (letter or email) the committee chair, vice chair or secretary along with the reason(s) for the proxy. The member shall name the proxy representative and their affiliation in the correspondence. No member of the committee can serve as a proxy for another member of the committee. It is expected that the proxy will adhere to the Voting Members’ Expectations and Requirements as described in Section 3 of this document.

Agenda
1. Agendas with materials to be voted on will be posted two weeks prior to the meeting.
2. Only a voting member can put forth a motion.

Action without a Meeting
The Committee may act by mail or email ballot without a regularly scheduled meeting. Two-thirds of the members present and voting is required to approve any action. A quorum for actions without a meeting is two-thirds of the Committee members. The committee chair or a majority of the EC may initiate the request for such action without a meeting. The secretary shall post a notice on the NERC website and shall provide committee members with a written notice (letter or email) of the subject matter for action not less than three business days prior to the date on which the action is to be voted. The secretary shall distribute a written notice to the Committee (letter or email) of the results of such action within five business days following the vote and also post the notice on the NERC website. The secretary shall keep a record of all responses from the committee members with the committee minutes.

Regular Meetings
CIPC meetings will be conducted at the discretion of the chair, generally once every three months.

Open Meetings
NERC committee meetings are open to the public, except as noted below under Confidential Sessions. Although meetings are open, only voting members may offer and act on motions.

Antitrust Guidelines
All persons attending or otherwise participating in the committee meeting shall act in accordance with NERC’s Antitrust Compliance Guidelines at all times during the meeting. A copy of the NERC antitrust statement shall be included with each meeting agenda.
Confidential Sessions
The chair of a committee may limit attendance at a meeting or portion of a meeting, based on confidentiality of the information to be disclosed at the meeting. Such limitations should be applied sparingly and on a non-discriminatory basis as needed to protect information that is sensitive to one or more parties. A preference, where possible, is to avoid the disclosure of sensitive or confidential information so that meetings may remain open at all times. Confidentiality agreements may also be applied as necessary to protect sensitive information. (See also the following paragraph on Confidential Matters.)

Confidential Matters
On occasion, the CIPC may be called upon to provide information or support in relation to a matter that requires confidentiality. Upon such an occasion and with the approval of the NERC President/CEO, the chair of the CIPC may convene a working group to provide such information or support without notice or approval of any other member or group. The existence of such a working group, its mission and results, will be shared with the members only to the degree and at the time deemed appropriate by the NERC President/CEO. Information labeled under Traffic Light Protocol (TLP) shall be handled according to published conventions of that protocol.

Parliamentary Procedures
In the absence of specific provisions in this scope document, the Committee shall conduct its meetings guided by the most recent edition of Robert's Rules of Order, Newly Revised.

Non-Voting Members.
Non-voting members will have a voice at all open meetings
Chapter 6: Subgroups

Appointing Subgroups
The EC may appoint technical subgroups to address security-related issues as it deems fit or may assign such issues to its subcommittees, working groups and task forces. Working groups and task forces will take assignments from the EC and all work products will be presented to the CIPC for any further action. Subgroups will be reviewed annually by the EC to ensure that work plans are being accomplished, workload is equitably distributed, and the subgroup is still adding value to the Committee function.

Nominating Subcommittee
1. At the last regular meeting (normally the June meeting) before the selection of a new committee chair (normally the September meeting), the incumbent chair will nominate, for the committee’s approval, a chair of the nominating subcommittee. The subcommittee will recommend candidates for the committee’s chair, two vice-chairs, and four SME EC members. The nominating subcommittee may be formed upon the vacancies.
2. The subcommittee chair will then assemble five committee members which shall include the subcommittee chair and four additional members drawn from the larger committee.
3. The subcommittee will solicit nominations for the Officer and SME EC positions from the voting members of the committee.
4. The subcommittee will review the nominations received and develop a slate of seven candidates: one for the committee chair, two for the committee vice-chairs, and four SME members of the EC.
5. The subcommittee will present its slate of officers at the committee’s September meeting and SME EC members at the committee’s December meeting.
Appendix A: Security Guidelines Approval Process

Guidelines
Guidelines are documents that suggest approaches or behavior in a given technical area for the purpose of improving security and reliability. Security guidelines are not binding norms or mandatory requirements. Security guidelines may be adopted by a responsible entity in accordance with its own facts and circumstances.

Approval of Guidelines
Because guidelines contain suggestions that may result in actions by responsible entities, those suggestions must be thoroughly vetted before a new or updated guideline receives approval by a technical committee.

The process described below will be followed by the CIPC:

1. New/updated draft guideline approved for comment by the committee. The workgroup Chair approves for comment request the release of a new or updated draft guideline developed by its groups. Alternately, the EC reserves the right to waive such posting.

2. Post draft guideline for comment if required. The draft guideline is posted for comment for forty-five (45) days (or a period specified by the EC). If the draft guideline is an update, a redline version against the previous version must also be posted.

3. Post comments and responses. After the comment period, the CIPC will post the comments received as well as its responses to the comments. The committee may delegate the preparation of responses to a committee subgroup.

4. New/updated guideline approval and posting. A new or updated guideline, which considers the comments received, is approved by the CIPC and posted as "Approved" on the NERC website. Updates must include a revision history and a redline version against the previous version.

5. Guideline updates. After posting a new or updated guideline, the CIPC will periodically assign a workgroup task to review the library of guidelines.

6. Standards Committee authorization is required for a security guideline to become a supporting document that is posted with or referenced from a NERC Reliability Standard. See Appendix 3A in the NERC’s Rules of Procedure under “Supporting Document.”

7. In order to receive ERO endorsement, the CIPC must follow the NERC approved process for development and publication of implementation guidance for documents that support a NERC Reliability Standard.
Supply Chain Activities

**Action**
Update

**Background**
On July 21, 2016, the Federal Energy Regulatory Commission (Commission) issued Order No. 829, directing NERC to develop a new or modified Reliability Standard that addresses supply chain risk management for industrial control system hardware, software, and computing and networking services associated with Bulk Electric System (BES) operations, as follows:

> [The Commission directs] NERC to develop a forward-looking, objective-based Reliability Standard to require each affected entity to develop and implement a plan that includes security controls for supply chain management for industrial control system hardware, software, and services associated with bulk electric system operations. The new or modified Reliability Standard should address the following security objectives, [discussed in detail in the Order]: (1) software integrity and authenticity; (2) vendor remote access; (3) information system planning; and (4) vendor risk management and procurement controls. (P. 45)

Following the issuance of Order No. 829, NERC staff initiated Reliability Standards Project 2016-03 to address supply chain risk management in the Critical Infrastructure Protection (CIP) standards. The project resulted in the development of new standard CIP-013-1, and modifications in CIP-005-6 and CIP-010-3 (collectively, the Supply Chain Standards). The Supply Chain Standards support reliability by requiring entities to implement plans and processes to mitigate supply chain cyber security risks to high and medium impact assets. Following industry approval of the Supply Chain Standards on July 20, 2017, the Board of Trustees (Board) adopted the Supply Chain Standards at its August 10, 2017 meeting.

In adopting the Supply Chain Standards, the Board concurrently adopted additional resolutions related to implementation and risk evaluation. The resolutions outlined in detail six actions by NERC management and stakeholders to assist in the implementation and evaluation of the Supply Chain Standards, as well as other actions to address potential supply chain risks for assets not currently subject to the standards. Collectively, the activities to address the Board’s supply chain resolutions are designed to establish a common understanding of the supply chain risk to the BES and initiate activities to mitigate those risks. The resolutions and activities in support of the resolutions are described further below.

NERC staff filed the Supply Chain Standards with the Commission on September 26, 2017. FERC issued a notice of proposed rulemaking on January 18, 2018, to which NERC submitted comments on March 26, 2018. On October 18, 2018, the Commission issued Order No. 850

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approving the Supply Chain Standards. The Commission also approved the associated Violation Risk Factors, Violation Severity Levels, and the proposed implementation plan, under which the standards will be effective the first day of the first calendar quarter that is 18 months following the effective date of the final rule. While finding that the standards addressed the Commission’s directive in Order No. 829 and constitute “substantial progress” in addressing supply chain cybersecurity risks, the Commission also issued two directives to NERC.

First, noting the significant role that EACMS play in the protection scheme for medium and high impact BES Cyber Systems, the Commission found that excluding EACMS from the scope of the supply chain standards presents risks to the cybersecurity of the bulk electric system. Therefore, the Commission directed NERC to develop modifications to the standards to address EACMS associated with medium and high impact BES Cyber Systems and to submit those modifications within 24 months of the effective date of the final rule. NERC requested that the Commission refrain from issuing a directive on EACMS until the study of cybersecurity supply chain risks directed by the NERC Board in its resolutions was completed. The Commission concluded, however, that the existing record supports the directive at this time.

Second, while continuing to express its concern that excluding certain categories of assets (low impact BES Cyber Systems, Physical Access Control Systems (“PACS”), and Protected Cyber Assets (“PCAs”)) from the standards could pose a reliability risk, the Commission found that NERC is taking “adequate and timely steps” to study whether these items should be included in the standards. The Commission accepted NERC’s commitment to evaluate the risks of low impact BES Cyber Systems, PACS, and PCAs in the Board-directed study and directed NERC to file the final report with FERC upon its completion.

**Board Resolutions**

**Support Effective and Efficient Implementation:** NERC to commence preparations for implementation of the Supply Chain Standards using similar methods during the CIP V5 transition, and regularly report to the Board on those activities.

The following activities have occurred to support this action:

- NERC created a Supply Chain Risk Mitigation Program webpage to provide a single source for resources.

- The Critical Infrastructure Protection Committee (CIPC) has established an advisory task force to provide input on activities to support standard implementation, to develop a schedule for webinars, workshops, and technical conferences in coordination with NERC and the Regional Entities, and to document existing risks and develop security guidelines for use by industry in managing known supply chain risks.

- NERC and the Regional Entities have conducted small group advisory sessions. These sessions led to the development of a frequently asked questions document, which is posted on the Supply Chain Risk Mitigation Program webpage.

**Cyber Security Supply Chain Risk Study:** 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. (Interim report 12 months after adoption of the resolutions and a follow-up final report 18 months after adoption).
The following activities have occurred to support this action:

- NERC contracted the Electric Power Research Institute to prepare an initial report on supply chain risks. The report focuses on the following areas:
  - An assessment of product/manufacturer types used on the BES
  - An analysis and applicability to BES Cyber Assets
  - An analysis of best practices and standards in other industries to mitigate supply chain risks
  - An analysis of generalized vendor practices and approaches used to mitigate supply chain risks
- NERC staff presented the interim report at the August 2018 Board meeting, and posted the report on the Supply Chain Risk Mitigation Program webpage.
- NERC staff and the CIPC are assessing the recommended actions in the report and are preparing actions to be addressed in the final report due to the Board in February 2019.

**Communicate Supply Chain Risks to Industry:** NERC should communicate supply chain risk developments and risks to industry and in connection with the Cyber Security Supply Chain Risk Study.

The following activities have occurred to support this action:

- NERC and E-ISAC have used NERC Alerts to communicate supply chain risks to industry.
- E-ISAC included a supply chain risk topic in GridEx IV.
- NERC and Regional Entities have included supply chain topics at planned workshops in 2018.
- CIPC is in the process of developing supply chain security guidelines.

**Forum White Papers:** The Board requested that the North American Transmission Forum and the North American Generation Forum (the “Forums”) to develop (and distribute, as permissible) white papers to address best and leading practices in supply chain management, as described in the resolution.

- In support this action, the Forums have developed whitepapers, which are posted on the Supply Chain Risk Mitigation Program webpage.

**Association White Papers:** The Board requested that the National Rural Electric Cooperative Association and the American Public Power Association (the “Associations”) to develop (and distribute, as permissible) white papers to address best and leading practices in supply chain management, as described in the resolution, focusing on smaller entities that are not members of the Forums, for the membership of the Associations.

- In support this action, the Associations jointly developed a whitepaper, which is posted on the Supply Chain Risk Mitigation Program webpage.
Evaluate Supply Chain Standard Effectiveness: Collaborating with NERC technical committees and other experts, NERC should develop a plan to evaluate the effectiveness of the Supply Chain Standards, as described in the resolution, and report to the Board.

- The plan to evaluate the effectiveness of the Supply Chain Standards will be developed by NERC staff in 2019, with assistance of the CIPC advisory group and Regional Entities.

Additional Information
A link to the Supply Chain Risk Mitigation Program page is provided for reference: Supply Chain Risk Mitigation Program
Standards Efficiency Review

**Action**
Update

**Background**
As part of its continuing focus on supporting the success and evolution of NERC Reliability Standards to ensure they appropriately address risks to the bulk power system, NERC, in consultation with stakeholders, developed a process to review the existing body of Reliability Standards to determine whether any requirements could be retired or modified. This effort is referred to as the Standards Efficiency Review (SER).

In Phase 1 of the SER project, teams of industry participants compiled a list of approximately 113 requirements that are candidates for retirement, along with a justification for retirement of each candidate. A draft Standard Authorization Request (SAR) was posted for informal comment from June 7 to July 10, 2018. After reviewing and incorporating industry comments into the SAR, the SAR was posted for a formal comment period from August 28 to September 26, 2018. Nominations for SER drafting team members were due on September 17, 2018. The Standards Committee (SC) shall appoint a team at its October 17, 2018 meeting.

In Phase 2 of the project, a consolidated SER team will transition effort to identify continued efficiencies and reduce compliance burdens. The SER Phase 2 team will develop and evaluate new efficiency concepts, alternative to retiring requirements. Some concepts under consideration include consolidating and simplifying training and data requirements, transferring competency-based requirements to the certification program and/or Compliance Monitoring Enforcement Program controls review process. The SER Advisory Group is considering a timeline for addressing Critical Infrastructure Projection standards.

**Key Deliverables and Timeline**
- SC solicit for standard drafting team(s) for SARs (2018 Q3)
- Phase 2 team assembled to investigate issues and potential solutions (2018 Q3)
- Phase 1 industry ballots on proposed retirements/modifications to standards (2018 Q4 – 2019 Q1)
- Phase 1 proposed balloted standards to NERC Board of Trustees (2019 Q1 – Q2)
- Phase 2 team to provide draft SARs for additional standard modifications (2019)
TPL-001-5 — Transmission Planning Performance Requirements

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

- Reliability Standard — TPL-001-5 — Transmission Planning Performance Requirements
  [Clean] [Redline to Last Approved]
- Implementation Plan for TPL-001-5 — Transmission Planning Performance Requirements
  [Implementation Plan]
- Violation Risk Factors (VRFs) and Violation Severity Levels (VSLs)
  [VRF/VSL Justification]
- Retirement
  TPL-001-4 — Transmission System Planning Performance Requirements

Background
Project 2015-10 Single Points of Failure TPL-001 was first initiated in 2015 to address three sets of issues regarding Reliability Standard TPL-001-4:

- Address the recommendations from the NERC System Protection and Control Subcommittee/System Analysis Modeling Subcommittee report, Order No. 754 Assessment of Protection System Single Points of Failure based on the Section 1600 Data Request (September 2015) to modify the TPL-001-4 standard to account for the potential risks posed to reliability by single points of failure on Protection Systems;
- Address the Federal Energy Regulatory Commission (“FERC”) directives from Order No. 786, issued October 17, 2013, in which FERC directed NERC to: (i) “modify Reliability Standard TPL-001-4 to address the concern that the six month threshold could exclude planned maintenance outages of significant facilities from future planning assessments”; and (ii) “consider a similar spare equipment strategy for stability analysis upon the next review cycle of Reliability Standard TPL-001-4”; and
- Update the Modeling, Data and Analysis (“MOD”) standard references in TPL-001-4 to the current MOD standard addressing those issues, MOD-032.

The Standards Committee approved the final Standard Authorization Request (SAR) on July 20, 2016, after it was posted for two 30-day comment periods.

The Project 2015-10 standard drafting team (SDT) developed Reliability Standard TPL-001-5 to address the recommendations, directives, and MOD standard reference issue identified in the SAR. Specifically, the standard was revised to:

- specify the types of events involving non-redundant components of a Protection System that should be studied under the standard under the revised Category P5 planning event and the new extreme events 2e.-h, as well as the specific types of non-redundant
components of a Protection System that should be studied (see Table 1 and footnote 13);

- Address the FERC Order No. 786 directives by: (i) replacing the six-month threshold for known outages from Requirement R1.1 with Requirements to assess known outages based on a documented procedure or rationale that does not exclude known outages based on the outage duration (see R2.1.4, R2.4.4); and (ii) adding a Requirement to consider spare equipment strategy for stability analysis (see R2.4.5); and

- Update the references to MOD-010 and MOD-012 to MOD-032 (R1).

