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NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

**DRAFT FIVE-YEAR
ELECTRIC RELIABILITY ORGANIZATION
PERFORMANCE ASSESSMENT REPORT**

SUBMITTED IN ACCORDANCE WITH 18 C.F.R. §39.3(c)

JULY 21, 2014

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I. EXECUTIVE SUMMARY

A. Improvements in Reliability and the Importance of Industry Engagement

The electricity industry has made tremendous strides towards improving reliability since the August 2003 blackout, a turning point for industry that left 50 million customers without power. The North American Electric Reliability Corporation's ("NERC's") subsequent certification as the electric reliability organization ("ERO") as well as the adoption of mandatory and enforceable Reliability Standards renewed industry focus on reliability. This renewed focus, which includes proactive steps by the ERO to identify and address risks and avoid preventable events, has had a demonstrable and positive impact on reliability.

NERC is improving the performance of the bulk power system ("BPS") and mitigating risks to the BPS as related to avoidable outages. As detailed in NERC's *State of Reliability 2013* report, other than events caused by factors external to the transmission system's actual performance (*i.e.*, weather-initiated events), the number of BPS transmission-related events resulting in loss of firm load decreased from an average of nine over a four year period (2008 – 2011) to two in 2012. The daily severity risk index value, a new metric created by NERC that measures risk impact or "stress" from events resulting in the loss of transmission, generation, and load, has been stable from 2008 to 2012. Including weather-initiated events, 2012 had three high-stress days, which is within the range of zero to seven days experienced during 2008 – 2011. The availability of the bulk transmission system continues to remain high with no statistically significant change from 2008 to 2012.

NERC's compliance monitoring and enforcement efforts have matured into a robust program that provides industry with more certainty on actions, outcomes, and reliability consequences. For example, rigorous enforcement of NERC's vegetation management Reliability

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Standard, which became mandatory and enforceable in 2007, reduced, if not eliminated, vegetation growing into high voltage lines. To date, industry has seen a reduced risk to reliability by the actions taken to identify, correct, and prevent violations of the Reliability Standards. Between June 18, 2007, and the end of 2012, 5,115 confirmed violations. Of these confirmed violations, 85 percent posed a minimal risk to reliability, 13 percent posed a moderate risk to reliability and 2 percent posed a serious risk to reliability. The Key Compliance Monitoring Index shows that the risk to BPS reliability based on the number of violations of NERC's Reliability Standards has trended lower from 2008 to 2012.

The Energy Policy Act of 2005 recognized the importance of an international ERO across North America to ensure the reliability of the BPS. As the ERO, NERC plays a unique role in facilitating industry engagement to create effective approaches for reliability initiatives. For example, industry participation in Reliability Standards development from start to finish is critical. In 2012 alone, NERC worked with 879 participants in the Registered Ballot Body, hosted 18 Reliability Standard industry webinars attended by an average of 360 participants, held 102 Reliability Standard drafting team ("SDT") meetings, and recruited 188 industry volunteers on active SDTs. There are additional opportunities, outside of Reliability Standards development, for industry input and participation including through NERC committees. For example, the Reliability Issues Steering Committee ("RISC"), created in August 2012 to advise the NERC Board of Trustees ("Board") on ERO reliability strategy, is comprised of industry executives as well as representatives from the Operations, Planning, Standards, Critical Infrastructure Protection, and Compliance and Certification Committees.

Industry engagement is also pivotal to various NERC initiatives including the Reliability Assurance Initiative ("RAI"), which seeks to reduce the administrative burden on registered

entities by adopting a risk-based approach to compliance monitoring and enforcement activities. NERC and the Regional Entities are spearheading RAI, with substantial input from industry representatives on several important RAI projects. On the enforcement side, RAI is examining information flow requirements for self-reporting, among other things. On the compliance side, RAI is developing criteria to evaluate the various approaches to reliability risk assessments and internal controls review and testing. Other RAI projects have varying levels of industry involvement. Industry input also played a role in the Find, Fix, Track and Report (“FFT”) initiative. Through a series of focus groups, NERC launched FFT, an enforcement mechanism that differentiates and addresses instances of noncompliance according to their significance to the reliability of the BPS.

NERC recognizes that despite progress to date, there are numerous opportunities for continuous improvements and enhancements to ensure that the BPS remains reliable. For each area of accomplishment in this five-year assessment, NERC also identifies areas for improvements and enhancements going forward.

B. Development and Structure of the Five-Year Performance Assessment

On July 20, 2006, the Federal Energy Regulatory Commission (“FERC” or “Commission”) certified NERC as the ERO pursuant to §215(c) of the Federal Power Act (“FPA”),¹ as added by Title XII of the Energy Policy Act of 2005.² The Commission’s regulations at 18 C.F.R. Part 39³ require the ERO to submit an assessment of its performance three years from the date of

¹ 16 U.S.C. §824o(c) (2013).

² *Order Certifying the North American Electric Reliability Corporation as the Electric Reliability Organization and Ordering Compliance Filing*, 116 FERC ¶61,062 (2006).

³ *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 (2006).

certification and every five years thereafter. On September 16, 2010, the Commission issued an order accepting the three-year ERO performance assessment of NERC as the ERO as well as the Regional Entities and found that they continue to satisfy the statutory and regulatory criteria for certification.⁴

In this five-year assessment, which complies with 18 C.F.R. §39.3(c) of the Commission's ERO regulations, NERC describes its activities and accomplishments in carrying out its statutory and regulatory responsibilities as the ERO. NERC also evaluates of the effectiveness of each Regional Entity in carrying out its delegated functions.⁵ Finally, NERC and the Regional Entities identify actions that they will take to improve their operations and enhance the reliable operation of the BPS.

This five-year assessment has benefited from considerable input from industry. On October 31, 2013, NERC distributed a 36-question online survey soliciting numerical ratings and free-form responses regarding the performance of NERC and the Regional Entities in carrying out their respective responsibilities from NERC registered entities. On March 3, 2014, NERC posted a draft statement of its activities and accomplishments, as well as drafts of the Regional Entities' self-assessments, on NERC's website for broader industry comment. In total, NERC and the Regional Entities received responses from [•] organizations comprising [•] registered entities, [•]

⁴ *Order on the Electric Reliability Organization's Three-Year Performance Assessment*, 132 FERC ¶ 61,217 (2010).

⁵ The eight Regional Entities, each of which performs functions delegated by NERC pursuant to Commission-approved delegation agreements, are Florida Reliability Coordinating Council, Inc. ("FRCC"), Midwest Reliability Organization ("MRO"), Northeast Power Coordinating Council, Inc. ("NPCC"), ReliabilityFirst Corporation ("ReliabilityFirst"), SERC Reliability Corporation ("SERC"), Southwest Power Pool Regional Entity ("SPP RE"), Texas Reliability Entity, Inc. ("Texas RE"), and Western Electricity Coordinating Council ("WECC"). The Commission initially approved the delegation agreements between NERC and the Regional Entities, and thus the designation of the Regional Entities, in an Order issued April 19, 2007. *North American Electric Reliability Corp.*, 119 FERC ¶61,060 (2007).

trade associations or other organized interest groups, [•] government agencies, and [•] other interested parties. [•] responses were received from U.S. entities, [•] from Canadian entities, and [•] from Mexican entities. A compilation of the responses to the survey questions, for NERC and each Regional Entity, as well as the comments to the March 3, 2014 posting, are included as Attachment 4. Issues raised by stakeholders, and the responses by NERC and the Regional Entities to those issues, are addressed in this report. Industry feedback from both the survey as well as the March 3, 2014 posting was discussed at the February 28, 2014 NERC Member Representatives Committee (“MRC”) meeting and the May 6, 2014 NERC Board meeting.

Unlike the three-year assessment, which was organized by programmatic area, this five-year assessment highlights initiatives in support of the ERO Enterprise Strategic Plan (“Strategic Plan”).⁶ In the first part of this five-year assessment, NERC highlights its accomplishments as the ERO and outlines its path forward. Many of these accomplishments and initiatives span more than one programmatic area. In the second part, NERC evaluates the effectiveness of each Regional Entity in performing its delegated functions. This section draws from each Regional Entity’s self-assessment, as well as feedback solicited from industry through the posting of the industry survey and self-assessments. The third and final section of the report consists of the following attachments:

Attachment 1: Discussion of How NERC Meets the ERO Certification Criteria of 18 C.F.R. §39.3(b)

Attachment 2: Joint Regional Entity Self-Assessment

⁶ The ERO Strategic Plan identifies the following initiatives: (1) Reliability Standards reform; (2) RAI; (3) risks to reliability; (4) revision of the BES definition [compliance, registration, and certification]; (5) the development and support of ERO Enterprise software applications and infrastructure; and (6) reformation of the tools, procedures and controls necessary to support the NERC Board and to oversee the activities of the Regional Entities.

Attachment 3: NERC Assessment of the Regional Entities

Attachment 4: Raw Comments from the Posting of NERC's Statement of Activities and Accomplishments and the Regional Entities' Self-Assessments

Attachment 5: Status of Areas for Improvement Identified in the Order on the Three-Year ERO Performance Assessment

NERC requests that the Commission accept this filing as satisfying NERC's obligation under 18 C.F.R. §39.3 (c) to file a performance assessment every five years after the three year anniversary of NERC's certification as the ERO under §215 of the FPA. Pursuant to 18 C.F.R. §39.3(c), the Commission will initiate a proceeding, with opportunity for public comment, on NERC's five-year assessment. At the conclusion of this proceeding, the Commission will either issue an order finding that NERC and the Regional Entities meet the statutory and regulatory criteria, or direct them to come into or improve their compliance with the requirements of Part 39. Given stakeholder input through the industry survey and the posting of NERC's statement of activities and accomplishments and the Regional Entities' self-assessments, NERC urges the Commission to set a relatively short public comment period (*e.g.*, 45 days) on the filed report. Conducting the Commission's proceeding in an expeditious manner will allow NERC and the Regional Entities to move forward and devote time and resources to the various initiatives outlined in the report. NERC will use the contents of this five-year assessment and the results of the proceeding to guide the continuing implementation and evolution of its programs in the years ahead.

