

NERC

NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

Participant Conduct Policy

Charles Berardesco, Senior Vice President and General Counsel
Mark Lauby, Senior Vice President and Chief Reliability Officer
Member Representatives Committee Meeting
February 6, 2019

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- Derived from policies used by Operating Committee and standards development teams
- Applies to all participants in NERC activities
- Includes four sections:
 - General purpose
 - Policy
 - Restrictions on participation
 - NERC email list use

- Promote efficient use of participants' time
- Maintain a professional and constructive work environment
- Clarify expectations for participants

1. Conduct yourself in a professional manner
2. Do not use NERC activities for commercial or private purposes
3. Do not distribute Confidential Information
--“Confidential Information” is defined in Rules of Procedure Section 1500
4. Do not distribute work product if distribution is prohibited
--E.g., document is labeled “embargoed”, “do not release”, or “confidential”, among other similar labels

- Receive reminder to comply with Participant Conduct Policy
- May be asked to leave the meeting or teleconference
- May be permanently restricted from NERC activities
 - NERC notifies employer of permanent restriction
 - NERC General Counsel can review written requests to remove restriction

- Listserv topics are limited to group's scope of work
- Anti-competitive behavior is prohibited
- Personal views prohibited unless relevant to group's scope of work
- Offensive, abusive, or obscene language not permitted



Questions and Answers

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Special Reliability Assessment Development

James Merlo, Vice President, Reliability Risk Management
Member Representatives Committee Meeting
February 6, 2019

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- The ability to perform Special Reliability Assessments called for in Rules of Procedure
- NERC leverages technical committees to support development
- Topics generally based on findings from the Long-Term Reliability Assessment that require a “deeper dive”
- Seeking input from MRC provides front-end guidance as topics are selected for further assessment

- Reliability Value of Baseload Generation and Implications of Accelerated Retirements
- Contingency Response of DER and Other Inverter-Based Resources
- Changing Resource Mix on Reserves, Forecasting, and Resource Adequacy
- Changing End-Use Load Characteristics and Dynamic Load Modeling

- Potential topic for 2019 Special Reliability Assessment
 - Integration of significant amounts of battery storage
- Request for MRC policy input
 - Does the MRC support this potential topic for a 2019 Special Reliability Assessment?
 - Are there any additional topics that should be considered for future Special Reliability Assessments and, if so, what is their relative priority?

- Integration of Large Amounts of Energy Storage and Micro-Grids
 - Valuable for NERC to evaluate policies and develop guidelines
 - Supported by aggressive state goal; key resilience component
 - Important, but lower priority and possibly premature (some non-supportive)
 - Leverage existing working groups working through reliability challenges

Technical challenges include:

- Lack of accurate simulation models
 - Identification of amount and locations
 - Operating parameters and modes
 - Restoration capability and coordination
 - Potential for devices on distribution system to be in conflict with wider-system needs
- Alternative Approaches
 - Develop technical references and reports through the SPIDER WG
 - Use technical committees to define and vet the proposed topic and scope
 - Develop special assessment upon completion of the technical work more oriented to policy makers and industry leaders

- Contingency response for DER and other inverter-based resources
- Changing end-use load characteristics and dynamic load modeling
- Capacity value for generation with non-firm fuel
- Transmission end-of-life
- Resilience impacts and lessons learned for severe weather events
- Asset management and grid hardening



Questions and Answers

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Supply Chain Report

Howard Gugel, Senior Director of Engineering and Standards
Member Representatives Committee Meeting
February 6, 2019

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- Support effective and efficient implementation (e.g. CIP V5 transition)
- Supply chain risk study
- Communicate supply chain risks to industry
- Forum and Association white papers
- Plan to evaluate effectiveness of supply chain standards

- NERC used the Electric Power Research Institute (EPRI) to conduct risk study
 - Assessment of product/manufacturer types used on the Bulk Electric System (BES)
 - Analysis and applicability to BES Cyber Assets
 - Analysis of best practices and standards in other industries to mitigate supply chain risks
 - Analysis of generalized vendor practices and approaches used to mitigate supply chain risks

- Applying Industry Practices and Guidelines
 - Third-party accreditation processes
 - Secure hardware delivery
 - Threat-Informed Procurement Language
 - Unsupported or open-sourced technology components
- Use supply chain controls to mitigate common-mode vulnerabilities
- Assess the risks through data analysis
 - Pre-Audit surveys and questionnaires
 - Targeted outreach to vendors
 - Develop standardized vendor supply chain practices
 - Independent testing of legacy applications and products

- Risks
 - Allow remote access through backdoor
 - Impact ability to respond
 - Single platform vulnerabilities
- Mitigation factors
 - Existing Critical Infrastructure Protection (CIP) access controls
 - Testing, verification, and validation of architecture, configuration, and management controls
- Staff recommendations
 - Include electronic access controls in Supply Chain Standards
 - In interim, voluntarily identify and assess supply chain vulnerabilities

- Risks
 - Allow physical access to assets
 - Adverse action without detection
 - Impact ability to respond
- Mitigation factors
 - Existing CIP access controls
 - Requires physical presence
- Staff recommendations
 - Include physical access controls in Supply Chain Standards
 - In interim, voluntarily identify and assess supply chain vulnerabilities

- Risks
 - Malicious code
 - Vendor access
 - Common mode vulnerabilities
- Mitigation factors
 - Basic cyber hygiene
 - Overall market impact
 - Common procurement methods
- Staff recommendations
 - Voluntarily apply to low if subject to CIP-013
 - If low only, develop supply chain risk management programs tailored to risk
 - Monitor practices through pre-audit surveys

