UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

North American Electric Reliability Corporation	**)** **)**	**Docket No. _____**

NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION FIVE-YEAR ELECTRIC RELIABILITY ORGANIZATION PERFORMANCE ASSESSMENT REPORT IN ACCORDANCE WITH 18 C.F.R. § 39.3(c)

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The North American Electric Reliability Corporation ("NERC") respectfully submits its Five-Year Electric Reliability Organization ("ERO") Performance Assessment Report ("Performance Assessment") for the 2014-2018 Assessment Period[1] in accordance with the requirements of the Federal Energy Regulatory Commission's ("FERC" or "Commission") regulations at 18 C.F.R. § 39.3(c) (2018) and the directives in Order No. 672.[2] As required by 18 C.F.R. § 39.3(c)(1), this Performance Assessment:

(i) identifies how the ERO Enterprise's[3] activities and achievements during the Assessment Period build upon the certification criteria of 18 C.F.R. §39.3(b);

(ii) evaluates the effectiveness of each Regional Entity in carrying out its Delegated Authority; and

(iii) addresses stakeholder comments on NERC's performance (specific comments attached as directed by the Commission in the 2014 Five Year Order).[4]

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[1] The Assessment Period runs between June 1, 2014 – December 31, 2018.

[2] *Rules Concerning Certification of the Electric Reliability Organization; and Procedures for the Establishment, Approval, and Enforcement of Electric Reliability Standards*, Order No. 672, FERC Stats. & Regs. ¶ 31,204, *order on reh'g*, Order No. 672-A, FERC Stats. & Regs. ¶ 31,212 (2006). NERC was certified by the Commission as the ERO, pursuant to § 215(c) of the Federal Power Act ("FPA"), by Commission order issued July 20, 2006. *Order Certifying the North American Electric Reliability Corporation as the Electric Reliability Organization and Ordering Compliance Filing*, 116 FERC ¶ 61,062 (2006).

[3] The ERO Enterprise is comprised of NERC and its seven Regional Entities: (i) Florida Reliability Coordinating Council, Inc. ("FRCC"); (ii) Midwest Reliability Organization ("MRO"); (iii) Northeast Power Coordinating Council, Inc. ("NPCC"); (iv) ReliabilityFirst Corporation ("ReliabilityFirst"); (v) SERC Reliability Corporation ("SERC"); (vi) Texas Reliability Entity, Inc. ("Texas RE"); and (vii) Western Electricity Coordinating Council ("WECC").

[4] *Order on the Electric Reliability Organization's Five-Year Performance Assessment*, 149 FERC ¶ 61,141 at P 70 (2014) ("2014 Five Year Order").

NERC requests that the Commission accept this Performance Assessment.

I. NOTICES AND COMMUNICATIONS

Notices and communications with respect to this filing may be addressed to:

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II. INTRODUCTION

The ERO Enterprise is facing unprecedented, rapid change in the electric industry, which raises new challenges to and opportunities for the reliability and security of the Bulk Power System ("BPS"). Over the past five years, the ERO Enterprise has been navigating these changes by leveraging assessments and expertise across NERC and the Regional Entities to identify and to reduce existing and emerging risks to reliability. Through its assessments of the state of reliability, NERC has demonstrated that there is improved resilience, decreased protection system misoperations, and advanced risk management for the BPS.[5]

[5] The following key indicators show how NERC is managing risks to improve the reliability of the BPS during the Assessment Period: (i) there were no Category 4 or Category 5 events; (ii) the protection system misoperation rate continues to decline; (iii) frequency response shows improvement; and (iv) the BPS experienced no loss-of-load due to cyber or physical security events, despite continually evolving threats.

Reliability and security of the BPS is fundamental to national security, economic development, and public health and safety. A major disruption in electric service due to extreme weather, equipment failure, a cyber security incident, or a physical attack could have far-reaching effects. Users, owners and operators of the BPS must therefore institute measures to protect against and mitigate the impact from both conventional risks (e.g., extreme weather and equipment failures) and emerging security risks, such as physical attacks intended to damage or disable critical elements of the BPS. Throughout the Assessment Period, the ERO Enterprise implemented several initiatives, described below, to better protect against risks to the grid. These efforts, done in coordination with the Commission and stakeholders build on programs highlighted in the last 2014 performance assessment.

A. Identifying and Assessing Emerging Risks

The ERO Enterprise effectively identifies, prioritizes and efficiently mitigates risks to the BPS. In addition to traditional reliability assessments, the ERO Enterprise produces detailed assessments of emerging risks, drawing from its varied sources. These assessments provided crucial data during the Assessment Period on characteristics associated with the changing electric industry. NERC's 2018 Summer Reliability Assessment revealed that grid operators are increasingly looking to fast-ramping natural gas units and other flexible generation capacity to maintain BPS reliability. The 2018 Long Term Reliability Assessment indicated that the transformation of the BPS generation mix requires grid planners to address new threats to reliability. NERC conducted a FERC-NERC-Regional Entity Joint Review of Restoration and Recovery Plans in May 2018, which found BPS users, owners and operators have sufficient capability to quickly restore their systems using blackstart resources in the event of a widespread outage.[6]

Further, NERC identified previously unknown risks to reliability. For example, inverter-based resource controls, protection, and performance issues were brought to the forefront of NERC efforts. NERC posted Alerts in 2017 and 2018 to address this issue and formed a joint Inverter-Based Resource Performance Task Force to develop guidelines and recommended practices for inverter based resources connected to the BPS. This example reflects the steps that NERC, working collaboratively with industry, has taken to better understand the changing resource mix, identify mitigation solutions, monitor their implementation and thereby improve reliability of the BPS as the grid evolves.

[6] Available at: https://www.ferc.gov/legal/staff-reports/2018/bsr-report.pdf?csrt=7470569717912204516.

B. Reliability Standards are Addressing Cyber Security, Physical Security and Planning Risks to the Bulk Electric System

During the Assessment Period, NERC developed a suite of new and revised Reliability Standards to address cyber security supply chain management for industrial control system hardware, software, and computing as well as networking services associated with bulk electric system operations. These Reliability Standards provide a forward-looking and objective-based approach to managing cyber security supply chain risks. Approved by the Commission in October 2018, these Reliability Standards will, when implemented, require responsible registered entities to develop a plan addressing the security objectives of:

(i) software integrity and authenticity;

(ii) vendor remote access;

(iii) information system planning; and,

(iv) vendor risk management and procurement controls.

NERC supports the implementation of the supply chain risk management Reliability Standards. In 2018-2019, NERC prepared a report on cyber security supply chain risks with recommendations for future actions. NERC worked with the Electric Power Research Institute to provide an independent assessment of industry supply chain risks and presented an interim report to the NERC Board of Trustees in August 2018. The final report was presented to the NERC Board of Trustees in May 2019. Recognizing the complex and evolving nature of supply chain risks, This report contains several recommendations for further study and Reliability Standards development work.

NERC developed two Reliability Standards addressing potential geomagnetic disturbance ("GMD") events: Reliability Standard EOP-010-1 (Geomagnetic Disturbance Operations) and three versions of the TPL-007 Reliability Standard (Transmission System Planned Performance

for Geomagnetic Disturbance Events)). Further, NERC began work on a FERC mandatory request for GMD data pursuant to Section 1600 of the NERC ROP to improve the availability of GMD data.[7]

NERC continues to address emerging risks to critical infrastructure through its development and modifications of the Critical Infrastructure Protection ("CIP") Reliability Standards. In 2014, NERC developed Reliability Standard CIP-014-2 (Physical Security) to require Transmission Owners and Transmission Operators to protect certain critical Transmission stations and substations and their associated primary Control Centers from physical attack that could damage or render such facilities inoperable. NERC also addresses cyber security risks through development and modification of other CIP Reliability Standards. In 2018, NERC developed proposed CIP-012-1 (Cyber Security – Communications between Control Centers) to protect the confidentiality and integrity of Real-time Assessment and Real-time monitoring data transmitted between Control Centers. NERC also developed enhancements to its mandatory reporting requirements of certain Cyber Security Incidents in proposed Reliability Standard CIP-008-6.

[7] *See* directive in Order No. 830, *Reliability Standard for Transmission System Planned Performance for Geomagnetic Disturbance Events*, 156 FERC ¶ 61,215 (2016).

C. The E-ISAC is Securing the BPS through Information Sharing and Analysis

In conjunction with Reliability Standards and electric industry coordination, the ERO Enterprise continues deploying information sharing and analysis as part of a comprehensive approach to securing the grid. In particular, over the Assessment Period, NERC enhanced capabilities of the Electricity Information Sharing and Analysis Center ("E-ISAC") and coordination with the Electricity Subsector Coordinating Council ("ESCC"). The E-ISAC serves as a security communications channel for the electricity industry which enhances industry readiness and ability to respond to threats, vulnerabilities, and incidents that could affect the BPS. The ESCC fosters the coordination of sector-wide policy-related activities and initiatives to improve reliability and resilience of the electricity sectors. In 2018, the E-ISAC began implementing a long term strategic plan developed with guidance from the industry-led ESCC. The E-ISAC must adapt to the changing threat landscape, technologies, and business processes across the industry. Over the next five years, the E-ISAC will increase its capability to collect, analyze and disseminate actionable information regarding security threats to the electric industry.

In 2014, the E-ISAC, in close coordination with the DOE and the ESCC, assumed the role of program manager in facilitating the expansion of the Cyber security Risk Information Sharing Program ("CRISP")[8] to electric utilities. Throughout the period, the E-ISAC has also continues to enhance its membership portal[9], including offering more granular security alerts and notifications, tools for industry peer collaboration, and training materials. NERC continues to improve the capability of the portal by launching updates to enhance functionality, organization, and security.

NERC's biennial GridEx simulation exemplifies the way in which E-ISAC capabilities support security of the BPS. GridEx allows participants the opportunity to self-assess their emergency response and recovery plans through simulated security exercises featuring stresses on the system. Each exercise builds on lessons learned from prior exercises and real-life scenarios (such as the attack on Ukraine's electricity infrastructure through improper infiltration of the supervisory control and data acquisition system). The E-ISAC also hosts an annual grid security conference to discuss cyber and physical security issues.

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[8] CRISP is a voluntary program to facilitate real-time, computer-to-computer-data exchange involving potential security threats identified through monitoring participant utility networks.

[9] The E-ISAC portal is the primary means for voluntary information sharing between the E-ISAC and its membership.

D. Strengthening the ERO Enterprise Model through Operational Alignment

In addition to addressing reliability risks, the ERO focused on improving operational efficiencies associated with oversight of the Regional Entities to whom NERC has delegated certain authority pursuant to Section 215 of the Federal Power Act.[10] In the 2014 performance assessment, NERC proposed steps to achieving a more unified implementation of the major statutory functions with the Regional Entities. The Commission agreed with this vision and directed NERC to increase consistency and to promote coordination across the ERO Enterprise.

To achieve alignment, consistent with the Commission's directive in the 2014 Five Year Order, NERC implemented two important tools: (i) formal oversight and audit of targeted risks associated with functions delegated to Regional Entities; and (ii) the ERO Enterprise Program Alignment Process. NERC initiated a formal oversight program for each of its delegated functions pursuant to which it required every business unit responsible for a delegated function to prepare an oversight plan for the Regional Entities. In each oversight plan, business units outlined the roles and responsibilities of NERC and the Regional Entities and identified performance metrics to evaluate Regional Entities from year to year. NERC requires each business unit to document these annual metrics as well as lessons learned from oversight in an annual performance report. Through oversight and targeted audits conducted pursuant to Section 1207 and Appendix 4A of the NERC Rules of Procedure ("ROP"), NERC monitors operational risks that are a priority for the ERO Enterprise.

[10] 16 U.S.C. § 824o.

The ERO Enterprise Program Alignment Process ("Alignment Process") operates parallel and complementary to oversight and audits. The Alignment Process is designed to track (identify and capture), triage (classify, analyze, and prioritize), and provide transparency (post and report) on areas where the ERO Enterprise could improve or increase alignment. NERC tracks and publicly posts all identified topics, recommendations and resolutions or mitigation actions on its website. The Alignment Process is an expansion of a "Consistency Reporting Tool" that was developed by the Regional Entities in 2017 and posted on the individual Regional Entity websites to allow stakeholders to identify any inconsistencies across Regional Entities.

NERC also began implementing enhancements to effectiveness and efficiency of ERO Enterprise operations. For example, NERC launched the ALIGN tool (previously called the Compliance Monitoring and Enforcement Program ("CMEP") Technology Project). The ALIGN tool will enhance the ERO Enterprise's ability to share and analyze data that is crucial to reliability and security of the BPS. The tool will enhance NERC's ability to leverage the benefits of the ERO Model by eliminating varying systems and processes for monitoring compliance and establishing a single platform that aligns the business processes of the ERO Enterprise and improves documentation. NERC initiated the project in 2018 targeting complete implementation of the tool in 2020. NERC also commenced a similar project for its registration function (*see infra* Section IV.C.1), which will accomplish the same effectiveness and efficiency goals. Together, these operational efforts illustrate NERC's actions to address consistency and coordination across the ERO Enterprise.

III. NERC'S ACTIVITIES AND ACCOMPLISHMENTS CONTINUE TO SATISFY THE ERO CERTIFICATION CRITERIA OF 18 C.F.R. § 39.3(b)

When NERC was certified as the ERO for North America, NERC demonstrated that it met the criteria and developed the processes required under 18 C.F.R. § 39.3(b).[11] In this section, NERC highlights new activities and initiatives from the Assessment Period which demonstrate that NERC should continue to serve as the ERO, consistent with the criteria and processes mandated in 18 C.F.R. § 39.3(b).

A. NERC Continues to Advance its Ability to Develop Reliability Standards that Provide for an Adequate Level of Reliability of the BPS

During the Assessment Period, NERC continued to demonstrate its ability to develop Reliability Standards in support of a reliable and more secure grid. NERC addressed gaps in reliability through the following exemplary Reliability Standards projects:

(i) To address the physical security of the BES, NERC developed the CIP-014 Reliability Standard. Through this Reliability Standard, NERC seeks to protect

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[11] 18 C.F.R. § 39.3(b) provides that the Commission must determine that any entity certified as the ERO achieves the following:

> (1) Has the ability to develop and enforce, subject to §39.7, Reliability Standards that provide for an adequate level of reliability of the BPS; and
>
> (2) Has established rules that:
>
> (i) Assure its independence of users, owners and operators of the BPS while assuring fair stakeholder representation in the selection of its directors and balanced decision-making in any Electric Reliability Organization committee or subordinate organizational structure;
>
> (ii) Allocate equitably reasonable dues, fees and charges among end users for all activities under this part;
>
> (iii) Provide fair and impartial procedures for enforcement of Reliability Standards through the imposition of penalties in accordance with § 39.7, including limitations on activities, functions, operations, or other appropriate sanctions or penalties;
>
> (iv) Provide reasonable notice and opportunity for public comment, due process, openness, and balance of interests in developing Reliability Standards, and otherwise exercising its duties; and
>
> (v) Provide appropriate steps, after certification by the Commission as the Electric Reliability Organization, to gain recognition in Canada and Mexico.

critical Transmission stations and substations and their associated primary Control Centers from physical attack that could damage or render such facilities inoperable.

(ii) To address the potential impacts of GMD events on reliable operations, NERC developed the TPL-007 Reliability Standard. This Reliability Standard uses the latest in scientific and technical understanding to define GMD planning events for entities to use in assessing their vulnerabilities to GMD events. NERC also initiated the GMD Research Work Plan to continue to advance its understanding of this reliability risk and to inform future versions of the standard.

(iii) To address cyber security risks posed by vulnerabilities in the supply chain, NERC developed one new and two revised Reliability Standards to address supply chain risk management for industrial control system hardware, software, and computing and networking services associated with BES operations. In May 2019, NERC completed a study further assessing supply chain risks with recommendations for future actions.[12]

(iv) To provide for enhanced information sharing of actual and attempted efforts to compromise the cyber security of the grid, NERC developed Reliability Standard CIP-008-6. This Reliability Standard broadens Requirements for mandatory incident reporting and require that information be shared with the National Cyber security and Communications Integration Center, in addition to the currently mandated reporting to the E-ISAC.

(v) To improve the quality and rigor of planning studies and thereby promote a more reliable BPS, NERC developed proposed Reliability Standard TPL-001-5. This Reliability Standard would require planning entities to study, among other things, the potential impacts of Protection System "single points of failure" on their Systems. NERC identified this risk following an analysis of data collected pursuant to a data request under Section 1600 of the NERC ROP.

In addition to adopting new Reliability Standards, NERC implemented initiatives to enhance the Reliability Standards development process. First, in response to the Commission's directive in the 2014 Five Year Order to develop and to post more granular assessments of Reliability Standards development, NERC launched a pilot project to track, on a going-forward basis, actual Reliability Standard project completion times as compared to estimated time for completion at the outset of a given project. At the time of the 2014 Five Year Order, FERC noted

[12] [Insert Cite to Final Supply Chain Report (due May 2019).]

that information regarding Reliability Standards projects was limited to whether a given project was "urgent" or "non-urgent."[13] The Commission sought information regarding how total time for development reflects the overall complexity of a project.[14] As part of its pilot, NERC designed a Project Tracking Spreadsheet to examine a project's actual completion time, defined as the total time between the first posting and the date of the final ballot. NERC tracks the following features of a Reliability Standard project as indicators of the complexity of a project:

(i) project priority (1 - 3, with 1 being the highest priority) consistent with the annual Reliability Standards Development Plan;

(ii) number of directives that are addressed by the project;

(iii) number of recommendations from FERC orders that do not rise to the level of a directive, but that are addressed by the project; and

(iv) number of other Reliability Standards affected by the project (i.e., those requiring retirement or amendment).

NERC updates the tracker monthly using inputs from Reliability Standard developers as well as Project Management and Oversight Subcommittee liaisons to the Standards Committees.

Second, NERC launched initiatives to improve the body of Reliability Standards so that risks to the BPS are addressed in a more effective and efficient manner. Since its certification as the ERO, NERC has addressed the Commission's standard modification directives from Order No. 693[15] and subsequent orders and remaining gaps within the body of Reliability Standards, as discussed above. NERC has shifted its focus towards refining the existing Reliability Standards to become more effective and efficient and addressing any newly identified reliability risks. This

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[13] 2014 Five Year Order at P 64.

[14] *Id*.