II. NERC ACTIVITIES AND ACCOMPLISHMENTS

A. The ERO Is Implementing Numerous Reforms to Develop Clear, Reasonable and Technically Sound Mandatory Reliability Standards.

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As the ERO, NERC is making a positive impact on reliability by efficiently developing Reliability Standards using a streamlined process. This improved process is the product of realigning management and accountability for Reliability Standards development, reforming the development process to achieve a results-based focus, and restructuring Reliability Standards projects to ensure more efficient allocation of resources. These process reforms translate into new and substantially improved Reliability Standards that respond to FERC directives and NERC's mission to ensure the reliability of the BPS.

NERC has made significant progress on a number of FERC obligations, addressing more than 100 FERC directives and retiring dozens of Paragraph 81 requirements. NERC initiated work to remove less important requirements with limited reliability value based on risk analysis and prioritization. The input of a Standards Independent Experts Review Panel was central to this prioritization effort. This panel evaluated all existing requirements in Reliability Standards for reliability relevance and quality. The panel's recommendations set the course for delivering high-quality, results-based Reliability Standards with sustainable requirements. Also central to this prioritization effort are the Paragraph 81 criteria which identify for retirement those requirements with little to no impact on the reliability of the BPS per a March 15, 2012 FERC order on NERC's FFT process. Standard Drafting Teams continue to apply Paragraph 81 criteria in other formal development projects.

NERC is also effective and diligent at assessing the need for Reliability Standards that address reliability gaps. While **Attachment 1** provides an overview of all the Reliability Standards adopted since the three-year assessment, this section features three sets of Reliability Standards. The featured Reliability Standards highlight high-impact, low-frequency risks to the BPS which

do not manifest as readily in performance data that we measure today (i.e., cybersecurity and geomagnetic disturbances) and vegetation management (a former top ten cause for outage events).

1. Creating a Concise Set of Results-based Reliability Standards

NERC launched several initiatives to create a concise set of Reliability Standards that have the necessary combination of risk-performance and capability-based requirements to ensure BPS reliability.

a. Results-based Reliability Standards

Results-based Reliability Standards focus on actions or results - not necessarily the methods by which to accomplish those actions or results. They specify the preventive requirements necessary to reduce the risks of failure to acceptable tolerance levels. Each requirement of a results-based Reliability Standard identifies a measurable outcome such as: (i) a stated level of reliability performance; (ii) a reduction in a specified reliability risk (prevention); or (iii) a necessary competency. NERC began training SDTs to write results-based Reliability Standards in 2011. In 2013, the Commission approved the first Reliability Standard that resulted from that effort, FAC-003-2 – Vegetation Management. NERC completed several major revisions of other key families of Reliability Standards, including Reliability Standards for long-term planning, reliability coordination, and real-time operations, to make them results-based. Major revisions of Reliability Standards for modeling, as well as voltage and reactive control, commenced in 2013.

b. Standards Independent Experts Review Panel

To set the foundation for a technically sound, results-based and stable body of Reliability Standards, NERC assembled a Standards Independent Experts Review Panel (“Panel”) to evaluate the existing families of Reliability Standards and requirements. Due to the ongoing evolution of

NERC's Reliability Standards, the Panel addressed requirements from two groups of Reliability Standards: (i) Reliability Standards that were enforceable in 2013 or that would later become enforceable in 2013 ("Enforceable in 2013") and (ii) Reliability Standards that would become enforceable after 2013 ("Future Enforceable").

At the end of its review, the Panel made three short-term recommendations. First, it recommended that NERC retire 147 requirements. In making this determination, the Panel assessed whether a requirement: (i) did not support a reliability principle; (ii) met the Paragraph 81 criteria;⁷ or (iii) was better suited as a guideline rather than a part of a Reliability Standard. If a requirement met any of these criteria, the Panel recommended it for retirement. For the remaining requirements, the Panel examined whether they were "steady-state" or needed additional work ("reliability gap") by applying content⁸ and quality⁹ criteria. For these remaining

⁷ See Section II.A for a description of the Paragraph 81 initiative. The March 15, 2012 FERC Order Accepting with Conditions the Electric Reliability Organization's Petition Requesting Approval of New Enforcement Mechanisms and Requiring Compliance Filing, *North American Electric Reliability Corporation*, 138 FERC ¶ 61,193 at P 81 provided the opportunity for the ERO to evaluate requirements, which resulted in the Paragraph 81 initiative. The Paragraph 81 criteria are located in the Phase I Technical Paper, which can be located on the NERC website at: http://www.nerc.com/pa/Stand/Pages/Project2013-02_Paragraph_81.aspx.

⁸ The Panel examined the following content criteria: (1) whether the content of the requirement is technically correct, including identifying who does what and when; (2) whether the requirement identifies the correct functional entities; and (3) whether there are appropriate actions for which there should be accountability included or is there a gap.

⁹ The Panel examined the following quality criteria: (1) whether the requirement should stand alone or be consolidated with other Reliability Standards; (2) whether the requirement was drafted as a results-based standard; (3) whether a requirement is technologically neutral; (4) whether the requirement aligns with the purpose; (5) whether the requirement is a higher solution than the lowest common denominator; (6) whether the requirement is measureable; (7) whether a requirement has a technical basis in engineering and operations; (8) whether a requirement is complete and self-contained; (9) whether the language is clear and does not contain ambiguous or outdated terms; (10) whether a requirement can be practically implemented; and (11) whether a requirement uses consistent terminology.

requirements, the Panel evaluated the risk to reliability taking into consideration the ranking developed by the RISC and the violation risk factor for each requirement.

Second, the Panel identified seven areas, categorized as either high or medium priority, as inadequately addressed by Reliability Standards and as posing a risk to the BPS.¹⁰ The Panel recommended that NERC develop a Reliability Standard, requirement or guideline to address these gaps. Finally, the Panel recommended that NERC reorganize the remaining body of Reliability Standards to eliminate duplicative requirements in various Reliability Standard families. The Panel believes that the current organization of Reliability Standards has duplicative requirements in various Reliability Standard families.¹¹ The Panel advised that NERC pursue consolidation and organization of 25 requirements around “themes” of Authority, Emergency Operations and Interconnected Reliability Operations. These consolidation and prioritization efforts will move the remaining requirements closer to a Steady State¹² quality and content grade. They will also enable registered entities to improve BPS reliability by focusing scarce resources on activities that directly affect reliability such as operations, planning and maintenance. The Panel developed a proposed “Authority” standard for use by a future SDT.

¹⁰ The seven areas are: (1) outage coordination; (2) governor frequency response; (3) situational awareness tools; (4) three-part communications; (collectively the high priority gaps) (5) infrastructure maintenance; (6) short circuit / fault duty models; and (7) verification of accuracy of planning models (collectively the medium priority gaps).

¹¹ The Panel did not address the Critical Infrastructure Protection (“CIP”) family of Reliability Standards. Review of CIP Reliability Standards requires a particularized expertise. Therefore, the Panel recommended that NERC commission a team of experts to review and evaluate the CIP requirements in a similar fashion as it had done with physical security, cybersecurity and power system operations experts as a team. The Panel also did not review regional Reliability Standards.

¹² The Panel defined a Reliability Standard that had reached a “Steady State” as one that is clear, concise, sustainable (stable), necessary for accountability, and sufficient to maintain the reliability of the BPS. These Reliability Standards only require revision when there is a change in risks, technology, practice, or some other impetus.

In addition to the short-term recommendations, the Panel proposed three longer-term projects for the ERO. First, the Panel presented a new family construct for Reliability Standards to improve understanding, simplify enforcement, and minimize duplicate requirements. The new family construct consists of the following 10 families of Reliability Standards: (i) Transmission Planning; (ii) Facility Limits and Capabilities; (iii) Protection Systems; (iv) Infrastructure Maintenance; (v) Operations; (vi) System Recovery; (vii) Authority; Communication and Human Factors; (viii) Control Center and Communication Capabilities; (ix) Cybersecurity; and (x) Nuclear Interface. Second, the Panel advised NERC to update its functional model by expanding the tasks identified to facilitate maintenance of a focused, concise number of Reliability Standards or requirements. Finally, the Panel suggested exploring the use of dashboards to measure reliability trends and monitor potential risks to the reliability of the BPS. The Panel views dashboard monitoring as a tool to reduce the number of Reliability Standards and reduce compliance monitoring of those Reliability Standards.

The Panel's recommendations informed the *2014-2016 Reliability Standard Development Plan* ("RSDP") which was presented to the NERC Board in November 2013.

c. Paragraph 81

In its March 15, 2012 order ("March 2012 Order") on NERC's FFT program,¹³ the Commission invited NERC to propose specific Reliability Standards or requirements for revision or retirement if they did not provide meaningful benefit to BPS reliability. This project, also known as the Paragraph 81 initiative, expands upon the approach taken in the FFT program, which emphasizes efficiency through streamlined processing of lesser risk violations so that the ERO and

¹³ *Order Accepting with Conditions the Electric Reliability Organization's Petition Requesting Approval of New Enforcement Mechanisms and Requiring Compliance Filing*, 138 FERC ¶ 61,193 (2012).

industry can focus resources on issues that pose the greatest risk to reliability. Consistent with FFT, NERC strives to retire requirements that have little or no effect on reliability and increase the efficiency of the ERO compliance program through the Paragraph 81 initiative. It also enables industry stakeholders to focus their resources on reliability risk. In February 2013, NERC filed a petition with FERC to retire 34 requirements or sub-requirements within 19 Reliability Standards.¹⁴ Generally, NERC proposed to retire a requirement if it was redundant, determined not to pose a great risk to the reliability of the BPS, or found otherwise unnecessary for reliability. In its June 20, 2013 notice of proposed rulemaking (“NOPR”), the Commission agreed with NERC that the identified requirements proposed for retirement either: (i) provided little protection for BPS reliability; or (ii) were redundant with other aspects of the Reliability Standards. In fact, the Commission went beyond the scope of NERC’s petition and proposed to withdraw several outstanding Commission directives relating to Reliability Standards.¹⁵ The Commission identified Reliability Standards-related directives for withdrawal based on the following three guidelines:

- 1) Whether the reliability concern underlying the outstanding directive has been addressed in some manner, rendering the directive stale;
- 2) Whether the outstanding directive provides general guidance for Reliability Standards development rather than a specific directive; and
- 3) Whether the outstanding directive is redundant with another directive.