- Risks
 - Vary with the asset
 - By definition, do not represent an immediate 15-minute adverse impact to the reliability of the BES
 - Typically Information Technology assets
- Staff recommendations
 - Evaluate risk on case-by-case basis
 - Verify authenticity

- Include in Supply Chain Standards
 - Electronic access controls for medium and high BES Cyber Systems
 - Physical access controls for medium and high BES Cyber Systems
- Do not include in Supply Chain Standards
 - Electronic access monitoring and logging
 - Physical access monitoring and logging
 - Protected Cyber Assets
- Collect more data on low impact BES Cyber Systems
- Additional actions
 - Support EPRI report conclusions
 - Monitor emerging technologies for risks

- Policy input on staff recommendations - April
- Summary of policy input and final report to Board - May
- Report filed with FERC
- SAR developed to address final recommendations - June



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Effectiveness and Efficiency

Stakeholder Engagement

Mark Lauby, Senior Vice President and Chief Reliability Officer
Member Representatives Committee Meeting
February 6, 2019

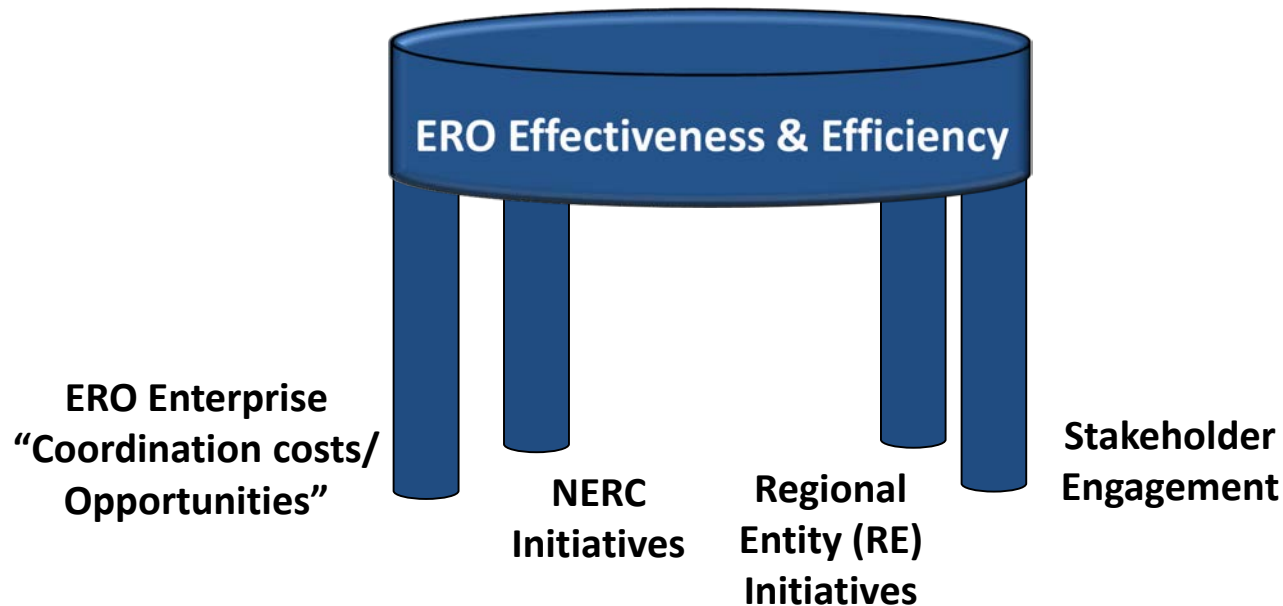
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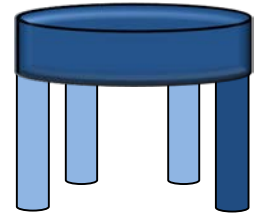
- **Objectives**

- Enhance Electric Reliability Organization (ERO) effectiveness in executing its statutory functions, recognizing the value of industry expertise
- Improve the efficiency of ERO operations and use of stakeholder resources