Following an initial 30-day informal comment period, the standard was posted for a 45-day comment period and initial ballot from September 8, 2017 through October 23, 2017, which received a 30.5 percent industry approval with a quorum of 82.71 percent. The standard was posted for a second 45-day formal comment period and additional ballot from February 23, 2018 through April 23, 2018, during which the standard received a 26.44 percent industry approval with a quorum of 80 percent. The implementation plan was balloted separately and received a 41.13 percent industry approval with a quorum of 77.97 percent.

The standard was posted for a third 45-day formal comment period and additional ballot from July 30, 2018 through September 14, 2018, and the standard received a 69.07 percent industry approval with a quorum of 75.59 percent. The implementation plan was again balloted separately and received a 73.27 percent industry approval with a quorum of 75.25 percent. The final ballot closed after these materials were distributed and will be presented at the November 2018 Board of Trustees meeting.

**Minority Issues**

Some stakeholders believe that more clarification is needed for Table 1, footnote 13 regarding the study of non-redundant components of a Protection System. The SDT maintains that the purpose of the footnote is not to define redundancy, but to specify the components to be considered as part of studies.

Some stakeholders believe that the study of known outages in Requirement R2 will cause an overlap in the Near-Term Planning Horizon and Operational Planning Horizon. The SDT disagrees and believes that the proposed draft addresses the FERC directive and that “planned maintenance outages of significant facilities” will be included in the planning study.

**Cost Effectiveness**

The SDT sought stakeholder input on the cost effectiveness of the proposed standards during the formal comment periods. A background document was provided to highlight options the SDT discussed for the proposed drafts. The majority of stakeholders indicated that the proposed standard would provide registered entities the ability to meet the reliability objectives in a cost effective manner. However, some stakeholders believe that the proposed revisions to address the Order No. 754 directives are generally not cost-effective because the standard could create a substantial cost impact when addressing a low probability event concerning single points of failure when studied under a P5 event.

**Additional Information**

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

[Project 2015-10 Single Points of Failure TPL-001]
**IRO-006-TRE-1**  
**IROL and SOL Mitigation in the ERCOT Region**

**Action**  
Retire the following Regional Reliability Standard and authorize NERC staff to request approval of the retirement with applicable regulatory authorities:

- Regional Reliability Standard IRO-006-TRE-1  
  [IRO-006-TRE-1 - Clean]

**Background**  
The Federal Energy Regulatory Commission (FERC) approved Regional Reliability Standard IRO-006-TRE-1 (Interconnection Reliability Operating Limits and System Operating Limits Mitigation in the ERCOT Region) on May 31, 2012. A Standard Authorization Request (SAR) was submitted to Texas Reliability Entity (Texas RE) on June 27, 2017, stating the Standard should be retired because it is redundant to other Reliability Standards and is no longer needed to support reliability. The Texas RE Board approved its retirement on September 12, 2018.

**Summary**  
The Texas RE drafting team for IRO-006-TRE-1 concluded the Regional Reliability Standard should be retired because its requirements are redundant to those in NERC Reliability Standards IRO-002-5, IRO-008-2, TOP-001-3, TOP-001-4, TOP-002-4 and IRO-009-2. The retirement of IRO-006-TRE-1 will not impact reliability.

NERC posted the Regional Reliability Standard retirement on the NERC website for a 45-day public comment period on June 21, 2018. No adverse comments were received. NERC staff supports the retirement as it meets Paragraph 81 criteria.

**Pertinent FERC Directives**  
None.

**Additional Information**  
A link to the project history and files is included here for reference.  
[IRO-006-TRE-1]
2019-2021 Reliability Standards Development Plan

**Action**
Approve the 2019-2021 Reliability Standards Development Plan (RSDP).

**Background**
The 2019-2021 RSDP focuses on periodic reviews, Federal Energy Regulatory Commission directives, the Standards Efficiency Review, and the standards grading initiative. The RSDP also includes time frames and anticipated resources for each project under development as well as considerations for cost effectiveness. NERC and the Standards Committee (SC) will continue to work with the other NERC committees and task forces to bridge any potential reliability gaps and risks.

The 2019-2021 RSDP was posted for a public comment period from August 8, 2018 through August 31, 2018. Modifications were made to the RSDP based on industry comments. The SC endorsed the RSDP at its September 13, 2018 meeting.

**Additional Information**
A link to the 2019-2021 RSDP is included for reference: [2019-2021 RSDP](#).
Reliability Standards Development Plan
2019-2021

October 2, 2018
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As described herein, the 2019-2021 Reliability Standards Develop Plan (RSDP) builds upon the goals of the previous RSDPs with an additional objective of implementing changes based on the Standards Efficiency Review (SER) efforts that began in 2018.

Pursuant to Section 310 of the NERC Rules of Procedure, NERC is required to develop and provide to applicable governmental authorities an annual RSDP for Reliability Standards development. Each annual RSDP must include a progress report comparing results achieved to the prior year’s RSDP. NERC is required to consider the comments and priorities of the applicable governmental authorities in developing and updating the annual RSDP. NERC also provides the RSDP to the NERC Standards Committee (SC) for review and posts the RSDP for industry comment.
Executive Summary

This 2019-2021 RSDP provides insight into standards development activities anticipated at the time of publication, so that stakeholders may make available resources needed to accomplish the standards development objectives. Additional activities such as Requests for Interpretation and Regional Variance development may impact the plan, but are not included at this time. In order to help the industry understand resource requirements for each project, the RSDP now shows time frames and anticipated resources for each project under development.

The 2019–2021 RSDP recognizes the diligent work over the last few years in transforming the body of NERC Reliability Standards into a mature state while shifting the focus of the standards program to Periodic Reviews, Federal Energy Regulatory Commission (FERC) directives, emerging risks, Standard Authorization Requests (SARs), the SER, and the standards grading initiative. The 2019-2021 RSDP also contemplates that the work of the various NERC technical committees and working groups thereunder may result in one or more SARs and subsequent standards projects. The 2019-2021 RSDP also includes plans for completing the Periodic Reviews initiated in prior years and for commencing additional Periodic Reviews in 2018.

Periodic Reviews and initiatives such as the streamlining SER project also enable NERC to identify requirements that do little to promote reliability and should therefore be retired. As with the 2018-2020 RSDP, Periodic Reviews will occur at a measured pace compared to the level of activity and pace of standards development during recent years. Additionally, Periodic Reviews will be aligned with the strategic consideration of reviewing standard families that are interrelated. The Standards Grading and “Final Grades for Standards Graded in 2018” (Attachment 1) also help to inform the Periodic Reviews as to the quality and content of the standards.¹

While most of the work in the next three years will focus on Periodic Reviews, SER implementation, and Standards Grading, there may be new or emerging risks identified that could generate new standards development projects. NERC will continue to seek input and recommendations from the Reliability Issues Steering Committee (RISC) with regard to emerging or potential risks to Bulk Electric System (BES) reliability that may require revisions to existing standards or new standards development.

To help determine impact of potential risk to BES reliability, NERC will use a variety of feedback mechanisms, including but not limited to, the Compliance Monitoring and Enforcement Program, RISC profiles, Events Analysis, and Compliance violation statistics, as well as any published “Lessons Learned.” The Regional Entities also have feedback mechanisms in place to solicit comments from industry and to help identify approaches to meet concerns and provide input to the standards. Input into standards will also continue to be coordinated with the North American Energy Standards Board as appropriate. In assessing feedback to create new or revised standards, NERC will focus on risk, reliability or security data, and enforcement information to determine whether a standard revision is the best tool to initially address the reliability risk.

¹ The Periodic Review standing review team grades the standards prior to conducting Periodic Reviews. The team includes representatives from NERC, the Regional Entities, and NERC technical committees. If the standard is revised through the standard development process in response to a Periodic Review recommendation(s), the Periodic Review standing review team will re-grade the standard with the revised language.
2018 Progress Report

Pursuant to Section 310 of the NERC Rules of Procedure, NERC offers the following progress report on Reliability Standards development in 2018.

**FERC Directives**
As of August 31, 2018, there are 16 outstanding FERC directives, six of which are related to standards and being resolved through the standards development process. The status of the Standards directives are reported quarterly to the NERC Board of Trustees (Board).

**Projects Completed in 2018**
The 2018-2020 RSDP identified 11 projects initiated in 2018 or continued from 2017. All of the projects listed therein were either completed or are planned to be completed in 2018 except for (see detailed description of the specific activities in the next section titled 2019 Projects):

1. Project 2015-09 Establish and Communicate System Operating Limits,
2. Project 2016-02 Modifications to CIP Standards, and
3. Project 2017-01 Modifications to the BAL-003-1.1.

Additional project information is available on the NERC website on the Standards web page. Also, the SER completed an initial assessment of the entire body of standards in 2018 prior to initiating the Standards development process to consider any changes to the body of Reliability Standards.

The following projects have been or are planned to be completed in 2018 (actual and anticipated Board adoption dates are noted):

1. Project 2016-04 Modifications to PRC-025-1 (adopted by the Board in February 2018)
2. Project 2017-02 Modifications to Personnel Performance, Training, and Qualifications Standards – PER-003-1, and PER-004-2 (adopted by the Board May 2018)
3. Project 2017-06 Modification to BAL-002-2 (adopted by the Board in August 2018)
4. Project 2016-02 Modifications to CIP Standards, CIP-012-1 only (adopted by the Board in August 2018)
5. Project 2015-10 Single Points of Failure TPL-001 (Board adoption anticipated November 2018)

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2 As of the date of publication, the subject web page resides at [http://www.nerc.com/pa/Stand/Pages/default.aspx](http://www.nerc.com/pa/Stand/Pages/default.aspx).
2019 Projects

Projects Continuing into 2019
In determining high, medium, or low priority designations for projects as listed in this RSDP, the following factors were taken into consideration:

1. Outstanding regulatory directives with filing deadlines (High Priority)
2. RISC category rankings of high impact with consideration of probability of occurrence (High or Medium Priority)
3. Potential reliability risks from stakeholders provided through feedback mechanisms (High, Medium, or Low Priority, based on the risk)
4. Outstanding regulatory directives without regulatory deadlines or “soft directives” such as considerations (High or Medium Priority)
5. Outstanding requirements that are known candidates for retirement (Medium or Low Priority)
6. Any known adverse content and quality assessments (likely Low Priority, as any reliability gaps identified have already been addressed)

High Priority

- Project 2018-02 Modifications to CIP-008 Cyber Security Incident Reporting (drafting estimated to be completed by February 2019 requiring approximately 10 industry subject matter experts for approximately 85 work hours each for the remaining part of this project)
- Project 2016-02 Modifications to CIP Standards (drafting estimated to be completed by November 2019 requiring approximately 13 industry subject matter experts for approximately 120 work hours each for the remaining part of this project)
- Project 2015-09 Establish and Communicate System Operating Limits - FAC-010, FAC-011, FAC-014 (drafting estimated to be completed by February 2019 requiring approximately 10 industry subject matter experts for approximately 50 work hours each for the remaining part of this project)

Medium Priority

- Project 2017-01 Modifications to the BAL-003-1.1 (drafting estimated to be completed by May 2019 requiring approximately eight subject matter experts for approximately 40 work hours each for this project)
- Project 2018-01 Canadian-specific Revisions to TPL-007-2 (drafting estimated to be completed by February 2019 requiring approximately eight subject matter experts for approximately 50 work hours each for this project)

Low Priority

- Project 2017-07 Standards Alignment with Registration (drafting estimated to be completed by May 2019, pending the SER project, requiring approximately eight subject matter experts for approximately 40 work hours each for this project)
- Project 2017-05 Periodic Review of NUC-001-3 (drafting estimated to be completed by May 2019, pending the SER project, requiring approximately eight subject matter experts for approximately 40 work hours each for this project)
• Project 2017-04 Periodic Review of Interchange Scheduling and Coordination Standards - INT-004-3.1, INT-006-4, INT-009-2.1 and INT-010-2.1 (drafting estimated to be completed by May 2019, pending the SER project, requiring approximately eight subject matter experts for approximately 40 work hours each for this project)

• Project 2017-03 Periodic Review of FAC-008-3 (drafting estimated to be completed by May 2019, pending the SER project, requiring approximately eight subject matter experts for approximately 40 work hours each for this project)
NERC Reliability Standards Efficiency Review
In 2018, NERC began using both internal ERO Enterprise resources and industry resources to evaluate candidates for potential retirements. NERC solicited industry participants to evaluate possible candidate requirements that may no longer be necessary to support reliability or address current risks to the Bulk Power System (BPS). Through open and transparent industry participation, the SER teams submitted a SAR to the SC in order to implement recommended changes to the body of Reliability Standards. The SAR was accepted at the August 2018 SC meeting, and the SER project will continue into 2019. The SER initiative may continue past 2019 pending additional industry input and SAR authorizations.

NERC will continue to coordinate with the industry team to ensure all of the information developed through the 2018 Standards Grading efforts, which includes consideration of content, quality, cost, and reliability impact analysis align with the SER projects. Thus, some projects such as the Standards Alignment with Registration and periodic reviews may have some natural synergies that allow for other projects to be combined with the SER initiative.

Other Projects Commencing
At least two Periodic Reviews should commence in 2019 based on feedback from industry and results of the Standards Grading project and other initiatives. However, the Periodic Reviews will coordinate timing with the SER project to ensure the initiatives work together to review the standards that may need to be modified. Additionally, SARs, emerging risks to the BPS, and FERC regulatory directives that may occur subsequent to publishing this RSDP may prompt additional projects through 2019.

Technical Rationale Transition Plan
The SC also charged the Technical Rationale Advisory Group (TRAG) with developing and overseeing an effective approach to implementing the “Technical Rationale for Reliability Standards” policy endorsed by the SC at its June 14, 2017 meeting. Consistent with the policy, the Reliability Standards template will no longer include a Guidelines and Technical Basis (GTB) section. Upon completion of this project, the GTB will be replaced by Technical Rationale documents and/or Implementation Guidance. That project will also require industry participation in order to review the existing GTB and determine: 1) if it is eligible to be transitioned directly to Technical Rationale; or 2) if the GTB should be reviewed using the Standards Development process prior to transition to a Technical Rationale document.
Standards Grading Metrics

The NERC SC endorsed the initial grading system for standards as a metric on March 9, 2016. The grading activity was directed by the NERC Board and is conducted by the Periodic Review Standing Review Team (PRSRT) as set forth in the Periodic Review process. The PRSRT is comprised of the following:

- SRT chair: SC chair or (or SC chair delegate)
- Operating Committee (OC) chair (or OC chair delegate)
- Planning Committee (PC) chair (or PC chair delegate)
- NERC staff
- Representation from the Regional Entities

The grading metrics include possible scores of 0-3 for quality and 0-13 for content. The set of standards chosen each year for grading, according to the criteria in the above section, will be graded to prioritize, and be a factor in determining the sequence they should enter into the Periodic Review process. At least one industry comment period will take place to allow industry to comment on the grading performed by the PRSRT. The grades, based on the PRSRT and any industry input, will be finalized, appended to the RSDP, and used to complete the prioritization each year. Additionally, input from other standards projects such as the Standards Efficiency Review, are being considered and coordinated with the Standards Grading activities.

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3 The process is detailed in the Periodic Review template which is available at: https://www.nerc.com/pa/Stand/Resources/Documents/Periodic%20Review%20Template%20Feb%202016.pdf.
Attachment 1: Final Grades for Standards Considered in 2018

The PRSRT was tasked with using metrics from the 2013 Independent Experts Review Panel to assign numeric grades to instruct future Periodic Review teams.

While the PRSRT’s final standards grades are important data points for the Periodic Reviews to consider, they are intended as one of many inputs to facilitate discussion during the reviews. Detailed analysis and background information on the Standards Grading process and PRSRT recommendations for periodic review project prioritization based on 2018 grades are posted on the project page.

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Revisions to the NERC Rules of Procedure (Sections 600, 900, and Appendix 3A)

Action
Approve proposed revisions to Sections 600, 900, and Appendix 3A (Standard Processes Manual) of the NERC Rules of Procedure (ROP) and direct staff to file the revised ROP with the applicable governmental authorities for approval.