¹⁴ For a detailed list of criteria required to retire a Reliability Standard requirement *see Paragraph 81 Project Technical White Paper* (December 20, 2012) available at http://www.nerc.com/pa/Stand/Project%20201302%20Paragraph%2081%20RF/P81_Phase_I_technical_white_paper_FINAL.pdf.

¹⁵ *Electric Reliability Organization Proposal to Retire Requirements in Reliability Standards*, Notice of Proposed Rulemaking, 143 FERC ¶ 61,251 (2013).

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On November 21, 2013, the Commission issued an order approving, as proposed in the NOPR, the retirement of 34 requirements and sub-requirements within 19 Reliability Standards, and withdrew the identified directives effective January 21, 2014 (“Effective Date”).¹⁶ The proposed retirement of these requirements enable the ERO to redirect resources to matters posing greater risks to the reliability of the BPS and to ensure that the costs of reliability are proportionate to the benefits. Concepts from the Paragraph 81 initiative will carry forward into improving the drafting of Reliability Standards. SDTs will be encouraged to examine duplication of requirements across the NERC body of Reliability Standards as well as the technical basis and necessity for each requirement. Within 30 days of the Effective Date, Regional Entities will dismiss existing possible violations and issue dismissal letters to registered entities. In the period leading up to the Effective Date, Regional Entities shall not actively monitor these 34 retired requirements pursuant to the compliance discovery methods set forth in the NERC Rules of Procedure, nor shall they process any new or existing possible violations of these retired requirements. Regional Entities should document removal of any of the 34 retired requirements from audit engagements in the final Compliance Audit reports. Registered entities that opt to retain information relating to newly discovered instances of non-compliance with the 34 retired requirements in lieu of submitting a self-report may dispose of this information as of the Effective Date.

2. Reforms in Reliability Standard Development

NERC has implemented a number of reforms to modify the Reliability Standard development process and develop technically sound, results-based Reliability Standards. NERC leveraged these reforms to decrease the development time for Reliability Standards projects.

¹⁶ *Electric Reliability Organization Proposal to Retire Requirements in Reliability Standards*, 145 FERC ¶ 61,147 (2013).

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The NERC Board, in consultation with the MRC, formed the Standard Process Input Group (“SPIG”).¹⁷ The MRC tasked SPIG with developing process improvements in four key areas:

- 1) Provide clarity on the reliability objectives, technical parameters, scope and relative priority of Reliability Standards;
- 2) Review the drafting process to ensure that Reliability Standards contain specific technical content;
- 3) Assess Reliability Standards project management and workflow; and
- 4) Evaluate formal balloting and commenting.

SPIG gathered input from stakeholders through interviews and a formal survey. Using this input, SPIG made the following five recommendations to modify the way NERC develops Reliability Standards:

- 1) Continue following the minimum requirements of the American National Standards Institute accreditation;
- 2) Form an advisory committee to conduct front-end, high-level reviews of nominated reliability issues and to direct the initiation of Reliability Standards projects or other solutions that will address reliability issues;
- 3) Develop a strategy for improving the communication and awareness of effective reliability risk controls to increase input and alignment with state, federal and provincial authorities;
- 4) Revamp the Reliability Standards development process to address results-based Reliability Standards, cost effectiveness, alignment between Reliability Standard Audit

¹⁷ The SPIG is comprised of the MRC Chair, Vice Chair, other MRC members, two NERC trustees, the NERC CEO, and the Standards Committee Chair.

Worksheets (“RSAWs”), and the retirement of Reliability Standards not needed to meet an adequate level of reliability; and

5) Improve timely stakeholder consensus and form efficient well-balanced SDTs.

Based on these recommendations, NERC worked with stakeholders to develop revisions to the *Standard Processes Manual*. As a result, NERC (i) changed the composition of SDTs to include legal, project management, and compliance experts in addition to subject matter experts; (ii) streamlined the comment and balloting process allowing for summary responses to comments; and (iii) granted the Standards Committee the authority to waive provisions in the *Standard Processes Manual* for good cause shown. The Commission agreed that these changes allow for greater flexibility and efficiency.¹⁸ With the Board’s direction, the Standards Committee also developed a strategic plan and enhanced its charter, focusing on increasing its effectiveness, efficiency, and ability to deliver Reliability Standards.

Also in response to the SPIG’s recommendations, NERC’s Board formed the RISC in August 2012 to establish a collaborative effort to set priorities on issues of importance to the grid. The RISC is comprised of industry executives and thought leaders, including representatives from the Operations, Planning, Standards, Critical Infrastructure Protection, and Compliance and Certification committees. The RISC’s first public meeting took place in October 2012. In November 2012, the committee also participated in a NERC-sponsored conference in which reliability topics were discussed with technical experts. The conference, conducted as series of panel discussions, highlighted several existing and emerging reliability risks and created an opportunity for informed dialogue about technical topics.

¹⁸ *Order Approving Revisions to Electric Reliability Organization’s Standard Processes Manual*, 143 FERC ¶ 61,273 (2013).

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NERC held a second conference, the Reliability Leadership Summit, in October of 2013. At this conference, key industry decision makers gathered to discuss reliability priorities and industry trends. NERC intends for this Summit meeting to be an annual event, with the next Summit scheduled for September of 2014.

The RISC is categorizing NERC's existing and planned reliability activities, consolidating those activities into general areas of reliability risk, and evaluating the relative reliability importance of each area. In its initial analysis, the RISC identified four high-priority focus areas for Reliability Standards: (i) cyber attacks; (ii) workforce capability and human error; (iii) protection systems; and (iv) monitoring and situational awareness. The RISC presented these priorities to the Board in February 2013. In response, the Board directed the RISC to conduct further analysis of the issues identified as high and medium priority. The Board also directed NERC to integrate RISC input into the overall ERO planning process. NERC staff is in the process of implementing changes to meet this objective.

Subsequently, the RISC issued an updated report in August 2013 identifying a fifth area of focus: adaptation and planning for change. Efforts to review these risk areas and to develop appropriate risk management strategies continue. Integrating these priorities with the annual Business Plan and Budget will be a cornerstone of NERC's annual planning process going forward. To effect this change in planning, NERC has developed the Reliability Risk Management Process, a multi-year strategy development method that uses industry expertise through the RISC and other standing committees to develop actionable, measurable efforts to manage reliability risk.

NERC realigned resources in the Reliability Standards department by creating three teams of Reliability Standards developers and one team focused on information management. This realignment focuses resources on the production of Reliability Standards rather than the executing

and monitoring process. This increases throughput to complete outstanding projects and resolve outstanding directives. Each team is assigned one of the following high-level goals:

- 1) Resolve directives through a process similar to the Paragraph 81, Phase I Reliability Standards development project or the omnibus enforcement filings;
- 2) Conduct the required five-year reviews for current Reliability Standards after the “steady-state” is reached;¹⁹ or
- 3) Oversee emerging issue projects and the completion of remaining open projects.

These three teams closely coordinate with one another to ensure a balance in workload and to create an expertise in each of these three major work areas. As the Reliability Standard transformation continues, these teams may refocus their efforts toward overall Reliability Standards families or groups.

NERC improved the composition of SDTs by enhancing its selection process to identify, for each project, the necessary technical, writing, and project management expertise to form a balanced team towards improved effectiveness and enhanced efficiency. In addition, SDTs now benefit from increased NERC staff support, including dedicated legal support for each project. Each standard development project is staffed by a lead Standard Developer, and many projects have a second Standard Developer. Standard Developers bring project management and facilitation experience as well as additional skills, including technical writing, legal skills, and consensus-building skills, which contribute to the development of high-quality Reliability Standards. With this enhanced staffing, SDTs are better able to reach milestones and build consensus amongst industry in advance of balloting. NERC also provides facilitation training to

¹⁹ The revised *Standard Processes Manual* (NERC Rules of Procedure **Attachment 3A**) now requires periodic reviews every ten years.

all newly appointed drafting team leaders. Finally, NERC developed the Standards Development Process Participant Conduct Policy to ensure that the Reliability Standards development process is conducted in a professional and constructive environment.

3. Improved Stakeholder Access to Reliability Standards Information

All Reliability Standards are available to stakeholders through NERC's public website, including: (i) Reliability Standards enforceable in specific jurisdictions; (ii) Reliability Standards pending regulatory approval; (iii) Reliability Standards approved by the NERC Board and pending regulatory filing; and (iv) Reliability Standards no longer subject to enforcement. In 2012, NERC launched an improved interface to allow stakeholders to filter the complete set of Reliability Standards so that they could identify which Reliability Standards were applicable to their respective functions. Work is ongoing to improve the completeness and timeliness of information for non-U.S. jurisdictions (*i.e.*, Canadian provinces or Mexico).

Industry can track Reliability Standards projects in a publicly posted spreadsheet, available on the left navigation tab of the NERC Standards home page. NERC updates this spreadsheet monthly. The spreadsheet also provides a link to the projects page, the deliverables, the number of Paragraph 81 requirements, the number of regulatory directives or guidance, the Project Management and Oversight Subcommittee liaison assigned to the project, the NERC Reliability Standards developer, and a month-by-month timeline.

4. Critical Infrastructure Protection Version 5 Reliability Standards

On November 22, 2013, the Commission issued Order No. 791 approving Critical Infrastructure Protection Version 5 ("CIP Version 5"), a suite of Reliability Standards demonstrating NERC's and industry's dedication to cybersecurity. These Reliability Standards provide a cybersecurity framework for the categorization and protection of BES Cyber Systems to

support the reliable operation of the grid. NERC worked with industry to ensure that these Reliability Standards address the differing roles of each registered entity in the operation of the BES, the criticality and vulnerability of the cyber systems needed to support BES reliability, and the risks to which they are exposed. In Order No. 791, the Commission found that CIP Version 5 is an improvement over the currently approved CIP Reliability Standards. The Commission also determined that categorizing BES Cyber Systems based on their Low, Medium, or High Impact on the reliable operation of the BES, with all BES Cyber Systems categorized as at least Low Impact, offers more comprehensive protection of the BES.²⁰ The Commission directed NERC to address several new directives, some of which must be addressed within a year. To address these directives, NERC has established a SDT and set an aggressive schedule to address all the Commission's concerns, consistent with the timeline set by the Commission. Outside of the SDT, NERC will solicit further industry about regarding how best to address these directives through two NERC-led technical conferences.