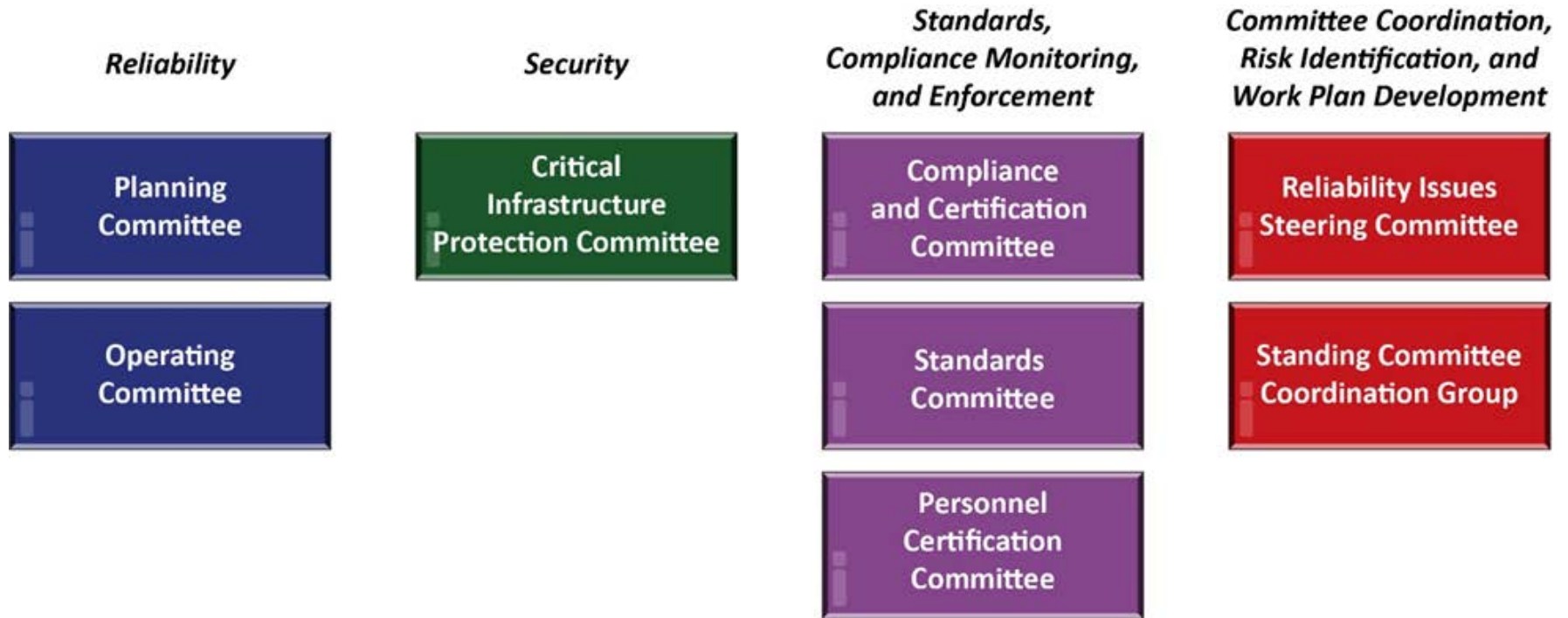
- **Four-legged approach**

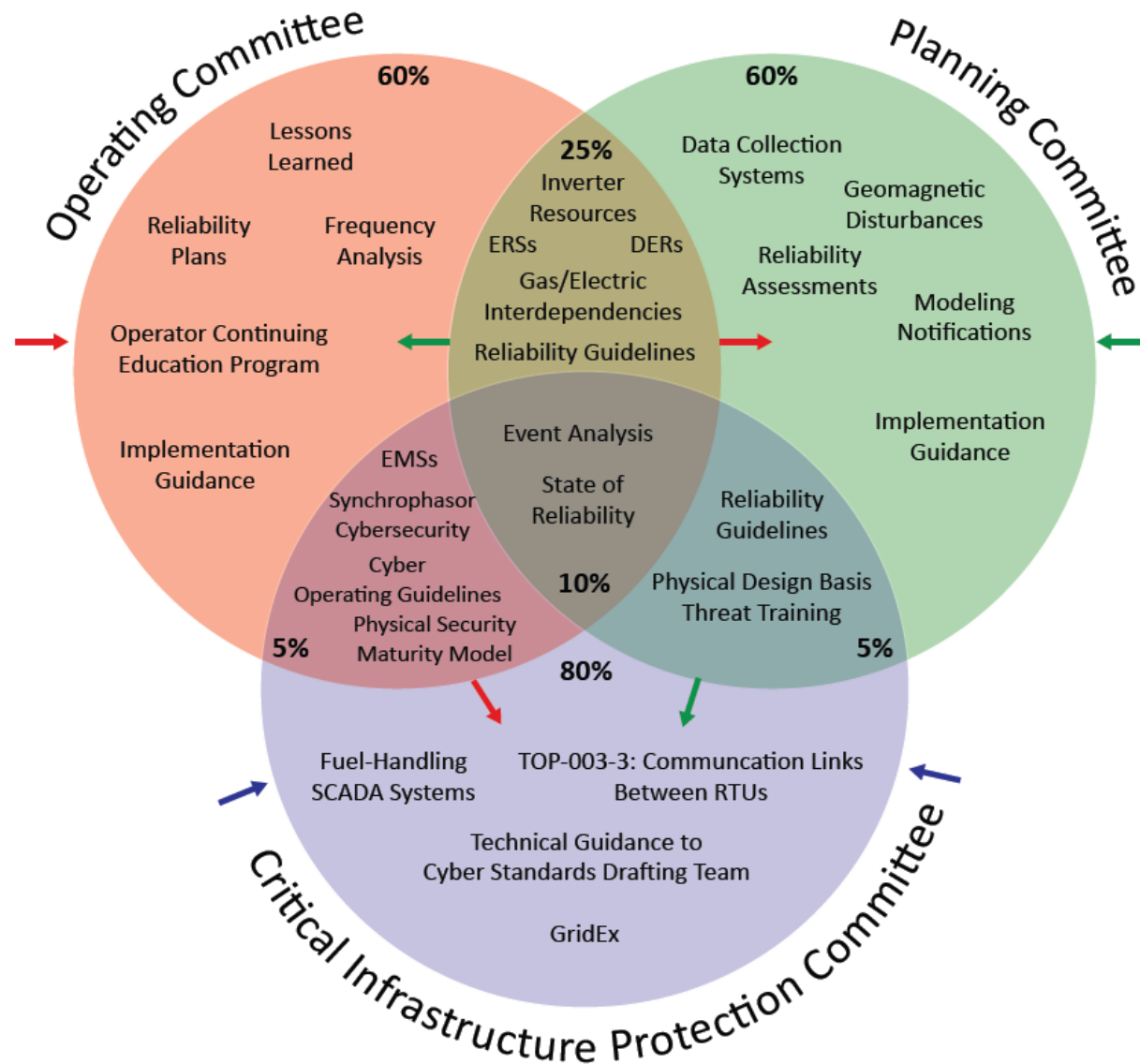


- **The current model has been in place for over ten years**
 - Model is expensive and time consuming for NERC members
 - The ERO Enterprise has matured
 - Several REs have had success enhancing their committee models
- **Committee “silos” blurring**
 - Committees activities increasingly overlap
 - New technology requires cross-cutting rethinking of many utility paradigms
- **Changing industry model**
 - Advances in new and unfamiliar technologies (e.g., inverters, batteries)
 - Risk profiles changing (e.g., fuel assurance, ERS preservation with resource mix changes)