[15] *Mandatory Reliability Standards for the Bulk-Power System*, Order No. 693, 2006–2007 FERC Stats. & Regs., Regs. Preambles ¶ 31,242, at P 144, *order on reh'g*, Order No. 693-A, 120 FERC ¶ 61,053 (2007); *Reliability Standard Compliance and Enforcement in Regions with Regional Transmission Organizations or Independent System Operators*, 122 FERC ¶ 61,247, at P 5 (2008) ("Guidance Order").

builds upon efforts from the previous assessment period, including the Independent Experts Review Project[16] and Project 2013-02 Paragraph 81.[17]

NERC's Standard Processes Manual ("SPM") requires the periodic review of each Reliability Standard to determine whether it should be reaffirmed, revised, or withdrawn.[18] In 2016, NERC began using a tool to support this periodic review process by grading all Reliability Standards that are currently enforceable or subject to enforcement for one year. Reliability Standards were graded through an open and inclusive stakeholder process and final grades were included in the Reliability Standards Development Plan filed yearly with the Commission on an informational basis.

NERC also initiated the Standards Efficiency Review in 2017. The goal of this project is to retire or modify unnecessary Reliability Standard Requirements. Following the first phase of this project, the Standards Efficiency Review team recommended that a number of Reliability Standards Requirements be retired on the basis that the requirements are duplicative of others, administrative in nature. In 2018, NERC initiated Project 2018-03 Standards Efficiency Review Retirements to implement identified recommendations as appropriate.[19]

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[16] The purpose of this project was to conduct an independent review and evaluation of the body of non-CIP Reliability Standards to recommend areas for improvements, identify reliability gaps, and recommend retirements and consolidations of standards. The final report, titled *Standards Independent Experts Review Project: an Independent Review by industry Experts* (June 2013), is available on NERC's website at: https://www.nerc.com/pa/Stand/Standard%20Development%20Plan/Standards_Independent_Experts_Review_Project_Report-SOTC_and_Board.pdf

[17] The purpose of this project was to propose the retirement of Reliability Standard requirements that provided little protection to the reliable operation of the BES, were redundant, or were unnecessary, in accordance with FERC's March 15, 2012 Order on NERC's Find, Fix, and Track process. *See N. Am. Elec. Reliability Corp.*, 138 FERC ¶ 61,193, at P 81 (2012).

[18] SPM Section 13.0.

[19] More information about Project 2018-03 is available at: https://www.nerc.com/pa/Stand/Pages/Project-2018-03-Standards-Efficiency-Review-Retirements.aspx.

B. NERC Coordinates Budget and Strategic Planning across the ERO Enterprise

During the Assessment Period, NERC sought to align NERC and Regional Entity annual business plans and budgets ("BP&Bs"), ERO Enterprise risks, and the ERO Enterprise strategic planning process. To achieve this alignment, NERC leverages the biennial report created by the Reliability Issues Steering Committee ("RISC"). The RISC is an advisory committee that reports directly to the NERC Board of Trustees regarding BPS reliability issues and how to address them. In its biennial report, RISC identifies and ranks BPS reliability risks to industry - to inform the following strategic and budget planning documents:

(i) ERO Enterprise Long-Term Strategy – The long-term strategy addresses the ERO Enterprise's approach to addressing risks for a five to seven year time frame.

(ii) ERO Enterprise Operating Plan – Guided by the long-term strategy, this plan identifies the ERO Enterprise's vision, mission, core principals, and goals, and provides a list of key contributing activities to inform a rolling operational planning horizon. NERC flags any activities that are recommendations from the RISC report.

(iii) ERO Enterprise BP&Bs – The BP&Bs set the specific annual activities, resources, and resource allocation in support of the goals and objectives in the operating plan. BP&Bs are prepared, reviewed, and approved annually for NERC and each of the Regional Entities, and NERC reviews the Regional Entities' BP&Bs for alignment with the ERO Enterprise Operating Plan.

(iv) ERO Enterprise Metrics – The metrics provide performance benchmarks for the ERO activities outlined in the BP&B.

C. NERC Continues to Enhance its Procedures for Compliance and Enforcement

The ERO Enterprise strives to serve as an objective and fair enforcement authority that promotes a culture of reliability excellence through risk-based registration, certification, compliance monitoring, enforcement and mitigation. During the Assessment Period, NERC enhanced its CMEP by: (i) researching and identifying trends in the incidence of noncompliance; (ii) maintaining the transparency of its dispositions of noncompliance; and (iii) increasing

procedural efficiencies in coordination with the Regional Entities. NERC ends this Assessment Period with a structure in place, through the CMEP Alignment Process, to collect, review, resolve, and communicate discrepancies in practices across the ERO Enterprise. NERC tracks identified discrepancies as well as their associated recommendations or resolutions.

1. Trends in Noncompliance

The ERO Enterprise continues to implement a risk-based approach focusing on registered entity-specific risks and serious noncompliance. NERC observed two notable trends during the Assessment Period: (i) reduced repeat moderate and severe risk violations; and (ii) continued progress in mitigating the ERO's older caseload of noncompliance.

To gauge the effectiveness of the risk-based CMEP in deterring and mitigating higher risk violations during the Assessment Period, the Commission directed NERC to examine the incidence of repeat noncompliance.[20] To measure this, NERC reviewed moderate and serious risk violations for registered entities with the following compliance histories: (i) no prior compliance history; (ii) compliance history involving dissimilar conduct; and (iii) compliance history involving similar conduct. NERC reviewed all noncompliance filed between 2012 and 2018 and found an overall downward trend of moderate or serious risk determinations with prior noncompliance with similar conduct over the past five years. In 2016, NERC filed 111 violations with moderate or serious risk determinations with prior noncompliance with similar conduct. In 2017, there were 48 filed violations with prior similar noncompliance. In 2018, there were 22 filed violations with prior similar conduct. NERC expects some level of noncompliance with similar underlying conduct to persist. The downward trend in repeat moderate and severe risk violations is noted in the **Figure [1]** below:

[20] 2014 Five Year Order at P 39.

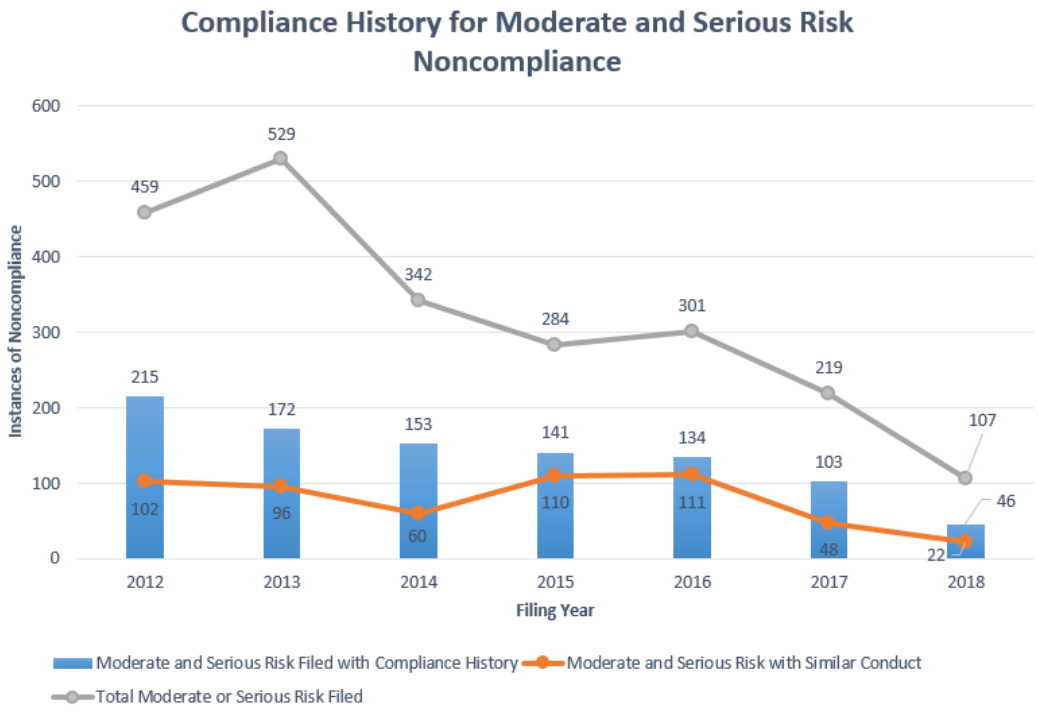

Figure 1 - Instances of Moderate and Serious Risk Noncompliance Filed with Compliance History or Similar Conduct, 2012-2018

As shown in **Figure [2]** below, there has also been a general decrease in the number of serious risk violations across the ERO Enterprise during the Assessment Period. Serious risk violations historically have comprised only a small percentage of the total:

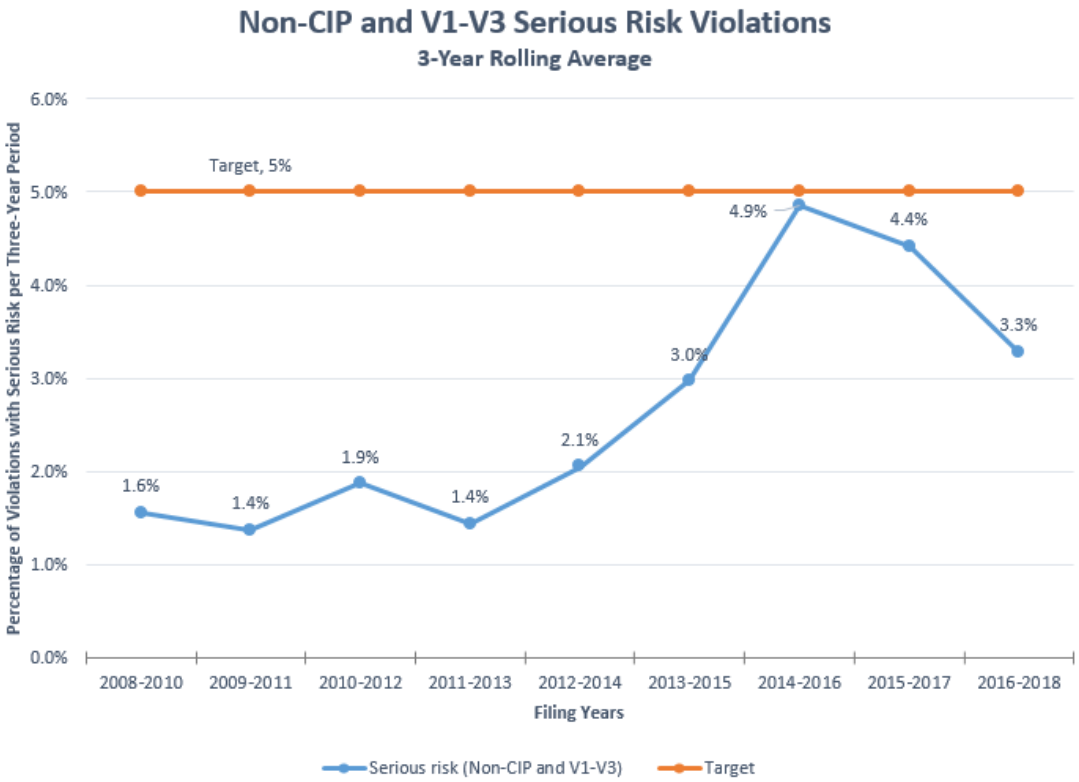

Figure - 2 Three-Year Rolling Average of Serious Risk Violations as a Percentage of all Filed Violations, by Filing Year (Non CIP and CIP Versions V1-V3)

Figure 3 - Three-Year Rolling Average of Serious Risk Violations as a Percentage of all Filed Violations, by Filing Year (CIP Only)

As shown in the preceding two figures, serious risk violations comprise a small percentage of the total noncompliance. NERC filed the highest number of serious risk violations as a percentage of total violations in 2016. Since that time, the percentage of serious risk violations as a percentage of all filed noncompliance has fallen to under NERC's self-determined target of five percent.

The ERO Enterprise conducted focused reviews in 2017 and 2018 to identify whether deficiencies in mitigation contributed to noncompliance and to identify potential methods of further reducing repeat noncompliance. To provide NERC with better visibility and a wider perspective of the issue, NERC now tracks and reports on compliance history on a quarterly basis.

2. Transparency in Compliance and Enforcement

Consistent with the Commission's expectations in the 2014 Five Year Order, NERC continues to maintain transparency in its disposition of noncompliance.[21] In addition to its quarterly reports on all matters associated with CMEP activities, public webinars and other opportunities to exchange information about its programs, on its website, NERC publicly posts dispositioned noncompliance, whether through a full Notice of Penalty, Spreadsheet Notice of Penalty, Find, Fix, Track, and Report ("FFT"), or compliance exception. In parallel path, NERC takes steps to safeguard confidential information and to ensure the accuracy and completeness of CMEP data. NERC enhanced its internal policies by: (i) segregating duties for the publication of content to NERC's public website from duties to develop materials for publication, and, (ii) developing procedures delineating roles and responsibilities in the event of inadvertent disclosure.

3. Enhancing Procedural Efficiencies in Compliance Monitoring and Enforcement Program

As the ERO Enterprise matures in its risk-based approach for CMEP, it is important to have a computer system that accurately manages and analyzes data and other information handled on a daily basis. Over the course of ALIGN's development, NERC worked with a stakeholder group to collect registered entity perspectives and feedback. The tool is expected to increase efficiencies by standardizing processes (including forms and interfaces) across the ERO Enterprise, to improve documentation, and to support ERO Enterprise-wide sharing and analysis of CMEP information. ALIGN will have a single, common portal for registered entities, enabling consistency of experience. NERC expects to eliminate delays and manual communications with the advent of real-time access to CMEP information. In addition to the procedural efficiencies,

[21] 2014 Five Year Order at P 72.

the CMEP tool is projected to provide cost-savings for the ERO Enterprise. By the end of the Assessment Period, NERC completed more than 50 percent of its business process harmonization activities for the anticipated launch of ALIGN. NERC expects to launch ALIGN through three releases ending in 2020 and resulting in a comprehensive, consistent, and efficient CMEP platform.

NERC also incorporated a consolidated hearing process into the ROP to increase efficiencies, to enhance consistency and to streamline costs in the ERO Enterprise CMEP hearing process. The process allows a Regional Entity to opt-in to a centralized hearing process whereby NERC conducts a contested case hearing in an enforcement dispute. The consolidated process still allows the Regional Entity from whom the dispute originates to appoint up to two members of what is typically a five-member Hearing Body. This process is optional to the Regional Entities. As of March 2019, all Regional Entities except Reliability First and Texas RE have opted to participate in the consolidated hearing process.

Finally, in late 2015, the NERC Board of Trustees accepted and endorsed the recommendations of the Compliance Guidance policy, which includes Implementation Guidance and CMEP Practice Guides.[22] Pre-Qualified Organizations or Standards Drafting Teams may develop Implementation Guidance providing industry-vetted examples and approaches to illustrate how registered entities could comply with a Reliability Standard. Once submitted to NERC, Implementation Guidance is reviewed for endorsement. The ERO Enterprise develops CMEP Practice Guides which address how ERO Enterprise CMEP staff execute compliance monitoring

[22] *See* https://www.nerc.com/gov/bot/Agenda%20highlights%20and%20Mintues%202013/Board_Agenda_Package_November_2015_v3a.pdf.

and enforcement activities. NERC publishes the complete list of ERO Enterprise endorsed Implementation Guidance as well as CMEP Practice Guides on its website.[23]

D. NERC Continues to Maintain Rules to Ensure Due Process, Openness and Balance of Interests in Developing Reliability Standards

NERC continues to maintain rules ensuring due process, openness, and balance of interests in developing Reliability Standards and otherwise exercising its duties. NERC continues to maintain its status as an American National Standards Institute (ANSI)-accredited standards developer in accordance with the policies and procedures of that organization.

During the Assessment Period, NERC revised its Standard Processes Manual.[24] The revised Standard Processes Manual improves the processes for conducting any necessary field tests for new and revised Reliability Standards, developing interpretations of Reliability Standards, and posting supporting technical documents to approved Reliability Standards. It also contains a number of clarifications and updates throughout. Additionally, in March 2018, the Commission approved revisions to Appendix 3D to the ROP - Registered Ballot Body Criteria - to help ensure that the votes of Independent System Operators and Regional Transmission Organizations are appropriately represented in segment 2 of the NERC Registered Ballot Body for voting on Reliability Standards.[25]

E. NERC Continues Gaining Recognition in Canada and Mexico

The North American BPS spans ten sovereign jurisdictions across three countries. Dedicated efforts by NERC and Canadian and Mexican partners over the past several years

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[23] *See* https://www.nerc.com/pa/comp/guidance/Pages/default.aspx.

[24] *Petition of the North American Electric Reliability Corporation for Approval of Proposed Revisions to the Standard Processes Manual, Appendix 3A to the NERC Rules of Procedure*, Docket No. RR19-2-000 (filed Nov. 19, 2018).

[25] *N. Am. Elec. Reliability Corp.*, Docket No. RR18-1-000 (unpublished letter order).

continue to move the reliability regulatory framework toward a high level of consistency across jurisdictional boundaries.

As some of the original proponents for an international ERO, Canadian stakeholders are committed to the 2005 *Principles for an Electric Reliability Organization That Can Function on an International Basis* ("Bilateral Principles"). During the Assessment Period, the ERO saw continued Canadian dedication to a consistent, continent-wide regulatory framework for reliability. Below is a table showing that compliance monitoring arrangements in place between the ERO and all Canadian provinces and showing the parties and dates of all currently effective legislation or agreements.

	MOU Parties	Year Signed
BC	NERC+WECC+BC Utilities Commission	2018
AB	NERC+WECC+AESO; WECC+MSA	2010
SK	NERC+MRO+SaskPower	2015
MB	NERC+MRO+MB Government NERC+MRO+Manitoba Hydro	2012 2018
ON	NERC+NPCC+IESO NERC+OEB	2006 2006
QC	NERC+NPCC+Régie	2009, 2014
NS	NERC+NPCC+NS Power; NERC+NSUARB	2006
NB	NERC+NPCC+NB Energy and Utilities Board	2016
NEB	NERC+NEB	2007

In addition to Canada, Mexico is increasing its interaction with the ERO Enterprise. In 2015, Mexico began implementing comprehensive energy reforms adopted in 2013 and 2014,

thereby prompting greater Mexican participation in the ERO Enterprise. Mexico adopted its first comprehensive mandatory reliability framework and garnered the support and resources of the ERO Enterprise to implement its historic energy reforms. To formalize its relationship with NERC as a resource and expert on electric reliability, NERC, CENACE, and the Comisión Reguladora de Energía[26] executed a memorandum of understanding ("MOU") in 2016. Through the MOU, the parties created a senior management Steering Group to oversee activity under the MOU and to finalize the funding framework for activities under the MOU. The parties also committed to exploring opportunities for formal Mexican participation in the ERO. Pursuant to this MOU, NERC conducted a Cyber Risk Preparedness Assessment on Mexican utilities in 2016. The purpose of the assessment was to ensure that CENACE operations were consistent with Reliability Coordinator, Balancing Authority and/or Transmission Operator-type Reliability Standards, inclusive of Critical Infrastructure Protection Reliability Standards.