Recognizing that registered entities are in various stages of implementation of CIP Versions 3 and 4, NERC tackled the need for flexibility as well as the need to identify and address transition challenges with industry. Specifically, NERC offered guidance to help industry understand its roles and responsibilities and address technical and other implementation challenges associated with the changing nature of the CIP Reliability Standards.²¹ In the *Cybersecurity*

²⁰ In Order No. 791, the Commission directed NERC to develop modifications to address some concerns with the CIP Version 5, including: (1) the “identify, assess, and correct” language; (2) protections for Low Impact BES Cyber Systems; (3) the risks posed by transient devices; and (4) the protection of communication networks.

²¹ NERC prepared the *Cybersecurity Standards Transition Guidance* (“Transition Guidance”) document, first issued on April 11, 2013, and revised on September 5, 2013, to clarify responsible entities’ options and obligations to comply with CIP Reliability Standards during the transition from Version 3 to Version 4 while Version 5 was pending approval at the

Standards Transition Guidance (“Transition Guidance”) document, NERC outlined its plans to develop a CIP Version 5 Transition Implementation Study (“CIP Version 5 Study”) to collect and to evaluate relevant data from select responsible entities regarding their experience in implementing CIP Version 5 requirements. Through the CIP Version 5 Study, which was launched on October 1, 2013, NERC is identifying successful implementation methods and challenges that the industry faces in transitioning to CIP Version 5. Moreover, NERC continues to provide industry with appropriate guidance and lessons learned from the CIP Version 5 Study.

On October 11, 2013, NERC submitted an informational filing to FERC that described how the CIP Version 5 Study would assist all responsible entities in making the transition to CIP Version 5. As part of the CIP Version 5 Study, NERC selected a small group of six (6) responsible entities based on various factors, including willingness to participate, past performance on the CIP Reliability Standards, and expected relevance to the CIP Version 5 Study’s goals. NERC is sharing the aggregate experience and information obtained through the CIP Version 5 Study with industry throughout the study period. NERC will also prepare a final report that synthesizes the Responsible Entities’ experiences in applying CIP Version 5. In this report, NERC will focus on the effectiveness of meeting the CIP Version 5 requirements and the methods employed during implementation. NERC will also focus on the:

- 1) Methods, approaches, and policies that were effective in implementing the technical controls of CIP Version 5;
- 2) Tools, policies, and training that were effective in aligning employees’ skills and cooperation with the responsible entity’s mission and the CIP Version 5 Standards;

Commission. [http://www.nerc.com/pa/comp/Resources/ResourcesDL/Cyber%20Security%20Standards%20Transition%20Guidance%20\(Revised\).pdf](http://www.nerc.com/pa/comp/Resources/ResourcesDL/Cyber%20Security%20Standards%20Transition%20Guidance%20(Revised).pdf).

- 3) Hurdles encountered by the responsible entities and the relevant outcomes; and
- 4) Requirements and concepts of CIP Version 5 that responsible entities had difficulty implementing and why.

In Order No. 791, the Commission also approved NERC's proposed implementation plan for the CIP Version 5 Study to bypass CIP Version 4 and move directly to CIP Version 5.

5. Geomagnetic Disturbances

As high-impact, low-frequency (“HILF”) events, extreme geomagnetic disturbances (“GMDs”) pose a unique threat to BPS reliability, and NERC is committed to working with stakeholders and the Commission to address these challenges as consistent with its responsibilities as the ERO. NERC is also working to improve the performance of the BPS to mitigate the risk of large events such as GMD. While recognizing that there is significant disagreement in the scientific and manufacturing communities about the most likely effects of a GMD event on the BPS, NERC does not minimize the potential for GMDs to affect the BPS. Events, such as the 1989 event in Hydro-Québec, demonstrate that severe solar storms can challenge the BPS. During a severe GMD event, geomagnetically-induced current (“GIC”) flow in transformers (resulting in half-cycle saturation) can substantially increase absorption of reactive power, create harmonics, and, in some cases, cause transformer hot spot heating. Depending on factors such as geomagnetic latitude, system configuration, ground resistivity, and overall equipment health, a GMD event could lead to loss of reactive power support. This would cause voltage instability, relay misoperations and potential equipment loss-of-life or damage, respectively. Through the efforts of the Geomagnetic Disturbance Task Force (“GMDTF”), NERC released the 2012 *Special Reliability Assessment Interim Report: Effects of Geomagnetic Disturbances on the Bulk Power System* in February 2012. In the report, NERC identified four recommendations for industry:

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- 1) Improve tools for industry planners to develop geomagnetic mitigation strategies;
- 2) Improve tools for system operators to manage geomagnetic impacts;
- 3) Develop education and information exchanges between researchers and industry; and
- 4) Review the need for enhanced NERC Reliability Standards.

To address GMD concerns, NERC took the following actions:

- 1) Developed operating procedure templates for transmission operators and generator operators that reflect best practices and consensus among technical experts;
- 2) Improved ground conductivity models that represent the geological regions of North America and a draft application guide for GIC” modeling; and
- 3) Initiated a transformer modeling and testing project to validate models used to assess the effects of GIC on transformers.

The GMDTF’s quarterly webinars and in-person meetings contributed to a strong collaborative climate between industry, researchers, and policymakers to continue development of an effective risk control strategy for GMDs. These efforts will continue in order to expand the technical foundation for understanding the potential impact of GMD.

On May 16, 2013, the Commission issued Order No. 779 on Reliability Standards for GMDs.²² In that order, the Commission directed NERC to submit proposed Reliability Standards that address the impact of GMD on the reliable operation of the BPS to the Commission for approval. The Commission directed NERC to implement the directive in two stages. In the first stage, NERC must submit one or more Reliability Standards that require owners and operators of the BPS to develop and implement operational procedures to mitigate the effects of GMDs consistent with the reliable operation of the BPS. In the second stage, NERC must submit one or

²² 143 FERC ¶ 61,147 (2013).

more Reliability Standards that require owners and operators of the BPS to conduct initial and on-going assessments of the potential impact of benchmark GMD events on BPS equipment and the BPS as a whole. As part of the first stage, NERC submitted a petition in November 2013 requesting Commission approval of its first GMD Reliability Standard that allows entities to tailor their operating plans, processes, and procedures.

6. Vegetation Management

In Order No. 777,²³ the Commission approved NERC's proposed FAC-003-2, a Reliability Standard that calls for minimizing encroachments from vegetation located adjacent to the rights-of-way and within a transmission owner's control. Historically, vegetation-related outages have been a recurring contributor to blackouts. In fact, inadequate vegetation management practices causing tree contact was one of the initiating causes of the 2003 Northeast blackout. Industry compliance with FAC-003-2, together with a continued industry focus on best practices for vegetation management enhances the reliability of the BPS.

FAC-003-2 contains several features that are improvements over Version 1. For example, while FAC-003-2 continues to apply to overhead transmission lines operated at or above 200 kV, it additionally applies to any lower voltage overhead transmission line that is either an element of an Interconnection Reliability Operating Limit or a Major WECC Transfer Path. Another improvement is that it makes explicit a transmission owner's obligation to prevent an encroachment into the minimum vegetation clearance distance for a line subject to this standard, regardless of whether that encroachment results in a sustained outage or fault. FAC-003-2 also requires, for the first time, transmission owners to annually inspect all transmission lines subject

²³ *Revisions to Reliability Standard for Transmission Vegetation Management*, 142 FERC ¶ 61,208 (2013).

to the Reliability Standard and complete 100 percent of their annual vegetation work plan. FAC-003-2 is the first results-based Reliability Standard approved by the Commission.

On September 19, 2013, the Commission approved FAC-003-3,²⁴ which extends FAC-003-2 vegetation management requirements to certain generator interconnection facilities to address a reliability gap created when the requirements only applied to transmission owners. Certain generator owners with overhead lines, particularly those with generator interconnection facilities longer than one mile and which run through areas that may be densely populated with trees and other plants, are now also required to perform vegetation management of those lines. For purposes of this Reliability Standard, these lines are treated as transmission lines.

7. Looking Ahead

a. Move Reliability Standards Closer to a “Steady-State”

In the 2013-2015 RSDP, NERC revised its approach to managing Reliability Standards development workload. Under the new approach, NERC plans to:

- (i) Complete current and new Reliability Standards projects dealing with high risk reliability issues or emerging issues in a timely and efficient manner to resolve the reliability concerns that created the projects;
- (ii) Conduct five-year reviews of Reliability Standards that have not been revised in recent development projects;
- (iii) Address outstanding FERC directives and file any revised Reliability Standards that result from that process;

²⁴ *Generator Requirements at the Transmission Interface*, 144 FERC ¶ 61,221 (2013).

- (iv) Apply Paragraph 81 criteria and results-based drafting concepts to existing and future Reliability Standard projects; and
- (v) Increase coordination between SDTs and NERC’s compliance operations in the development of Reliability Standards.

The currently effective 2014-2016 RSDP continues this approach and NERC expects Reliability Standards to reach a “steady-state”²⁵ by the end of 2015. The 2014-2016 RSDP prioritizes future enforceable Reliability Standards projects as high, medium, low or pending technical committee input based on a series of inputs, which include the Panel’s content and quality assessments.²⁶ NERC will also prepare training materials for SDTs to highlight the use of the Panel’s methodology for content and quality assessments.

b. *Develop and Implement Procedures for the Cost-Effective Analysis Process*

NERC developed the Cost-Effective Analysis Process (“CEAP”) in response to requests by registered entities and regulators to address compliance costs and the efficiency and reliability impact of draft NERC Reliability Standards.²⁷ The CEAP affords stakeholders an opportunity to share projected cost information regarding implementation of draft Reliability Standards and provides the opportunity to offer alternatives that would be equally, or more efficient at achieving the reliability objective of the draft standard while also taking into consideration implementation

²⁵ Please note that the 2014-2016 RSDP defines “steady-state” slightly differently than the Panel. The 2014-2016 RSDP defines “steady-state” as a stable set of clear, concise, high quality, and technically sound Reliability Standards that are results-based, including retirement of requirements that do little to promote reliability.