Current NERC Stakeholder Committees





- **Is there a different structure?**

- Strengthen alignment of stakeholder input with ERO Enterprise priorities
- Accommodate the changing industry model with focus on reliability and security risks from a strategic planning, operating and security perspective
- Effectively address the increasing overlap between the committees driven by the current and evolving industry model and convergence of issues?
- Achieve a higher level of industry participation (effectiveness) and more cost-effectively leverage subject matter expertise (efficiency)?
 - Increase effectiveness of industry and ERO Enterprise resource allocation
 - Balance the burden and benefits of time and travel
 - Ensure continued availability of industry subject matter expertise
 - Consider committee succession planning to fortify stakeholder leadership
- Right people working on the right issues

- Stakeholder Engagement Team formed to develop a future vision for ERO stakeholder engagement needs and put forward a committee structure to support:
 - Execution of statutory functions
 - Improvement in the efficiency of ERO operations and stakeholder resources
 - Recognizing and leveraging the value of industry expertise
- Review the existing technical committee structure and make recommendations to improve efficiency and effectiveness
- The team was formed in late 2018 and held a kick-off webinar on December 14, 2018 to discuss the team's purpose and scope

- **Leadership:**

Jennifer Sterling

Mark Lauby

- **Team members:**

Marc Child

Jeffrey Cook

Michael Desselle

Brian Evans-Mongeon

Greg Ford

Lloyd Linke

Jennifer Flandermeyer

Jason Marshall

Patti Metro

David Short

Martin Sidor

Lori Spence

Scott Tomashefsky

- **NERC Staff:**

Stephen Crutchfield

Nina Jenkins-Johnston

- Face-to-face meeting held on January 18, 2019 to:
 - Refine the scope and work plan
 - Begin the evaluation process
 - Regional Entity staff provided lessons learned from transforming their regional stakeholder engagement structure and processes
- During the January 18 meeting:
 - Discussed existing ERO committee and subcommittee structure
 - Reviewed NERC's Strategic Plan, Operating Plan, and RISC Report to facilitate the evaluation process
- The team established project work streams, identified deliverables, and developed a project work schedule

- Review existing ERO committee structure
 - List deliverables from each NERC group and determine if those deliverables are still needed and what is needed for the future
 - List statutory obligations of NERC
 - Obligations per the NERC Rules of Procedure, Federal Power Act, etc. – identify and map tasks/responsibilities
 - Survey industry on what committee activities they see of value and include future needs
 - Consider a NERC oversight committee for technical committees
 - PCGC/PS synergies and funding

- Review existing ERO committee structure (continued)
 - Regional Entity participation as members of committees - is there duplication of effort?
 - Committee (OC, PC, CIPC) work plans – analyze for overlapping responsibilities
 - RISC Report – consider assigning risk items to a specific committee for accountability
 - Consider future needs, NERC vision

- Assess "best practices" and "lessons learned"
 - Survey Regions on what they learned from restructuring, before/after analysis with more specific data (number of committees, number of meetings, number of members, membership model/requirements, etc.)
- Develop
 - proposed structure
 - participation model
 - implementation plan
 - proposed committee and task force charter templates
- Draft report for industry policy input
- Present results and recommendations to the MRC and Board – August 2019

- Members volunteered to support these work streams
- Advanced work plan developed for next steps and milestones
- Team will continue to gather information between meetings
- Next face-to-face meeting is scheduled for February 20, 2019



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NERC Personnel Certification Governance Committee

Brett Hallborg, PCGC Member
Member Representatives Committee Meeting
February 6, 2019

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- Provides oversight to the policies and processes used to implement and maintain the integrity and independence of NERC's System Operator Certification Program
- Structure of the PCGC shall be implemented and maintained so that policies and procedures are established to protect against undue influence that could compromise the integrity of the System Operator Certification process