IV. EVALUATING REGIONAL ENTITY PERFORMANCE

Commission regulations require that each assessment of the ERO's performance include "an evaluation of the effectiveness of each Regional Entity, recommendations by the Electric Reliability Organization, users, owners, and operators of the BPS, and other interested parties for improvement of the Regional Entity's performance of delegated functions, and the Regional Entity's response to such evaluation and recommendations."[27] Through oversight and audit conducted pursuant to Section 1207 and Appendix 4A of the ROP, NERC evaluates Regional Entity performance and compliance with the ROP, Commission directives, the Regional

[26] CENACE is a public decentralized body in Mexico that exercises the operative control of the power system. Comisión Reguladora de Energía is an agency of CENACE, as a coordinated energy regulator of Mexico.

[27] 18 C.F.R. § 39.3 (2018).

Delegation Agreements, NERC policies or procedures as well as guidance and directions issued by the NERC Board of Trustees.[28] During the Assessment Period, NERC launched a formal oversight program pursuant to which NERC identified oversight monitoring activities, as well as performance metrics for the Regional Entities.[29] Each year, these monitoring activities shift focus to address new risks and to reflect the results of Regional Entity performance from the prior year. NERC documents Regional Entities' performance, as measured against the oversight plan metrics, in annual performance reports shared with the Regional Entities and NERC senior management. Using Regional Entity and senior management feedback, NERC updates oversight plans to reflect any identified areas of focus or risk.

As indicated in NERC's 2015 informational filing to the Commission, NERC developed a staggered schedule to develop oversight plans for each function. The first set of oversight plans developed were implemented in 2017 and NERC issued performance reports in the first quarter of 2018. Regional Entities reviewed the performance reports and provided feedback to NERC, including proposals to mitigate any areas of improvement identified by NERC business units. This feedback loop resulted in revised oversight plans for the 2018 calendar year. NERC repeated the process in 2018 with performance reports issued in 2019 for 2018 activities.

NERC leverages the oversight plan performance reports and results of other Regional Entity oversight activities[30] to identify risk areas warranting targeted audits conducted in

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[28] *See Pro Forma* NERC Regional Delegation Agreement, Section 8(f).

[29] In the 2014 Five Year Order, the Commission directed NERC "to continue developing performance metrics to measure consistency, coordination, and efficiency between and among NERC and the Regional Entities in order to achieve predictable, timely, and consistent results across the ERO Enterprise." 2014 Five Year Order at P 73.

[30] In addition to oversight plan performance reports, NERC examines the following during its audit scoping process: (i) annual ERO Enterprise risk assessments; (ii) Regional Entity self-certifications; (iii) targeted reviews of different areas, and (iv) feedback from the NERC Board of Trustees.

accordance with generally accepted auditing principles. During the Assessment Period, NERC performed targeted audits of the following five risk areas:

(i) confidentiality and conflict of interest;

(ii) event analysis;

(iii) compliance monitoring competency evaluation guide; and,

(iv) Section 215 accounting.

NERC functions also reflected feedback from these targeted audits in their revised oversight plans for the following calendar year. Below, NERC outlines its findings and recommendations from Regional Entity oversight.

A. Reliability Standards

While each Regional Entity may propose regional Reliability Standards to the ERO,[31] the ERO Enterprise has made a concerted effort to focus efforts on supporting the development of continent-wide Reliability Standards and using Variances,[32] where possible, to address necessary differences while achieving a similar or greater level of reliability. In support of this shift, the Regional Entities are engaged in continual review of their standard development procedures for opportunities to align them with NERC's procedures while continuing to maintain individual FERC approved efficient processes. The Regional Entities also initiated projects to conduct periodic reviews of regional Reliability Standards and Interconnection-wide Variances and to

[31] *See* Section 215(d) of the Federal Power Act, Section 39.8 of the Commission's regulations, and the Regional Delegation Agreements.

[32] A "Variance" is defined in Appendix 2 to the NERC ROP as "an aspect or element of a Reliability Standard that applies only within a particular Regional Entity or group of Regional Entities, or to a particular entity or class of entities. A Variance allows an alternative approach to meeting the same reliability objective as the Reliability Standard, and is typically necessitated by a physical difference. A Variance is embodied within a Reliability Standard and as such, if adopted by NERC and approved by the Applicable Governmental Authority(ies), shall be enforced within the applicable Regional Entity or Regional Entities pursuant to delegated authorities or to procedures prescribed by the Applicable Governmental Authority."

revise or retire existing regional Reliability Standards. No new regional Reliability Standards were proposed during the Assessment Period. As of December 31, 2018, 12 regional Reliability Standards remained in effect. Out of these 12 regional Reliability Standards, one has been subsequently approved for retirement and another retirement is pending regulatory approval.

The following table provides a summary of Regional Entity standard development activity requiring NERC action through December 31, 2018, with dates of Commission approval (where applicable):

Regional Entity	**Standard Activity**
MRO	Revisions to Regional Reliability Standards Process Manual, RR16-3-000 (approved 5/6/2016)
NPCC	Revisions to Regional Reliability Standards Development Procedure, RR14-7-000 (approved 12/23/2014) Retirement of PRC-002-NPCC-01, RD16-8-000 (approved 8/16/2016) PRC-006-3 (revised Variance for the Quebec Interconnection), (filed for information with the Commission on September 5, 2017)
RF	BAL-502-RF-03, RD17-8-000 (approved 10/16/2017)
SERC	Revisions to Regional Reliability Standard Development Procedure, RR18-2-000 (approved 3/31/2018) PRC-006-SERC-02, RD17-9-000 (approved 10/16/2017)
Texas RE	Revisions to Regional Reliability Standards Development Process, RR17-3-000 (approved 5/30/2017) Retirement of IRO-006-TRE-1, RD19-2-000 (approved 1/29/2019)
WECC	Revisions to Reliability Standards Development Procedures: - RR14-8-000, (approved 12/23/2014) - RR17-5-000 (approved 10/27/2017) BAL-002-WECC-2a, RD17-3-000 (approved 1/24/2017) BAL-004-WECC-3, RD18-2-000 (approved 5/30/2018) FAC-501-WECC-2, RD18-5-000 (approved 5/30/2018) IRO-006-WECC-3, Docket pending (filing pending)

	VAR-001-5 (revisions to VAR-001 WECC Variance), RD18-8-000 (approved 10/15/2018) VAR-002-WECC-2, RD15-1-000 (approved 3/3/2015) VAR-501-WECC-2, RD15-1-000 (approved 3/3/2015) VAR-501-WECC-3, RD17-5-000 (approved 4/28/2017) VAR-501-WECC-3.1 (errata), RD17-7-000 (approved 9/26/2017) **Retirements** Retirement of PRC-004-WECC-2, RD18-3-000 (filed 3/9/2018) Retirement of TOP-007-WECC-1a, RD16-10-000 (approved 5/10/2017) Retirement of VAR-002-WECC-2, RD18-1-000 (approved 9/5/2018)

B. Compliance Monitoring and Enforcement Program

In this section, NERC describes the oversight activities performed pursuant to the Compliance Monitoring and Enforcement oversight plans and provides a summary of the results of NERC's oversight during the Assessment Period.

1. Compliance Monitoring

One of the most significant changes to compliance monitoring over the Assessment Period was the implementation of a risk-based approach. The ERO found that it is not practical, effective, or sustainable for the ERO Enterprise to monitor all compliance issues to the same degree or to treat all noncompliance in the same manner. Compliance monitoring and enforcement must be "right-sized" based on a number of considerations, including risk factors and registered entity management practices related to the detection, assessment, mitigation, and reporting of noncompliance. A risk-based approach is necessary for a proper allocation of resources. It also encourages registered entities to enhance internal controls, including those focused on the self-identification of noncompliance. This shift resulted in compliance changing from using a one-size-fits-all actively monitored list of Reliability Standards to focusing on the largest risks each entity posed to the reliability of the BPS.

During the prior assessment period, NERC's multi-year Reliability Assurance Initiative resulted in the development of the ERO Enterprise Risk-Based Compliance Monitoring Framework ("Framework").[33] In this Framework, NERC focused on identifying, prioritizing, and addressing risks to the BPS, which enables each Compliance Enforcement Authority ("CEA") to focus resources where they are most needed and likely to be the most effective. The first step of the Framework is the identification and prioritization of ERO Enterprise-wide risks. Through the review of the ERO Enterprise-wide risks, the ERO develops an annual compilation of Risk Elements. NERC documents the Risk Elements in the ERO Compliance Monitoring and Enforcement Program Implementation Plan ("CMEP IP").

Taking into account the Risk Elements and other factors, CEAs develop registered entity-specific Compliance Oversight Plans ("COPs"). A COP reflects the CEA's assessment of a registered entity's inherent risk as well as the risk mitigation activities conducted by the registered entity, such as its internal controls. The COP determines the interval of monitoring, the depth of testing (i.e., a list of NERC Reliability Standards and requirements), and the types of CMEP tools used to engage a registered entity (i.e., audit, spot check or self-certification). The COP is dynamic and requires updating from time to time. CEAs use the COP to tailor CMEP activities based on identified registered entity-specific risks. A CEA may revise a COP if a registered entity experiences significant changes, new compliance responsibilities, or faces new reliability risks. NERC allows development of Regional Entities to consider local risks and specific circumstances associated with individual registered entities within their footprint in developing their respective COPs. As a result, the scope of monitoring of a particular registered entity in a COP may include

[33] *See* Overview of the ERO Enterprise's Risk-Based Compliance Monitoring and Enforcement Program (Sept. 2014), https://www.nerc.com/pa/comp/Reliability Assurance Initiative/Overview of the ERO Enterprise%E2%80%99s Risk-Based CMEP.pdf.

more, fewer, or different Reliability Standards than those outlined in the ERO CMEP IP. **Figure [4]** below shows the various inputs for the development of a COP for a given registered entity.

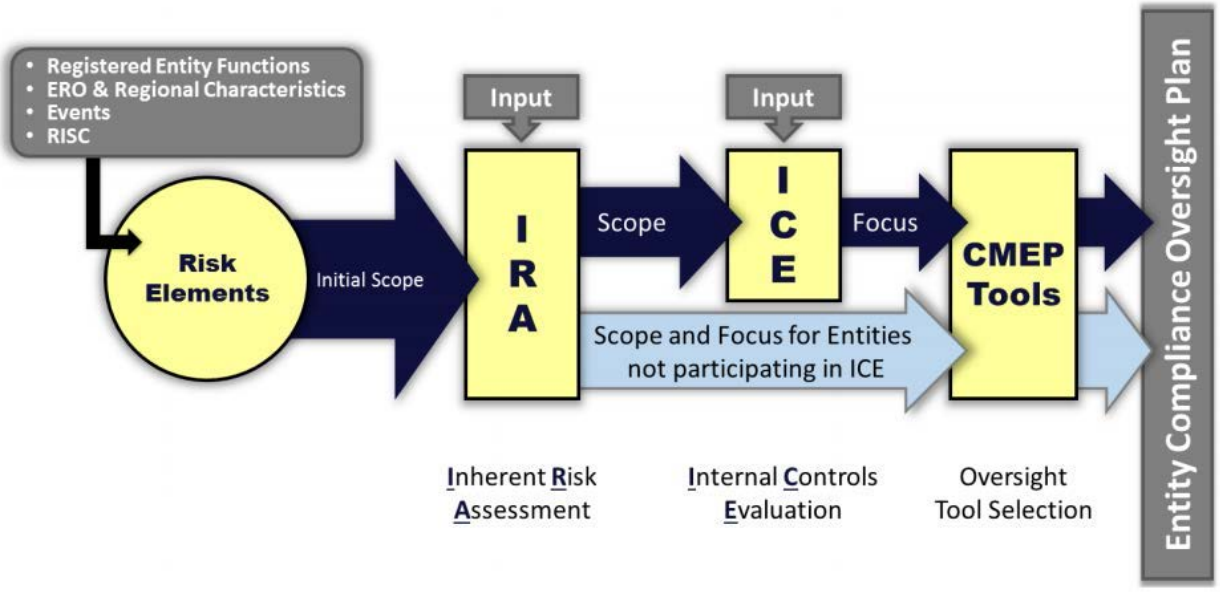

Figure 4 - Inputs for the Development of a COP

a. Risk Elements

NERC and the Regional Entities are responsible for identifying Risk Elements that reflect emerging and impactful risks to the BPS as well as other ERO-wide and Regional Entity-specific risks. NERC leads the effort to identify Risk Elements using inputs from compliance findings, event analysis data, and the expert judgment of NERC and Regional Entities, committees, and subcommittees (e.g., NERC Reliability Issues Steering Committee). NERC lists the Risk Elements in the annual CMEP IP. NERC also identifies Reliability Standard requirements correlated with the identified Risk Elements to prioritize compliance monitoring efforts for a given registered entity.

In the table below, NERC shows the change in Risk Elements during the Assessment Period. The change in Risk Elements from the early years of this Assessment Period to the present

reflect a maturation of the risk-based approach to compliance monitoring. The most recent Risk Elements focus on discrete issues that NERC encourages the Regional Entities and industry to prioritize for the upcoming year. NERC expects the Regional Entities to also develop Risk Elements specific to their footprints to further inform their compliance monitoring activities.

2015	2016 - 2018	2019
Cyber security	Critical Infrastructure Protection	Improper management of employee and insider access
Extreme Physical Events	Extreme Physical Events	Insufficient Long-Term Planning Due to Inadequate Models
Infrastructure Maintenance	Maintenance and Management of BPS Assets	Insufficient Operational Planning Due to Inadequate Models
Monitoring and Situational Awareness	Monitoring and Situational Awareness	Spare Equipment with Extended Lead Time
Protection System Misoperations / Uncoordinated Protection Systems	Protection System Failures	Improper determination of misoperations
Long-Term Planning and System Analysis	Event Response / Recovery / Planning and System Analysis	Improper determination of misoperations / Inhibited Ability to Ride through Events
Human Error	Human Performance	Gaps in Program Execution
Workforce capability		

b. Inherent Risk Assessments and Internal Controls

To successfully implement risk-based CMEP, the ERO Enterprise refined its understanding of the risks each registered entity poses to the reliability of the BPS. During the Assessment Period, the Regional Entities developed common risk factors and conducted inherent risk assessments ("IRAs") for registered entities. The common risk factors are quantitative thresholds for various operational features. By developing these common risk factors, the ERO Enterprise could align its approach for conducting IRAs and consistently identifying areas of focus (i.e., specific lists of NERC Reliability Standards) for compliance monitoring activities. Upon completing an IRA, a CEA knows the unique characteristics of a registered entity and its inherent risks to the reliability of the BPS. The CEA can also refine its evaluation of which risk areas should be included in compliance monitoring activities. The CEA accomplishes this by reviewing the registered entity's performance history (i.e., compliance history, event analysis trends, etc.) to understand how an entity is using internal controls to manage compliance and to mitigate risks.

c. Evaluation of Regional Entity Performance

During the Assessment Period, NERC tailored compliance monitoring oversight priorities and activities based on the maturity and phase of risk-based compliance implementation. In 2014, prior to the launch of the formal oversight program in 2016, NERC and Regional Entity activities focused on designing the process to be used for risk-based CMEP. From 2015 to 2016, the ERO Enterprise developed 18 common risk factors to aid in measuring inherent risk and in aligning the process for conducting IRAs. In 2016, NERC developed a formal compliance monitoring oversight plan for Regional Entities.

(1) Development of COPs

By the end of the Assessment Period, all Regional Entities implemented processes (i.e., IRA completion) under the risk-based Framework described above. All Regional Entities are

using common ERO Enterprise risk factors to develop IRAs and to inform COPs. NERC determined that all the Regional Entities are using their knowledge of a registered entity's inherent risk and performance risk in identifying which monitoring tool to apply, the scope of monitoring engagements, and selecting Reliability Standards to examine. **Figure [5]** below identifies the number of IRAs completed by each Regional Entity. In 2018, the Regional Entities completed 1,314 IRAs for 1,488 registered entities. All Regional Entities have completed IRAs for Reliability Coordinators, Balancing Authorities, and Transmission Operators in 2018.

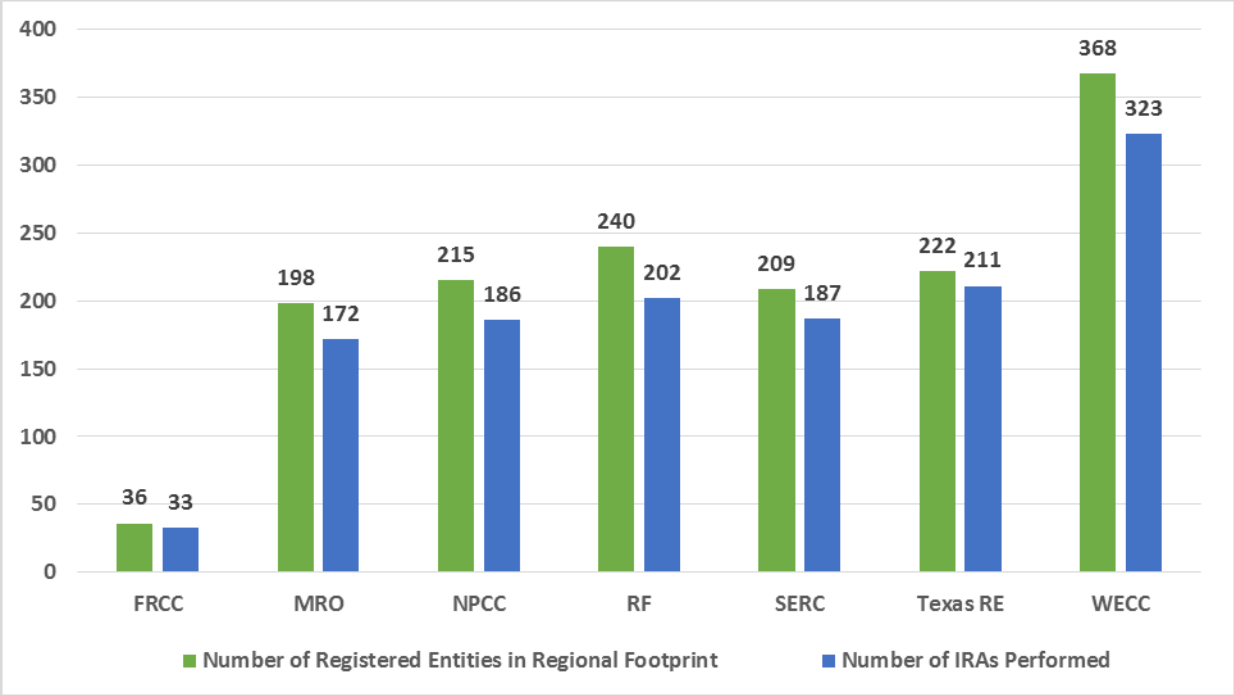

Figure 5 - Number of IRAs Completed by Each Regional Entity

Additionally, NERC and the Regional Entities developed ERO Enterprise-approved templates for their compliance monitoring activities. For example, as of 2017, all Regional Entities use the IRA Summary Reports, Audit Notification Letters, and Audit and Spot Check Reports, as well as templates for these activities occurring in the Coordinated Oversight Program for MRREs. NERC also sampled at least one internal control evaluation ("ICE") engagement per Regional

Entity. In 2018, Regional Entities had completed seven ICE engagements. ICE engagements allow Regional Entities and registered entities to begin examining mitigation of risks more broadly than just compliance with the NERC Reliability Standards. Regional Entities continue to conduct internal control review activities and implement processes for conducting reviews of internal controls during CMEP activities, such as Compliance Audits.