Attachment 1 – Redline Changes to Sections 600 and 900

Attachment 2:
Attachment 2B: Appendix 3A, Standard Processes Manual (redline)

Sections 600 and 900

Background

Summary
Below is a section-by-section summary of the changes:

Section 600
NERC restores the language of Section 603 which contains the procedural requirements for obtaining the system operator certification. NERC restores the language of Section 604 which contains the requirements for the dispute resolution process for the Personnel Certification Program. NERC also restores the language of Section 605 which contains the disciplinary action requirements for the Personnel Certification Program.

NERC corrects some typographical errors.

Section 900
NERC corrects some typographical errors.

Summary of Comments
NERC posted the proposed revisions to Sections 600 and 900 of the ROP for a 45-day comment period from August 27, 2018 through October 11, 2018. No comments were received.

Background
Under the oversight of the NERC Standards Committee (SC), a small group consisting of Standards Committee Process Subcommittee members and NERC staff have reviewed specific sections of the NERC Standard Processes Manual (SPM) for the purpose of proposing revisions to clarify and improve existing language and standard processes as well as to update the document.

In accordance with Section 15 of the SPM, the revisions were posted for formal comment and ballot. Additional information on these comment and ballot periods and the comments received is provided below. The final ballot concluded following the distribution of these materials. The results will be presented to the Board at this meeting.

Summary
Below is a section-by-section summary of the proposed revisions to the SPM. In addition to the changes described below, the SPM document has been reformatted into the current NERC template, and typographical and capitalization errors have been corrected throughout.

Section 1.0: Introduction
Revisions are proposed to clarify and streamline language. A provision is added to clarify that the term "days", unless otherwise specified, refers to calendar days (corresponding changes are also made throughout the document).

Section 2.0: Elements of a Reliability Standard
Updates are made to reflect the current definition of Reliability Standard and the components of a Reliability Standard.

Section 3.0: Reliability Standards Program Organization
Revisions are proposed to clarify and streamline language, as well as to maintain consistency with other SPM sections. Revisions are also proposed to specify that the NERC Director of Standards may delegate authority to perform certain responsibilities under the SPM.

Section 4.0: Process for Developing, Modifying, Withdrawing or Retiring a Reliability Standard
Section 4.4.2 is revised to reflect current practice that drafting teams may develop and post technical documents to support draft Reliability Standards or related elements. Revisions are proposed to the language regarding posting periods to improve readability and organization.

Section 6.0: Processes for Conducting Field Tests and Collecting and Analyzing Data
(proposed new title: Process for Conducting Field Tests)
Revisions are proposed to create a more detailed process for field tests supporting Reliability Standards development. Under this process, NERC technical committees with relevant technical expertise will have a formal role in the development, approval, and oversight of field tests. Provisions are made for ongoing communication and transparency and for actions that must be taken in the event a field test is suspended or terminated due to reliability concerns.
**Section 7.0: Process for Developing an Interpretation**
Revisions are proposed to improve organization and clarify language regarding what constitutes a valid Interpretation and the circumstances under which a request for Interpretation may be rejected.

**Section 8.0: Process for Appealing an Action or Inaction**
Revisions are proposed to specify that an appellant may withdraw its Level 1 or Level 2 appeal by providing written notice to the NERC Director of Standards.

**Section 9.0: Process for Developing a Variance**
Revisions are proposed to clarify that Variances that are proposed to apply only to the Quebec Interconnection may be developed through the Northeast Power Coordinating Council Regional Reliability Standards development procedure.

**Section 10.0: Processes for Developing a Reliability Standard Related to a Confidential Issue**
In response to comments, explanatory text is added between the header and flowchart appearing under Section 10.7.

**Section 11.0: Process for Approving Supporting Documents**
*proposed new title: Process for Posting Supporting Technical Documents Alongside an Approved Reliability Standard*
Revisions are proposed to clarify that the scope of Section 11.0 is to define a process for approving the posting of supporting technical documents to approved Reliability Standards (i.e., Reliability Standards approved by applicable governmental authorities) and to define the criteria to be used for reviewing such documents before they may be approved for posting.

**Section 13.0: Process for Conducting Periodic Reviews of Reliability Standards**
Revisions are proposed to clarify the terminology used to refer to periodic reviews.

**Section 16.0: Waiver**
Updates are made to reflect the dissolution of the Standards Oversight and Technology Committee.

**Summary of Comments**
The SPM was posted three times for public comment. First, the revisions to Section 6.0 (field tests) were posted for a 30-day informal comment period from September 29, 2015 through October 28, 2015. Most commenters supported the changes, particularly the formal inclusion of the NERC technical committees in the field test process, but indicated that further work should be done to clarify roles and responsibilities for developing, approving, conducting, and overseeing field tests. The full set of comments is available here: Comments on First Posting (Section 6.0)

A revised draft of the SPM was posted for a 45-day formal comment period and initial ballot from March 20, 2017 through May 3, 2017. This draft included changes to Section 6.0 in response to comments in addition to changes in other sections. Commenters continued to provide feedback on Section 6.0 and provided comments on the changes proposed in other sections. Commenters did not support a proposal for a shorter comment and ballot process for Interpretations, which was removed in the subsequent draft. Commenters also requested additional clarity on the processes for approving the posting of supporting technical documents.
alongside approved Reliability Standards. The initial ballot achieved a 64.72 percent approval rating with 78.65 percent quorum. The consideration of comments from this posting is available here: Consideration of Comments (Second Posting)

The draft was posted for a second 45-day formal comment period and additional ballot from June 25, 2018 through August 10, 2018.¹ Most commenters supported the changes in this draft. The additional ballot achieved an 81.95 percent approval rating with 80.34 percent quorum. In response to comments, several additional non-substantive revisions were made in the final draft. The consideration of comments from this posting is available here: Consideration of Comments (Third Posting).

The results of the final ballot will be presented to the Board at this meeting.

Unresolved Minority Issues
In Section 6.0, field tests, the revisions team declined to incorporate suggested revisions relating to compliance-related issues, which are outside the scope of the SPM. The team also declined to adopt suggestions to specify when an individual entity may terminate its participation in a field test, as such issues are best addressed in the context of the individual field test and not in the SPM.

In Section 7.0, Interpretations, the team declined to adopt a suggestion to expand the definition of Interpretation to cover additional elements beyond Requirement language or to add a deadline for consideration of Interpretation requests.

In Section 11.0, the team declined to eliminate a proposed role for NERC staff to perform an initial screen of proposed technical documents before further action may be taken.

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

Revisions to the NERC Standard Processes Manual

¹ The ballot was extended one day to reach quorum.
Reliability Issues Steering Committee Resilience Report

Action
Accept

Background
The Reliability Issues Steering Committee (RISC) is an advisory committee reporting to the NERC Board that provides front-end, high-level leadership for issues of strategic importance to bulk power system (BPS) reliability. The RISC advises the NERC Board, NERC Standing Committees, NERC staff, regulators, Regional Entities, and industry stakeholders to establish a common understanding of the scope, priority, and goals for the development of solutions to address these issues. Every two years, RISC produces the ERO Reliability Risk Priorities Report. In performing these activities, the RISC provides a framework for steering, developing, formalizing, and organizing recommendations to help NERC and industry effectively focus their resources on the critical issues needed to best improve the reliability of the BPS.

In August of 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 Grid Report and NERC assessments, the Board directed the RISC to examine resilience in today’s environment and develop a framework for resilience. In accordance with the NERC Board’s directive, the RISC has worked with NERC stakeholders to reexamine the meaning of resilience in today’s changing environment and how resilience impacts NERC activities. The RISC developed a report that summarizes the results of its own examination of resilience, including the RISC Resilience Framework.

The RISC will present its Report on Resilience to the NERC Board for acceptance at the Board’s November 2018 meeting.
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Preface

The vision for the Electric Reliability Organization (ERO) Enterprise, which is comprised of the North American Electric Reliability Corporation (NERC) and the seven 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.

The North American BPS is divided into seven 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.
Executive Summary

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.¹ 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 framework for resilience and examine resilience in today’s environment. At the November 2017 NERC Board Meeting, Board Chair, Mr. Roy Thilly commented that, “Resilience is already built into what NERC does, and NERC is not looking to expand scope but rather to examine resilience more closely. The NERC Board requested that the RISC report back with a framework on how to think about resiliency in the context of reliability.”

In accordance with the NERC Board’s directive, the RISC has 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 Federal Energy Regulatory Commission (FERC) have continued evaluating the relationship of resilience and reliability. This report summarizes the results of the RISC’s examination of resilience, including the RISC Resilience Framework.

Since its inception and consistent with section 215 of the FPA, NERC has focused on the grid’s ability to withstand and manage event impacts, and respond to emerging issues and risks to ensure the Reliable Operation of the BPS.² Resilience is a performance characteristic of the Reliable Operation of the BPS and a critical part of ERO Enterprise activities. Per its statutory mission, NERC has an essential leadership role in identifying and mitigating evolving and emerging risks to reliability. Further, as a learning industry, NERC supports sharing of lessons learned and monitors system performance to identify evolving and emerging risks. Through its subject authority over Bulk Electric System (BES) reliability and its reliability programs, NERC can identify and share ways industry can increase resiliency of the BES to resist anticipated threats.

In particular, NERC must develop and enforce Reliability Standards for Reliable Operation on the BES of the BPS and conduct periodic assessments of the reliability and adequacy of the BPS in North America. For more than 50 years, “reliability” for the BPS has been defined to consist of two fundamental and aspirational concepts:

- **Adequacy** is the ability of the electric system to supply the aggregate electrical demand and energy requirements at the end-use customers at all times,³ taking into account scheduled and reasonably expected unscheduled outages of system elements.

- **Operating reliability** (formerly titled Security) is the ability of the electric system to withstand sudden disturbances such as electric short circuits or unanticipated loss of system components.


² Reliable Operation of the BPS is defined in section 215 of the Federal Power Act (FPA) as, “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 such system will not occur as a result of a sudden disturbance, including a cybersecurity incident, or unanticipated failure of system elements.” 16 U.S.C. §824o(a)(4). As discussed in section 215 of the FPA, the BPS and NERC’s jurisdiction, “does not include facilities used in the local distribution of electric energy.” 16 U.S.C. §824o(a)(1).

³ For example, many times industry designs capacity reserve margins so sufficient resources are available to meet a Loss of Load Probability (LOLP) criteria of 1-day-in-10 years. Capacity reserve margins (which do not directly consider potential energy limitations) are thus not planned to levels that ensure the system has the resources to supply aggregate electrical demand at all times, but to an agreed upon design level. This is part of the resilient design of the BPS, whereby sufficient resources have been constructed to meet a 1-day-in-10 years criteria, thus reducing the likelihood of not meeting aggregate electrical demand requirements. In the event that resources are insufficient, emergency procedures are in place to support restoration.
A resilient BPS should provide an Adequate Level of Reliability (ALR). Resilience is a critical aspect of reliability of the BPS and central to NERC’s mission. Based on its analysis of resilience, the RISC has determined that:

1. Resilience has consistently been, and should continue to be, a central component of NERC’s mission to “assure the effective and efficient reduction of risks to the reliability and security of the grid;”

2. The National Infrastructure Advisory Council (NIAC) Framework for establishing Critical Infrastructure Goals (NIAC Framework) serves as an appropriate framework for resilience as refined by the RISC and further informed by NERC’s FERC-filed definition of what constitutes the ALR of the BES;

3. NERC currently engages in a broad array of activities in support of resilience, as demonstrated by the RISC Resilience Framework’s mapping of NERC activities to aspects of resilience, and as called for in NERC’s Reliability Standards;

4. NERC should continue pursuing activities to further support a resilient and reliable BPS, as illustrated by standing committee suggestions to the RISC and NERC’s workshop on gas infrastructure risk;

5. NERC, in conjunction with industry stakeholders, should expand reliability assessment activities to support the development of a model or metrics to measure the resilience and energy security of the BPS;

6. NERC standing committees should work to develop additional guidance around achievement of both resilience and energy security, focusing on flexible design approaches and timely recovery processes for differing threats; and

7. NERC should continue to work with the North American Generator Forum, North American Transmission Forum (NATF), the Electric Power Research Institute, and other industry partners to facilitate sharing of industry practices and experiences related to addressing resilience issues as well as performing needed research and development activities.

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4 See, Chapter 2 for discussion of NERC’s definition of the ALR, as filed with FERC on an informational basis. The ALR is available at https://www.nerc.com/pa/Stand/Resources/Documents/Adequate_Level_of_Reliability_Definition_(Informational_Filing).pdf
Introduction

The electric sector is in the midst of unprecedented evolution in both the pace and magnitude of change. This evolution is driven by a number of factors, including economics, new technology, public policy priorities, and customer expectations. The changing resource mix, for example, is altering the operational characteristics of the BPS. NERC’s reliability assessments have identified and analyzed the manner in which the generation resource mix has been evolving from a fleet that primarily relies on coal, hydro, and nuclear generation to one with increasing levels of non-synchronous and natural gas-fired resources. Non-synchronous generation fueled by the sun and wind introduces greater diversity to the resource mix and is independent from traditional fuel transportation systems, although these resources may be challenged by fuel uncertainty. With the discovery of new drilling technologies, natural gas-fired generation has become a predominant conventional resource addition as older plants retire. These resources may also introduce uncertainty as they can be susceptible to fuel interruptions due to the nature of fuel procurement and gas transport capacity in some areas in North America. Similarly, inverter-based resources introduce new opportunities and potential new vulnerabilities in the form of resource tripping or blocking during some disturbances. Battery storage is also increasingly being considered as an alternative to meet system and local needs. On the cyber and physical security front, the landscape grows ever more complex as the electric sector confronts an expanding array of malicious threats and actors. Working with stakeholders, NERC and the ERO Enterprise must continue to assure the effective and efficient reduction of risks to BPS reliability and security as the industry undergoes rapid transformation. This focus is necessary to ensure that the electric sector continues to evolve with sufficient levels of resilience which is critical for Reliable Operation of the BPS.

The RISC is an advisory committee reporting to the NERC Board that provides front-end, high-level leadership for issues of strategic importance to BPS reliability. The RISC advises the NERC Board, NERC Standing Committees, NERC staff, regulators, REs, and industry stakeholders to establish a common understanding of the scope, priority, and goals for the development of solutions to address these issues. Every two years, RISC produces the ERO Reliability Risk Priorities Report. In performing these activities, the RISC provides a framework for steering, developing, formalizing, and organizing recommendations to help NERC and industry effectively focus their resources on the critical issues needed to best improve the reliability of the BPS.

In August 2017, the DOE issued the DOE Grid Report regarding reliability and resilience in light of the changing energy environment. One recommendation stated that NERC should consider adding resilience to its mission statement and work with its members to broaden its ways of addressing resilience. On November 9, 2017, in response to the DOE report and NERC assessments, the NERC Board directed the RISC to develop a framework examining resilience, its definition, and NERC activities contributing to resilience.

Pursuant to the Board’s directive, the RISC developed a Resilience Framework based on the NIAC Framework and further informed by NERC’s, FERC-filed definition of the ALR. Relying on these prior activities, the RISC prepared a Resilience Framework mapping ERO Enterprise activities to four outcome-based abilities of resilience: (1) robustness; (2) resourcefulness; (3) rapid recovery; and (4) adaptability. The RISC then requested NERC Standing Committee feedback, to assist with its subsequent evaluation of whether NERC should take additional steps to address key elements of BPS resilience. At the same time, the RISC monitored NERC’s Natural Gas Workshop held on July 10, 2018 and focused on evaluating solutions to potential resilience issues associated with fuel adequacy and assurance presented by increasing dependence on natural gas-fired generation.

While NERC’s reexamination of resilience was underway, on October 10, 2017, the DOE submitted a proposed rule to FERC on grid reliability and resilience pricing. NERC and other stakeholders provided comments in that proceeding. On January 8, 2018, FERC issued an order terminating the DOE’s proposed rule and initiating a new proceeding to

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define and examine resilience. FERC’s proposed definition of resilience was based on the NIAC Framework, and FERC asked whether resilience was addressed by existing operating procedures, Regional Transmission Operator/Independent System Operator (RTO/ISO) planning processes, and NERC Reliability Standards. RTO/ISO comments were filed on March 9, 2018, and reply comments were filed by NERC and other stakeholders on May 9, 2018. Consistent with the RISC’s findings, NERC’s comments focused on resilience as an element of Reliable Operation of the BPS. NERC explained that reliability encompasses aspects of resilience of the BPS consistent with NERC’s statutory mission, the definition of the ALR, and NERC activities. NERC’s comments also presented the RISC Resilience Framework.7 These issues were addressed once more in testimony given by James Robb, president and chief executive officer of NERC, and Mark Lauby, senior vice president and chief reliability officer of NERC, during FERC’s 2018 Reliability Technical Conference.8 Mr. Lauby’s testimony at the resilience panel stated, “[a]s the ERO, a highly reliable and secure grid is at the heart of our vision and the very foundation of the ERO Enterprise. NERC, and the Regional Entities, which make up the ERO Enterprise, work with industry every day to identify risks to reliability, prioritize actions, and implement mitigation strategies.” 9

This report presents the RISC’s findings in response to the NERC Board’s directed evaluation of resilience and summarizes relevant regulatory proceedings.