<https://www.nerc.com/comm/PCGC/Pages/Charter.pdf>

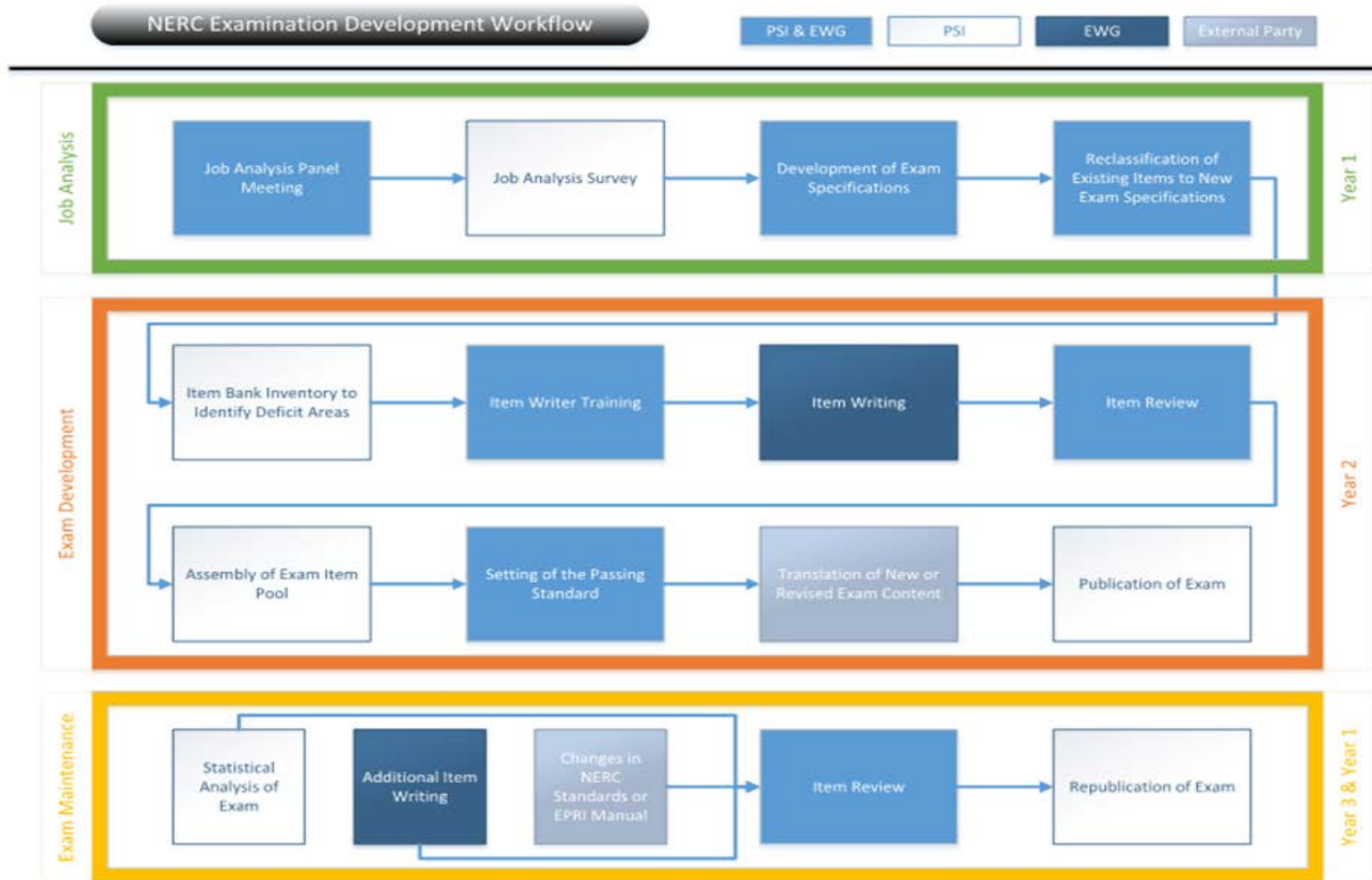
- 10 voting members from the U. S. and Canada:



- Each member maintains a current NERC System Operator Credential
- The Federal Energy Regulatory Commission (FERC) and other governmental authorities in Canada have the option of having a non-voting member

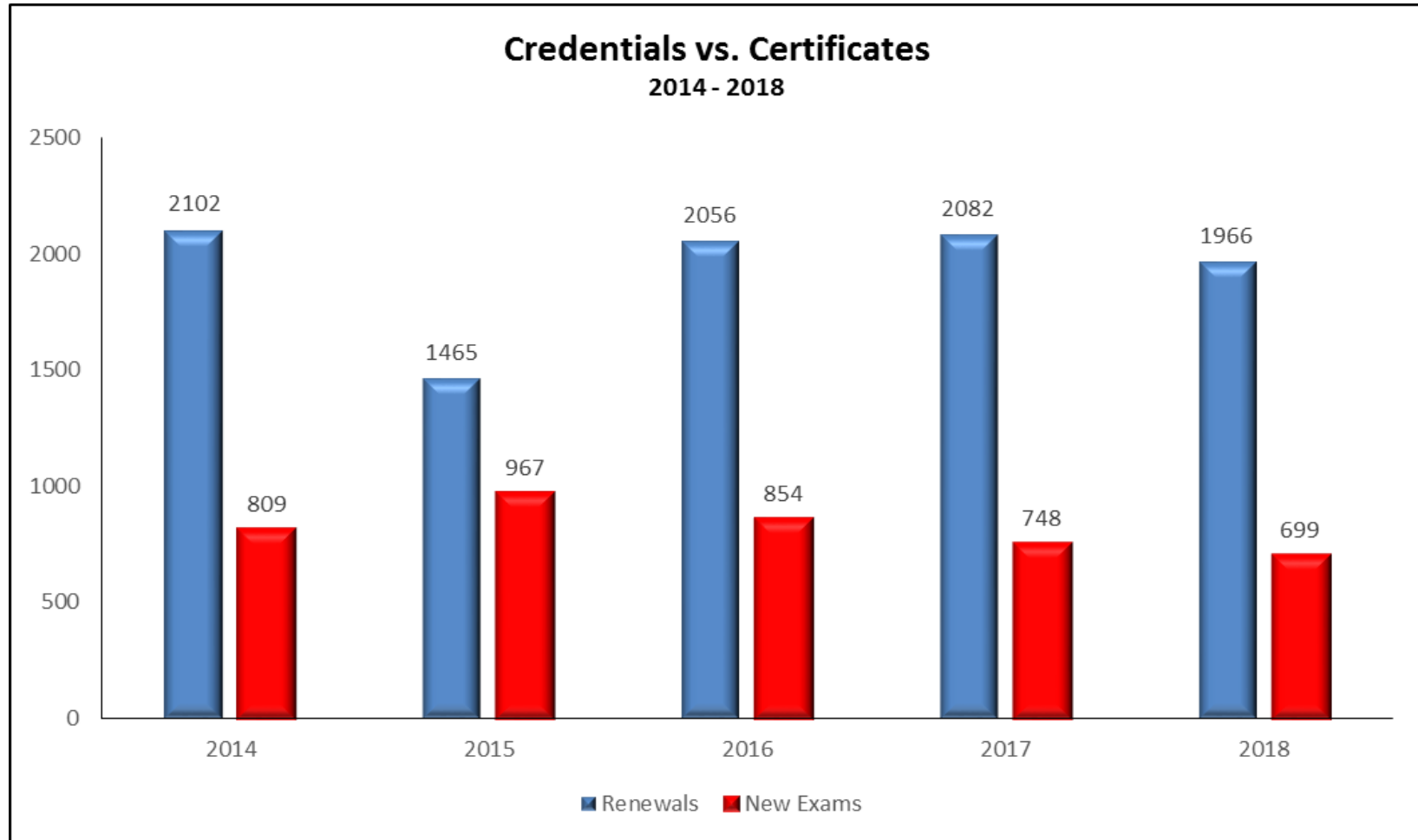
- Exam Working Group (EWG)
 - Responsible for development and maintenance of the System Operator Certification exams under the general guidelines set by the PCGC
 - Recommend Exam Cut Scores
- Membership:
 - Minimum of 12 Members
 - All members hold a current NERC System Operator credential
 - Subject matter experts in real time control centers or operational support personnel