²⁶ Prioritization considerations are influenced by: (1) RISC category rankings; (2) outstanding regulatory directives; (3) regulatory deadlines; (4) Paragraph 81 candidates; (5) the Panel’s content and quality assessments; and (6) additional considerations such as fill-in-the-blank status and five-year assessment commitments.

²⁷ NERC notes that this was an issue raised in response to the five-year performance assessment survey.

costs. CEAP is used for new Reliability Standards, revised Reliability Standards, Reliability Standard being revised to meet FERC directives and for rapid revisions.

The CEAP currently proposes a two-phase process for identifying projected implementation costs. The first phase of the CEAP, identified as the Cost Impact Analysis (“CIA”), is conducted during the standard authorization request (“SAR”) stage of the Reliability Standard development. It provides an opportunity to identify approximate implementation costs associated with a proposed Reliability Standard prior to its development. Information related to the proposed Reliability Standard’s mission and forecasted implementation costs is collected from the industry during the initial SAR comment period. Collected information is shared with the NERC Standards Committee and the SDT, and is posted on the NERC website.

The second phase of the CEAP, identified as the Cost Effective Analysis (“CEA”), is typically comes after the draft Reliability Standard is developed by the SDT and is ready for the first combined formal comment period and ballot. During this phase, NERC again solicits industry to provide forecasted implementation costs of the proposed requirements and propose alternative methods to achieve the Reliability Standard’s reliability objective more efficiently. Any alternative proposals provided by the industry during this phase should contain sufficient technical justification, and if possible, cost comparison data for consideration. Upon approval by the NERC Board, the Reliability Standard and the CEAP final report are provided for informational purposes in the filings to applicable regulatory authorities.

c. Continue GMD Efforts

NERC will continue to expand the technical foundation for understanding the potential impact of GMD by supporting the work of the GMDTF as well as the research of Electric Power Research Institute (“EPRI”). Current EPRI research includes providing a suite of open-source and

technically valid tools, operational measures and transformer modeling. Additionally, coordinated work efforts to understand the potential ranges of geomagnetically induced currents from coronal mass ejections on the sun are underway — using these tools, measures, and modeling — at the National Aeronautics and Space Administration, National Oceanic and Atmospheric Administration, other international space weather entities, and the U.S. Geological Survey. The results of this work will permit registered entities to conduct vulnerability assessments. Once the EPRI and industry efforts are complete, the GMDTF will finalize tool development to support Reliability Standard development. The objective for 2014 is to complete research efforts and produce a report containing an overall assessment of the vulnerability. In this report, NERC will explain how these factors potentially affect reliability of the BPS in North America. This work will also support the development of Reliability Standards needed to address FERC’s order.

d. Conduct Vegetation Management Research with EPRI

In Order No. 777, the Commission required NERC to validate the technical foundation supporting the inclusion of factors for the minimum vegetation clearance distance (“MVCD”) within the Gallet Equation. Significant industry support for the application of the Gallet Equation was a key factor in achieving approval for this Reliability Standard. Contractor support will be used to conduct the necessary research that provides the technical foundation supporting the use of the MVCD in the application of the vegetation management standard. This research is supported by a draft statement of work prepared by EPRI involving approximately a 9-month through 15-month period of effort and associated activity, ultimately leading to a final report, which is preliminarily targeted for release in 2015.

The Commission also directed NERC to ascertain the issues surrounding access for vegetation and related maintenance for transmission assets crossing public lands. The Commission

is concerned that issues arising from federal and state governed lands (e.g. – Bureau of Land Management areas, national and State forests, etc.) restrict access to transmission assets crossing such lands and may potentially lead to a reliability risk for outages and/or delayed restoration. NERC will use consultants to develop a plan to gather technically valid information that identifies the nature and extent of such issues on public lands. Under the current research plan, NERC will use existing industry groups to formulate and validate this information and will then incorporate it into a report submitted to FERC. In this report, NERC will advise FERC about the issues it encountered and how best to address them.

e. *Convene an Independent Expert Panel to Review CIP Reliability Standards and Regional Reliability Standards*

At an appropriate time in the CIP Reliability Standards development, NERC will commission a team of physical security, cybersecurity and power system operations experts to review and evaluate the CIP Reliability Standards. NERC will conduct a similar effort to evaluate regional Reliability Standards and identify candidates for retirement or consolidation with continent-wide standards. If not, these Reliability Standards should align with continent-wide Reliability Standards. Finally, the regional Reliability Standards will need to align with the new family construct introduced by the Panel.

f. *Clarify of Compliance Assessment Expectations*

NERC supports industry's call for an alignment of timelines between Reliability Standards development and the RSAW processes to improve communication about compliance expectations.²⁸ Industry has specifically asked that NERC make RSAWs available prior to balloting of Reliability Standards. Under the current process, NERC develops RSAWs after

²⁸ This addresses an issue raised in the five-year survey.

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regulatory approval of a Reliability Standard. This occurs approximately six months before the standard's enforcement date, but after industry stakeholders and the NERC Board have reviewed and adopted the Reliability Standard. Going forward, NERC will implement the following enhancements to the Reliability Standards and RSAW development processes:

- (i) Formalize the coordination of input between SDTs and compliance staff;
- (ii) Post a draft RSAW during a Reliability Standard's formal comment period and ballot, approximately 15 days from the start of the comment period; while the draft RSAW is not subject to a ballot, stakeholders will be able to provide comments or raise concerns at that time; and
- (iii) Continue to involve Regional Entity compliance staff in drafting RSAWs to strengthen compliance consensus throughout the ERO and capture additional subject matter expertise.

These enhancements will increase early coordination and input from NERC compliance staff and standards staff. It will also ensure that the SDTs and compliance staff are aligned as to the language and intent of Reliability Standards and that the RSAWs reflect the same. This effort should reduce the need for Interpretations and Compliance Application Notices. These enhancements will also help to communicate more uniform compliance expectations from Reliability Standards much earlier. They will also help alleviate disparate interpretations of Reliability Standards in RSAWs. NERC standards staff will lead the coordination between departments. NERC compliance staff is assigned to Reliability Standards projects and SDTs. These enhancements will apply to Reliability Standards projects that begin in 2014. For existing projects, NERC will develop RSAWs in parallel with Reliability Standards development as the facts and circumstances of the project permit.

B. The ERO Registers Entities Commensurate with Risk to the Bulk Power System.

The FERC-approved, revised definition of the bulk electric system (“BES”) enables NERC to define assets that are material to the reliability of the interconnected transmission network. By devising a definition with continent-wide, “bright line” criteria, which replaces a predecessor framework of regionally determined criteria, NERC can effectively ensure that the users, owners and operators of these assets comply with applicable and mandatory Reliability Standards. NERC offers industry improved clarity by identifying specific categories of facilities and configurations as inclusions and exclusions to the BES definition. The approved case-by-case exception process to add elements to, and to remove elements from, the BES definition provides needed transparency and uniformity to NERC’s determinations of what constitutes the BES. Together with industry participants, NERC delivered a technically grounded and legally supportable foundation for identifying elements and facilities that make up the BES.

1. Improve Registration Processes, Information Systems and Methods across Regional Entities

NERC’s organization registration process identifies entities that are responsible for compliance with the FERC approved Reliability Standards. Entities that are registered are included on the NERC Compliance Registry (“NCR”) and are responsible for compliance with all applicable Reliability Standards. NERC delegates entity registration to Regional Entities in accordance with the procedures in Section 500 of the Rules of Procedure through approved Regional Entity delegation agreements or other applicable agreements. To further consistency and increase transparency among the Regional Entities, NERC developed a Common Registration Form (“CRF”) which registered entities use to provide the Regional Entities with real time updates of the information recorded in the Compliance Registry that pertains to ownership, operations,

contact information, asset lists and other information that may affect registration status. A corollary benefit of the CFR is that it serves as a check for the Regional Entities to ensure that owners, users, and operators of the BPS are registered appropriately. To further ensure that all owners, users and operators of the BPS are registered on NCR, NERC is undertaking an effort to map all the inter-relationships between registered entities on the NCR.

2. BES Definition

NERC is revising the definition of the BES in response to Commission directives in Order Nos. 743 and 743-A to ensure consistent inclusion or exclusion of certain types of registered entity elements subject to Reliability Standard requirements. In Phase 1 of this process, NERC proposed to eliminate regional discretion and establish a bright-line threshold that includes all facilities operated at or above 100 kV; the Commission accepted in Order No. 773²⁹. NERC also identified specific categories of facilities and configurations as inclusions and exclusions to the BES definition. These inclusions and exclusions, along with the process for requesting an inclusion or exclusion, are set forth in Appendix 5C of NERC's Rules of Procedure.³⁰ Finally, NERC created an exception process to add elements to, or remove elements from, the BES definition on a case-by-case basis. NERC developed for a "Detailed Information to Support an Exception Request" for entities to request exception from the revised BES definition.

In Phase 2 of this process, currently underway, NERC is addressing additional regulatory directives from Commission Order Nos. 773 and 773-A, as well as industry comments received

²⁹ *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 (2013).

³⁰

http://www.nerc.com/FilingsOrders/us/RuleOfProcedureDL/Appendix_5C_ProcForReqAndRecExFromAppOfNERCDefBES_20140701.pdf.

during Phase 1. As part of Phase 2, NERC proposes substantive changes to Inclusion I4 (dispersed power producing resources), Exclusion E1 (radial systems), Exclusion E3 (local networks), and Exclusion E4 (reactive power devices). NERC developed changes with industry input as part of the Reliability Standard development process and with three comment periods.

To implement the revised BES definition, which becomes effective in July 2014, NERC developed a web-based, ERO Enterprise-wide application to provide a consistent platform for registered entities to submit self-determined notifications and to apply for exception requests for inclusions in or exclusions from the BES. This application is called the BESnet Enterprise Application Tool. Once a registered entity applies the BES definition to a specific element within its system, it must notify its respective Regional Entity of any newly identified system elements that are inclusions or exclusions (i.e., system elements with changed BES classifications under the revised BES definition). Inclusion and exception decisions are made by the Regional Entity through the BESnet tool in order to support uniform reviews and evaluations by the Regional Entity and NERC. If a Regional Entity receives notification of a self-determined exclusion, then it must evaluate whether that registered entity can stop its compliance obligations for that excluded system element. If a Regional Entity receives notification of a self-determined inclusion, then the Regional Entity must evaluate whether that registered entity should take steps to bring that system element into compliance within a fixed implementation period. NERC will also use the tool to manage associated support materials and records related to the technical reviews by the Regional Entities and NERC.