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7 See, Comments of NERC in Response to Grid Reliability and Resilience Pricing NOPR; and NERC Reply Comments on FERC Grid Resilience Proceeding (for NERC comments in FERC Docket Nos. RM18-1-000 and AD-18-7-000 respectively).
Chapter 1: The RISC’s Commitment to Evaluate Resilience

Overview of the NERC Board’s Directive to Evaluate Resilience

The DOE Grid Report was issued after the Secretary of the DOE requested a grid study to examine the evolution of wholesale electricity markets, compensation for resilience in wholesale energy and capacity markets, and baseload power plant retirements. The report asserted that a combination of market and policy forces, including low natural gas prices, low electricity growth, environmental regulations, and increased variable renewable energy penetration have accelerated the closure of a significant number of traditional baseload power plants. In addition, the report noted that: (1) bulk power reliability is adequate today, but long-term concerns about baseload retirements require further study; (2) markets recognize and compensate reliability, but more work is needed to understand resilience across a variety of scenarios; and (3) growing natural gas interdependence still needs to be addressed.

One recommendation stated that NERC should consider including resilience as an explicit part of its mission, stating “NERC should consider adding resilience components to its mission statement and develop a program to work with its member utilities to broaden their use of emerging ways to better incorporate resilience.”

After reviewing the report and its recommendations, the NERC Board directed the RISC to reexamine resilience and its definition, propose a resilience framework, review NERC’s ongoing activities and their contributions to resilience, and make recommendations for any additional actions.
Chapter 2: RISC Evaluation of Resilience and Development of the Resilience Framework

In response to the NERC Board’s directive, the RISC initiated activities to examine resilience in today’s environment, leveraging prior efforts to address resilience. Through its analysis of the issues, the RISC determined that resilience is an existing and central component of NERC’s mission, created a model for Reliable Operation of the BPS, and developed the NERC Resilience Framework.

The RISC Resilience Framework is presented in Table 2.1 as the culmination of these efforts and a tool supporting NERC activities in favor of resilience. In particular, the RISC Resilience Framework is intended to:

1. Develop a common understanding and definition of the key elements of BPS resilience;
2. Understand how these key elements of BPS resilience fit into the existing ERO framework; and
3. Evaluate whether there is a need to undertake additional steps, within the ERO framework, to address these key elements of BPS resilience beyond what is already in place and underway in connection with ongoing ERO Enterprise operations, including work being undertaken by each of the NERC standing committees.

Leveraging Prior Efforts Addressing Resilience

The RISC determined that it should begin developing a NERC Resilience Framework by building on prior efforts addressing resilience, including the NIAC Framework. As a result, the RISC Resilience Framework relies on the NIAC Framework as a credible source for understanding resilience, which breaks down resilience into four outcome-focused abilities: (1) robustness; (2) resourcefulness; (3) rapid recovery; and (4) adaptability.

The RISC Resilience Framework is based on the NIAC Framework, with additions in red proposed by the RISC based on standing committee feedback in March of 2018. Four outcome-based abilities of resilience are included as follows:

- **Robustness** – the ability to absorb shocks and continue operating
- **Resourcefulness** – the ability to detect and manage a crisis as it unfolds
- **Rapid recovery** – the ability to get services back as quickly as possible in a coordinated and controlled manner and taking into consideration the extent of the damage
- **Adaptability** – the ability to incorporate lessons learned from past events to improve resilience

In particular, the RISC modified the NIAC Framework to include the ability to detect crises (such as cyber incidences or equipment failure modes) within the scope of resourcefulness and to ensure rapid recovery is performed in a coordinated and controlled manner as provided in the ALR.

Resilience as an Existing and Central Component of NERC’s Mission

While developing the Resilience Framework, the RISC determined that resilience is an existing and central component of NERC’s mission to support Reliable Operations of the BPS. The RISC’s May 2018 presentation to the Member Representatives Committee (MRC) detailed the RISC’s evaluation of resilience as a key aspect of NERC’s mission. As provided in section 215 of the Federal Power Act, NERC develops Reliability Standards based on what is necessary to achieve an ALR for Reliable Operations. When FERC certified NERC as the ERO, it ordered that a definition of the ALR be submitted to FERC. NERC accordingly developed, filed, and later updated a definition of the ALR along with

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a technical report\textsuperscript{11} to guide Reliability Standards development, Reliability Assessments, and standing committee work. In particular, the ALR is defined as the state that design, planning, and operation the BES will achieve when five performance objectives are met.\textsuperscript{12}

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 to a sustainable operating state and recovery to a new steady state

These periods of time generally correspond to the four outcome-based abilities of the NIAC Framework and FERC’s proposed definition of resilience. (See Chapter 3 below for discussion of that proceeding). NERC must develop and enforce Reliability Standards on the BES for Reliable Operation of the BPS as well as assess reliability and adequacy of the BPS in North America.\textsuperscript{13}

The ALR provides granularity of NERC’s definition of BPS reliability which consists of two fundamental concepts that encompass aspects of resilience:

- **Adequacy** is the ability of the electric system to supply the aggregate electrical demand and energy requirements at the end-use customers at all times, taking into account scheduled and reasonably expected unscheduled outages of system elements.

- **Operating reliability** is the ability of the electric system to withstand sudden disturbances such as electric short circuits or unanticipated loss of system components.\textsuperscript{14}

As stated in the companion technical report to the definition of ALR:

\textsuperscript{11} \url{https://www.nerc.com/pa/Stand/Resources/Documents/Adequate_Level_of_Reliability_Definition_(Informational_Filing).pdf} (including with the informational filing at FERC as Exhibit B).

\textsuperscript{12} 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.

\textsuperscript{13} Section 215 of the FPA specifically does not authorize the ERO to develop standards related to adequacy and safety.

\textsuperscript{14} Adequacy assumes a certain level of forecast demand distribution does not cover all events that may occur. System are design cover a level of probabilistic service interruption (i.e. 1 event in 10 years) considering the distribution of louds and outages.
Simply stated, the ALRTF’s goal is to develop a definition of ALR that encompasses NERC’s responsibility to ensure reliable planning and operation of the BES, along with the obligation to assess the capability of the BES. The definition identifies and defines Reliability Performance Objectives that drive what system planners and operators do on a day-to-day basis to ensure that the BES is reliable and defines Reliability Assessment Objectives that identify risks to system reliability that alert system planners and operators so appropriate actions can be taken...

ALR is clearly not a single value or outcome or state; rather, ALR is an outcome of a multi-dimensional effort to identify Reliability Performance and Assessment Objectives and then achieve outcomes that will support reliable operations. This multi-dimensional effort is reflected in NERC’s current and evolving body of reliability standards, which work together to establish a portfolio of performance outcomes, risk reduction, and capability-based reliability standards that are designed to achieve an in-depth defense against an inadequate level of reliability. Other NERC programs, such as industry alerts; reliability assessments; event analysis; education; the compliance with and enforcement of reliability standards, are designed to work in concert with reliability standards to support reliable operation. Each of these activities should be driven by the goal of consistently achieving an adequate level of reliability. 15

The RISC’s Model for Reliable Operation of the BPS
Leveraging the NIAC Framework and the NERC ALR, the RISC created a model depicted in Figure 2.1 below that illustrates and enables measurement of system performance, or resilience, and provides an understanding of the elements needed to support the Reliable Operation of the BPS. Measuring the profile represented in this model provides relative characteristics of system performance, identifies areas where improvements may be desired, post events, and measures the success from system improvements. Some of the key areas that lend themselves for measurement are robustness, amplitude, degradation, recovery, and recovery state.

15 Supra, n. 11, at pp. 1-2.
Chapter 2: RISC Evaluation of Resilience and Development of the Resilience Framework

The RISC Resilience Framework as a Tool to Support Resilience

Relying on the NIAC Framework, NERC ALR, and the RISC Model described above, the RISC prepared a NERC Resilience Framework to map current ERO Enterprise activities to the four outcome-based abilities of the NIAC Framework. By bringing together the concepts in the refined NIAC Framework and NERC’s definition of the ALR, the RISC has arrived at an overall NERC-specific Resilience Framework. The RISC Resilience Framework reflects the realization that Reliable Operation varies and is a function of time.

Recognizing that the BPS cannot withstand all potential events, an adequate level of reliability must be provided so that the system can be reliably operated even with degradation in reliability due to an event. Further the system must have the ability to rebound or recover when repairs are made, or system conditions are alleviated. The resulting RISC Resilience Framework provides guidance on how resilience fits into NERC’s activities and how additional activities might further support resilience of the grid. The RISC Resilience Framework underscores NERC’s longstanding focus on aspects of resilience and emphasis on reexamining the issue in the face of the changing resource mix.
Table 2.1 provides the RISC Resilience Framework and the associated NERC activities that support the NIAC outcome-based abilities.16

<table>
<thead>
<tr>
<th>NIAC Resilience Constructs</th>
<th>Key Programs and Activities</th>
<th>Specific Efforts/Tools</th>
</tr>
</thead>
</table>
| Robustness — The ability to continue operations in the face of disaster. In some cases, it translates into designing structures or systems to be strong enough to take a foreseeable punch. In others, robustness requires devising substitute or redundant systems that can be brought to bear should something important break or stop working. Robustness also entails investing in and maintaining elements of critical infrastructure so that they can withstand low probability but high consequence events. | • Reliability and Emerging Risk Assessments  
• Risk, Event and Performance Monitoring  
• Technical Committee work, including special projects  
• Mandatory Reliability Standards  
• Reliability Guidelines and technical reference documents  
• System Operator Certification and Credential Maintenance  
• System Operator Training  
• E-ISAC information sharing programs | • Alerts  
• State of Reliability Report  
  • GADS  
  • TADS  
  • DADS  
  • Protection system misoperations  
  • TEAMS  
  • FR Performance  
• Long-Term Reliability Assessment  
• Key Reliability Standards:  
  • TPL (Extreme)  
  • EOP  
  • Blackstart Restoration  
  • Personnel Credentials  
  • GridEx  
• Security conferences and information sharing (e.g. GridSecCon)  
• Supply Chain Security  
• Security Practices |
| Resourcefulness — The ability to skillfully detect and manage a disaster as it unfolds. It includes identifying options, prioritizing what should be done both to control damage and to begin mitigating it, and communicating decisions to the people who will implement them. | • Situational Awareness and Industry Coordination  
• Government Coordination  
• Cross-Sector Information Sharing  
• Mandatory Reliability Standards/Functional Model | • BPSA information sharing tools and processes  
• E-ISAC information sharing tools and processes  
• Formation of a Crisis Action Team to support industry and governmental coordination  
• GridEx |

16 Other activities are ongoing with industry and governmental entities, such as NATF and the DOE. Coordination can help support effectiveness and avoid gaps or duplicative efforts.
17 Those items in red indicate NERC additions to the NIAC framework that includes the ability to detect (such as cyber incidences or equipment failure modes), or ensure rapid recovery includes that it is performed in a coordinated and controlled manner per the ALR.
### Table 2.1: RISC Resilience Framework

<table>
<thead>
<tr>
<th>NIAC Resilience Constructs</th>
<th>Key Programs and Activities</th>
<th>Specific Efforts\Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resourcefulness</td>
<td>• Reliability Guidelines and technical reference documents</td>
<td>• Standards requirements</td>
</tr>
<tr>
<td></td>
<td>• System Operator Certification and Credential Maintenance</td>
<td>▪ Reliability Coordinators</td>
</tr>
<tr>
<td></td>
<td>• System Operator Training</td>
<td>▪ Transmission Operators</td>
</tr>
<tr>
<td></td>
<td><em>Resourcefulness depends primarily on people, not technology.</em></td>
<td>▪ Communications</td>
</tr>
<tr>
<td>Rapid recovery</td>
<td>• Situational Awareness, Industry Coordination</td>
<td>• Support for Electric Sector Coordinating Council activities</td>
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<tr>
<td></td>
<td>• Government Coordination</td>
<td>▪ BES simulation</td>
</tr>
<tr>
<td></td>
<td>• Cross-Sector Information Sharing</td>
<td>▪ System restoration coordination</td>
</tr>
<tr>
<td></td>
<td>• Reliability Guidelines and technical reference documents</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• System Operator Certification and Credential Maintenance</td>
<td></td>
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<tr>
<td></td>
<td>• System Operator Training</td>
<td></td>
</tr>
<tr>
<td>Adaptability</td>
<td>• Reliability and Emerging Risk Assessments</td>
<td>• Technical Committee Recommendations</td>
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<td></td>
<td>• Event Analysis</td>
<td>• Reliability Guidelines</td>
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<td></td>
<td>• Event Forensics</td>
<td>• Lessons Learned</td>
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<tr>
<td></td>
<td>• Reliability Guidelines and technical reference documents</td>
<td>• Event Analysis, Investigations</td>
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<tr>
<td></td>
<td>• System Operator Certification and Credential Maintenance</td>
<td>• Audit Recommendations</td>
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<tr>
<td></td>
<td>• System Operator Training</td>
<td>• Reliability Assessments</td>
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<tr>
<td></td>
<td>• Periodic Review</td>
<td>• State of Reliability Report</td>
</tr>
<tr>
<td></td>
<td><em>Rapid recovery—The capacity to get things back to normal as quickly as possible after a disaster in a coordinated and controlled manner and taking into consideration the extent of the damage. Carefully drafted contingency plans, competent emergency operations, and the means to get the right people and resources to the right places are crucial.</em></td>
<td>• Annual BES Security Assessment</td>
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<td></td>
<td>• BES Security Metrics</td>
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<td></td>
<td></td>
<td>• Training</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• BES simulation</td>
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<tr>
<td></td>
<td></td>
<td>• Emergency operations</td>
</tr>
</tbody>
</table>
Chapter 3: Resilience Proceedings by Governmental Authorities

Overview of the Proceedings and Initial Comments

On October 10, 2017, following the DOE Grid Report, the DOE submitted a proposed rule on grid reliability and resilience pricing to FERC. On January 8, 2018, FERC issued an order terminating the DOE’s proposed grid resilience pricing rule and initiating a new proceeding to examine resilience.18 FERC proposed to define resilience as, “[t]he ability to withstand and reduce the magnitude and/or duration of disruptive events, which includes the capability to anticipate, absorb, adapt to, and/or rapidly recover from such an event.”19 FERC based its proposed definition on the NIAC framework. In addition, FERC asked whether existing operating procedures, RTO/ISO planning process, and NERC Reliability Standards address resilience and whether they should be modified to better address resilience.20

Initial RTO/ISO comments were filed with FERC on March 9, 2018. Reviewing RTO/ISO comments, the RISC noted:

• Most RTOs/ISOs generally appeared to have perspectives on reliance that were consistent with FERC’s proposed definition of resilience and the (then draft) RISC Resilience Framework;
• Most RTOs/ISOs commented that their planning processes take into account reliability and resilience;
• RTO/ISO comments did not indicate a gap in relation to the RISC’s discussions; and
• Several RTOs/ISOs highlighted regional concerns and the value of interregional coordination, NERC Reliability Standards, and resource diversity.

NERC’s Reply Comments in FERC’s Resilience Proceeding

On May 9, 2018, NERC and other stakeholders filed reply comments in the proceeding. Consistent with the RISC’s evaluation of resilience, NERC’s comments focused on resilience as an element of Reliable Operation of the BPS and as related to the ALR of the BES. NERC explained that reliability encompasses aspects of resilience of the BPS, consistent with section 215 of the FPA and NERC’s obligation to develop Reliability Standards supporting Reliable Operation of the BPS. NERC described how elements of resilience are incorporated into NERC’s definition of the ALR.