While the ERO successfully launched the COP development process during the Assessment Period, there are several ERO Enterprise-wide opportunities to enhance the COP development process. These opportunities include enhancing Regional Entity documentation for: (i) risk and monitoring decisions in COP development; and (ii) decisions around effectiveness for internal control reviews, particularly assessment of registered entity evidence, registered entity internal control design and implementation. NERC also found there is an opportunity to improve alignment of Regional Entity CMEP IPs, specifically around the development and use of Regional Risk Assessments and Regional Risk Elements. Moving forward, NERC will determine needs for guidance and training around the level of detail needed to document professional judgment and technical justifications for IRA and COP results.

(2) Audit Documentation

NERC notes that there is an overall opportunity for the Regional Entities to strengthen documentation processes around COP and final audit scope determinations, to ensure documentation is complete and contains sufficient detail to support significant judgments and conclusions. NERC identified certain gaps in documentation that made it difficult to understand final COP decisions around risk areas.

(3) Coordinated Oversight Program

NERC has a Coordinated Oversight Program designed to increase efficiency in the compliance monitoring and enforcement activities for multi-region registered entities ("MRREs"). The program is voluntary and a registered entity operating in or owning assets in two or more Regional Entity jurisdictions with one or more NERC Compliance Registry identification numbers is a potential candidate for inclusion in the program. A key area of improvement for the Coordinated Oversight Program is increasing regional coordination through refining IRAs, data submittals, and self-report processes. NERC expects that the ALIGN tool will address several of these issues. NERC also identified ERO Enterprise opportunities to improve coordination between lead Regional Entities and affected Regional Entities in developing final compliance monitoring decisions for MRREs in the program.

During the Assessment Period, the ERO Enterprise published an ERO Enterprise Guide for the Coordinated Oversight Program. In this guide, NERC provides details to participating and interested entities related to general roles and responsibilities, program applicability, and expectations for coordination of various activities. During the Assessment Period, the ERO Enterprise granted 40 MRREs entry into the Coordinated Oversight Program. Due to recent consolidation of a large MRRE group into a single NCR identification number, the number of registered entities participating in the program decreased from 231 in 2017 to 197 in 2018. **Figure [6]** below shows the distribution of MRREs under coordinated oversight by LRE as of the end of the third quarter of 2018.

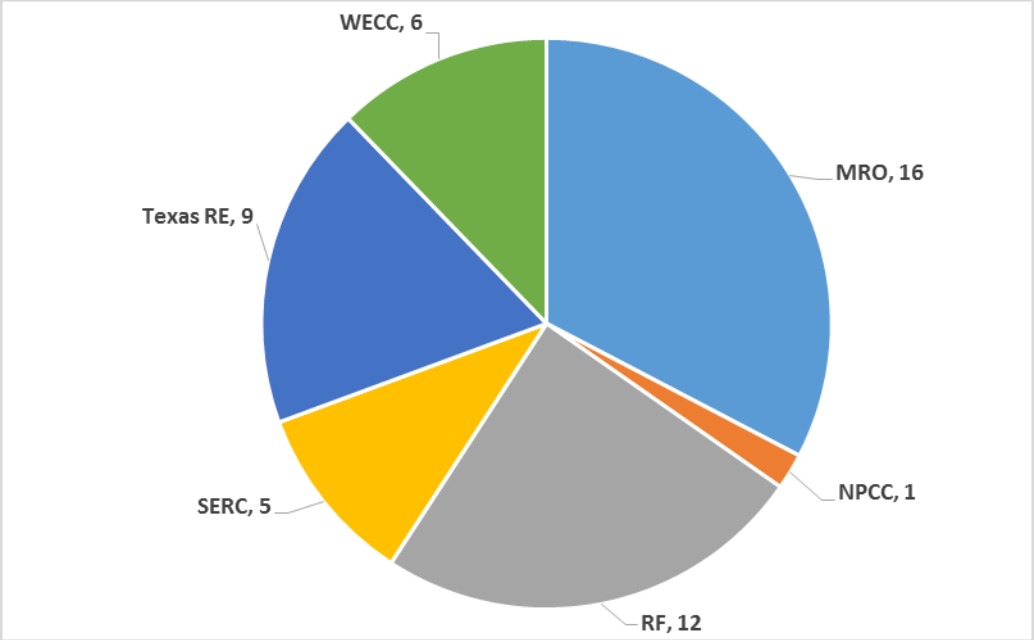

Figure 6 - Distribution of MRREs under coordinated oversight by LRE

d. Participation in ERO Enterprise CMEP Staff Training

NERC CMEP staff provide training to ERO Enterprise staff through workshops, instructor-led training events, and eLearning opportunities. Training opportunities focus on identifying gaps in staff knowledge and capabilities related to the risk-based CMEP. During the Assessment Period, NERC offered the following training opportunities for Regional Entity staff:

(i) A workshop called "From Theory to Field Application" attended by 175 Regional Entity staff. Participants learned about controls around Reliability Standards, penalty calculations, CIP auditing of high and medium impact BES Cyber Systems, and Transmission Operations / Interconnection Reliability Operations.

(ii) CIP auditor training on network security reviews. Approximately 21 Regional Entity staff attended the training in person and 21 attended remotely.

(iii) NERC and the Regional Entities hold two sessions a year on audit team leadership skills. This course ensures that audit team leaders and certification team leaders possess the requisite skills to lead a Compliance Audit or certification team.

(iv) Annual three-day workshop attended by 150 CMEP staff focusing on internal controls and updates on key processes, tools and techniques applied to operations and planning and critical infrastructure protection ("CIP") Reliability Standards, and use of network analysis tool for CIP auditors.

(v) NERC holds approximately two days of training per year on risk assessment and penalty determination training exercises

e. Targeted Compliance Audits

(1) Regional Entity Compliance Monitoring Competency Evaluation Guide Audit

In 2018, NERC gathered and reviewed information related to the procedures undertaken by NERC and each Regional Entity to ensure the competency of Regional Entity compliance personnel and how it is tracked, monitored, and updated. The objective of this initiative was twofold. First, it was designed to determine how NERC and the Regional Entities monitor, track, and update the professional competencies of Regional Entity compliance personnel. Second, it assessed how NERC and the Regional Entities verify that Regional Entity compliance personnel have and maintain the competencies necessary to execute their roles. NERC noted no non-conformance with the ROP by any of the Regional Entities.

(2) Regional Entity Internal Controls Evaluation Audit

The objective of the internal controls evaluation audit was to assess whether the Regional Entities are adequately and consistently evaluating registered entities' internal controls and using the results to impact risk assessments associated with compliance monitoring activities. The audit did not reveal any violations of the ROP by either the Regional Entities or NERC.

2. Enforcement

Section 402 of the ROP guides NERC's oversight of the Regional Entities' enforcement activities. During the Assessment Period, NERC's oversight activities consisted of monitoring Regional Entity performance metrics as well as performing reviews of how the Regional Entities execute enforcement processes. For example, in 2018 NERC tracked: (i) the average age of noncompliance; (ii) older caseload inventory; and (iii) certain measures related to the

implementation of the risk-based compliance and enforcement program, such as the number of entities participating in the self-logging program and the use of compliance exceptions[34] for minimal risk issues. In addition to enforcement processing metrics, NERC is strengthening its enforcement oversight by examining risks posed by noncompliance.

NERC's enforcement oversight consists of two components: metrics and reviews of Regional Entity enforcement processes, as discussed below. As NERC transitioned its focus toward a risk-based CMEP, enforcement metrics shifted to include metrics such as: (i) the percentage of noncompliance that is self-reported; (ii) the number of repeat and serious violations that were aggravated due to compliance history; and (iii) the percentage of noncompliance with incomplete mitigation. NERC reports on its metrics, measured at the ERO Enterprise level, in an annual Compliance Monitoring and Enforcement Program report,[35] as well as in public quarterly reports to the NERC Board of Trustees Compliance Committee.[36]

The second component of NERC's enforcement oversight activities consists of reviewing specific Regional Entity enforcement processes and the Regional Entity's implementation of those processes. These reviews are conducted on a rotating basis, followed by a summary report and specific feedback letters to each Regional Entity. For example, NERC performs an annual review of the implementation of the FFT and compliance exception programs in conjunction with FERC and reports on the results of such reviews in an annual filing with the Commission in Docket No. RC11-6. Based on these oversight activities, NERC and the Regional Entities have continued to

[34] Noncompliance that is not pursued through an enforcement action by the ERO Enterprise is referred to as a "compliance exception."

[35] These reports are available on NERC's webpage at https://www.nerc.com/pa/comp/Pages/AnnualReports.aspx. Until 2017, these reports were also filed with the Commission in Docket No. RR15-2.

[36] The quarterly reports are available on NERC's website at https://www.nerc.com/gov/bot/BOTCC/Pages/ComplianceCommittee(BOTCC).aspx.

process noncompliance in a timely and efficient manner and to execute enforcement processes in accordance with ERO rules and policies during the Assessment Period.

i. The ERO Enterprise Processes Noncompliance in a Timely and Effective Manner and Demonstrates Continued Progress in Using the Enforcement Program to Reduce Risks to Reliability

One metric NERC has consistently used to track enforcement processing performance during the Assessment Period is the "average age of noncompliance." During the Assessment Period, the average age of noncompliance decreased from approximately 12 months at its highest point in 2014 to 11.8 months at the end of 2018. NERC observes that there has been some variation in average violation age, with a trend upward from the five-year low of approximately seven months in mid-2017, but the overall average remains within NERC's goal that the average age of noncompliance should not exceed 12 months. The average age climbed to a similar peak by the end of 2018 for a number of reasons, chiefly, a sustained increase in discovered noncompliance resulting from the implementation of newly enforceable Reliability Standards in 2016.

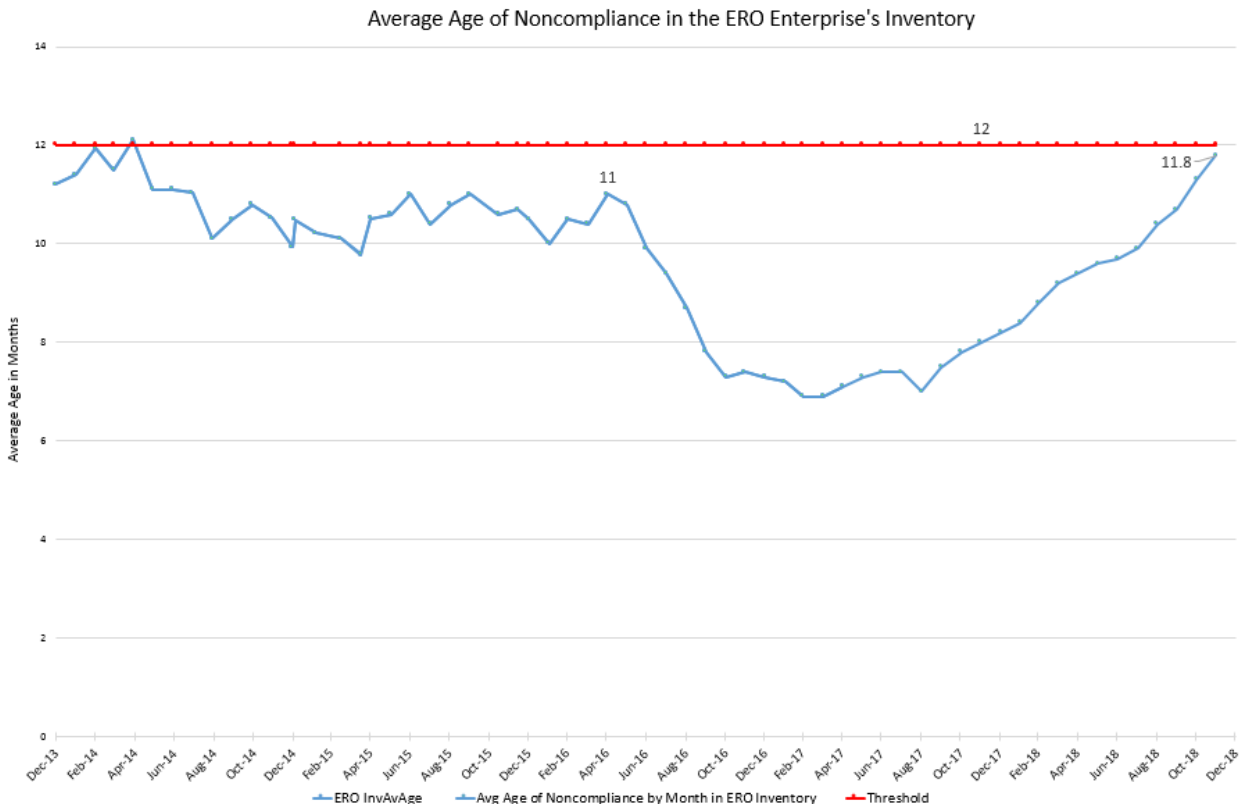

Figure 7 - Average Age of Noncompliance in the ERO Enterprise's Inventory[37]

As illustrated in the **Figure [7]** above, NERC observed an increase in the average age of noncompliance in inventory over the 2017-2018 timeframe. This increase in average age of noncompliance corresponds to a substantial increase in the amount of noncompliance discovered in the 2016-2018 timeframe compared to the 2014-2015 timeframe. The increase in discovered noncompliance, which peaked in the first quarter of 2017, appears to be associated with several new Reliability Standards coming into effect in July 2016 (including the CIP Version 5 standards).

The following chart compares the average age of noncompliance for each Regional Entity from January 1, 2015 (when the ERO average was approximately 10 months) to August 1, 2018 (when the ERO average was approximately 9.7 months):

[37] NERC notes that this chart excludes from the averages presented federal violations that were at one time placed on hold pending resolution of court proceedings.

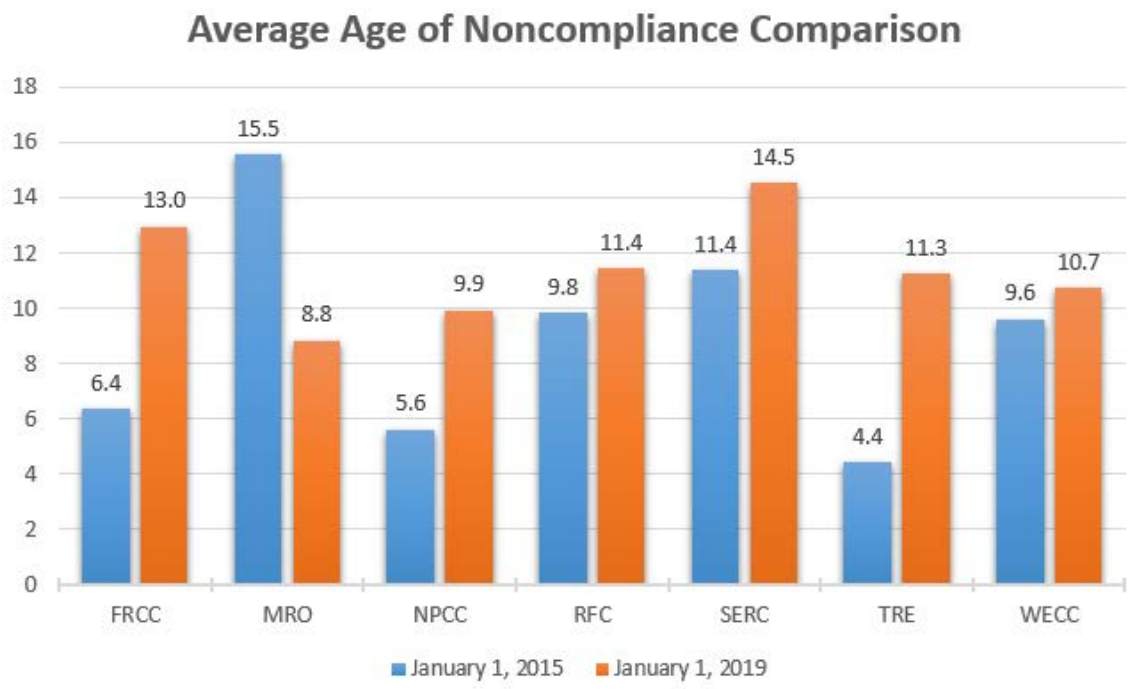

Figure 8 - Average Age of Noncompliance by Regional Entity, January 1, 2015 Compared to January 1, 2019

NERC observed that the average age of noncompliance varies by Regional Entity and can vary over time depending on the size, composition, and complexity of the Regional Entity's caseload. As shown in **Figure [9]** below, older noncompliance generally represents only a small portion of each Regional Entity's total caseload. The average percentage of older noncompliance has decreased from January 2015 to January 2019 across the ERO Enterprise:

One important factor driving efficiencies in enforcement processing across the ERO Enterprise during the Assessment Period has been the implementation of the compliance exception track. This track provides for a streamlined disposition of the majority of minimal risk noncompliance. As the majority of total noncompliance is minimal risk, NERC uses the compliance exception track to process the majority of overall noncompliance. The following **Figures [9-11]** demonstrate the percentage of minimal risk noncompliance posted as compliance exceptions for the years 2016-2018:

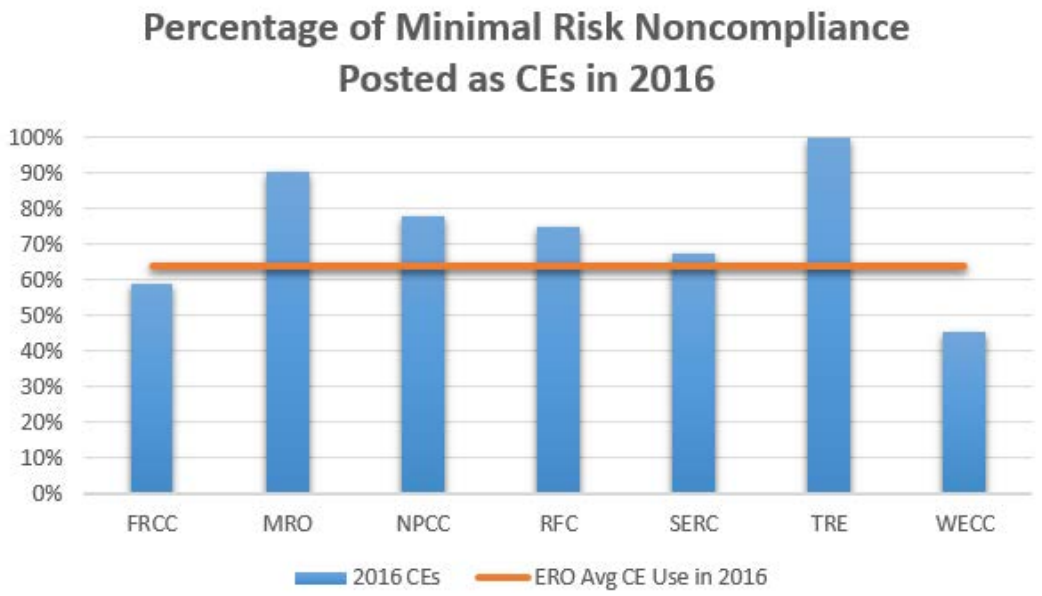

Figure 9 – Percentage of Minimal Risk of Noncompliance posted as CEs in 2016

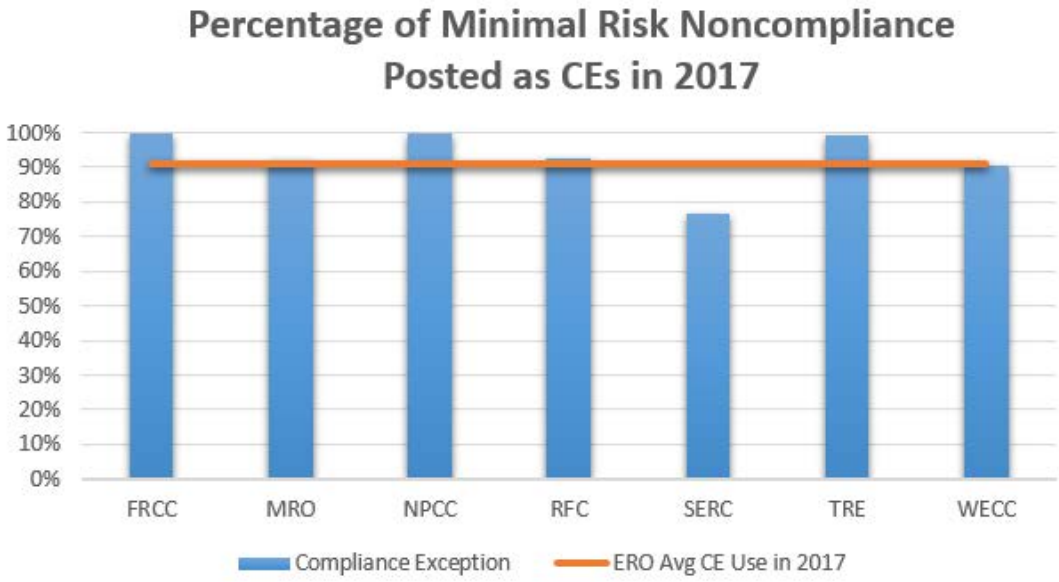

Figure 10 – Percentage of Minimal Risk of Noncompliance posted as CEs in 2017

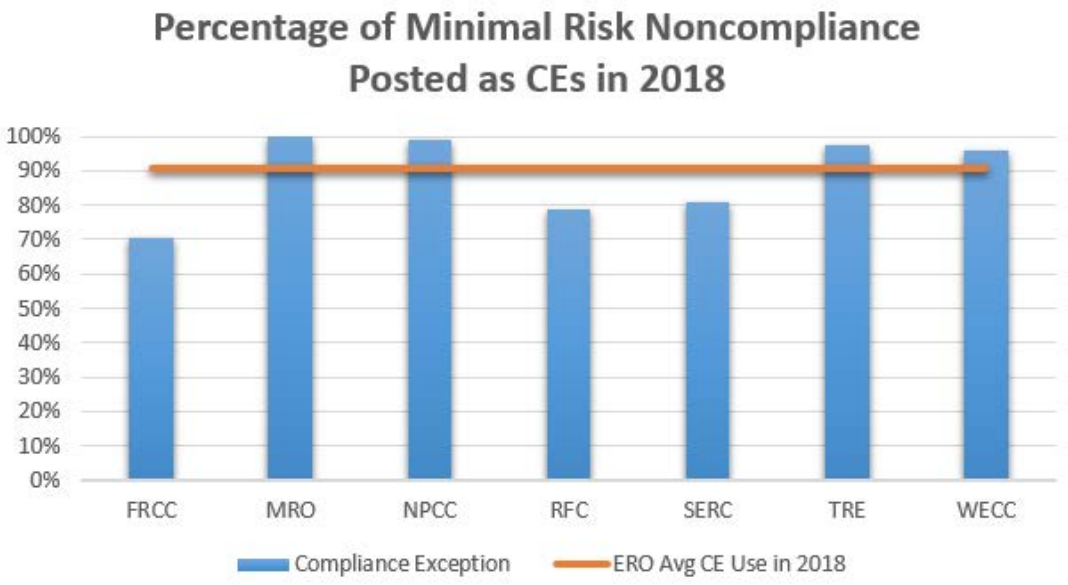

Figure 11 – Percentage of Minimal Risk of Noncompliance posted as CEs in 2018

NERC notes that each Regional Entity's use of the compliance exception track may depend on the composition of the Regional Entity's caseload; however, NERC has found that the Regional Entities have generally implemented this program in accordance with NERC's expectations.

NERC also monitors Regional Entity implementation of the self-logging program. The self-logging program, another component of NERC's risk-based enforcement program, allows registered entities with demonstrated effective management practices to keep track of minimal risk noncompliance (and related mitigation) on a log that is periodically reviewed by the Regional Entity. Minimal risk noncompliance added to the log is presumed to qualify for compliance exception treatment. After an initial pilot program, any registered entity may request evaluation by its Regional Entity in accordance with the program requirements. As of January 2019, 77 U.S. registered entities and one Canadian entity are participating in the self-logging program. **Figure [12]** below shows the distribution by Regional Entity:

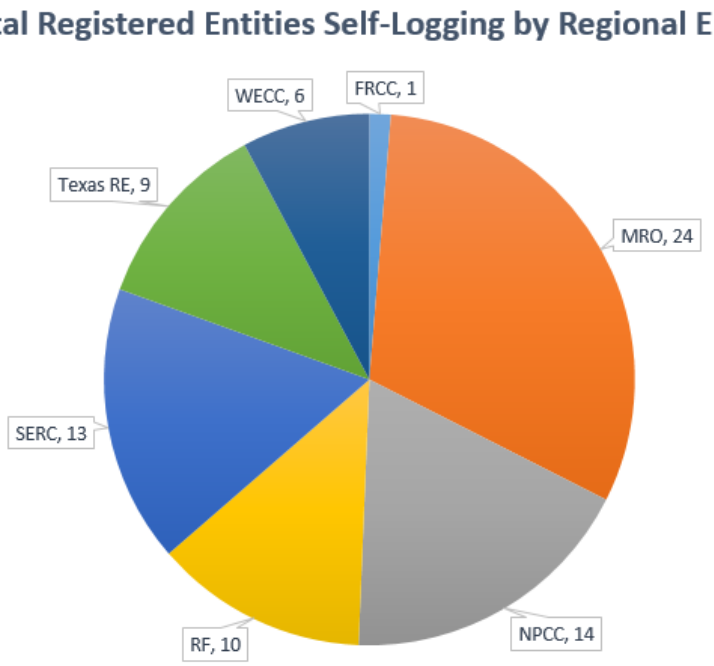

Figure 12 - Number of Registered Entities Participating in the Self-Logging Program by Regional Entity (current as of August 2018)

As discussed in detail below, NERC reviewed each Regional Entity's implementation of the self-logging program and has determined that each has implemented the program successfully and consistently during the Assessment Period.

ii. The ERO Enterprise Continues to Implement the FFT and Compliance Exception Programs Appropriately

Each year, NERC and the Commission perform a joint coordinated review of the implementation of the FFT and compliance exception programs during the prior year. NERC also files a report with the Commission summarizing the results of this review.[38] Through these

[38] Reports addressing the implementation of the program during the Assessment Period include: *North American Electric Reliability Corporation's Annual Report on the Find, Fix, Track, and Report Program* (Sep. 18, 2015); *North American Electric Reliability Corporation's Annual Report on the Find, Fix, Track and Report and Compliance Exception Programs* (Nov. 14, 2016); *North American Electric Reliability Corporation's Annual Report on the Find, Fix, Track and Report and Compliance Exception Programs* (Oct. 4, 2017), and *North American Electric*

reviews, and as described further in the individual annual reports, NERC has determined that the Regional Entities have implemented the FFT and compliance exception programs appropriately during the Assessment Period. Further, the Regional Entities have continued to improve the implementation of these risk-based enforcement programs during the Assessment Period, particularly with respect to identifying the root causes of noncompliance and identifying factors affecting the risk associated with individual noncompliance.[39] See *supra* Section IV regarding activities and accomplishments during the Assessment Period.

In the interest of continued improvement, NERC identified areas where Regional Entities could improve their implementation of the program and identified several best practices. NERC's observations are as follows:

(i) *Adherence to Relevant Rules and FERC Orders.* NERC found that each Regional Entity generally adhered to the relevant NERC ROP, CMEP, and FERC orders in its implementation of the FFT and compliance exception programs.

(ii) *Detailed and Updated Internal Procedures.* NERC found that each Regional Entity had comprehensive internal procedures to provide systematic guidance in the processing of noncompliance.

(iii) *Program Implementation.* NERC found that each Regional Entity implemented the FFT and compliance exception programs efficiently and that in each case reviewed, the selection of compliance exception or FFT treatment was appropriate. Following its review of each sampled case, NERC concluded that each Regional Entity generally included an appropriate discussion of the facts and circumstances of each case, an adequate evaluation of the root cause(s) of the noncompliance, an adequate risk assessment, and an adequate mitigation assessment. NERC, however, identified certain areas for continued improvement. Specifically:

Reliability Corporation's Annual Report on the Find, Fix, Track and Report and Compliance Exception Programs (TBD 2018), all filed in Docket No. RC11-6.

[39] In the 2014 performance assessment, NERC noted several opportunities for improvement across the ERO Enterprise, appropriately tailoring risk assessments, ensuring that internal Regional Entity program documentation remains up to date following program changes, and fully implementing processing efficiencies with respect to mitigation activities and verification of mitigation completion. *See also* NERC's Oct. 4, 2017 FFT and compliance exception filing at 7-8; *see also* Notice of Staff Review of Compliance Programs, Docket No. RC11-6-005 (Jun. 27, 2017).

- *Including Facts and Circumstances of Noncompliance in the Issue Description.* NERC observed that ReliabilityFirst, NPCC, and WECC could have included additional information in the issue description regarding the facts and circumstances of each noncompliance to improve clarity, although NERC found that none of the missing information was necessary to confirm the appropriateness of the ultimate disposition. NERC observed that MRO should consider whether to separate noncompliance into separate violation identification numbers when it involves multiple failures over a period of time. NERC made recommendations to WECC and SERC to include actual noncompliance duration dates.

- *Root Cause Evaluations.* NERC observed that some Regional Entities have greatly improved their evaluation and discussion of root causes. Such discussion is helpful in that it aids an entity in fully understanding the causes of its noncompliance and steps for effective mitigation.

- *Risk Assessments.* NERC observed opportunities for improvement of risk assessments. NERC recommended that sufficient information about the risk assessment be included. NERC specifically recommended that ReliabilityFirst, MRO, SERC, and WECC ensure that risk assessments include a complete evaluation of relevant compliance history of registered entities and their affiliates, or state when there is no relevant compliance history. NERC identified as a best practice WECC's practice of providing a thorough noncompliance evaluation that includes looking at deeper issues such as the quality of internal controls.

- *Mitigation Actions.* NERC also found that each Regional Entity generally had the appropriate documentation from the registered entity to demonstrate completed mitigation.

iii. The ERO Enterprise is Successfully Implementing the Self-Logging Program

In 2017, NERC completed a review of Regional Entity implementation of the self-logging program. Following its review, NERC determined that the majority of the Regional Entities have successfully implemented the self-logging program. NERC offered, among other things, the following observations regarding Regional Entity implementation of the program:

(i) *Outreach and Participation.* NERC identified NPCC, MRO, and Texas RE as having exemplary outreach activities to promote participation in the program. Reliability First and WECC had robust self-logging programs with ongoing outreach and high entity participation. SERC had demonstrated improvement in its outreach.

(ii) *Determining Eligibility for Participation.* NERC confirmed there was adequate evidence and information to support each of the registered entities' eligibility for participation in the program. In addition, NERC found that the Regional Entities were consistently performing formal reviews of registered entities' internal controls for identifying, mitigating, and reporting minimal risk noncompliance. NERC found that the quality and detail of documentation that is maintained by the Regional Entities to track eligibility, evaluation, and notification of participation into the self-logging program after FERC's November 2015 order had improved compared to the documentation during the pilot phase of the program.

(iii) *Review of Logs.* NERC determined that the Regional Entities were each reviewing the logs for completeness and accuracy prior to submitting to NERC, and that the number of instances where the Regional Entities needed to contact the registered entities for additional information was small. NERC noted some differences in the level of detail in Regional Entity processes for reviewing logs.

(iv) *Verification of Mitigation*. NERC determined that each of the Regional Entities with active participants in the program conducted some method of verification that mitigation activities were being completed for self-logged noncompliance. NERC encouraged those Regional Entities still verifying mitigation activities for all noncompliance (NPCC, Texas RE, and WECC) to consider verification by sample to enhance the efficiency benefits of the program.

Since the conclusion of this review, more Regional Entities are verifying completion of mitigation through sampling methods. The ERO Enterprise is currently working on developing a single process for such sampling. By the end of the Assessment Period, there were 78 registered entities self-logging.

2. Conflict of Interest and Confidentiality Targeted Audit

NERC conducted an audit of each Regional Entity's business practices to safeguard confidential information and to prevent conflicts of interests within its organization. For this audit, NERC examined practices and procedures in place at the Regional Entities between January 2015 and May 2016 including data access protocols, document handling, training, contingency protocols, authorization procedures and security testing procedures.

NERC's audit testing found instances at two Regional Entities where individuals participated in a compliance audit without a valid confidentiality agreement, in violation of Section 402.8.2 of the ROP. In both instances, NERC recommended that the Regional Entity review its

processes for obtaining and maintaining confidentiality agreements from compliance audit participants to ensure they all have agreements that are valid and in effect. In both instances, the Regional Entity accepted the observation and mitigated the issue.

C. Organization Registration and Certification

NERC is responsible for devising and implementing the criteria that determine which BPS users, owners, and operators are subject to approved Reliability Standards and for maintaining the corresponding NERC Compliance Registry of organizations. NERC accomplishes this through three functions – Registration, Certification, and BES Exception Requests. Through these functions, NERC monitors who and what is subject to compliance with mandatory Reliability Standards. Such work depends on close collaboration with Regional Entities through constant coordination via working group meetings, activities under the ROP, and continuous oversight. For example, NERC and Regional Entities meet frequently to discuss developments across these functions. In addition, both coordination and oversight occur regularly through the NERC-led Review Panel ("Panel") process, the Certification process, and the NERC approval process applicable to BES Exception Requests. The ERO Enterprise also collaborates closely during changes to Regional Entity footprints, such as those occasioned by dissolution of the former Southwest Power Pool, Inc. Regional Entity during the Assessment Period. Finally, NERC and Regional Entities met bi-weekly to facilitate coordination and oversight and to identify opportunities for consistency. This section details the results of NERC oversight regarding these functions.

1. Registration

A key goal for NERC's registration function during the Assessment Period was developing common and consistent registration processes to promote efficiencies across the ERO Enterprise. NERC reviews Regional Entity execution of the Organization Registration Program to meet

NERC's program goals and requirements. Areas that are reviewed may include the execution of the Organization Registration Program (ROP, Section 500), appeals process (ROP Sections 502-1.3), the functional mapping process (ROP, Sections 501-1.4), and data management processes (confidentiality, integrity, and retention) (ROP, Sections 502-2 and 1500). NERC tracks certain metrics to illustrate ERO Enterprise use of common and consistent registration processes to promote efficiencies.

Each Regional Entity supported ERO initiatives, such as the deployment of a new software tool for registration of Coordinated Functional Registration entities. Extending the functionality delivered with this tool, registration also has a new Centralized Organization Registration ERO System ("CORES") - tool which provides entity information to the CMEP system for use in compliance monitoring and enforcement. This new system will be brought online in 2019 and coordinate with the ALIGN tool.

NERC oversaw the successful implementation of the Panel process beginning in 2016. NERC established the Panel with the goal of maintaining consistency and oversight in registration decisions made by the ERO Enterprise. NERC convenes a Panel to evaluate requests for: (i) deactivation of, or decisions not to register, an entity that meets the Registry Criteria; (ii) requests to add an entity that does not meet (i.e., falls below) the Registry Criteria; (iii) disputes regarding the application of the Registry Criteria; and (iv) requests for a sub-set list of applicable Reliability Standards. Any convened Panel is comprised of a NERC lead with Regional Entity participants. To date, NERC has received ten Panel requests, two of which were subsequently withdrawn. The Panel has issued seven determinations and has one open case whose decision is pending. Panel decision summary reports are posted on the NERC website.