3. Looking Ahead

a. Increase Registration Process Efficiencies

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Beginning in January 2014, NERC will enhance the compliance registration and certification program (Risk-Based Registration Assessment Project) to be more efficient and aligned with reliability benefit. Through this initiative, NERC will register entities commensurate with the risk that they pose to the BPS by scaling registration criteria to an entity's size. NERC will continue registered entity mapping activities to ensure that registry criteria are accurate and eliminate any gaps or duplication of registration. NERC will also develop tools that enable registered entities to understand the relevant Reliability Standards and requirements that apply to them. Scoping compliance responsibilities according to BPS reliability risks equates to better use of resources at both the registered entity level in the implementation of compliance programs, and at the Regional Entity level with regard to overall compliance monitoring efforts. NERC is issuing a survey to solicit input from registered entities regarding reforms to the existing registration and certification rules and criteria.

b. Implement BES Exceptions Process

NERC is finalizing implementation materials that will guide the consistent evaluation of inclusions, exclusions and self-notifications of BES elements across the ERO enterprise. NERC is creating a single portal location to provide a central place to obtain useful materials to support registered entities' review of their respective BES elements. NERC is also developing a Reliability Standard reference document to explain the intended application of the BES definition to yield consistent results. Additional reference documents are underway to promote further consistency across the ERO Enterprise and they include:

(i) The BES Definition Reference Document, which addresses how to apply the BES definition using several examples;

(ii) The BES Notification Guidelines, which shows how the Regional Entities and NERC will review self-determined notifications and includes a high level summary of notification requirements (i.e., one-line diagrams); and

(iii) The BES Exception Request Evaluation Guideline which demonstrates how the Regional Entities and NERC will evaluate exception requests and provides a high level summary of the exception request evidentiary requirements.

During the first two quarters of 2014, NERC will hold communications and training sessions to address, among other things: (i) evidentiary requirements for BES determinations; (ii) review and appeal mechanisms; and (iii) Reliability Standards applicability.

C. The ERO Continues to Hold Registered Entities Accountable for Compliance and Enforcement in a Transparent Manner.

A key, strategic transformation that NERC, in collaboration with the Regional Entities and stakeholders, has embarked upon in its eighth year as the ERO, is the construction of a risk-based model for compliance monitoring and enforcement. This risk-based approach enables NERC to align industry resource investment with the most important issues. In this section, NERC highlights the FFT program, and its recently approved enhancements, which implements this risk-based approach. FFT enables NERC to achieve major efficiencies through its widespread use across the Regional Entities. NERC, through the use of FFT, is working to close minor issues that do not present a risk to the BPS reliability. Through this program, NERC recognizes that quickly disposing of minor issues allows industry to shift emphasis and financial resources to more important reliability matters. Furthermore, through careful planning and coordination and collaboration between NERC and the Regional Entities, NERC achieved major enforcement efficiencies, namely by halving enforcement processing time in just one year between 2012 and

2013. These efforts also led to a drastically reduced caseload; in particular, NERC reduced the pre-2012 caseload to less than 100 items. Industry continues to mitigate aggressively and self-report aggressively.

In this section, NERC also calls attention to RAI, which is in an earlier stage of development than the FFT program. RAI builds upon the success of FFT and develops enforcement incentives to discourage poor performance and encourage positive behaviors that contribute to higher accountability and improved performance. Through RAI, NERC promotes more effective reliability risk mitigation by maturing and expanding internal management controls and corrective-action programs at registered entities.

1. Compliance Enforcement Initiative and Find, Fix, Track and Report

NERC's mission as the ERO is to ensure and to improve the reliability of the BPS. NERC recognizes that accountability for reliability excellence is broader than just penalizing violations. It requires ongoing identification, correction, and prevention of reliability risks. The desired "end state" for enforcement is to have an enforcement process that allows NERC and the Regional Entities to exercise appropriate discretion over whether to initiate an enforcement action or to address an issue outside of enforcement (*i.e.*, through compliance). Discretion does not eliminate oversight or visibility regarding minimal or moderate risk issues. Instead, it permits NERC and the Regional Entities to devote resources to those issues that pose the greatest risk to the BPS. It also allows NERC and the Regional Entities to work with registered entities to address these issues outside of traditional enforcement actions.

Recognizing the need and the importance of ensuring that reliability risks are addressed properly through a scaled approach, NERC devised a risk control strategy that differentiates and addresses compliance issues according to their significance to the reliability of the BPS - the FFT

initiative. FFT highlights proportionality and discretion. The FFT initiative enables NERC to address lesser-risk possible violations of Reliability Standards through a spreadsheet posted on NERC's website. NERC submits violations that pose a greater risk to reliability or do not otherwise meet the FFT criteria to FERC in a spreadsheet notice of penalty or full notice of penalty format. This initiative demonstrates that NERC continually reevaluates, redirects and rebalances its Compliance Monitoring and Enforcement Program ("CMEP") implementation efforts.

NERC's development of FFT benefited from collaboration with representatives of registered entities through a series of focus groups. During these focus group sessions, participants explained that registered entities typically allocated time and resources equally among violations, regardless of the risk to reliability posed by each violation. FFT was the first step towards addressing this inadequate allocation of resources.

Since the launch of FFT in 2011, NERC has implemented several enhancements to the initiative. As part of these enhancements, NERC expanded FFT treatment to: (i) a limited pool of possible moderate risk violations and (ii) some unmitigated possible violations so long as mitigation occurs within 90 days from the date the FFT is filed or posted. To streamline processing of FFT violations, Regional Entities now publicly post FFTs on a common website at the end of each month. This replaces the prior requirement that NERC submit monthly informational filings to the Commission. Even though Regional Entities post monthly FFTs, NERC maintains its enforcement oversight by reviewing a representative sample of FFTs during the 60-day window following the Regional Entities' monthly posting on NERC's website.

Industry input remains integral to the evolution of FFT. Through recent workshops, focus group calls and board meetings, NERC is taking the following actions to improve FFT:

- 1) Revamping the intake process to identify minimal risk issues early;

- 2) Decreasing processing time for FFTs;
- 3) Enhance communication between Regional Entities and registered entities during processing;
- 4) Creating centralized information collection, particularly for multi-Region registered entities; and
- 5) Educating industry regarding risk, mitigation and the prevention of recurrence through early detection and corrective internal controls.

Thus far, NERC has completed a preliminary assessment of how to improve processing of minimal risk issues and identified the following potential solutions:

- 1) Identify potential bottlenecks in the process of determining that a minimal risk issue qualifies for FFT treatment; and
- 2) Implement an early triage process to allow minimal risk issues to be diverted into a separate track for processing.

The FFT initiative is well on its way to achieving the desired end state. All Regional Entities utilize FFT processing to track minimal risk issues. The parameters for identifying minimal risk issues are consistent throughout the ERO Enterprise. NERC is piloting an enhancement in which it enables registered entities to self-identify and record determinations on minimal-risk issues, subject to the oversight and determination of the Regional Entities. NERC will continue its oversight through Regional Entity audits or spot checks to confirm that registered entities have sufficient internal controls to make these determinations accurately. Under this approach, processing of minimal risk issues will transition from being addressed through FFT filings (which now consist of postings on NERC's web site) to being addressed in records of issues

found and fixed without triggering an enforcement action, which will be retained by the Regional Entities.

2. Risk-based Compliance Monitoring

The core concept of risk-based compliance monitoring is intended to guide Regional Entities in allocating compliance monitoring activities and methods based on a registered entity's potential impact on the BPS. Through continued refinement of the risk-based compliance monitoring program, NERC will ensure that registered entities are monitored in a cost-effective manner.

The ERO Reliability Risk Assessment is a process used to identify and prioritize risks and other conditions that can affect the reliability of the BPS. The ERO prioritizes risk using an established set of criteria and identifies Reliability Standards and requirements that are most critical to the reliability of the BPS. The ERO Risk Assessment involves a review of system-wide risks and considerations that include Reliability Standard and requirement Violation Risk Factors, events and disturbances, system trends, grid operating data (e.g., Transmission Availability Data System (“TADS”) and Generating Availability Data System (“GADS”)), input from FERC and NERC standing committees, and input from NERC program areas and departments. The ERO Reliability Risk Assessment process uses data inputs from various departments³¹ to determine ERO Enterprise-wide risk areas and select applicable Reliability Standards and requirements for the actively monitored list of Reliability Standards (“AML”). The AML is the result of this process and it serves as a baseline for Regional Entities to use in determining what Reliability Standards