NERC’s comments also summarized activities under Reliability Standards, Reliability Assessments, Event Analysis, Situational Awareness, and the Electric-Information Sharing Analysis Center (E-ISAC) in support of resilience of the BPS. For example, NERC’s comments highlighted that, as recognized by RTOs/ISOs in the proceeding, NERC Reliability Standards incorporate resilience by supporting robustness, resourcefulness, rapid recovery, and adaptability. These Reliability Standards relate to the BPS’s capability to withstand disturbances in anticipation of potential events, manage the system after an event, and/or prepare to restore or rebound after an event. For example, NERC has developed the following:

• Reliability Standard TPL-001-4 (Transmission System Planning Performance Requirements): regarding planning performance requirements in anticipation of potential events;
• Reliability Standard EOP-004-3 (Event Reporting): requiring that entities report disturbances and events threatening reliability;
• Reliability Standard EOP-005-2 (System Restoration from Blackstart Resources): requiring preparation for system restoration from Blackstart resources;
• Reliability Standard EOP-006-2 (System Restoration Coordination): requiring that plans and personnel be prepared to support system restoration after an event;

19 Order, P 23.
20 Order, P 27.
• Reliability Standard EOP-011-1 (Emergency Operations): requiring operating plans to mitigate emergencies;
• Reliability Standard CIP-006-6 (Cyber Security – Physical Security of BES Cyber Systems): requiring a physical security plan in support of protecting BES Cyber Systems;
• Reliability Standard CIP-008-5 (Cyber Security - Incident Reporting and Response Planning): requiring plans to address reportable cyber security incidents;
• Reliability Standard CIP-014-2 (Physical Security): pertaining to physical security; and
• Reliability Standard TPL-007-1 (Transmission System Planned Performance for Geomagnetic Disturbance Events): on planning to withstand a predefined level of geomagnetic disturbances.21

Other Reliability Standards codify obligations to implement lessons learned and thereby adapt after an event. See, for example:

• Reliability Standard TPL-007-1 (Transmission System Planned Performance for Geomagnetic Disturbance Events): requiring corrective action plans if a geomagnetic disturbance vulnerability assessment concludes that the system does not meet certain performance requirements;
• Reliability Standard PRC-004-5 (Protection System Misoperation Identification and Correction): requiring a corrective action plan after Protection System Misoperations or declaration explaining why corrective action plans are beyond the entity’s control or would not improve BES reliability;
• Reliability Standard PRC-006-3 (Automatic Underfrequency Load Shedding): requiring a corrective action plan where the automatic underfrequency load shedding (“UFLS”) design assessment determines that the UFLS program does not meet certain performance characteristics; and
• Reliability Standard PRC-016-1 (Remedial Action Scheme Misoperations): regarding corrective actions to avoid future remedial action scheme misoperations.22

In addition to Reliability Standards, NERC’s comments described Reliability Assessments and Event Analysis on issues impacting resilience, such as NERC’s 2017 Special Reliability Assessment: Potential Bulk Power System Impacts Due to Severe Disruptions on the Natural Gas System and Alert 1200 MW Fault Induced Solar Photovoltaic Resource Interruption Disturbance Report. NERC also highlighted activities by the E-ISAC such as GridEx and the Cybersecurity Risk Information Sharing Program. Finally, NERC described work being completed by the RISC to reexamine resilience and potential additional NERC activities in support of resilience.23

Third Party Comments on FERC’s Resilience Proceeding
A wide variety of third party comments were filed in the latest FERC proceeding, reflecting the diversity of issues affecting resilience. The RISC reviewed these comments as part of evaluating resilience pursuant to the NERC Board’s directive. Reviewing third party comments, the RISC observed that:

• Comments widely recognized NERC activities in support of resilience;
• Several commenters underscored FERC’s limited jurisdiction over the electric and natural gas distribution systems;
• Many commenters highlighted regional differences impacting resilience;
• Several comments highlighted the role of transmission infrastructure in resilience; and

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22 Id.
23 Supra n. 7.
• Comments presented varying perspectives on the extent to which reliance on natural gas-fired generation is impacting or could impact resilience of the BPS.
Chapter 4: Standing Committee Feedback

As mentioned above, the RISC requested NERC standing committee feedback regarding activities addressing resilience. In particular, the RISC requested input from the Compliance and Certification Committee (CCC), Critical Infrastructure Protection Committee (CIPC), Operating Committee (OC), Personnel Certification and Governance Committee, Planning Committee (PC), and Standards Committee (SC) on the RISC Resilience Framework.

The RISC requested that these committees comment on:

1. The committee’s views on how BPS resilience is currently being addressed within the scope of the committee’s responsibilities; and
2. Any additional activities the committee believes should be undertaken.

All committees supported the Resilience Framework. Standing committee comments underscored that resilience is an existing concept, reflected within the definition of the ALR as well as definitions of Reliability, Adequacy, and Security. The CCC, CIPC, OC, PC, and SC also suggested additional activities that might support resilience. Some additional activities included, for example, revisions to standards process templates and training materials, enhanced communication of NERC's ongoing resilience and risk mitigation efforts, additional compliance monitoring focus on standards supporting resilience, and additional focus on areas that might impact resilience. The RISC will review these suggestions as input to the 2019 ERO Reliability Risk Priorities Report for potential 2020 implementation.
Chapter 5: Conclusion

NERC’s activities, since its inception, have focused on the ability to withstand events, manage event impacts, and respond to emerging issues and risks to ensure the Reliable Operation of the BPS. As the ERO, NERC must identify new and emerging risks to reliability. Resilience is an existing part of NERC’s statutory mission to assure the effective and efficient reduction of risks to the reliability and security of the grid. The RISC’s examination of resilience demonstrates NERC has consistently considered aspects of resilience as part of what contributes to reliability. While a system able to withstand impacts from all risks is a difficult and costly goal to realize, it is feasible and imperative to establish an adequate level of reliability that gives due consideration to cost efficiency and effectiveness. A balance is achieved by coupling the ability to withstand impacts to certain design levels with resilience measures that are meant to mitigate risks to reliability and maintain Reliable Operation of the BPS. By leveraging industry expertise, informed by sound technical analysis and support by the ERO Enterprise, NERC fosters a learning environment to identify and mitigate risks in pursuit of improved reliability. The ERO Enterprise’s continued leadership role is essential to maintaining a focus on conventional risk, while anticipating emerging risks during a period of revolutionary change in the electricity sector.

The RISC Resilience Framework, informed by the NIAC Framework and NERC’s definition of the ALR, provides an appropriate definition of resilience in today’s environment. This definition is consistent with FERC’s proposed definition in pending regulatory proceedings. The RISC Resilience Framework demonstrates how various NERC activities support resilience by mapping NERC activities across the ERO Enterprise that are driven towards supporting the ALR and a resilient system. These activities include Reliability Standards, reliability assessments, event analysis, GridEx, and the E-ISAC work. As described in this report, the ERO should continue pursuing activities that support resilience.
Memorandum of Understanding between Manitoba Hydro, the North American Electric Reliability Corporation and the Midwest Reliability Organization

**Action**
Authorize the execution of a Memorandum of Understanding ("MOU") between Manitoba Hydro, the North American Electric Reliability Corporation ("NERC") and the Midwest Reliability Organization ("MRO").

**Background**
As of April 1, 2012, mandatory adherence to electric Reliability Standards became a legal obligation of all users, owners, and operators of the Bulk Power System within the Province of Manitoba through a statutory process and the associated adoption of the Manitoba Reliability Standards Regulation (C.C.S.M. c. H190). Reliability Standards that are developed by NERC or MRO and adopted within the province are implemented through the Manitoba Reliability Standards Regulation which includes the Manitoba Compliance Monitoring and Enforcement Program (which closely resembles the Uniform CMEP in effect in the United States.). There are currently 70 NERC Reliability Standards in effect in Manitoba.

In addition, pursuant to the *Manitoba Hydro Act*, Manitoba Hydro can develop reliability standards that are binding on specified entities in Manitoba. Manitoba Hydro has exercised this authority for two planning standards – MH-TPL-001-4 and MH-TPL-007-2 - that are based on the comparable NERC Reliability Standards – TPL-001-4 (currently in effect) and TPL-007-2 (pending approval by the Federal Energy Regulatory Commission). Manitoba developed these standards due to concerns surrounding Corrective Action Plan Requirements. Also pursuant to the *Manitoba Hydro Act*, Manitoba Hydro may conduct compliance monitoring or authorize another entity to perform compliance monitoring for Manitoba-developed reliability standards.

This MOU sets forth the roles and responsibilities of the signatories in relation to Manitoba Hydro’s authorization of MRO to conduct compliance monitoring for the Manitoba Hydro reliability standards. This MOU confirms NERC’s oversight of MRO’s role as the compliance body under the *Manitoba Hydro Act* and to permit the sharing of information amongst the signatories with respect to compliance monitoring of Manitoba-developed standards.

**Overview of MOU Provisions**

**Signatories**
- The signatories to the MOU are Manitoba Hydro, NERC, and MRO.

**Definitions**
- The signatories authorize sharing of information provided by a Monitored Entity with NERC and MRO.
Reliability Standards

- The signatories establish that Manitoba Hydro will provide NERC and MRO with notice of the development of any new Manitoba Standards.

Monitoring Program

- The signatories distinguish that while the monitoring of Manitoba standards by MRO may be performed at the same time as monitoring of NERC/MRO Standards adopted in Manitoba, documentation related to monitoring mechanisms for Manitoba Standards (such as Compliance Oversight Plans, pre-audit questionnaires, etc.) will be separate from the documentation associated with monitoring NERC/MRO Standards.

- Instances of alleged non-compliance with Manitoba standards by Monitored Entities will be tracked separately from instances of alleged non-compliance with NERC/MRO Standards.

- At their discretion, NERC staff may participate on any compliance audit team as an observer.

- MRO will provide NERC with its written report covering its monitoring activities as well as its assessment of compliance with the applicable Manitoba standards.

Next Steps
Following NERC Board of Trustee authorization to enter into the MOU, NERC will execute the MOU with MRO and Manitoba Hydro representatives.
Reliability Coordinator Function in the Western Interconnection

Action
Update

Introduction
The Western Interconnection (WI) has been served by a single Reliability Coordinator (RC) since January 2009. Following the September 8, 2011 Southwest Outage, the WECC Board of Directors began a process to establish Peak Reliability (Peak) as an independent company to provide RC services for the Western Interconnection. In January 2014, Peak officially assumed the RC assets and began performing the RC function for the WI (less Alberta who provides its own RC-like service).

In January 2018, the California Independent System Operator (CAISO) announced that it would become its own RC and offer these services to other Balancing Authorities (BAs) and Transmission Operators (TOP) in the West. On June 20, 2018, WECC received an official request from SPP to provide RC services in the WI. On July 18, 2018, Peak announced that it will cease operation at the end of 2019. In September 2018, British Columbia Hydro and Power Authority (BCH) notified WECC of its intentions to become the RC for the British Columbia province.

Background
As of October 17, entities representing all of the net energy for load (NEL) in the West had expressed nonbinding commitments to join various RCs. The current reporting structure has approximately 74 percent of the load selecting the CAISO RC, approximately 12 percent choosing SPP RC, and approximately seven percent choosing BCH as their preferred RC. The Alberta Electric System Operator (AESO) will continue to provide RC services for the Alberta province. While the ultimate configuration of RCs and the affiliations of TOPs and BAs to those RCs may change slightly, it is clear that over the next 12-18 months, there will be multiple RCs in the WI.

- As the Regional Entity for the WI, WECC has well-defined responsibilities and authorities related to this transition:
  - Ensure that the RC(s) that are formed are certified to perform the registered function;
  - Ensure that all TOPs and BAs are aligned with a certified RC (mapping); and
  - Perform ongoing compliance monitoring of the RCs to ensure they are compliant with the applicable Standards.

WECC is working closely with NERC to assure the reliability and security of the bulk power system in the WI during this transition. In response to requests from stakeholders, WECC has been hosting a series of RC Forums, most recently on October 12 and will continue to host them based on feedback from stakeholders. These forums have provided stakeholders with an opportunity to understand and discuss the reliability implications of multiple RCs in the WI. The RC-RC Coordination Group plans to meet two times per month through the end of the year. Both SPP and CAISO have organized several internal subgroups to facilitate the RC transition.
(i.e. modeling and data exchange, readiness and customer onboarding, training both customers and RCs, rating methodology and congestion management, shared tools, outage coordination).

The presentation will discuss in more detail the activities WECC and NERC have underway to understand the evolving situation and activities planned in preparation for the necessary Certifications.
Addressing Recommendations from Recent Reliability Assessments

**Action**
Update

**Background**
The 2017 NERC Special Reliability Assessment: *Potential Bulk Power System Impacts Due to Severe Disruptions on the Natural Gas System* included the following recommendation for NERC and the electric power industry to consider potential Reliability Standard improvements and/or Reliability Guideline development:¹

> NERC, with industry support, should enhance its Reliability Guidelines and/or Standards as necessary to include additional planning and operating requirements for analyzing disruptions to the natural gas infrastructure and their impacts on the reliable operation of the bulk power system (BPS). The standards should include developing and deploying mitigation plans to address reliability risks caused by outages of significant natural gas infrastructure.

In March 2018, the PC established an advisory group to identify potential enhancements to existing transmission planning documents. As part of its review, the PC Advisory Group conducted a Natural Gas and Electric Reliability Workshop on July 10, 2018.

As a result of this process and in coordination with the PC, the PC Advisory Group has identified the following objectives for developing enhanced planning approaches to address fuel assurance and fuel disruption risk to the reliable operation of the BPS:

- Development of a reliability guideline for studying BPS impacts due to generator fuel issues;
- Establishment of a working group to support development of tools for addressing natural gas interoperability concerns;
- Enhancing Generator Availability Data System (GADS) data collection to support information needs related to fuel assurance impacts on generating units; and
- Evaluation of the need for reliability standards to support fuel assurance and, if deemed necessary, development of a Standards Authorization Request (SAR).

Each objective and its associated course of action are described in the attachment.

**Next Steps**
Subject to direction from the NERC Board, the PC intends to implement the courses of action described in the attachment starting as soon as possible.

Planning Committee Actions to Address Assessment Report Recommendations

Background
On Tuesday, July 10, 2018, NERC conducted a workshop regarding recommendations made in its report titled 2017 Special Reliability Assessment: Potential Bulk Power System Impacts Due to Severe Disruptions on the Natural Gas System.¹ In the report, NERC recommended that industry enhance Reliability Guidelines and/or Reliability Standards to include additional considerations for assessing disruptions of natural gas infrastructure and impacts on the reliable operation of the bulk power system (BPS) in planning studies. As recommended by NERC, the guidelines/standards should include developing and deploying mitigation plans to address reliability risks caused by outages of significant natural gas infrastructure. The workshop presented information from subject matter experts on how to achieve the reliability recommendation goal. Participants included representatives from NERC Planning Committee (PC) and Operating Committee (OC), Federal Energy Regulatory Commission (FERC), Department of Energy (DOE), Regional Entities, electric utilities, RTOs/ISOs and natural gas industry trade organizations such as the American Gas Association, Interstate Natural Gas Association of America, and American Petroleum Institute.

Building on workshop outcomes, the PC Advisory Group identified objectives and PC actions for developing enhanced planning approaches to address fuel assurance and fuel disruption risk to the reliable operation of the BPS. The PC Advisory Group presented their recommendations for PC input during the September 2018 PC meeting.

Action Plan
The PC intends to address the 2017 Special Reliability Assessment report recommendations through the following actions:

- The PC will oversee the development of a new Reliability Guide that focuses on including fuel assurance and fuel disruption risk into BPS planning studies. The PC will form a task force to convene subject matter experts and establish the goals and deliverables for the creation of a new guide.
  - Based on reactions from some workshop attendees, it is clear that system planners would like guidance around establishing “contingency selection” and other assumptions to be used for studying the impact on the BPS from gas unavailability as well as natural gas system disturbances. Planners also would like guidance as to how to evaluate which impacts to the BPS, including the ability to serve load, they should be willing to accept. The Reliability Guideline will address all fuel sources and fuel assurance and disruption risks will be evaluated regardless of the fuel type. Each fuel type has variety of factors that affect its assurance and/or availability and the Reliability Guideline is expected to provide clarification on how they should

be factored into planning studies. This effort is expected to provide guidance to system planners in support of addressing emerging reliability risks and not to impose additional compliance requirements.