https://www.nerc.com/comm/PCGC/EWG%20DL/EWG%20Scope%20Final_Revised_No_v_2017.pdf

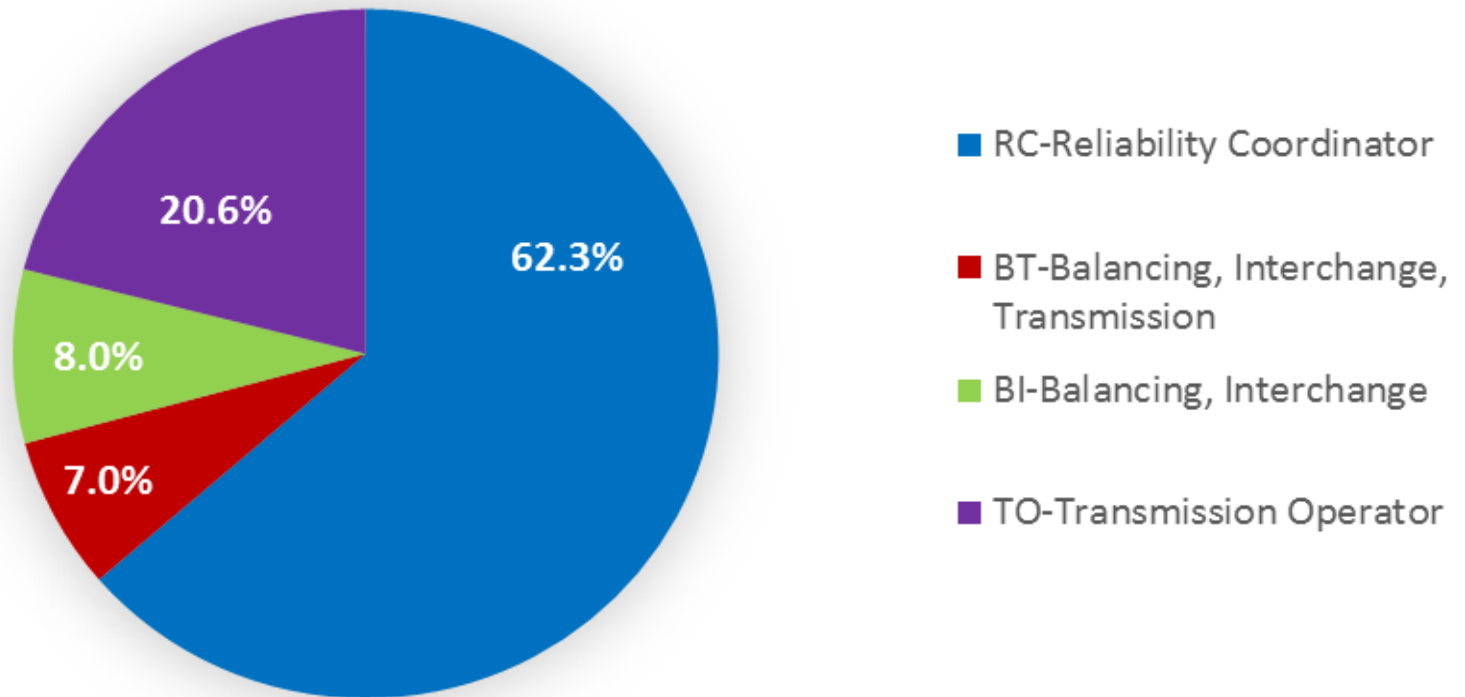


System Operator Certification (SOC) Program Statistics

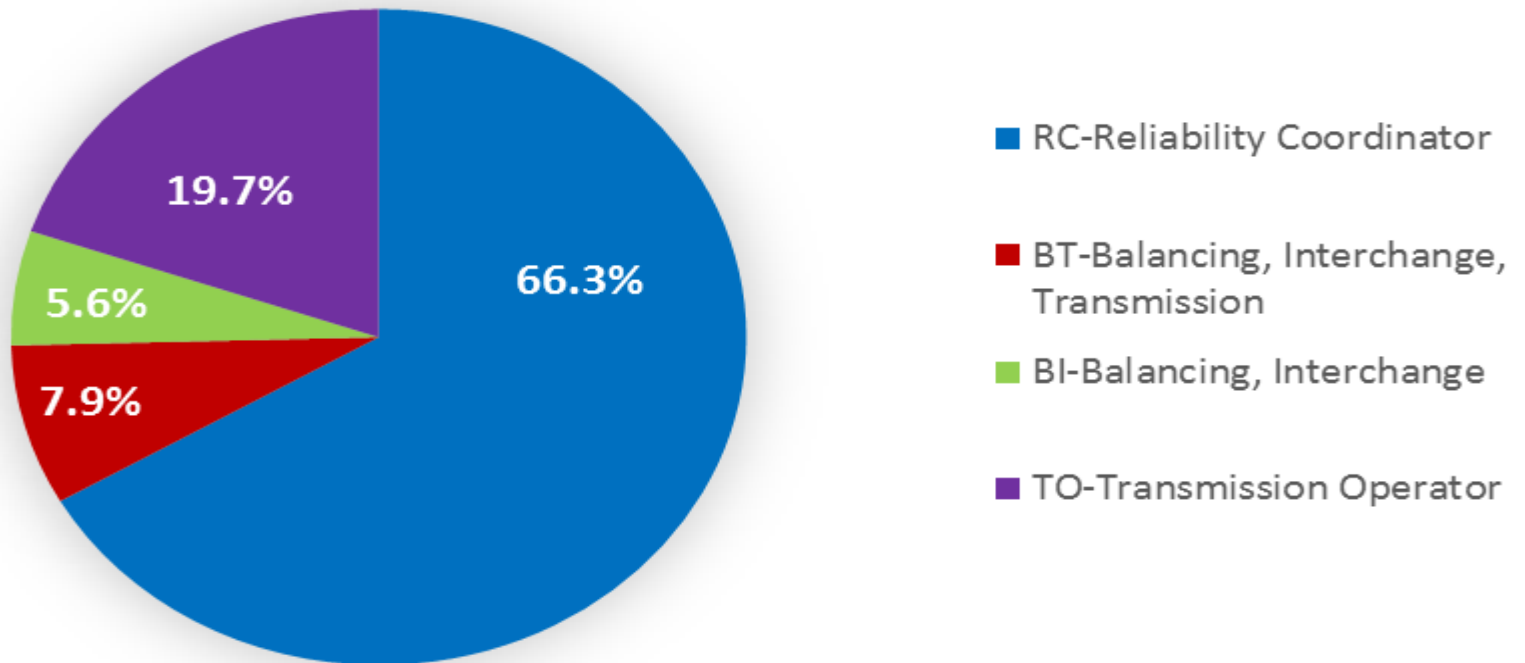
Year	Credential Maintained	New Certificates	Exams Taken
2006	0	943	
2007	109	729	1568
2008	833	634	1520
2009	1200	652	1005
2010	1597	638	914
2011	1691	607	874
2012	1291	588	894
2013	2063	631	943
2014	2102	620	809
2015	1465	725	967
2016	2056	624	854
2017	2082	521	748
2018	1966	496	699
Totals	18455	8408	11795