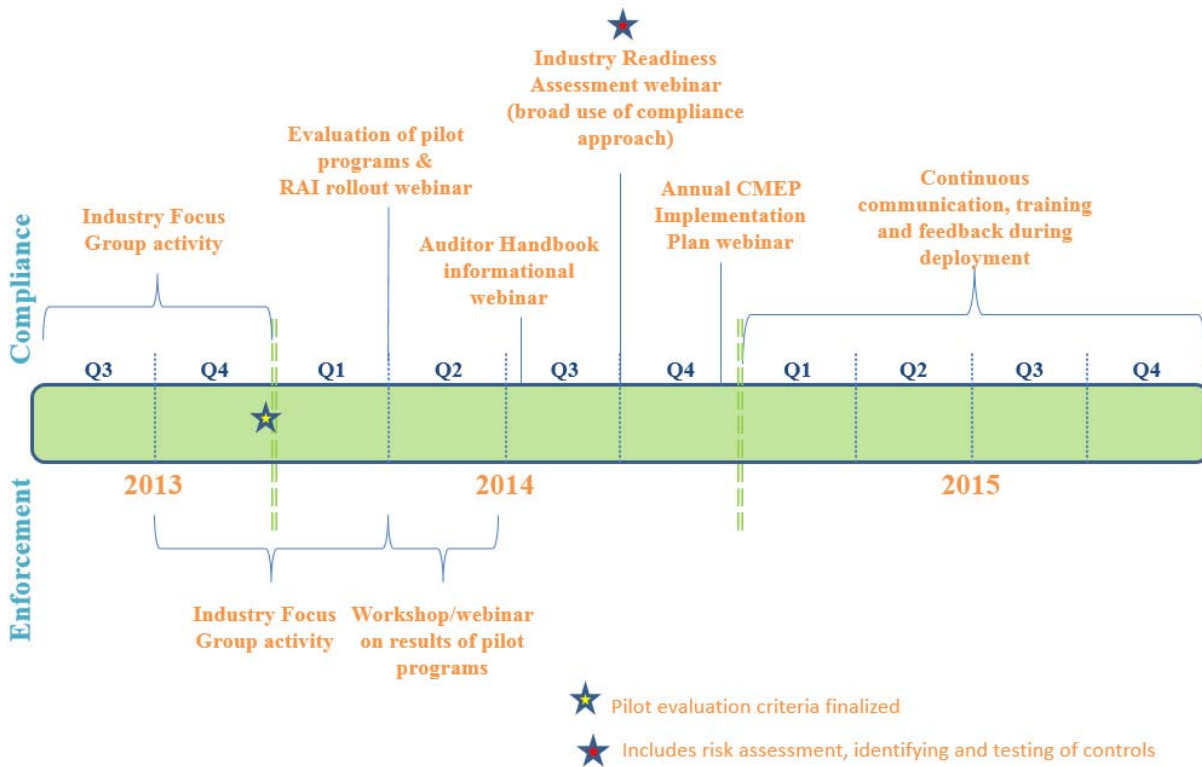
³¹ NERC program areas that contribute data are Reliability Assessment and Performance Analysis, Compliance Investigations, Compliance Operations, Enforcement, Critical Infrastructure Department, Event Analysis, and Human Performance.

and requirements to monitor. It consists of 53 Reliability Standards for monitoring through audits and self-certifications.

3. Reliability Assurance Initiative

In November 2012, NERC management proposed a multi-year effort to identify and implement changes to enhance the effectiveness of the ERO's compliance and enforcement functions. This effort is known as RAI. RAI will help NERC foster consistency and efficiency in its compliance monitoring and enforcement processes. NERC expects RAI to improve BES reliability by refocusing efforts on serious and substantial reliability risks and on the internal controls that mitigate those risks. Increased consistency in the ERO Enterprise's compliance and enforcement efforts yields a level of predictability for registered entities to understand how Reliability Standards are applied and enforced and to model positive behaviors.

To foster dialogue and seek industry feedback on the various aspects of RAI, NERC hosted a series of workshops in 2013 that addressed defining internal controls, conducting risk assessment, launching the pilot programs, enhancing FFT and improving self-reporting. NERC is planning additional quarterly forums for industry to provide feedback.



a. RAI Compliance Track

NERC is revising its compliance practices to achieve risk-based compliance monitoring and to establish the end-state of a mature compliance program. Prior to adopting a risk-based model, NERC monitored registered entities using a “one size fits all” approach based on functional registration and NERC’s AML of Reliability Standards. To reach a desired end state for compliance by 2016, RAI calls for NERC to do the following:

- 1) Adopt standard, risk-based audit practices similar to other industries;
- 2) Develop audit scoping based on a standard approach to assessing a registered entity’s risk to reliability;
- 3) Shift the focus of compliance to assessing the strength of management controls of Reliability Standards compliance;

- 4) Establish a process that allows for lower-risk violations to stay within compliance; and
- 5) Maintain the visibility of all violations, including self-reported ones, to allow for trend analysis.

In an effort to reach these end state goals, NERC launched two projects in 2013. First, NERC is developing a compliance auditor manual to standardize the compliance approach that Regional Entity auditors follow during the course of their engagement activities. The manual consists of three primary parts:

- 1) A compliance auditor handbook;
- 2) An audit checklist; and
- 3) The handbook glossary.

NERC completed the audit checklist in August 2013. NERC is developing additional sections for the compliance audit manual, which include:

- 1) Compliance auditor role expectations and training guide;
- 2) A section introducing compliance auditing;
- 3) Ethics and standards;
- 4) Sampling methodology;
- 5) Supporting diagrams and flow charts; and
- 6) Common forms and templates, and other content as needed.

Together, these tools will enable auditors to capture key steps performed during an audit. The need for consistency in approach in audit practices is particularly important for registered entities with operations in more than one Regional Entity. Consistency in approach with defined parameters also helps auditors enhance their audit preparation. NERC anticipates that it will begin

training Regional Entity auditors on use of the compliance audit manual during the first quarter of 2014, with full implementation during the second half of 2014.

Second, NERC is conducting prototypes and pilot programs through several Regional Entities to develop registered entity reliability risk assessment profiles. The purpose of the prototype and pilot program is to develop and test risk-based assessments, scoping, internal controls review concepts, and tests of management controls. These prototypes and pilots will help NERC design a compliance program that recognizes a registered entity's risk to reliability as well as its management controls and corrective action programs. When the prototypes and pilots are complete, NERC will standardize risk evaluation criteria for registered entities as well as for testing management controls. ERO executive management will review these methodologies and incorporate a standardized approach for reliability risk assessments into the compliance audit manual.

While separate and apart from RAI, the above-mentioned CIP Version 5 Study is similar to the RAI pilots. In the CIP Version 5 Study, NERC uses a similar, internal controls-based model for its participants. The CIP Version 5 Study calls for registered entity participants to perform a voluntary assessment of their security programs by evaluating various control and process-based security domains. When the CIP Version 5 Study is complete, NERC will leverage the voluntary security programs of registered entity participants for compliance and enforcement to tailor risk assessment, audit and spot-check processes, and resolution of non-compliance.

b. RAI Enforcement Track

As discussed above, the enforcement aspect of RAI builds on the success of FFT to develop enforcement incentives for registered entities to distinguish between poor performance and

positive behaviors that contribute to higher accountability and improved performance. To reach the end state for enforcement, RAI calls for NERC to do the following by 2016:

- 1) Exercise discretion to focus resources on the most serious and substantial risks to the reliability of the BPS; and
- 2) Empower registered entities to self-identify, mitigate and record noncompliance subject to NERC and Regional Entity oversight (as described above).

Similar to the RAI compliance monitoring effort, the enforcement element of RAI seeks to align the ERO's enforcement processing activities with the level of risk the particular activity poses to the reliability of the BPS. Achieving this alignment will promote efficiencies for both the ERO Enterprise and registered entities by eliminating undue regulatory burdens, streamlining documentation and filing requirements, and substantially improving the processing of alleged violations and their companion mitigation plans.

NERC is implementing two enforcement projects in connection with RAI. The first is FFT enhancements to reach the FFT end state described in Section II.C of this report. The second project is the improvement of registered entity self-reporting. NERC expects to achieve the following through the RAI enforcement pilots:

- 1) Develop an ERO user guide for self-reports and mitigation and offer training for its use;
- 2) Identify a point of contact at the Regional Entity level to provide registered entities with guidance and to facilitate centralized information collection;
- 3) Evaluate the ability of selected registered entities to self-assess issues, identify risk, and mitigate issues posing a minimal risk to reliability through the aggregation of minimal risk issues pilot; and

- 4) Develop and implement a triage process, in which the CEA will review noncompliance within 60 days of discovery and determine whether further formal enforcement action is necessary.

Through industry focus groups, NERC is evaluating its experience with self-reporting, as well as the experience of registered entities, in order to develop and address issues within the enforcement process.

4. Compliance Reporting, Analysis and Tracking System

NERC initiated a multi-phase project in 2008 to design and build a system for the collection, management, and exchange of compliance-related information between NERC and the Regional Entity Compliance Enforcement Authorities. The resulting system, which continues to evolve, is the Compliance Reporting, Analysis, and Tracking System (“CRATS”). The web-enabled, custom-developed software interfaces with complementary compliance tools used at the Regional Entities via custom-built web services.

CRATS consists of four modules: (i) Reliability Standards; (ii) Registration; (iii) Technical Feasibility Exceptions (“TFEs”); and (iv) Compliance Violations. The foundational components of CRATS are Registration and Reliability Standards. NERC placed the TFE module into service in June 2010 and the Compliance Violations module in the second quarter of 2012. At this time, Regional Entities are capable of synchronizing data to the NERC system, thereby eliminating the need to report information to NERC through periodic spreadsheet submittals. In the third quarter of 2012, NERC placed the document synchronization feature into production. This feature allows Regional Entities to upload violation documents into a SharePoint-based program. This replaces the previous folder-based data upload process. This enhancement reduces the document-handling burden for NERC. In the third quarter of 2013, NERC and the Regional Entities, working in close

collaboration, developed a set of business rules to implement in CRATS and the compliance databases at each of the Regional Entities to ensure integrity and alignment amongst NERC and Regional Entity data.

As described in further detail below, NERC continues to evaluate current compliance tools with respect to future ERO Enterprise needs for enhancement and efficiencies for data and information exchange. In addition, NERC and the Regional Entities are working together on system changes that will be required to implement RAI concepts.

5. Looking Ahead

a. Develop a Consolidated CMEP Implementation Plan for the ERO

NERC and the Regional Entities no longer create nine separate Implementation Plans and consolidated the documents into a single integrated plan. The consolidated plan uses a streamlined format that eliminates redundant information, improves transparency of CMEP activities, and promotes consistency among the Regional Entities' Implementation Plans. The new format addresses ERO-wide CMEP implementation and contains Regional Entity appendices. This new implementation format is the initial step toward a risk-based approach to compliance monitoring.

During the implementation year, NERC or a Regional Entity may update the Implementation Plan to change the AML, compliance monitoring processes, Regional Entity processes, or to provide updates. When updates occur, NERC will post a revised plan to the company website and issue a compliance communication. A Regional Entity may also update its Implementation Plan, with NERC approval. NERC will be responsible for updating the ERO CMEP Implementation Plan to reflect any Regional Entity's changes and will post the updated plan to the website and issue compliance communications.