NERC determined that each Regional Entity has met the requirements in Section 501 of the ROP, with respect to functional mapping. The functional mapping process is intended to ensure that: (i) no areas are lacking any registered entities to perform the duties and tasks identified in and required by the Reliability Standards to the fullest extent practical; and (ii) there is no unnecessary duplication of such coverage or required oversight. NERC also verified that each of the Regional Entities has adequate data management processes and procedures to meet their data confidentiality, integrity, and retention obligations under the Rules of Procedure. **Figures [13] – [18]** show the changes in registration activity during the Assessment Period.

5-Year (2014-2019) ERO Registration Activity by Function

Year	Type	BA	DP	DP-UFLS	GO	GOP	IA	LSE	PA/PC	PSE	RC	RP	RSG	RRSG	FRSG	TO	TOP	TP	TSP	Total
2014	Activation	4	7		67	70		8	3	29		1				4	1	6	1	201
	Deactivation	29	66		64	71	4	48		38	1	3				21	7	3	6	361
2015	Activation		1	44	76	90		2	3	14						8	1	2	2	243
	Deactivation		95		48	60	44	522	6	734		2				18	1	4	4	1538
2016	Activation			4	88	119									2	22	8	10	1	254
	Deactivation		23	4	64	86		3				3				10	2	1	1	197
2017	Activation		12	12	77	93			2			1				16	1	5	1	220
	Deactivation		16		43	61			1			1				12	4	1		139
2018	Activation	1	3	7	71	82			2							7		11		184
	Deactivation	9	68	2	177	181			6		3	29	3		1	44	20	28	6	577

Figure 13 – 5-Year (2014-2019) ERO Registration Activity by Function

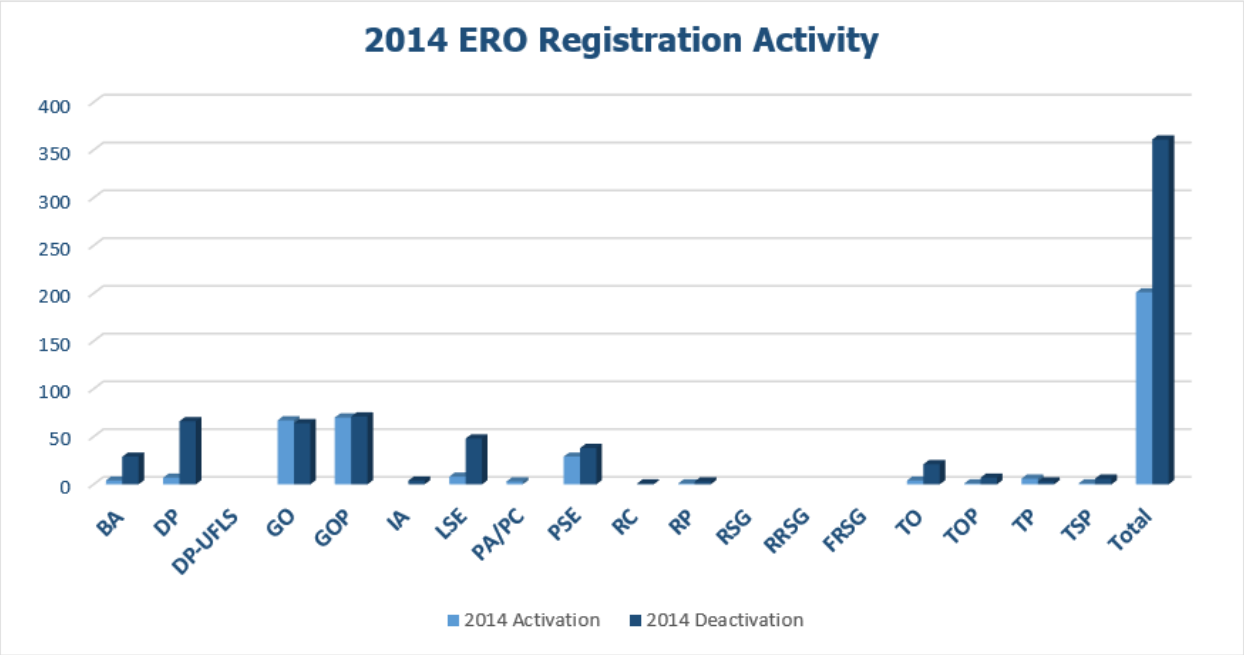

Figure 14 – 2014 ERO Registration Activity

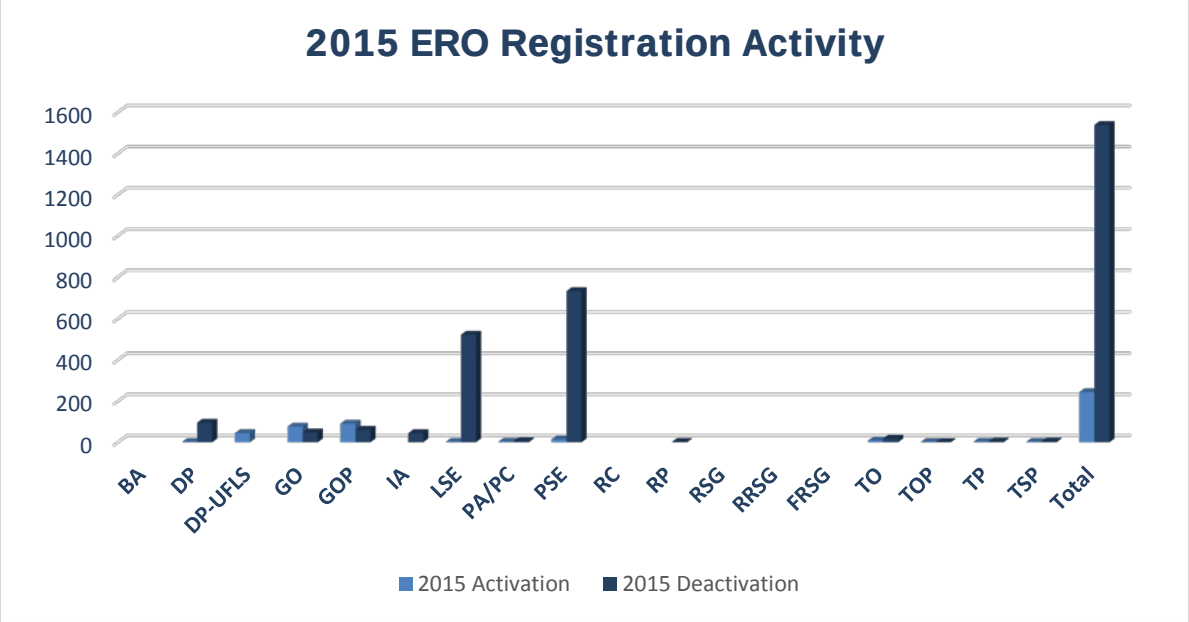

Figure 15 - 2015 ERO Registration Activity

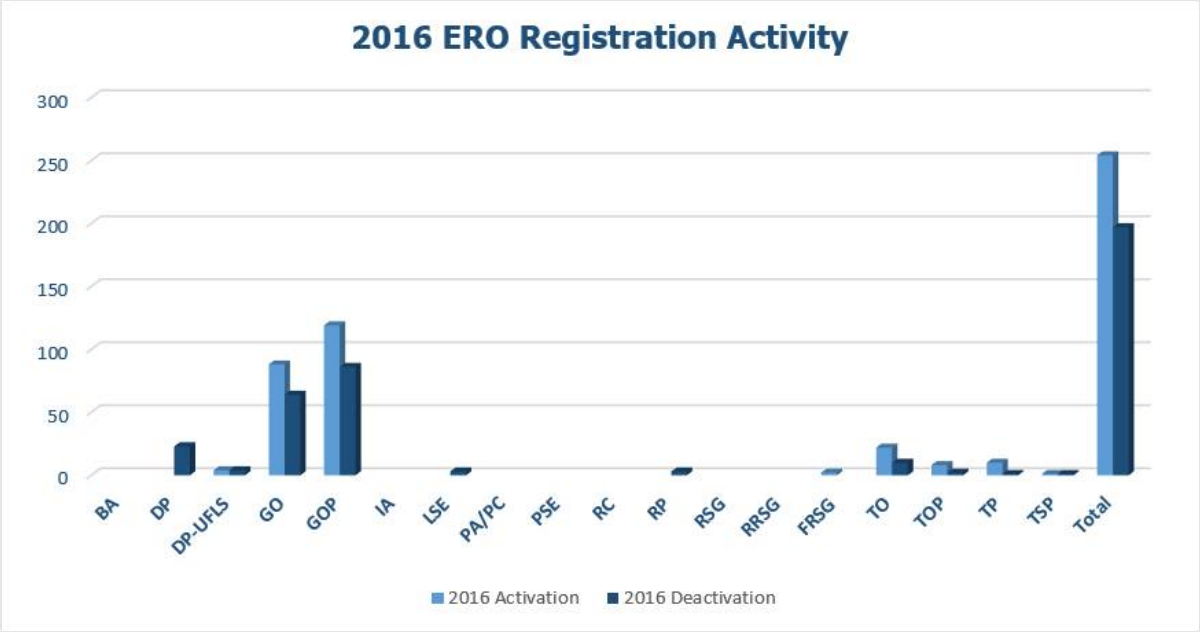

Figure 16 - 2016 ERO Registration Activity

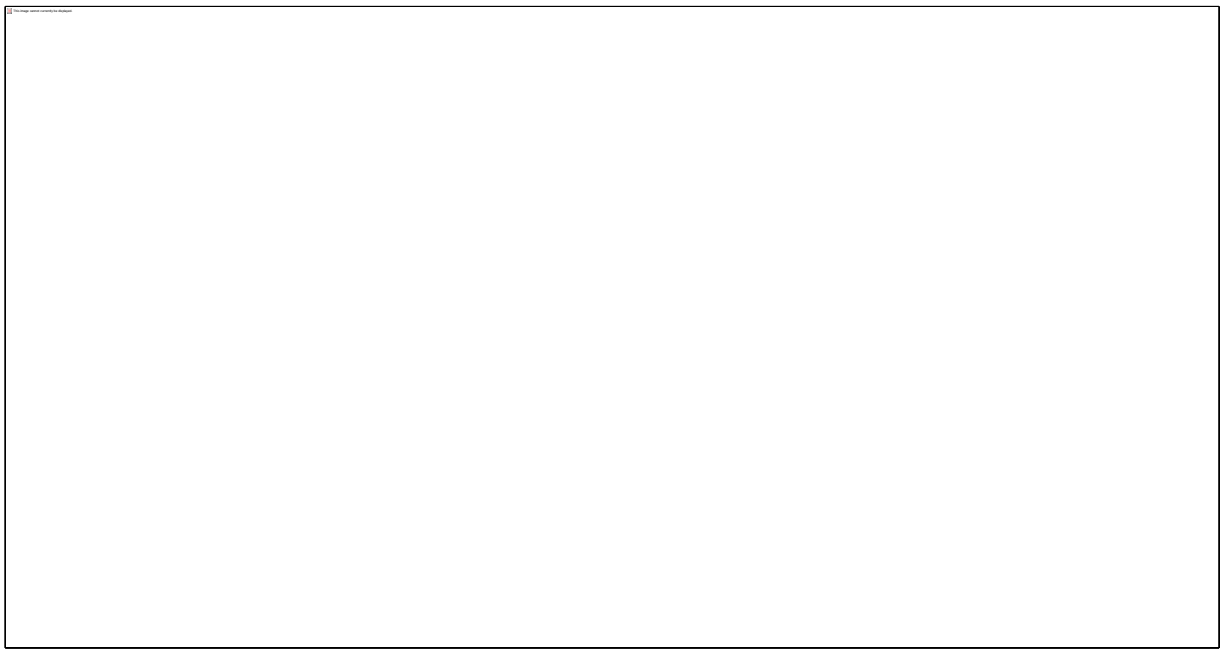

Figure 17 - 2017 ERO Registration Activity

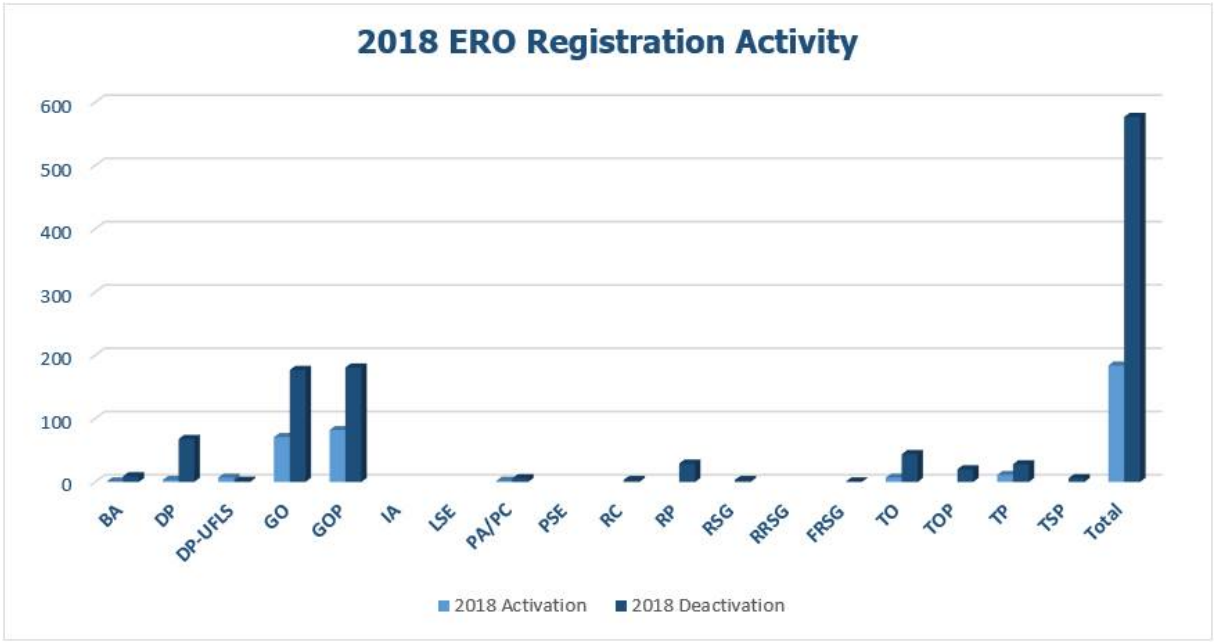

Figure 18 - 2018 ERO Registration Activity

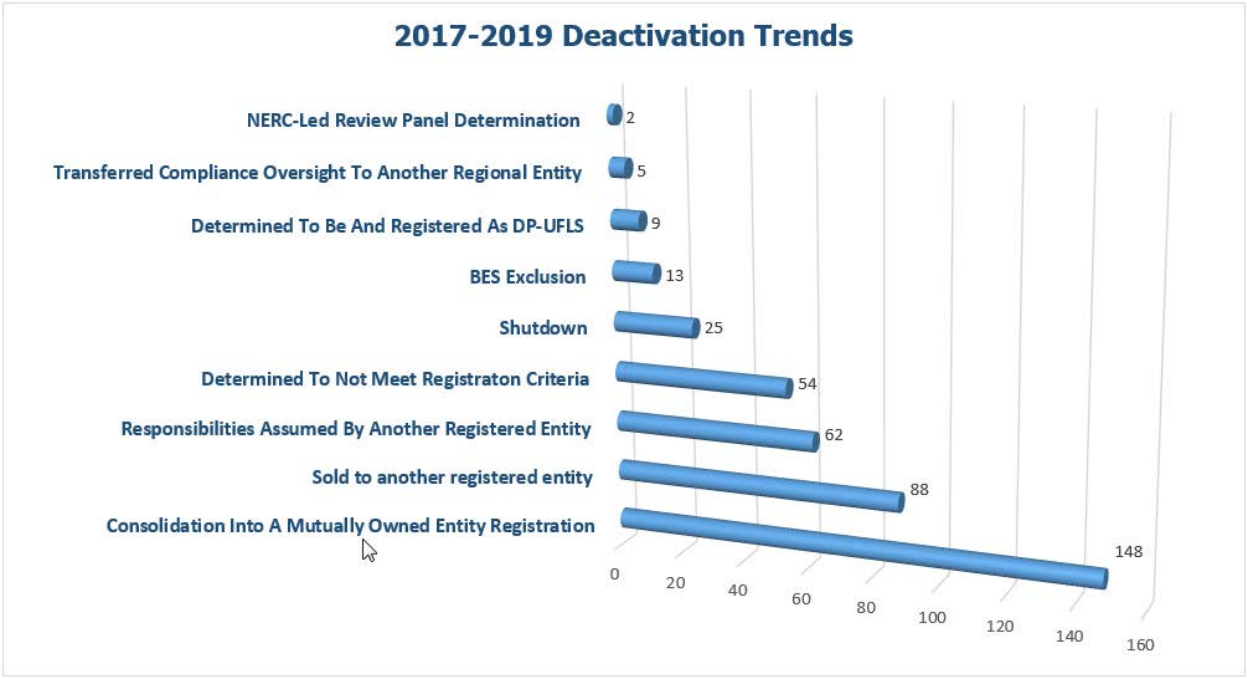

Figure 19 - 2017-2019 Deactivation Trends

2017-2019 Deactivation Trends

2017-2019 Deactivation Trends	
Consolidation Into A Mutually Owned Entity Registration	148
Sold to another registered entity	88
Responsibilities Assumed By Another Registered Entity	62
Determined To Not Meet Registraton Criteria	54
Shutdown	25
BES Exclusion	13
Determined To Be And Registered As DP-UFLS	9
Transferred Compliance Oversight To Another Regional Entity	5
NERC-Led Review Panel Determination	2

NERC is continuing to refine its metrics to provide more qualitative data for Regional Entity performance evaluation in future years.

2. Certification

During the Assessment Period, NERC revised training for certification and made it available to ERO Enterprise personnel and industry subject matter experts as an on-demand computer-based training module. Training now includes courses on Fundamentals of Auditing and Gathering Quality Evidence.

The 2018 CMEP Annual Report included results from NERC's first year of implementing the Certification oversight plan. These results included the ERO Enterprise's completion of one certification of a new Balancing Authority ("BA") and 12 certification reviews of already certified and operational entities. NERC accomplished certification oversight through direct participation in all certification engagements as required by NERC's ROP and participation on biweekly calls coordinating with Regional Entities. NERC also tracked fundamental program measures in the areas of utilization, fairness of administration, and consistency and comparability of executed process parameters. In 2019, Certification plans to complete processing one new Transmission

Operator, one new BA, and three new Reliability Coordinator certifications, as well as conducting at least four certification reviews.