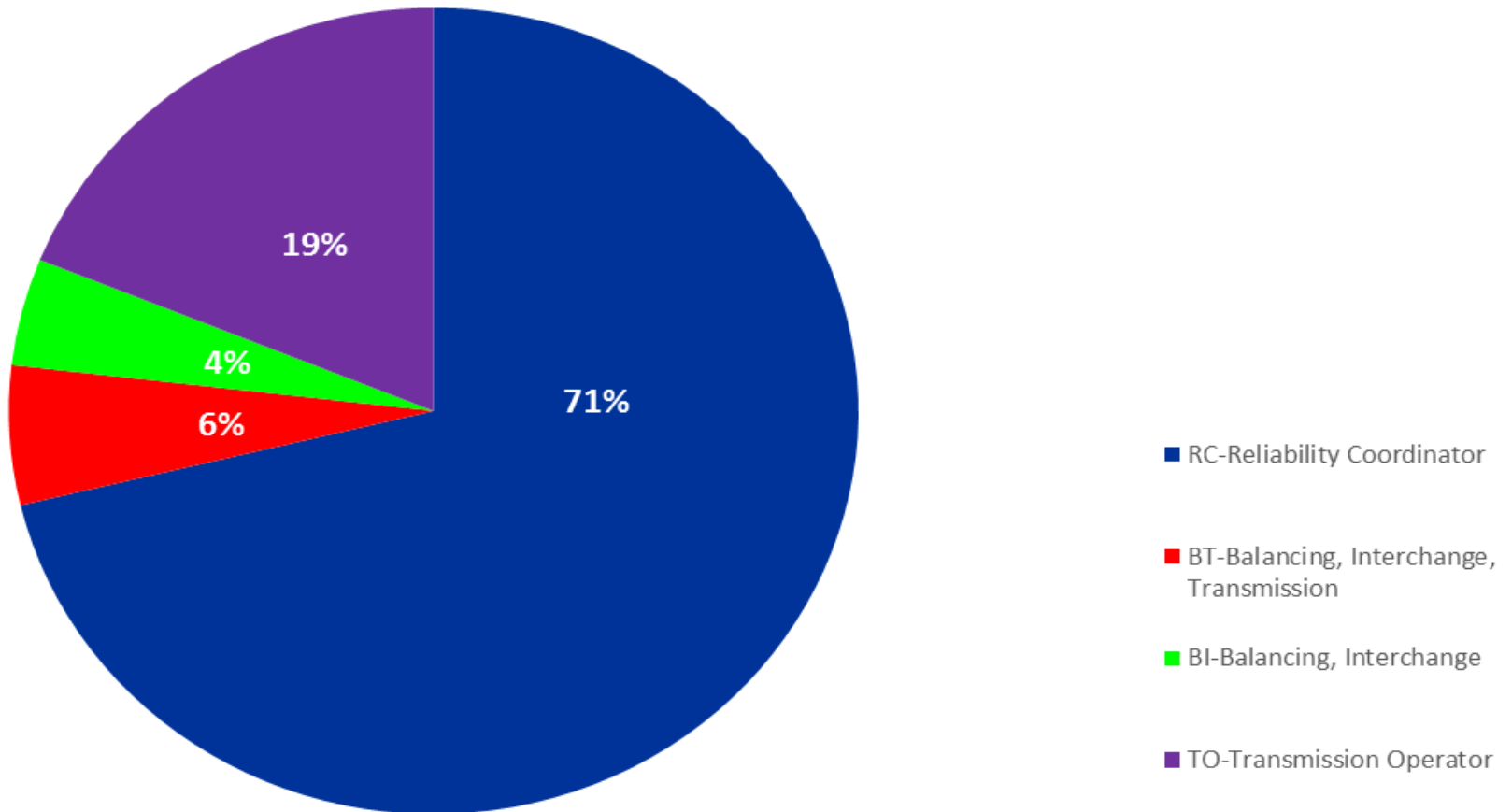
SOC Exams by Type 2016



SOC Exams by Type 2017



**SOC Exams by Type
2018**



- Linear On-The-Fly Testing (LOFT) – 2016
- System Operator Certification Continuing Education Database (SOCCED) Transition – 2017
- System Operator Certification Program Survey – 2017

- Benefits of LOFT:
 - Reduced the exam development cycle from three year to real time
 - Elimination of fixed forms has increased the integrity of the exams
 - Item Bank currently maintained at a minimum of 3 items per task
 - Ability to update exams as Standards are created or deactivated
 - Implemented Q1 2017
 - New Content Outlines
 - New Cut Scores

Fixed Form Exams



Real Time Exam Creation



- Previous Platform
 - Multiple Tables of Same Data
 - Old Technology
 - System was not user-friendly
 - Support from existing vendor was inadequate
 - Improvements to system were costly
- Credential Maintenance Database – New Platform
 - Deployed December 2017
 - Current Technology
 - One Source for Data
 - Improved Accuracy



- Purpose was to gather information from industry stakeholders related to the evolving NERC System Operator Certification program
 - Use of one credential was launched in 1998 with a 5-year expiration
 - This credential was expanded to four credentials in 2001
 - Credential maintenance was implemented in 2005 in lieu of testing
- The collected information was used to determine potential future development and improvement of the program

Four System Operator Exams/Credentials:

- Reliability Coordinator (RC)
 - 200 Continuing Education Hours (CEHs)
- Transmission Operator (TO)
 - 140 CEHs
- Balancing, Interchange and Transmission Operator (BT)
 - 160 CEHs
- Balancing and Interchange Operator (BI)
 - 140 CEHs

At this time, the only proposed changes to the program are one credential and the required CEHs to maintain this credential.

- One Credential:
 - NERC Certified System Operator (NCSO)
 - 140 CEHs

- 1998: System Operator Certification Program established
- 2001: 4 Credentials with 3 year expiration
- 2005: Credential maintenance in lieu of retesting
- 2006-2014: Focused on Exam Development
- 2015-2017: Strategic Plan
- 2017-Q1 2018: System Operator Certification Program Survey
- 2018: Survey Analysis and Develop One Credential Whitepaper
- 2019: Whitepaper/Credential Maintenance Analysis
- 2020-2021: Update program



Questions and Answers



Recent FERC Activity

Andy Dodge

Director, Office of Electric Reliability

Federal Energy Regulatory Commission

February 6, 2018

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

GMD Reliability Standard

- Final Rule in RM18-8 issued 11/15/18