- **Based on some observations made from the July 10, 2018 Workshop, fuel assurance continues to grow and impact the Reliable Operation of the Bulk Electric System which could lead to widespread implications. The PC, may, if appropriate, oversee the creation of a Standard Authorization Request (SAR).**
  - Initial thoughts focus on accomplishing this through a Reliability Guideline first, evaluating if a measurable and desired level of performance by industry is achieved, and if a standard is needed.
  - Risks from the lower levels of fuel assurance continue to show up in various studies and could have wide-spread implications to the bulk power system. Results from planning studies may underestimate potential reliability impacts to the BPS if planning studies are not required to consider fuel assurance or disruption risks.
  - Enhancements to Reliability Standards may be needed to assure that steady-state and stability planning studies are being performed and Corrective Action Plans are developed based on agreed upon contingency selection and design criteria.

- **The PC will form a new working group to study and assist with the development of tools and other resources on natural gas interoperability concerns.**
  - This working group would be open to all types of organizations, but we are seeking those from gas and electric based utilities and particularly interested in expanding the opportunity to bring in gas industry personnel to ensure that we have broad and open discussions amongst those in the gas-electric operating world.

- **NERC should enhance its Generator Availability Data System database for more granular information on unit availability due to fuel assurance and energy security concerns.**

**Plan Oversight**

The Planning Committee Executive Committee (PCEC) will oversee the execution of the action plan. Specific tasks will be incorporated into the PC Work Plan, including task description, group responsible, status, and estimated completion date. The work plan will be updated monthly, or more frequently as required.
Operating Committee Report

Operating Committee’s (OC) Major Accomplishments for 2018 (year-to-date)

1. **OC and Subcommittee Work Plans** – The OC Executive Committee and the leadership of its subcommittees met on January 10, 2018 to review and update the OC Work Plan. At the March 2018 OC meeting, the OC reviewed and approved the OC Work Plans.

2. **Resiliency Framework** – The Reliability Issues Steering Committee (RISC) has requested that each standing committee provide the RISC, on or before March 28, 2018, with their views on how BPS resilience is currently being addressed within the scope of their committee’s responsibilities and recommend any additional activities they believe should be undertaken. The OC provided its input to the Chair of the RISC, Peter Brandien on March 27, 2018.

3. **OC Strategic Plan** - At its March 2018 meeting, the OC formed a task team to review and revise, if appropriate, its Strategic Plan to ensure alignment with the updated NERC Strategic Plan. After a thorough review, the team believes the OC and ERO plans are fully aligned. In the process of conducting the review, the team noted a few observations on the OC Strategic Plan:
   a. There is an opportunity to make clarifying changes to improve the plan without making substantive changes.
   b. There is an opportunity to enhance the plan by adding metrics.
   c. With the rapidly changing resource portfolio, including increasing Distributed Energy Resources (DERs), the team recommends the OC reviews progress on and consider being more proactive in achieving Goal - OC 1.

   The OC will consider these observations during the next OC Strategic Plan revision.

4. **Reliability Guidelines and Reference Documents** – The OC has developed and approved Reliability Guidelines and Reference Documents addressing:
   a. Reliability Guideline for Operator Recognition Cyber Intrusion into Operating System to provide System Operators with information on the recognition of cyber intrusion into their operating systems.
   b. Methods for Establishing Interconnection Reliability Operating Limits (IROLs) Reliability Guideline which was developed by the Methods for Establishing IROLs Task Force to provide guidelines for developing such limits.
   c. BPS-Connected Inverter-Based Performance Reliability Guideline which developed by the Inverter-based Resource Performance Task Force (IRPTF) to address issues relating to inverter based resource performance during the Blue Cut Fire.
OC’s Major Initiatives for 2018

1. **Reliability Guidelines and Reference Documents** – Each subcommittee will develop a summary for each of the Reliability Guidelines and Reference Documents under their purview. The OC has also established a team to develop a formal roll-out process for new or revised documents to include industry webinars to inform industry. The OC is developing, or has developed, Reliability Guidelines and Reference Documents addressing:

   a. A revision to the Reliability Guideline: Primary Frequency Control to include asynchronous generation.
   
   b. Develop a Reliability Coordinator Reliability Plan Reference Document to review and approve reliability plans.
   
   c. Reliability Guideline: Generating Unit Operations during Complete Loss of Communications per OC Charter requirement to review all Reliability Guideline and Reference Documents at least once every three years.
   
   d. Reliability Guideline: Loss of Real-Time Reliability Tools Capability/Loss of Equipment Significantly Affecting ICCP Data per OC Charter requirement to review all Reliability Guideline and Reference Documents at least once every three years.
   
   e. NERC Balancing and Frequency Control Reference Document will be reviewed and determine whether to update this document or retire if the topics are addressed in other reference documents.

2. **Operating Reliability Subcommittee (ORS)** – The ORS will continue to focus on regular review, update, and communication of Reference Documents and Reliability Guidelines within its area of responsibility and is working on several new guideline development initiatives. The ORS will also continue to prepare for implementation of the Interchange Distribution Calculator Parallel Flow Visualization field trial.

3. **Resources Subcommittee (RS)** – The RS will review and revise several reliability guidelines, reference documents and training guides under its purview. The RS will also provide ongoing support of the NERC Planning Committee’s (PC) Performance Analysis Subcommittee metric M4, Interconnection Frequency Response for the annual State of Reliability Report.

4. **Event Analysis Subcommittee (EAS)** – The EAS collaborates with the North American Transmission Forum (NATF) and the North American Generator Forum (NAGF) regarding the development of Lessons Learned. The EAS will also review and revise the Reliability Guideline: Generating Unit Winter Weather Readiness.


6. **Coordination with other groups** – The OC continues efforts to better coordinate its activities with other industry groups such as the NATF, NAGF and ISO/RTO Council (IRC).

**September 2018 Meeting Summary:**
The following is a summary of the OC’s September 2018 meeting, which highlights the latest activities of the OC and its associated subcommittees in support of the NERC or OC mission and corporate goals. The [September 2018 OC meeting Minutes](#) are posted on the NERC website.
1. **Joint PC/OC Meeting** – A joint meeting of the PC and the OC was held from 10:00 a.m. to 12:00 p.m. on September 11, 2018. The agenda for the joint session allowed the committees to discuss agenda items of mutual interest to both committees which included:
   a. Western Interconnection Gas - Electric Interface Study
   b. EPRI Electromagnetic Pulse (EMP) Research Project
   c. Electricity Information Sharing and Analysis Center (E-ISAC) Update
   d. Standards Efficiency Review Update
   e. Inverter-based Resource Performance Task Force Update
   f. Methods for Establishing IROLs Task Force Update

2. **OC Nominating Committee** – Meg Albright was appointed to the committee.

3. **Operating Reliability Subcommittee (ORS)** – ORS Vice Chair Chris Pilong summarized the subcommittee’s status report which was included in the agenda package. Highlights of the report include:
   a. The ORS continues to monitor pending changes to the MISO and PJM Reliability Plans. These expected minor changes are required due to the OVEC Balancing Area moving from MISO to the PJM RC area. ORS will provide an update at the December OC meeting.
   b. ORS received an update from California ISO (CAISO) on their transition to a Reliability Coordinator (RC) role. CAISO has prepared a draft Reliability Plan that was shared with the group.
   c. At the request of the OC, the ORS has re-examined the draft RC Reliability Plan Reference Document. The revised document maintains a forum for RCs to discuss pending changes to other RC’s plans, while shifting the assessment of an entity’s capability from ORS to the NERC registration process.
   d. As part of the 2018 work plan, the ORS has formed a task team that will review and revise the ORS Scope document. Changes are required due to the transition of reliability tools away from NERC. The final version will be revised to reflect changes to the ORS role in reviewing RC Reliability Plans.
   e. The Chairs of the ORS and the RS presented overviews of the activities of their respective Subcommittees at each other’s recent meetings. The groups will continue to look at ways to assist each other with their work plans.
   f. The ORS has reviewed the Essential Reliability Services Working Group (ERSWG) final measures to determine if there should be revisions to the group Scope. Specifically, Measures 1 (inertia), 2 (initial frequency deviation), 4 (frequency response), and 6 (Ramping capability) were discussed. The ORS will continue to monitor RS activities related to these measures and will assist as needed. The ORS does not recommend a scope change to do so.
   g. The ORS continues to receive updates from the EIDSN Steering Committee on the IDC Tool enhancements. Specifically, the Parallel Flow Visualization (PFV) project is intended to improve the data quality used by the IDC during curtailment of transactions and may eventually result in changes to both NERC Reliability Standards
and NAESB Business Practices. The 12-18 month field trial began on schedule in September 2107.

h. The Electricity Infrastructure Security (EIS) Council (Frank Koza) provided a presentation related to “Black Sky” scenarios. EIS is working with regulators and the nuclear industry to consider the use of nuclear generation to support public health and safety following extreme contingencies/events.

4. Resources Subcommittee - RS Chair Tom Pruitt provided an overview of subcommittee’s status report. Highlights of the report include:
   a. NERC Primary Frequency Response Guideline Document – Substantial progress by the sub-team has been made. Additional information from the LBNL report and the IRPTF draft is being incorporated to provide additional guidance on sustained performance and response from non-synchronous resources. Work is on target for review and endorsement by the RS at the October meeting and subsequent submittal to the OC for consideration at the December meeting.
   b. NERC Balancing Authority Area Footprint Change Tasks Reference Document – A draft of the document was covered at the meeting and a review by the ORS and NERC staff was recommended to obtain additional comments/edits for inclusion prior to the October RS meeting. Work is on target for review and endorsement by the RS at the October meeting and subsequent submittal to the OC for consideration at the December meeting.
   c. (New Task) Frequency Response Analysis Tool (FRAT) enhancement – NERC staff suggested an enhancement to the tool to flag the governor dead band. The RS concurred and a sub team has been formed to help improve the tool.
   d. RS Frequency Working Group (FWG) – The FWG selected M4 and BAL-003-1 frequency events for March 2018, April 2018, and May 2018 for the interconnections. Revision of a draft on systematic approach to event selection continues.
   e. RS Inadvertent Interchange Working Group (IIWG) – An update on the interconnection inadvertent interchange was provided and balances continue to trend downward. The Eastern Interconnection trend beginning near the end of 2017 continues and continues to be investigated.
   f. Reserves Working Group (RWG) — Chair Tony Nguyen reviewed the voluntary DCS submittal process for BAL-002-2. Changes to the form to accommodate BA footprint changes were reviewed and implemented.

5. Events Analysis Subcommittee – EAS Chair Rich Hydzik provided an overview of the subcommittee’s status report. Highlights of the report include:
   a. The EAS is reviewed and revised its Scope document. The revised document was approved by the OC.
   b. The EAS is reviewing the Event Analysis Process. Issues being considered include the potential inclusion of a new category for inverter-based resource disturbance and DC Asynchronous events as well as potential revisions to Category 1.h (EMS) events.
   c. Sixth Annual Monitoring and Situational Awareness Technical Conference is planned for October 2-3, 2018 at MISO Energy located in Carmel, IN. An announcement with conference details, registration, and travel information was sent out in July.
EAS Chair Rich Hydzik presented an update on four Lessons Learned that have been published since the March OC meeting. Lessons Learned may be accessed from the NERC website [here](#).

6. **Personnel Subcommittee** – Trion King (NERC Staff) summarized the subcommittee’s status report which was included in the agenda package.
   
a. The PS is working on a comprehensive evaluation of adult learning principles and instructional design concepts in order to develop program criteria that results in quality learning events.

b. The PS is recruiting new members for the Continuing Education Review Panel (CERP).

c. Job task analysis survey being conducted.

7. **Reliability Guideline/Reference Document Outreach Effort** - Task team chair, Sidney Jackson, presented the proposed framework for communications which was sent to OC members on June 1, 2018 for review. The team developed a stand-alone document outlining the process for communications and outreach to industry when a Reliability Guideline or Reference document is created or revised. The OC approved the document.

8. **Industry Outreach efforts** – In order to better coordinate activities within industry, the OC invited representatives from the NAGF and the NATF to participate in the September, 2018 meeting. Al Schriver provided an overview of the NAGF activities in an effort to better coordinate activities with the NERC OC.

9. **Lessons Learned** – Chris Pilong (PJM) gave an update on the Twin Branch/Edison Area Load Shed Event that occurred on May 29, 2018. Initial conditions for the event included a Hot Weather Alert and several scheduled transmission outages in the area. The event was precipitated by tree contact by the Twin Branch Jackson Road 138kV line which tripped the line and the Jackson Road 345/138kV #3 transformer. A subsequent cascade analysis failed to solve and was considered a possible cascade condition. PJM directed AEP to shed load to mitigate the condition. Once the transformer was returned to service, the cascade condition was mitigated and the load shed was cancelled.

   Recommendations regarding this event are:
   
a. Relay Settings: AEP reviewed and updated the relay settings associated with the Jackson Rd J1 breaker.

b. Outage Approvals: PJM will review the outage approval process during emergency procedures, including possible N-1-1 analysis.

c. Technology: PJM will review tools and technology to develop alternative methods to provide a solution when a contingency ‘doesn’t solve’.


10. **WECC RC Update** – The OC was provided updates on activities in WECC regarding RCs.

   a. **Southwest Power Pool (SPP)** – CJ Brown, SPP - Public announcement regarding SPP RC is coming. Continuing to work with other RCs that plan to be in the West for tool. Committed to helping Peak in any way possible. SPP plans to update their reliability plan and submit to the ORS for approval.

   b. **CAISO** – Eric Schmitt, CAISO - CAISO submitted tariff change to FERC and expect a decision by November. This change will include an RC agreement. CAISO is currently
preparing for certification visit. They are also preparing to go live with BAs in CA 1/1/19., preceded by 60 days of shadow operations. CAISO is very supportive of transition work in play, making sure Peak is viable.

c. Peak RC – Peak is coordinating with potential RCs in WECC and will continue efforts to ensure a smooth transition in 2019. Peak will cease operations December 31, 2019.
Planing Committee Report

Action
Information

The Planning Committee (PC) is pleased to provide this update to the Board of Trustees (Board) for their review.

Forward perspectives

• PC Activities Addressing Reliability Assessments Recommendations
  
  Informing and Soliciting Board Concurrence in Separate Board Meeting Agenda Item

  As recommended by a PC Advisory Group of electricity and gas industry experts, the PC has identified the following specific objectives for developing enhanced planning approaches to address fuel assurance and fuel disruption risk to the reliable operation of the bulk power system (BPS):

  ▪ development of a reliability guideline for studying BPS impacts due to generator fuel issues;
  ▪ establishment of a working group to support development of tools for addressing natural gas interoperability concerns;
  ▪ enhancing Generator Availability Data System (GADS) data collection to support information needs related to fuel assurance impacts on generating units; and
  ▪ evaluation of the need for reliability standards to support fuel assurance and, if deemed necessary, development of a Standards Authorization Request (SAR).

  PC leadership is presenting detailed findings and intended course of action in a separate Board meeting agenda item.

• PC Activities Addressing System Reliability with Increasing Distributed Energy Resources (DER)
  
  No Board Approval Required

  The PC continues moving forward with addressing system planning, modeling, and reliability impacts to the BPS associated with increasing penetration of DER. The System Planning Impacts from Distributed Energy Resources Working Group (SPIDERWG) has been established and industry is identifying working group participants. PC and SPIDERWG leadership have solicited stakeholders for input on the proposed working group scope. Work plan development is underway.

• PC Activities to Identify and Address Potential Gaps in Reliability Standard PRC-024-2 for BPS-connected Inverter-Based Resources.
  
  No Board Approval Required

  PC and Operating Committee (OC) leadership coordinated with Inverter-Based Resource Performance Task Force (IRPTF) to review PRC-024-2 – Generator Frequency and Voltage Protective Relay Settings for potential gaps related to BPS-connected inverter-based resources. The review will support developing provisions in the standard to
address issues identified in the Blue Cut Fire and Canyon 2 Fire disturbances that led to tripping of solar photovoltaic (PV) resources during these events. Prior to the November NERC Board meeting, the PC and OC intend to review and act on a white paper and SAR developed by the IRPTF.

Recently Completed Committee Activities and Initiatives

- **Review of NERC Reliability Assessments**
  *Board Action Anticipated Prior to Year End*

  The PC reviewed the NERC Special Reliability Assessment on *Accelerated Generation Retirement Scenarios* at the September PC meeting and provided written comments to NERC staff. The PC is reviewing the 2018-2019 *Winter Reliability Assessment (WRA)* and the 2018 *Long-Term Reliability Assessment (LTRA)* in October. NERC Staff will provide the LTRA and WRA to the PC for endorsement as part of the process of finalizing the assessments.