3. BES Exception Requests

In Order No. 773, the Commission approved the revised BES Definition[40] and Appendix 5C of the ROP, providing procedures that registered entities might use to request exceptions to facility inclusion or exclusion from the BES Definition ("Exceptions Process"). During the Assessment Period, NERC developed a BES oversight plan and coordinated with the Regional Entities through a working group to implement the revised BES Definition and Exception Process. Through these efforts, the ERO Enterprise published implementation guidance for consistent evaluation of BES inclusions, exclusions, and self-notifications of Registration status under the ROP.[41]

The BESnet Tool also enables NERC, Regional Entities, and Submitting Entities requesting an exception from the BES Definition to efficiently manage and review materials associated with an Exception Request. NERC has processed approximately five years of Exception Requests – totaling [37] Exclusion Exception Requests and seven Inclusion Exception Requests. NERC requires formal notification to its Registration function of Exception Request decisions and includes BES matters at each meeting with Regional Entities regarding Registration matters.

In 2017, NERC developed the BES Exceptions oversight plan as a mechanism for oversight of ERO Enterprise-wide activities under Appendix 5C of the ROP. These results are included in

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[40] *Revisions to Electric Reliability Organization Definition of Bulk Electric System and Rules of Procedure*, Order No. 773, 141 FERC ¶ 61,236 (2012); *order on reh'g*, Order No. 773-A, 143 FERC ¶ 61,053, *order on reh'g and clarification*, 144 FERC ¶ 61,174 (2013), *aff'd sub nom.* People of the State of New York and the Pub. Serv. Comm'n of New York v. FERC, 783 F.3d 946 (2d. Cir. 2015).

[41] NERC's BES Initiative webpage.

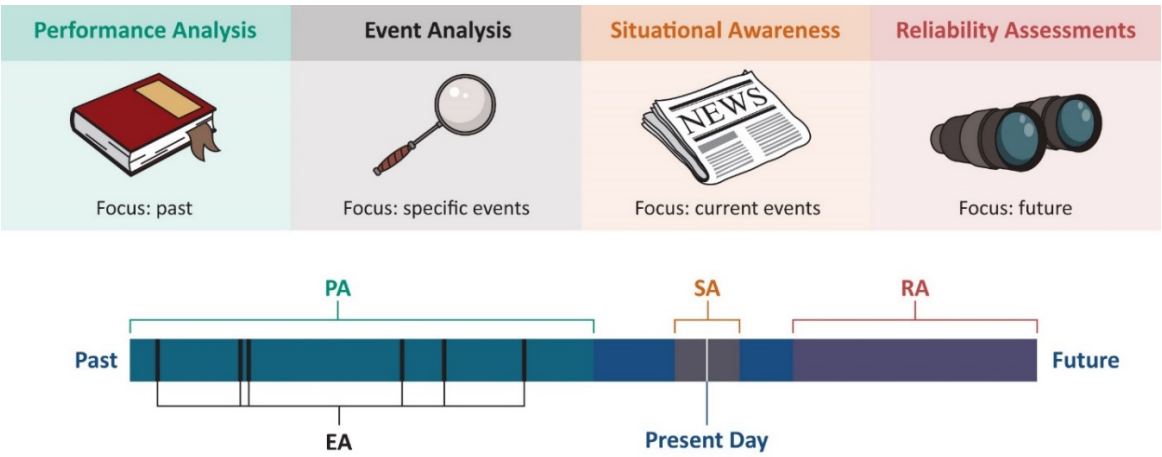
the 2018 CMEP Annual Report and reflect NERC's review of certifications of Exception Requests, examination of Inclusion and Exclusion Exception Requests, and confirmation of Self Determination Notifications regarding the BES status of Registered Entity facilities. In 2019, NERC will continue working with Regional Entities to ensure a coordinated and transparent approach to implementation of Appendix 5C of the ROP.

D. Reliability Assessments of the BPS

NERC fulfills its statutory obligation to "conduct periodic assessments of the reliability and adequacy of the [BPS] in North America"[42] through its work under the following functions: Bulk Power Situational Awareness ("SA"), Event Analysis ("EA"), Performance Analysis ("PA"), and Reliability Assessments ("RA"). These four functions create a feedback loop for reliability by gathering and analyzing data on the BPS and sharing the results of this analysis with the public. During the Assessment Period, these functions issued publications addressing the state of reliability, potential vulnerabilities in the BPS, and forward-looking analyses of the BPS.[43] The following diagram illustrates the relationship between the functions.

[42] 16 U.S.C. § 824o(g).

[43] ERO Enterprise tools support NERC's collaborative operations and are an important component of the effort to assure reliability. For example, the Misoperations Information Data Analysis System ("MIDAS") improves misoperations analysis coordination between NERC and the Regional Entities, leading to faster and more accurate identification of acute reliability risks. Another tool, the Reliability Assessment Data System ("RADS"), automates the process of collecting and validating data used in the development of long-term and seasonal reliability assessments. Further, NERC uses the Event Analysis Management System ("TEAMS") to collect information about specific reliability events for further analysis and potential lessons learned development. In addition, the Generator Analysis Data System ("GADS") Wind tool provides a platform for registered entities to report information about the operation and performance of wind turbines.



The following section examines NERC oversight of Regional Entity activities for these functions.

1. Performance Analysis Regional Entity Performance

NERC measures Regional Entity performance in the PA process by evaluating if the Regional Entities are timely in sharing information (i.e., submission timelines in the relevant NERC PA database), responsive (i.e., quarterly evaluation of timelines in the relevant PA databases and annual evaluation of Regional Entity review of key findings during development of the State of Reliability Report), and active in training opportunities. The primary area of improvement for the Regional Entities is in timely information sharing. NERC is working with Regional Entities to enhance activities to correct untimely or incomplete data submissions by responsible entities. In **Figures** [**20**]-[**23**] below, NERC tracks submission rates for the Regional Entities.[44]

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[44] SPP RE is excluded from these tables due to the termination of its RDA with NERC.

Please note that MIDAS percentages may have reflected a lower than expected percentage of completion due to confusion regarding the process for opting out of Misoperations reporting by responsible entities claiming to not have owned any Composite Protection Systems protecting BES Elements.

Please also note, tables may not reflect most recently submitted data or the impacts of recent Regional Entity transfers.

2017 GADS and TADS Submissions (Report Date: March 29, 2018)								
Percentage of Complete Data Submissions								
Reporting Quarter	2017-Q1		2017-Q2		2017-Q3		2017-Q4	
	GADS	TADS	GADS	TADS	GADS	TADS	GADS	TADS
MRO	90%	100%	90%	100%	90%	100%	90%	100%
NPCC	98%	100%	98%	100%	98%	100%	98%	100%
RF	99%	100%	99%	100%	99%	100%	99%	100%
SERC	99%	97%	99%	94%	99%	97%	99%	91%
Texas RE	100%	100%	100%	100%	100%	100%	100%	100%
WECC	95%	99%	95%	99%	95%	99%	95%	99%

Figure 20 - 2017 GADS and TADS Submissions (Report Date: March 29, 2018)

2017 MIDAS Submissions (Report Date: March 29, 2018)				
Percentage of Complete Data Submissions				
Reporting Quarter	2017-Q1	2017-Q2	2017-Q3	2017-Q4
	MIDAS	MIDAS	MIDAS	MIDAS
MRO	77%	77%	81%	79%
NPCC	87%	87%	81%	77%
RF	91%	92%	90%	92%
SERC	93%	91%	92%	94%
Texas RE	90%	91%	81%	84%
WECC	96%	95%	97%	99%

Figure 21 - 2017 MIDAS Submissions (Report Date: March 29, 2018)

2018 GADS and TADS Submissions (Report Date: December 19, 2018)						
Percentage of Complete Data Submissions						
Reporting Quarter	2018-Q1		2018-Q2		2018-Q3	
	GADS	TADS	GADS	TADS	GADS	TADS
FRCC	81.0%	93.8%	76.2%	87.5%	66.7%	62.5%
MRO	92.8%	96.4%	92.8%	90.9%	88.4%	81.8%
NPCC	87.4%	74.1%	87.4%	74.1%	87.4%	55.6%
RF	97.4%	100.0%	96.8%	96.6%	94.2%	100.0%
SERC	86.8%	97.1%	85.1%	94.3%	82.6%	74.3%
Texas RE	93.4%	57.7%	93.4%	50.0%	88.5%	50.0%
WECC	87.7%	86.5%	86.4%	79.7%	74.0%	74.3%

Figure 22 - 2018 GADS and TADS Submissions (Report Date: December 19, 2018)

2017 MIDAS Submissions (Report Date: December 19, 2018)			
Percentage of Complete Data Submissions			
Reporting Quarter	2018-Q1	2018-Q2	2018-Q3
	MIDAS	MIDAS	MIDAS
FRCC	96%	100%	100%
MRO	96%	96%	97%
NPCC	89%	90%	89%
RF	96%	99%	98%
SERC	99%	97%	99%
Texas RE	97%	95%	94%
WECC	99%	99%	100%

Figure 23 - 2017 MIDAS Submissions (Report Date: December 19, 2018)

2. Events Analysis Regional Entity Performance

The EA function facilitates the sharing of lessons learned from applicable system events and trends to enhance reliability. The EA Process ("EAP") provides a structured framework for analyzing events on the system.[45] During the Assessment Period, the ERO Enterprise received hundreds of new qualified events, including Hurricanes Harvey and Irma as the first Category 5 Events since 2012. Texas RE, FRCC and SERC compiled reports to capture impacts and high-level lessons learned from these storms. Hurricanes Michael and Florence occurred in 2018. FRCC and SERC, respectively, are compiling reports to capture impacts and identify high-level lessons learned and effective practices from the planning, preparation, and response to these storms. Further collaborative analysis took place with WECC for a 2016 California Independent System Operator, Inc. frequency excursion and the 2016 Blue Cut Fire. In addition, NERC conducted a joint analysis with RF, SERC, and WECC in 2017 regarding the impact of the total solar eclipse on photovoltaic energy production. Additionally, collaborative analysis took place with WECC for the October 2018 solar generation loss event. In 2018, a wildfire (Canyon 2 Fire) caused transmission line faults that triggered 900MW of solar resource loss. A major disturbance

[45] The Event Analysis Process is posted on the NERC website at: http://www.nerc.com/pa/rrm/ea/EA%20Program%20Document%20Library/ERO_EAP_V3_final.pdf

report was published and a second solar loss alert was issued as a result of this analysis. Outreach activities included publishing lessons learned, hosting annual Monitoring and Situational Awareness Technical Conferences, providing industry-wide causal analysis training, and conducting workshops in MRO, RF, Texas RE, and WECC addressing protective relay misoperations. NERC also provided trending data about event counts and impact in support of Regional Entity workshops and conferences.

NERC tracks Regional Entity performance by focusing on the following:

(i) Initial Report Completion - measuring the average time between event occurrence and NERC's receipt of an initial report compared with the goal time period specified in the EA Process;

(ii) Final Report Completion - measuring the average time between event occurrence and NERC's receipt of a final brief report or event analysis report;

(iii) Cause Coding - tracking average time between event occurrence and completion of entity-involved cause coding. Cause Coding seeks to characterize the causes of reportable events in a structured, measurable, and continuously improvable method;

(iv) Lessons Learned Development/Publishing - tracking the number of events leading to published lessons learned from registered entities in the Regional Entity area;

(v) EA Qualifying Event Processing and Closure - measuring average time for an event to be processed; and,

During the Assessment Period, the ERO Enterprise exhibited good performance in analyzing, understanding, and communicating lessons learned from events affecting reliability of the BPS. Nonetheless, NERC may apply incrementally more active oversight over Regional Entities regarding the timeliness of initial and final brief reports, as well as consistency of outcomes while still respecting Regional differences.

The following tables and graphs provide a Regional Entity by Regional Entity comparison of performance in 2017 and 2018.

Category 1-5 Events Only (2017)							
Region	Number of Events	Number of Events with EOP-004 or OE-417	Number of Events with BR	Number of Events started with EOP or OE and resulted in BR	Average workdays to initial BR received at NERC	Number of Events with Final BR	Average workdays to Final BR received at NERC
FRCC	9	8	8	7	24.00	8	24.63
MRO	39	34	38	33	26.47	20	28.80
NPCC	23	21	23	21	15.09	18	22.78
RF	37	31	35	29	16.34	35	23.69
SERC	18	16	12	10	27.92	9	27.78
Texas RE	11	8	11	7	13.20	6	19.50
WECC	30	22	25	18	17.76	22	28.73
Total	167	140	152	125	20.05	118	25.52

Figure [24·] – Report Completion (2017)

Category 1-5 Events Only (2018)							
Region	Number of Events	Number of Events with EOP-004 or OE-417	Number of Events with BR	Number of Events started with EOP or OE and resulted in BR	Average workdays to initial BR received at NERC	Number of Events with Final BR	Average workdays to Final BR received at NERC
FRCC	2	2	1	1	17.00	1	27.00
MRO	20	15	20	15	20.00	12	18.50
NPCC	26	22	26	22	17.38	22	26.23
RF	40	32	38	30	13.76	35	17.14
SERC	32	32	17	17	22.00	14	23.86
Texas RE	11	9	10	8	32.70	10	39.60
WECC	33	21	33	21	17.15	24	33.79
Total	**164**	**133**	**145**	**114**	**18.34**	**118**	**25.14**

Figure [25·] - Report Completion (2018)

Figures [26-27] illustrate the Cause Code Assignment Process ("CCAP") followed by NERC and the Regional Entities to assign cause codes after an event on the BPS is analyzed for the two years during which oversight plans were in place for Event Analysis. The charts in each figure measure the number of events at issue, per Regional Entity, for each stage of CCAP. The four stages of the CCAP represented are:

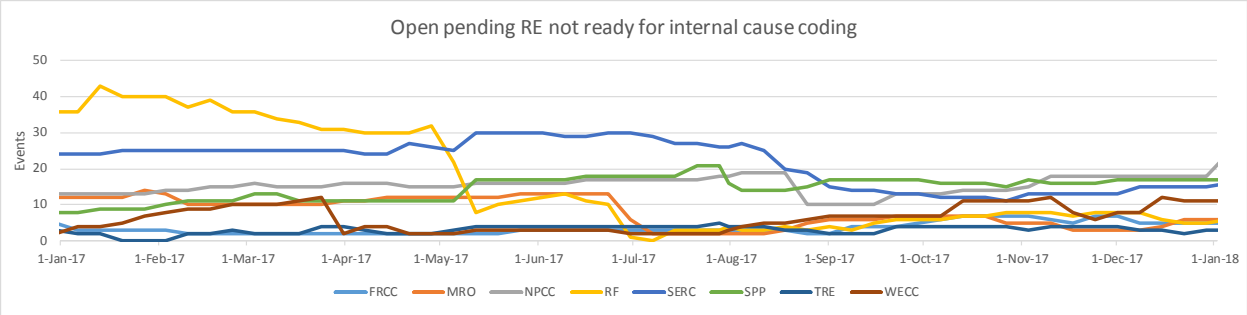
(i) the receipt of event analysis brief reports[46] by the Regional Entities from registered entities;

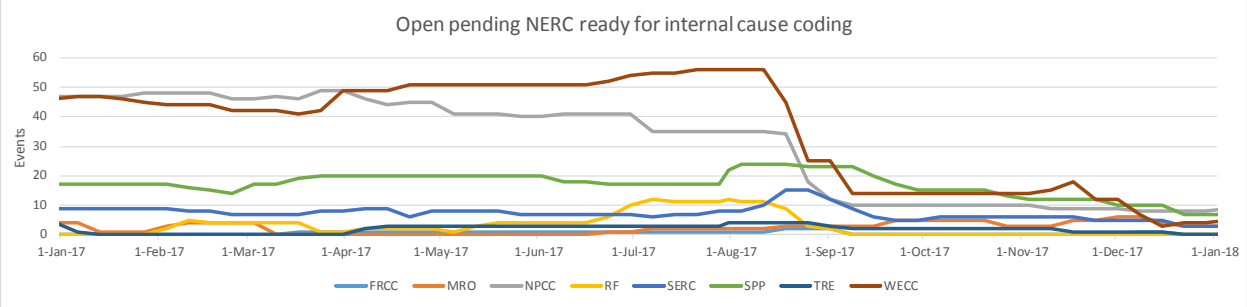
(ii) the receipt of event analysis brief reports by NERC from the Regional Entities and internal cause coding of the event;

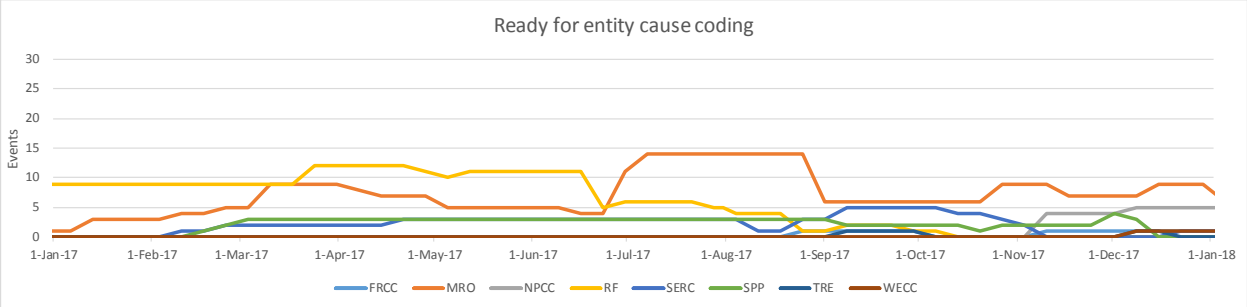
(iii) external cause coding discussion with registered entity, NERC and the Regional Entities; and,

(iv) the completion of cause coding by NERC and the Regional Entity.

[46] Registered entities impacted by an event prepare brief reports for all qualifying events.