- Approves proposed Reliability Standard TPL-007-2 (Transmission System Planned Performance for Geomagnetic Disturbance Events) submitted by NERC in response to Commission directives in Order No. 830
- Directs NERC to modify the reliability standard to:
 - Require the development and implementation of corrective action plans to mitigate assessed supplemental GMD event vulnerabilities; and
 - Authorize extensions of time to implement corrective action plans on a case-by-case basis.
- Accepts the revised GMD research work plan submitted by NERC
- Modified standard due 12 months from the effective date of Reliability Standard TPL-007-2

Removing Barriers to Storage Participation

- Final Rule in RM16-23 issued 2/15/18
- Requires grid operators to remove barriers to participation of electric storage resources in capacity, energy and ancillary services markets
- Requires each regional grid operator to revise its tariff to establish a participation model for electric storage resources
 - Market rules to recognize the physical and operational characteristics of electric storage resources
 - Must ensure that a resource is eligible to provide all capacity, energy and ancillary services that it is technically capable of providing
- All RTOs/ISOs have completed compliance filings, which were due 12/3/18
- FERC, grid operators and stakeholders have one year to review, revise and implement plans by 12/3/19

Transmission Incentives

- Commission will consider whether changes are required in calculation of base ROE and transmission incentives under Order No. 679
- At the 11/15/18 Commission meeting, Chairman Chatterjee indicated that the policies were overdue for a “fresh look”
- Commission is expected to consider changes to:
 - Calculation of base ROE
 - Whether the current policies are producing the appropriate level and type of transmission investment
- Any changes to the Commission’s transmission incentives policy would be prospective from the time of the determination

Market Actions with Reliability Implications

- SPP Dispatchable Variable Energy Resources
 - On 1/10/19 in ER19-356, FERC issued deficiency letter requesting more information to evaluate proposed tariff changes
 - SPP proposed to require most variable energy resources in its footprint to be dispatchable
- ISO-NE Interim Solution for Retaining Units for Fuel Security
 - On 12/3/18, FERC accepted ISO-NE's compliance filing in ER18-2364 proposing interim solution for retaining units at cost of service rates if they are needed for fuel security
 - ISO-NE will file a long-term market solution by 7/1/19

Upcoming Activities

- ERO Recertification and Self-Assessment
 - Every five years, NERC, as the ERO, must submit an assessment of its performance
 - Expected to be filed in 7/19
- West RC Transition

- Thank you!

- Questions?