- **Approved Reliability Guidelines**
  *No Board Approval Required*

  - **Establishing Reliability Operating Limits:** The PC approved the reliability guideline *Methods for Establishing Interconnection Reliability Operating Limits (IROLs)*. The guideline was developed by the joint OC-PC task force to support ongoing standards project that is considering revisions to System Operating Limit Reliability Standards.

  - **Inverter-based Resource Performance:** The PC approved the reliability guideline *BPS-connected Inverter Based Resource Performance*. The guideline was developed by the IRPTF. It provides recommended steady-state and dynamic performance characteristics for inverter-based resources, and also covers a wide range of related aspects from protective functions to monitoring capability.

  - **Modeling Accuracy:** The PC approved the reliability guideline *Power Plant Model Verification for Inverter-Based Resources*. This guideline provides recommended practices related to verification testing and modeling practices for inverter-based resources. It primarily applies to Generator Owners, Generator Operators, Planning Coordinators, Transmission Planners, Transmission Operators, Reliability Coordinators, testing engineers, and other applicable subject matter experts related to NERC MOD standards pertaining to model verification and capability testing.

- **Interconnection Reliability Operating Limits (IROL) Framework Assessment**
  *No Board Approval Required*

  The PC approved the *IROL Framework Assessment Report* developed by joint OC-PC task force. In December 2017 the joint OC-PC task force presented an IROL framework based on the technical rationales and consensus of industry stakeholders. An alternate framework has since been developed by the task force to address potential regulatory concerns. The report describes and reviews both frameworks and provides examples of applying both frameworks. The report also includes recommendations from the task force for consideration by NERC Staff and stakeholders in the Project 2015-09 standards development project. With completion of this report, the joint OC-PC task force completed its work scope and was disbanded with the approval of the PC and the OC.
Future Meetings

- December 11-12, 2018 – Atlanta, GA
- March 5-6, 2019 – Location TBD
- June 4-5, 2019 – Location TBD
- September 10-11, 2019 – Location TBD
Critical Infrastructure Protection Committee Report

Action
Information

Additional Highlights and 2018 Accomplishments (year-to-date)

• CIPC and Subcommittee Work Plans – The CIPC Executive Committee and the leadership of its subcommittees met in September 2017 to review and update the CIPC Work Plan for 2018-2019. That plan was reviewed and approved by the CIPC at the meeting in December, 2017.

• Resiliency Framework – The Reliability Issues Steering Committee (RISC) asked each standing committee to provide the RISC with its views on how bulk – power system resilience is addressed by the committee’s responsibilities, and recommend any additional activities that could be undertaken. The CIPC response was provided in the first quarter of 2018.

• Compliance Implementation Guidance – The CIPC developed and submitted Compliance Implementation Guidance:
   CIP-002-5.1a R1 Shared Ownership of BES Facilities (CIPC): approved by Electric Reliability Organization (ERO), published February 9, 2018
   CIP-002-5.1a, R1, Voice Communications in a CIP Environment (CIPC): not approved by the ERO; the document is currently being revised and is expected to be resubmitted for consideration in early 2019

Summary

The following summary of CIPC’s September 2018 meeting highlights the committee’s key activities and its associated subcommittees in support of the NERC or CIPC mission and corporate goals. The September 2018 CIPC Meeting Minutes will be posted on the NERC website.

• Supply Chain security – CIPC’s Supply Chain Working Group (SCWG) will address the most critical issues identified in the EPRI Supply Chain Risk Assessment Report:
   Supply Chain risks related to cloud service providers
   Considerations for secure hardware delivery
   Considerations for establishing provenance of systems and components
   Considerations for threat-informed procurement language
   Considerations for supply chain risk management lifecycle (assessments and reassessments, external dependencies, and concluding supplier relationships)
   Considerations for unsupported or open-source technology

The SCWG is currently in its second round of drafting a vendor essential security practices document (aka “open letter to vendors”). The group is also seeking additional utility vendors to provide input.
1. **Security Guidelines** – The Control System Security Working Group (CSSWG) is developing a survey that CIPC members will be asked to complete. Results will be used to identify the concerns and establish the priorities for development of security guidelines.

2. **Collaboration with IEEE** – C37.240 (IEEE Standard Cybersecurity Requirements for Substation Automation, Protection, and Control Systems) is under revision. Members of the IEEE committee working on the standard have sought CIPC participation to consider cybersecurity measures that balance technical and economic feasibility while addressing the risks expected at a substation.

3. **Collaboration with Department of Energy** – CIPC will provide input to a pilot project that is sponsored by DOE’s Office of Cybersecurity, Energy Security, and Emergency Response. CyTRICS (Cyber Testing for Resilience of Industrial Control Systems) will identify vulnerabilities or malicious behavior in energy technologies.

4. **CIPC Executive Committee (EC)** – Planning for 2019 was discussed by the EC in September. The group identified work plan additions for 2019, subject to CIPC review and approval in December.

### Key Activities and Initiatives for 2018 and 2019

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<tr>
<th>Strategic Input</th>
<th>Activity</th>
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| **ERO Enterprise Long-term Strategy Focus Area #5** | Identification and reduction of cyber and physical security risks while improving resilience: Implementation guidance:  
- Voice communications in environments that are subject to compliance with the CIP Reliability Standards  
- Using cloud computing in a secure and compliant manner  
Reliability guidelines:  
- Physical security considerations for high-impact control centers  
- Security considerations during extreme events |
| **ERO Reliability Risk Priority - Risk Profile #8 & #9** | Assess the cyber security risk of Fuel Handling SCADA systems for Generation:  
- Reliability Guidelines to address risks associated with control system security for natural gas distribution systems |
<p>| <strong>FERC-Led Audits Compliance Report</strong> | Address Remote Access Security Findings #1-#18 |
| <strong>Remote Access Study Report</strong> | Collaborate with E-ISAC and industry stakeholders to plan for next GridEx and share lessons learned. |
| <strong>Supply Chain Risk Management</strong> | Vendor Essential Security Practices Model. |
| <strong>Supply Chain Risk Management</strong> | Legacy system testing coordination with National Labs. |
| <strong>CIP-014 High Impact Control Center Report</strong> | Security practices for High Impact Control Centers. |
| <strong>CIPC Priority Topic in coordination with PC</strong> | Reduction in asset criticality by developing design standards. |</p>
<table>
<thead>
<tr>
<th>CIPC Priority Topic</th>
<th>Security implications of UAVs and clarifying the rights of stakeholders.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIPC Priority Topic</td>
<td>Key management security guideline.</td>
</tr>
</tbody>
</table>
Personnel Certification Governance Committee (PCGC) Report

Action
None

Background
This report summarizes the key activities of the PCGC during 2018. The PCGC meets four times per year. Standing Task Force meetings via conference call and/or Web Ex are held as needed between meetings. The August 2018 meeting minutes are under review and pending approval.

Exam Development Activities Scheduled for 2018
Items Review/Analyze Statistical Performance Jan-Dec 2018
Write New Items Mar-Dec 2018
Job Task Analysis (JTA) Report Nov 2018

Strategic Planning
The System Operator Certification program survey ended on June 15, 2018. The survey was sent to all certified System Operators, Continuing Education providers, and entities. Out of a possible 8,000 participants, less than 800 responses were received by NERC. The PCGC is currently reviewing and analyzing the survey results. The committee is in the process of drilling down into each response and statistics associated with each question. The committee will use the data points to establish appropriate white paper topics to present to the industry. The number of white papers remains to be determined by the committee. The expectation is a broad range of topics; including returning to one credential, credential maintenance, recertification requirements, and length of certification period.

System Operator Certification Continuing Education Database (SOCCED) Update
The PCGC has worked with the Personnel Subcommittee (PS) to create a list of future enhancements. Each month, a select number of enhancements for the System Operators, Continuing Education providers, and NERC staff will be submitted to the vendor for development and implementation into SOCCED. The goal is for each user type to benefit from the monthly enhancements. As budget and resources allow, prioritization of the enhancements may change.

Certification Program Fees Adjustment
During the annual preparation for the 2019 budget, the PCGC voted to increase the examination fee and the credential renewal fee. Effective January 1, 2019, the examination fee for all System Operator Certification exams will increase from $600 to $650. The fee to renew any System Operator Certification credential will increase from $350 to $400.

2018 Tasks
- Develop Detailed Strategic Plan
- Enhancements to new SOCCED platform
- Analyze JTA results and recommendations
- Analyze System Operator Certification Program survey results and recommendations
- Begin white paper on future System Operator Certification Program & Credential Maintenance
Standards Committee Report

Action
Information

Background
This report highlights some key activities of the Standards Committee (SC) during the third quarter of 2018.

Summary
At its July 18 meeting, the SC endorsed member appointments for the Guidelines and Technical Basis Review Team, authorized initial posting of numerous documents for Project 2015-09 Establish and Communicate System Operating Limits, and requested the NERC Operating Committee provide a technical review of a Standard Authorization Request (SAR) for BAL-002-3 from Arizona Public Service.

On August 10, the Standards Committee Executive Committee, acting on behalf of the SC, accepted the SAR for CIP-008-5 developed in response to FERC Order No. 848, authorized posting for a 30-day informal comment period, and authorized soliciting standard drafting team members.

At its August 22 meeting, the SC authorized initial posting of Project 2015-09 Establish and Communicate System Operating Limits documents, authorized initial posting of documents under Project 2016-02 Modifications to Critical Infrastructure Protection (CIP) for CIP-002-6 and CIP-003-8, accepted the SAR, authorized a 30-day formal comment period and solicitation of nominations for a drafting team for Project 2018-03 Standards Efficiency Review.

At its September 13 meeting, in consideration of the project plan to meet the FERC Order filing deadline, the SC approved three waiver of provisions of the Standard Processes Manual for Project 2018-02 Modifications to CIP-008 Cyber Security Incident Reporting compressing the initial, additional and final comment and ballot period durations. Two SARs submitted by the California ISO related to PRC-024-2 and Inverter Based Resources were rejected. In addition, the Committee discussed the ongoing challenges in the area of cybersecurity using current standard development processes. The SC also endorsed the draft 2019-2021 Reliability Standards Development Plan (RSDP) that is before the Board.

A Special Election for a Segment 2 vacancy was conducted, and Michael Puscas of New England ISO was elected.
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  2018 ANSI Reaccreditation.......................................................................................................................................... 1
  Projects with Regulatory Directives ............................................................................................................................ 1
  Trend in Number of Reliability Requirements............................................................................................................. 2

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Preface

The vision for the Electric Reliability Organization (ERO) Enterprise, which is comprised of the North American Electric Reliability Corporation (NERC) and the seven 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.

The North American BPS is divided into seven 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.
Chapter 1 Standards Development Forecast (Continent-wide)

Board Forecast for Standard Projects in Active Development

November 2018

- Project 2015-10: Single Points of Failure (TPL-001)

February 2019

- Project 2015-09: Establish and Communicate System Operating Limits
- Project 2016-02: Modifications to CIP Standards (CIP-003 directive on malicious code and CIP-002 updates with IROL language)
- Project 2018-01: Canadian-specific Revisions to TPL-007-2

May 2019

- Project 2017-01: Modifications to BAL-003-1.1
- Project 2017-07: Standards Alignment with Registration

August 2019 and after

- Project 2016-02: Modifications to CIP Standards (Revisions related to Transition Advisory Group Identified Issues, virtualization, and CIP Exceptional Circumstances)

2018 ANSI Reaccreditation

In accordance with the accreditation processes of the American National Standards Institute (ANSI), NERC will begin the process of seeking reaccreditation of its standard development processes later in 2018. These efforts will be timed to coincide with the completion of an ongoing project to revise certain sections of the NERC Standard Processes Manual relating to field tests, interpretations, and supporting technical documents. NERC staff will continue to keep the Board updated on the status of reaccreditation.

Projects with Regulatory Directives

Table 1 below, lists the current projects with regulatory directives. As of July 31, 2018, there are five standards-related directives to be resolved through standards development activities (not including non-standards related directives).

<table>
<thead>
<tr>
<th>Project</th>
<th>Regulatory Directives</th>
<th>Regulatory Deadline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project 2015-09 Establish and Communicate System Operating Limits</td>
<td>2</td>
<td>N/A</td>
</tr>
<tr>
<td>Project 2015-10 Single Points of Failure</td>
<td>2</td>
<td>N/A</td>
</tr>
<tr>
<td>Project 2016-02 Modifications to CIP Standards (CIP-003 revisions for malicious code)</td>
<td>1</td>
<td>N/A</td>
</tr>
<tr>
<td>Project 2018-02 Modifications to CIP-008 Cyber Security Incident Reporting</td>
<td>1</td>
<td>4/1/2019</td>
</tr>
</tbody>
</table>
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\(^1\) 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.\(^2\) Standards with variances were not included in the requirement count. Projections from projects that include standards currently under development, and board adopted standards are also included in the total number of requirements based on their projected effective date.\(^3\)

The trend for total number of requirements indicates a constant flat trend line for the last four years, with a slight 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 a total of 499 continent-wide requirements; Figure 2 indicates a total of 76 Regional Reliability standards forecast for 2027.

---

1 Available from the Standards section of the NERC website: [http://www.nerc.com/pa/Stand/Pages/default.aspx](http://www.nerc.com/pa/Stand/Pages/default.aspx)
2 Charts were developed using end of Q3 2018 data.
3 These projects include the following: Project 2015-09 (FAC-010-4, FAC-011-4, FAC-014-3), Project 2017-01 (BAL-003-2), Project 2015-10 (TPL-001-5), Project 2016-02 (CIP-003-7(i))
Figure 2: Trend for Number of Requirements for Regional Reliability Standards
## NERC Regulatory Update- Standards
July 1, 2018 - September 30, 2018

### NERC Filings to FERC

<table>
<thead>
<tr>
<th>FERC Docket No.</th>
<th>Filing Description</th>
<th>FERC Submittal Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>RM18-16-000</td>
<td>Petition for Approval of PER-003-2 and Retirement of Reliability Standard PER-004-2</td>
<td>7/23/2018</td>
</tr>
<tr>
<td></td>
<td>NERC submitted a petition for approval of proposed Reliability Standard PER-003-2 (Operating Personnel Credentials) and retirement of currently-effective Reliability Standards PER-003-1 and PER-004-2.</td>
<td></td>
</tr>
<tr>
<td>RM18-8-000</td>
<td>Comments of NERC in Response to Notice of Proposed Rulemaking</td>
<td>7/23/2018</td>
</tr>
<tr>
<td>RD18-7-000</td>
<td>Petition of NERC for Approval of Proposed Reliability Standard BAL-002-3</td>
<td>8/17/2018</td>
</tr>
<tr>
<td>RR10-1-000</td>
<td>Annual Report of NERC on Wide-Area Analysis of Technical Feasibility Exceptions</td>
<td>9/28/2018</td>
</tr>
<tr>
<td>FERC Docket No.</td>
<td>Filing Description</td>
<td>FERC Submittal Date</td>
</tr>
<tr>
<td>----------------</td>
<td>-----------------------------------------------------------------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>RM18-20-000</td>
<td><strong>Petition of NERC for Approval of Proposed Reliability Standard CIP-012-1</strong></td>
<td>9/18/2018</td>
</tr>
<tr>
<td></td>
<td>NERC submitted a petition for approval of proposed Reliability Standard CIP-012-1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Cyber Security - Communications between Control Centers.</td>
<td></td>
</tr>
<tr>
<td>RM17-13-000</td>
<td><strong>Informational Filing regarding Proposed Supply Chain Risk Management Reliability Standards</strong></td>
<td>9/07/2018</td>
</tr>
<tr>
<td></td>
<td>NERC submitted an informational filing regarding Proposed Supply Chain Risk</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Management Standards as directed by FERC in its NOPR on Jan. 18, 2018.</td>
<td></td>
</tr>
<tr>
<td>RD18-8-000</td>
<td><strong>Petition of NERC for Approval of Proposed Reliability Standard VAR-001-5</strong></td>
<td>9/06/2018</td>
</tr>
<tr>
<td></td>
<td>NERC submitted a petition for approval of proposed Reliability Standard VAR-001-5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Voltage and Reactive Control).</td>
<td></td>
</tr>
</tbody>
</table>
### FERC ISSUANCES

<table>
<thead>
<tr>
<th>FERC Docket No.</th>
<th>Issuance Description</th>
<th>FERC Issuance Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>RM18-2-000</td>
<td><strong>Order No. 848 on Cyber Security Incident Reporting</strong></td>
<td>7/19/2018</td>
</tr>
<tr>
<td></td>
<td>FERC issued a final rule requiring expanded cyber security incident reporting. The Commission directed NERC to develop, within six months of the effective date of the final rule, modification to the Critical Infrastructure Protection Reliability Standards to improve mandatory reporting of cyber security incidents, including attempts that might facilitate subsequent efforts to harm reliable operation of the nation's bulk electric system.</td>
<td></td>
</tr>
<tr>
<td>RD18-7-000</td>
<td><strong>Letter Order Approving Reliability Standard BAL-002-3</strong></td>
<td>9/25/2018</td>
</tr>
<tr>
<td>RD18-1-000</td>
<td><strong>Letter Order Approving the Retirement of VAR-002-WECC-2</strong></td>
<td>9/05/2018</td>
</tr>
<tr>
<td></td>
<td>FERC issued a Letter Order approving the Joint Petition submitted by NERC and WECC requesting the retirement of regional Reliability Standard VAR-002-WECC-2 (Automatic Voltage Regulators) effective immediately.</td>
<td></td>
</tr>
</tbody>
</table>
Chapter 3 Standards Committee Report

**Action**
Information only.

**Background**
This report highlights some key activities of the Standards Committee (SC) during the third quarter of 2018.