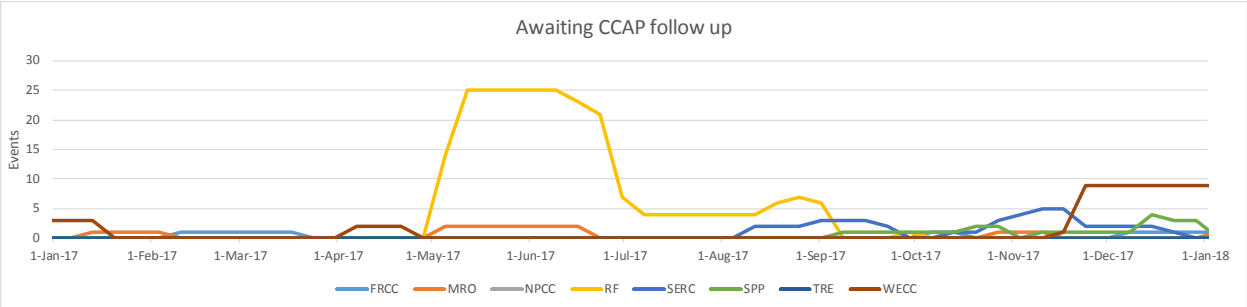


Figure [26·] - Cause Coding (2017)

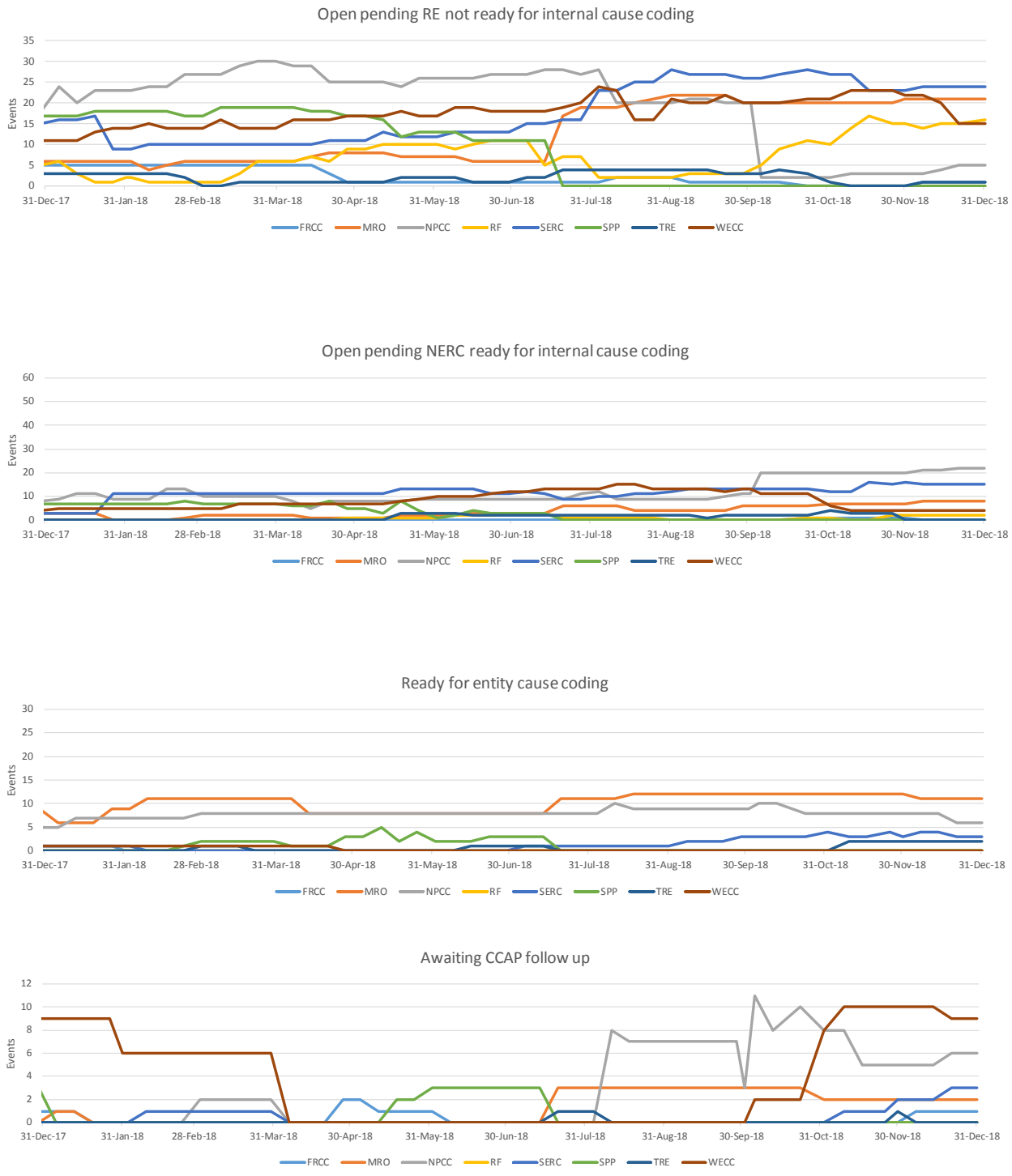


Figure [27·] - Cause Coding (2018)

Table 3: Lessons Learned Development						
Region	**2014**	**2015**	**2016**	**2017**	**2018**	**Total**
FRCC	3	1	2	0	**0**	**7**
MRO	1	0	2	0	**3**	**13**
NERC	1	0	0	1	**0**	**26**
NPCC	4	10	6	2	**4**	**38**
RF	4	1	1	1	**5**	**19**
SERC	1	1	0	0	**0**	**4**
Texas RE	2	1	1	2	**0**	**20**
WECC	1	1	1	3	**3**	**22**
Total	**19**	**16**	**13**	**9**	**15**	**149**

Figure [·28] - Lessons Learned Development

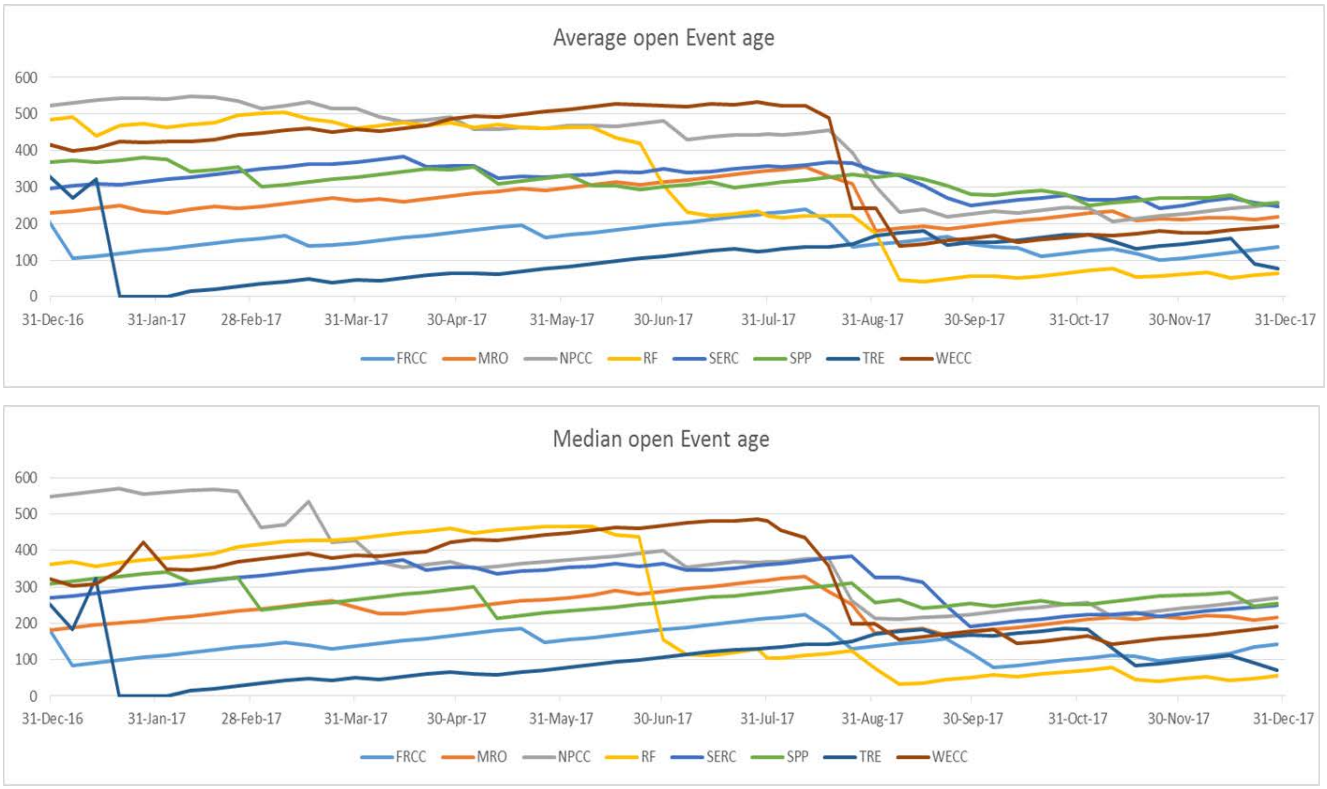


Figure [29·] - EA Qualifying Event Processing and Closure (2017)

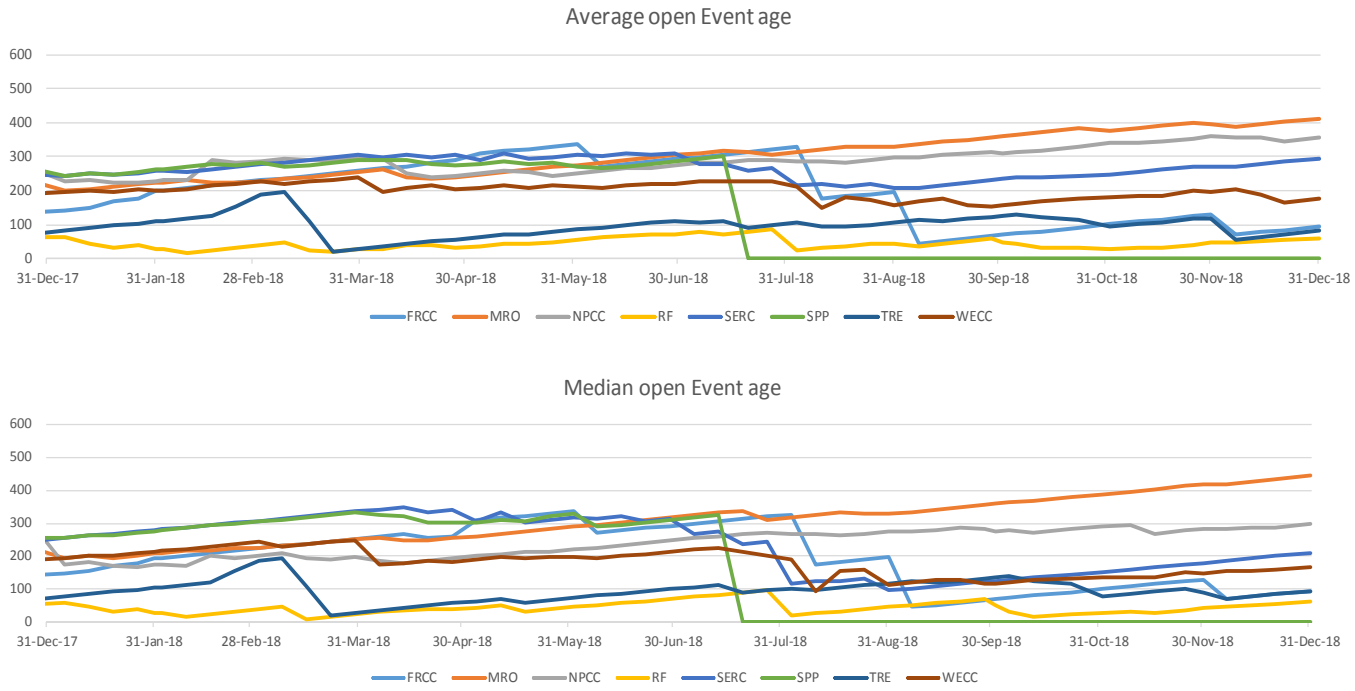


Figure [30] - EA Qualifying Event Processing and Closure (2018)

3. Targeted Event Analysis Audit

A catastrophic event on the BES is a significant risk to the ERO Enterprise operations. As a result, NERC conducted a targeted audit of the EAP to examine Regional Entity compliance with the processes and procedures. The EA function is the main control of the ERO against a catastrophic event occurring. The targeted audit covered the January 2016 to July 2017 period. NERC found that all Regional Entities met the requirements of the ROP and Regional Delegation Agreements ("RDAs"). There were no instances of noncompliance by any Regional Entity for the ROP requirements in this area. Since all of the Regional Entities complied with requirements of the program, the audit focused on identifying leading practices and areas for greater consistency and alignment amongst the Regional Entities.

4. Situational Awareness Regional Entity Performance

NERC and Regional Entity SA functions coordinated to enhance industry's understanding of conditions and reliability risks to the BPS for several events that occurred during the Assessment Period. These events included hurricanes Harvey (Texas RE), Irma and Matthew (FRCC, SERC); wildfires around Santa Barbara, CA (WECC); winter storms in the Northeast and Pacific Northwest (NPCC, WECC); and the onset of a period of extreme cold weather and high loads for the last week of 2017 (MRO, RF, SERC). GridEx IV also brought NERC and Regional Entities together to practice triage and response to a simulated continent-wide coordinated attack on the BPS, bringing in cyber and physical security-related topics in a realistic exercise environment. **Figures [31] - [32]** show the incidence of events and occurrences during the Assessment Period.

2017 Situation Awareness Events, Occurrences, and Reports by Regional Entity					
Region	**Number of Events and Occurrences**	**Number of EOP-004 Reports**	**Number of OE-417 Reports**	**Number of EEA-3 Declarations**	**Metric 3 Firm Load Shed over 300 MW**
FRCC	17	9	7	0	0
MRO	32	26	6	0	0
NPCC	39	32	7	0	1
RF	69	59	10	0	0
SERC	68	35	33	0	0
SPP	31	25	6	0	0
Texas RE	24	17	7	0	0
WECC	129	85	44	5	1
Total	**409**	**288**	**120**	**5**	**2**

Figure [31·] -2017 Situation Awareness Events, Occurrences, and Reports by Regional Entity

2018 Situation Awareness Events, Occurrences, and Reports by Regional Entity					
Region	**Number of Events and Occurrences**	**Number of EOP-004 Reports**	**Number of OE-417 Reports**	**Number of EEA-3 Declarations**	**Metric 3 Firm Load Shed over 300 MW[47]**
FRCC	15	7	8	3	0
MRO	49	41	8	8	0
NPCC	231	207	24	1	0
RF	104	43	61	0	0
SERC	106	56	50	0	0
Texas RE	41	29	12	0	0
WECC	159	91	68	4	0
Total	**705**	**474**	**231**	**16**	**0**

Figure [32·] - 2018 Situation Awareness Events, Occurrences, and Reports by Regional Entity

5. Reliability Assessments Regional Entity Performance

NERC evaluates Regional Entity performance by evaluating the following metrics using a scale of 1 to 3 (3 = highest point possible):

(i) Accuracy – the degree to which the result of a measurement, calculation, or specification conforms to NERC instructions and processes;

(ii) Timeliness – submitting materials on or before a specified date and time;

(iii) Responsiveness – responding to appeals, questions, peer feedback, and requests;

(iv) Completeness – answering questions and including all relevant information, data, and analysis; and,

(v) Validity – data and information supporting the assessments are supported and adhere to NERC definitions and instructions.

i. Individual Regional Entity Performance

For the Summer and Winter Reliability Assessments, a total of 15 points can be earned toward the final score.

[47] 2018 ERO Enterprise Metrics, https://www.nerc.com/AboutNERC/Pages/Strategic-Documents.aspx.

2018 Summer Assessment							
	FRCC	MRO	NPCC	RF	SERC	TRE	WECC
Processes in place to validate data	2	2	2	2	3	3	2
Narratives are consistent with submitted data	2	2	2	2	2	2	2
On-time data and narratives	1	3	3	3	3	3	2
Narratives complete and comprehensive	2	2	2	1	2	3	1
Responsive to NERC	3	3	3	3	3	3	3
TOTAL	10	12	12	11	13	14	10

2018 Winter Assessment							
	FRCC	MRO	NPCC	RF	SERC	TRE	WECC
Processes in place to validate data	2	2	2	2	3	3	2
Narratives are consistent with submitted data	2	2	2	2	2	2	2
On-time data and narratives	3	3	3	1	3	3	3
Narratives complete and comprehensive	2	2	2	2	2	2	2
Responsive to NERC	3	3	3	3	3	3	3
TOTAL	12	12	12	10	13	13	12

For the Long-Term Reliability and Probabilistic Assessments, a total of 18 points can be earned.

2018 Long-Term Assessment and Probabilistic Assessment							
	FRCC	MRO	NPCC	RF	SERC	TRE	WECC
Processes in place to validate data	2	2	2	2	3	3	2
Narratives are consistent with submitted data	2	2	2	2	2	2	2
On-time data and narratives	3	3	3	3	3	3	2
Narratives complete and comprehensive	2	2	3	2	2	2	2
Responsive to peer review feedback	3	3	3	3	3	3	3
Responsive to NERC	3	3	3	3	3	3	3
TOTAL	15	15	16	15	16	16	14

Special Reliability Assessments are developed separately from the periodic assessments and they are not scored in the same manner. Since the Special Reliability Assessment targeted a specific risk (in this case, an assessment on accelerated generation retirement) not every Regional Entity was required to participate in the same manner. The 2018 Special Assessment primarily focused on coal and nuclear retirements in the Midwest and Mid-Atlantic areas.

NERC's 2018 RA oversight concluded that all Regional Entities adequately supported reliability assessments, with opportunities for improvement. In particular, NERC found that Regional Entities should consider conducting their own or leveraging existing study work to support assessments and that the ERO Enterprise as a whole should consider evaluating reliability beyond the peak hour resource adequacy assessment currently performed. Finally, NERC underscored that improvements for on-time submittal would enhance Regional Entity assessment processes. NERC will continue working with Regional Entities to improve ERO Enterprise Reliability Assessments.

V. ADDITIONAL TARGETED AUDITS

NERC conducted an audit of the three Regional Entities that engage in activities outside of §215 of the Federal Power Act of 2005 to gain reasonable assurance that they are properly budgeting, funding, and accounting for such activities separate from the activities that are funded with §215 assessments. Section 215 accounting is a financial risk per the annual enterprise risk assessment. The three Regional Entities subject to this audit are NPCC, Texas RE, and WECC. For this audit, NERC reviewed the procedures followed by these Regional Entities to account for their §215 and non-statutory activities. NERC conducted its work utilizing professional standards promulgated by the Institute of Internal Auditors. NERC did not find any instances of noncompliance by any of the three Regional Entities.

VI. CONCLUSION

Wherefore, for the foregoing reasons, the ERO Enterprise continues to satisfy statutory and regulatory criteria for certification. As a result, NERC respectfully requests that the Commission accept this Performance Assessment for the Assessment Period.

Respectfully submitted,

/s/ _____

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