**Summary**
At its July 18 meeting, the SC endorsed member appointments for the Guidelines and Technical Basis Review Team, authorized initial posting of numerous documents for Project 2015-09 Establish and Communicate System Operating Limits, and requested the NERC Operating Committee provide a technical review of a Standard Authorization Request (SAR) for BAL-002-3 submitted by Arizona Public Service.

On August 10, the Standards Committee Executive Committee, acting on behalf of the SC, accepted the SAR for CIP-008-5 developed in response to FERC Order No. 848 regarding cyber security incident reporting. The SC authorized NERC to post the SAR for a 30-day informal comment period and to solicit standard drafting team members.

At its August 22 meeting, the SC authorized initial posting of Project 2015-09 Establish and Communicate System Operating Limits documents, authorized initial posting of documents under Project 2016-02 Modifications to Critical Infrastructure Protection (CIP) for CIP-002-6 and CIP-003-8, and authorized the posting of a SAR for a 30-day formal comment period and solicitation of nominations for a drafting team for Project 2018-03 Standards Efficiency Review.

At its September 13 meeting, in consideration of the project plan to meet the deadline in Order No. 848, the SC approved three waivers of provisions of the Standard Processes Manual for Project 2018-02 Modifications to CIP-008 Cyber Security Incident Reporting. The waivers compress the initial, additional and final comment and ballot period durations. The SC also rejected two SARs submitted by the California ISO related to PRC-024-2 and Inverter Based Resources. In addition, the SC discussed the ongoing challenges in the area of cybersecurity using current standard development processes. The SC also endorsed the draft 2019-2021 Reliability Standards Development Plan (RSDP) that is before the Board.

A Special Election for a Segment 2 vacancy was conducted, and Michael Puscas of New England ISO was elected.
Reliability Issues Steering Committee Report

Action
Information

Summary
The Reliability Issues Steering Committee (RISC) met via conference call on September 20 to review and provide comments on the draft RISC Resilience Report, and subsequently provided approval to submit to the Board of Trustees for acceptance at its November meeting. In addition, the Committee met via conference call on October 5 to continue refining the proposed draft agenda for the 2019 Reliability Leadership Summit, commencing recommendations for topics and panelists, as well as reviewed and provided further input into the Emerging Risks proposed survey template. The Summit will be held on March 14, 2019 in Washington, DC.

Mr. Peter Brandien, RISC chair, will present a summary of the RISC Resilience Report and request acceptance at the Board’s November meeting, as well as provide an update on current activities of the Committee.
Compliance and Certification Committee (CCC) Report

**Action**
Information

**Additional Highlights**
The CCC and its associated subcommittees held meetings at the Midwest Reliability Organization offices in St. Paul, MN on September 18-19, 2018.

- The Organization Registration and Certification Subcommittee (ORCS) continues working with the ERO Organization Registration Certification Group (ORCG) to propose NERC Rules of Procedure (ROP) changes, specifically Section 500 and Appendices 5A and 5B, due to Risk Based Registration and procedural updates. Suggested changes include modifications to provide additional clarity to the Joint Registration Organizations and Coordinated Functional Registration process, and Certification Reviews. The CCC will review the ROP changes in the first quarter of 2019. In addition, ORCS as well as the CCC Alignment Working Group (AWG) will be collaborating with NERC on the system implementation efforts for Registration tasks.

- The ERO Monitoring Subcommittee (EROMS) focused on planning for the upcoming review of the ERO Effectiveness Survey results. EROMS expects responses soon and will share a report with the CCC at the December meeting. We anticipate providing a report to the EWRC at the February 2019 meetings. In addition, EROMS is working on reviews of CCC Procedures. NERC’s Internal Audit and Corporate Risk Management (IACRM) will provide a report on the 2017 Self-Certification Forms for the Compliance Monitoring and Enforcement Program (CMEP), the Organization Registration and Certification Program (ORCP), and the Standards Processes Manual (SPM) to the CCC in December.

- The Compliance Processes and Procedures Subcommittee (CPPS) recommended and the CCC approved the criteria NERC uses to evaluate effectiveness of Regional Entity CMEP programs, as specified in the ROP. In addition, the CPPS continues to support NERC efforts to improve the Reliability Standards Audit Worksheets (RSAWs). The compliance experts on this subcommittee have completed reviews most recently of the following RSAWs: EOP-004-4, EOP-006-3, EOP-005-3, and EOP-008-2.

- The AWG continues to provide feedback and input to improvements to the ERO Consistency Tool. The Program Alignment process and initial outreach efforts are complete. The AWG continues to participate and collaborate with NERC staff on the CMEP Technology project providing a resource for information gathering and support. As mentioned above, the AWG will provide the same support for the Centralized Organization Registration Entity System (CORES) technology project focused on Registration. In addition, the AWG participated on a call with NERC Compliance Assurance leadership to review the Compliance Oversight Plan process and provide feedback.
NERC’s IACRM will be conducting the first reviews in accordance with Appendix 4A of the ROP in the fourth quarter of 2018 regarding the Regional Entities internal control testing. There will be six CCC members participating as observers of the NERC process in accordance with the ROP and CCC Procedures.

The next CCC meeting will be December 5-6, 2018 at the NERC offices in Atlanta, GA.
To: NERC Board of Trustees (BOT)

From: Thomas J. Galloway, NATF President and CEO

Date: October 16, 2018

Subject: NATF Periodic Report to the NERC BOT (November 2018)

Attachments: NATF External Newsletter (October 2018)

The attached October NATF external newsletter highlights NATF efforts to support our members and the industry.

An important aspect of the NATF value proposition is to foster efficient use of industry resources. To that end, the NATF interfaces with industry partners and regulatory agencies through meetings and conferences; shares documents with the industry via its public website; conducts joint workshops with select organizations; and coordinates or supports industry initiatives on key reliability and resiliency topics.

Examples in 2018 include:

- **Inverter-Based Resource Webinar Series** (March–June)
  - Hosted with NERC, EPRI, and the Utility Variable-Generation Integration Group (UVIG)
- **Joint NERC/NATF Human Performance Conference and Workshops** (March)
- Joint NATF-EPRI resiliency summit
- **NERC-NATF-EPRI 2018 Power System Modeling Conference** (June)
- Continued work with EPRI on equipment performance
- New MOU with the Utilities Technology Council to coordinate on topics of mutual interest and benefit
- **Report to the Department of Energy related to a Grid Security Emergency (GSE)**
  - Communication between the DOE and the electricity subsector after the declaration of a GSE
  - Suggested criteria for declaring a GSE related to GMD
  - Emergency operations and waivers associated with issuance of a GSE order
- **Posting of reliability documents** for the benefit of the industry on key topics
  - EMS external modeling
  - Supply chain cyber security
  - Distributed energy resources
  - Physical security plans
  - Software integrity
  - Vendor remote access
  - Redacted operating experience (safety)

1 Criteria for other GSEs to follow in subsequent phases
The NATF and NERC have been coordinating on select activities and issues for a number of years and plan to enhance alignment on key industry topics via regular leadership meetings and respective business plans. Existing and future coordination opportunities include resilience, misoperations, vegetation management, and the Reliability Coordinator function in the Western Interconnection.

A particular effort to highlight is the 2019 resiliency summit to be jointly conducted by the NATF, NERC, and EPRI. The summit, slated for April 2-4 in Charlotte, North Carolina, will focus on restoration, including blackstart. The joint offering will address the Reliability Issues Steering Committee (RISC) report recommendation to conduct a comprehensive workshop related to risk profile 7.

We look forward to continuing to address industry issues with NERC and other organizations in the most effective and efficient ways possible.

cc: T. Aldred, L. Underwood, K. Keels, R. Carter
External Modeling Reference Document Posted for Industry
We recently posted version 2.0 of the “NATF EMS External Modeling Reference Document” to our public website. The document provides guidance to those working to improve performance of their EMS external models. The intended audience for the document is persons with responsibility for developing and maintaining EMS models for real-time state estimator and real-time contingency analysis.

Cyber Security Supply Chain Risk Management White Paper and Guidance
The NATF shared its “NATF Supply Chain Risk Management Guidance” and “NATF CIP-013-1 Implementation Guidance” documents with the North American Electric Reliability Corporation (NERC) Board of Trustees in August. The documents were drafted in response to an August 2017 NERC board resolution requesting industry assistance via white papers.

Both documents are available on the NATF public website for industry use. The “NATF Supply Chain Risk Management Guidance” document (white paper), which describes practices for establishing and implementing a supply chain cyber security risk management plan, is also posted on NERC’s Supply Chain Risk Mitigation Program page, while the “NATF CIP-013-1 Implementation Guidance” document is posted on NERC’s Compliance Guidance page and is pending review for consideration as ERO-endorsed implementation guidance.

Redacted Operating Experience Reports
Since our last newsletter, we have posted five reports to our public site for members and other utilities to use internally and share with their contractors to help improve safety, reliability, and resiliency.

New MOU with the Utilities Technology Council
The NATF and the Utilities Technology Council (UTC) recently executed a memorandum of understanding (MOU) to leverage their collective knowledge, minimize duplication of effort, and promote collaboration in related efforts to provide timely support to energy owners/operators for the planning, management, and operation of the electric transmission system. The intended collaboration is expected to help facilitate greater responsiveness to the needs of the industry generally, the NATF and UTC memberships, electric power customers, and the public.

For more information about the UTC, please visit https://utc.org/.

NATF CEO Participates in FERC Technical Conference
NATF President and CEO Tom Galloway served as a panelist during the July 31 FERC technical conference regarding the Bulk-Power System. Galloway appreciated the opportunity to provide perspectives on resiliency during panel II (“Advancing Reliability and Resilience of the Grid”), which focused on power system planning and operations challenges and opportunities resulting from the changing generation resource mix.
Program Overview: Assistance
The NATF Assistance Program continues to be a popular and practical option to help our members with specific reliability topics or issues and identifies solutions that will improve reliability, security, and performance. A request for assistance may originate from an issue or problem, an event or near miss, or as a result of a current project for which the member would benefit from an independent review.

The program offers flexibility to meet member needs and timelines, with a goal of promoting operational excellence and continuous improvement. All services and products (e.g., onsite visit, webinars, surveys) offered by the NATF are considered when determining the best approach for meeting the member’s request.

One example is an assistance visit, which can be onsite or virtual based on member needs, where requesting members receive subject-matter expert input via meetings or conference calls and a final report with suggested actions or recommendations. Some topics covered to-date include switching, control center operations, critical switchyard assessments, security, and system protection.

Program Update: Peer Reviews
In 2018, the NATF marked the 11th year of the Peer Review Program. We conducted the first NATF peer review in October 2008 and are approaching 90 reviews total, with participation from over 1000 member experts.

An NATF peer review is an evaluation of a member company’s procedures, practices, and processes—for up to nine technical areas—by a group of subject-matter experts and peers from other NATF members. Concluding each peer review, the member company receives an exit presentation that highlights strengths, noteworthy items, and recommendations for improvement.

The program, which has continually evolved and matured, includes a follow-up aspect where, at the six-month and one-year (post review) timeframes, NATF staff and host members discuss and track the “realized value” the hosts are receiving (i.e., the implementation and resulting improvements from the peer-review recommendations).

Workshops and Meetings
In addition to regular web conferences, NATF working groups hold annual workshops and in-person meetings. Recent and upcoming activities include:

- Operator Training “Train the Trainer” Workshop (August)
- Substations Equipment and Asset Management Workshop (September)
- Human Performance Improvement Workshop (September)
- System Operations Workshop (October)
- Underground Cable Systems Working Group Meeting (October)
- Vegetation Management Workshop (October)
- Transmission-Nuclear Interface Workshop (November)

***

For more information about the NATF, please visit www.natf.net.
TO: NERC Board of Trustees
James B. Robb, President and CEO

FROM: Allen D. Schriver, Chief Operating Officer, North American Generator Forum (NAGF)

DATE: October 24, 2018

SUBJECT: NAGF 2018 Fall Report

---------------------------------------------------------------------------------------------------

NAGF Annual Meeting

The NAGF would like to thank NERC and Jim Robb for providing meeting space at the NERC Atlanta Office for the NAGF to hold its Board meeting followed by the NAGF Annual Meeting on October 2 - 3, 2018. The Keynote Speaker was Jim Robb, CEO, NERC. Presentations included:

- State of the Standards – Howard Gugel, NERC
- Peer Review Experience – Mike Gabriel & Tracy Dreymala, EthosEnergy
- PER-006 implementation – Venona Greaff, Oxy & Alison MacKellar, Exelon
- PER-006-1, NERC Technical Advisors – Scott Barfield-McGinnis, NERC
- E-ISAC 101 and Russian Reconnaissance Activity – Sam Chanoski, NERC
- GADS coding changes - Margaret Pate, NERC
- RF reliability and compliance awareness & engagement opportunities – Scott Etnoyer, Talen Energy; Jeff Craigo & Kristen Senk, RF
- FERC emerging concerns: resource mix, changing technologies, maintaining a reliable grid – Bob Cummings, NERC

In addition, the second afternoon offered two tracks:

**Cyber Security**

- Medium & High BES Cyber System Discussion Panel - Todd Bennett, AECI, Dan Goyne, Dominion Energy, Heather Morgan, EDP Renewables, Randy Calhoun, AEP and Jay Cribb, Southern Company
- NAGF Supply Chain White Paper - Wayne Sipperly, NAGF
- Project 2016-02 CIP Modifications - Jay Cribb, Southern Company
- Physical Security Update, assessments and lessons learned - Pete Scalici, NPCC
- CIP Low Impact Implementation Experience & Plans for CIP-003-7 - Mike Gabriel EthosEnergy & Frank Lyter, Talen Energy
Protection System Coordination Revisited: PRC-025, PRC-026 & PRC-027 - Maysam Radvar, Ready Technologies
Inverter Task Force Update - Allen Schriver, NextEra Energy
Standard Efficiency Review - David Lemmons, EthosEnergy, Laura Anderson, NERC
PFR Inner & Outer Loop Controls - Frank Buttler, Southern Company
BAL-003 Update - David Lemmons, EthosEnergy
PFR project and activities update - Dave Belanger, Utility Services
PRC-005 Compliance, Challenges & Strategies - Terry Crawley & Anthony Washington, Southern Company

DHS Workshop

On Monday August 15, the NAGF attended the Department of Homeland Security sponsored Grid Consequence Prioritization Workshop in Washington, D.C. The workshop covered the Idaho National Laboratory Cyber Core Integration Center’s Consequence-driven Cyber-informed Engineering (CCE). The CCE process is:

1. Define critical functions and services that allow you to accomplish your goals
2. Identify the critical systems that impact the critical functions
3. Quantify how to achieve a specific impact against a targeted system
4. Determine engineering design changes to mitigate the risk

Primary Frequency Response Webinar

The NAGF in collaboration with the NERC Resources Subcommittee will host two different Primary Frequency Response Webinars on November 13, 2018, each tailored to the largest generation classes. The first will cover traditional steam and the second natural gas fired combustion turbines and combined cycle units. The goal of the webinars is to continue to educate and provide resources to encourage the existing generation fleet in the Eastern and Western Interconnection to be primary frequency response capable.