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Following each implementation year, Regional Entities will complete a CMEP Implementation Survey due in January of the following implementation year (e.g., 2014 CMEP Implementation Plan survey is due in January 2015). This survey will provide Regional Entity-specific information on compliance monitoring, outreach, enforcement, CMEP program effectiveness, and other regional activities. NERC will use this information to monitor regional CMEP implementation and to plan for the following implementation year.

b. *Increase Oversight of Regional Entities' Processes and Actions*

NERC has obtained from the Regional Entities a month-by-month projection of the disposition of Regional Entity caseload with a discovery date preceding January 1, 2013 as well as any open mitigation items that are associated with noncompliance discovered prior to January 1, 2013. NERC will use this information to monitor the progress of the caseload index for the ERO Enterprise and for each Regional Entity. NERC will also monitor the progress in the average age of violations for the ERO Enterprise and each Regional Entity and the progress of the mitigation-aging curve.

NERC will continue to do the following:

- (i) Monitor the level of self-identification of noncompliance and provide that information to the Regional Entities and the Board of Trustees Compliance Committee regularly;
- (ii) Calculate triage metrics;
- (iii) Develop spot checks of Regional Entities conducted in 2013 to improve the systematic oversight conducted by NERC;
- (iv) Define and communicate to Regional Entities the scope of review noting that NERC oversight covers processes not specified in CMEP (FFT and discretion); and

- (v) Coordinate oversight methodology and schedules with compliance operations to avoid duplication, overlap, and undue burden.

c. Develop Auditor Qualifications

NERC and the Regional Entities will develop ERO auditor qualification requirements and auditor job descriptions across the ERO. Establishing ERO auditor qualifications is part of the ERO Strategic Plan for 2013–2016. NERC and the Regional Entities will establish key attributes and skill sets that audit team members should possess to help ensure that the audit team composition includes competencies needed to complete an effective audit. Common ERO job descriptions promote a consistent approach in attracting and retaining the necessary talent for audits. Common auditor qualification criteria, training, and audit approach help promote high-quality audits and consistency among CMEP implementation activities.

d. Develop a Training Program for Auditors so that the RAI-developed Processes and Procedures are Implemented Consistently across the ERO Enterprise Footprint

As part of its compliance operations function, NERC is responsible for supporting the development of qualified and trained compliance operations and auditing staff at both NERC and the Regional Entities. NERC ensures the proper qualifications of personnel for auditing and other essential compliance roles through training. Once NERC finalizes the RAI Handbook and Audit Checklist to incorporate lessons learned from the pilots, NERC will train auditors to ensure that Regional Entities are consistently applying its procedures and methodologies. Auditor training will also incorporate relevant changes related to enforcement processing, including changes to the self-reporting process and enhancements to the FFT process. Setting clear expectations for registered entities regarding audit practices and procedures should also allow registered entities to increase the efficiency and effectiveness of their pre-audit preparation.

e. Assess the Information System Tools Needed to Support Compliance Activities throughout the ERO Enterprise Including the Existing Compliance, Registration and Tracking Systems and Other Tools used by NERC and the Regional Entities to Support their Compliance Functions

One key RAI activity for 2014 is the assessment and enhancement of the ERO's CRATS and other available information systems and tools that are necessary to support the implementation and management of risk-based compliance monitoring and enforcement activities across NERC and the Regional Entities. The current CRATS software application manages compliance and enforcement information through a combination of the following:

- (i) SharePoint for physical document retention;
- (ii) A violation-tracking database with a translator; and
- (iii) Two different database applications.

As further described below, the capabilities of the current system will not support the compliance and enforcement process improvements contemplated under the ERO Strategic Plan and under RAI. The improvements in the self-reporting process and FFT enhancements will result in changes in compliance and enforcement data, retention requirements and analysis. This, in turn, requires changes to the supporting information systems and database management capabilities within CRATS.

NERC will retain outside consulting resources to support the following undertakings:

- (i) Conduct a comprehensive assessment of the CRATS application and other compliance and enforcement platforms currently in use by the Regional Entities;
- (ii) Identify data and analytic requirements needed to support the risk assessment and processing requirements associated with RAI;

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(iii) Identify how and the extent to which CRATS and any Regional Entity applications can be used and incorporated into the newly developed enforcement processing activities, including contemplated changes in self-reporting and FFT enhancements. These tools must ensure data integrity and accuracy to allow for effective oversight, as well as be flexible enough to accommodate possible segregation of matters not pursued through enforcement and streamlined reporting requirements; and

(iv) Develop recommendations regarding the development of an ERO-wide compliance information management and reporting system, including identification of the best platform to support this system.

f. Continue Implementing RAI

For the RAI compliance track, NERC and the Regional Entities will develop new prototype audit processes by analyzing the results of the 2013 RAI pilots, refine risk assessments in the determination of audit scoping, and design a second wave of pilots to test updated procedures. NERC will incorporate lessons learned from the 2013 RAI pilot programs into registered entities' risk assessments. Additionally, an industry team working with NERC and the Regional Entities will develop guidance documents on internal controls for use by registered entities. As part of the development of these guidance documents, the team will prepare scoping materials to assess and test how a registered entity's internal controls assist it in complying with Reliability Standards.

In addition, NERC will continue to do the following:

- (i) Finalize user guide and multiple region registered entity guidelines;
- (ii) Monitor and provide quarterly report to BOTCC on the percentage of discretion, FFT and SNOP items;

- (iii) Monitor the level of self-identification of noncompliance and provide that information to the Regional Entities and the BOTCC regularly;
- (iv) Provide greater definition regarding the parameters for FFTs of moderate risk issues to increase the utilization of FFT for this category of items to serve as a platform for allowing moderate risk issues to be processed through discretion in the near future; and

Prepare any necessary FERC filings, in conjunction with the Regional Entities, describing the results of the pilots and proposing an approach to implement the aggregation and discretion concepts throughout the ERO Enterprise.

g. Educate Industry about Compliance Requirements, Reduce Unnecessary Compliance Documentation and Support Reliability Standards Development

NERC compliance staff will continue to evaluate the value and effectiveness of compliance documents including the RSAW tool. Compliance tools must provide sufficient information to assist auditors in assessing compliance and promoting dialogue with registered entities so that they understand the audit process.

Compliance staff will supply SDTs with compliance and enforcement information, statistics, and perspectives to help develop Reliability Standards that provide an increased reliability benefit and clarify compliance risks. Compliance staff will continue collaborating with industry and Reliability Standards staff early in the Reliability Standards development process in order to:

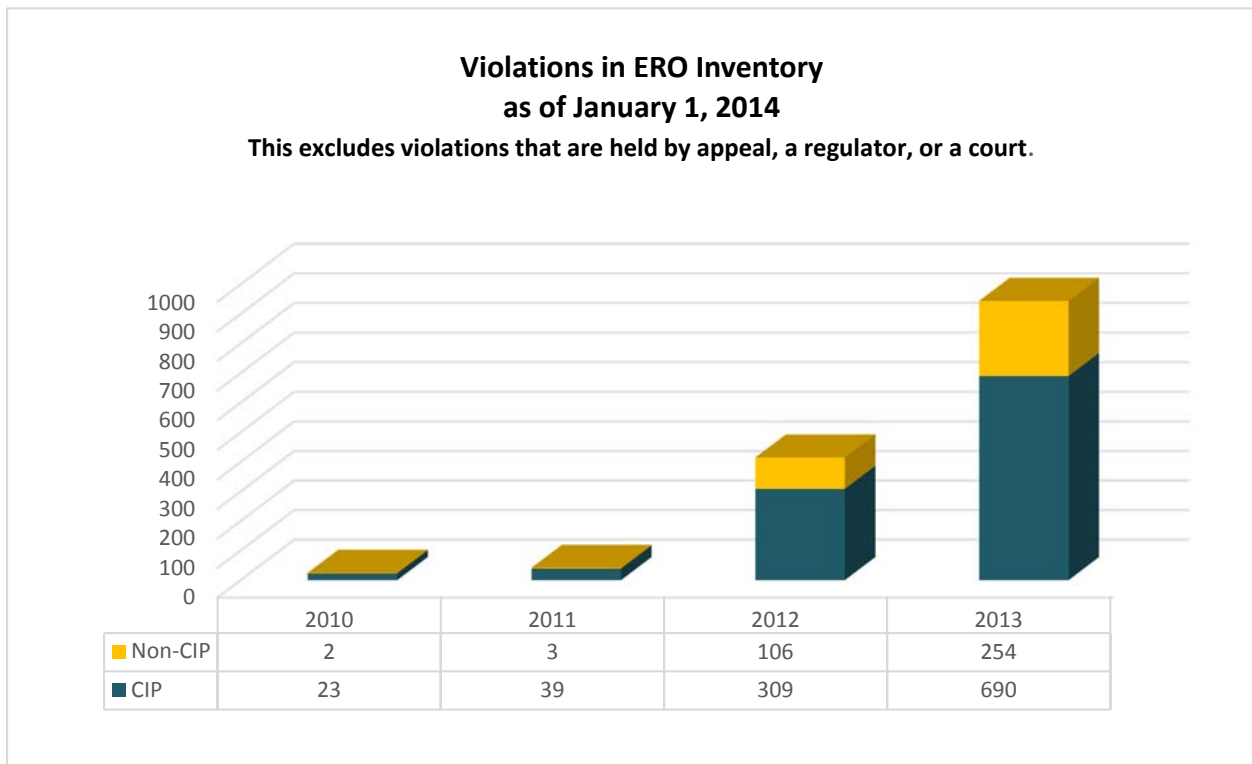
- (i) Understand the intent of Reliability Standards;
- (ii) Provide feedback on the language of the Reliability Standard; and

- (iii) Determine whether to audit a registered entity for compliance with a Reliability Standard as proposed by a SDT.

After the NERC Board approves a Reliability Standard, but before its effective date, NERC will conduct compliance trials to provide auditors and industry with clear expectations of compliance.

h. Reduce Outstanding Caseload and Increase Processing Efficiencies

NERC will continue to identify processing efficiencies to enhance enforcement activities and focus on issues with the greatest impact on the reliability of the BPS. By the end of 2013, NERC reduced the number of active violations discovered prior to January 1, 2012 (those that are not held by appeal, a regulator, or a court) so that only 67 active violations remained.³²

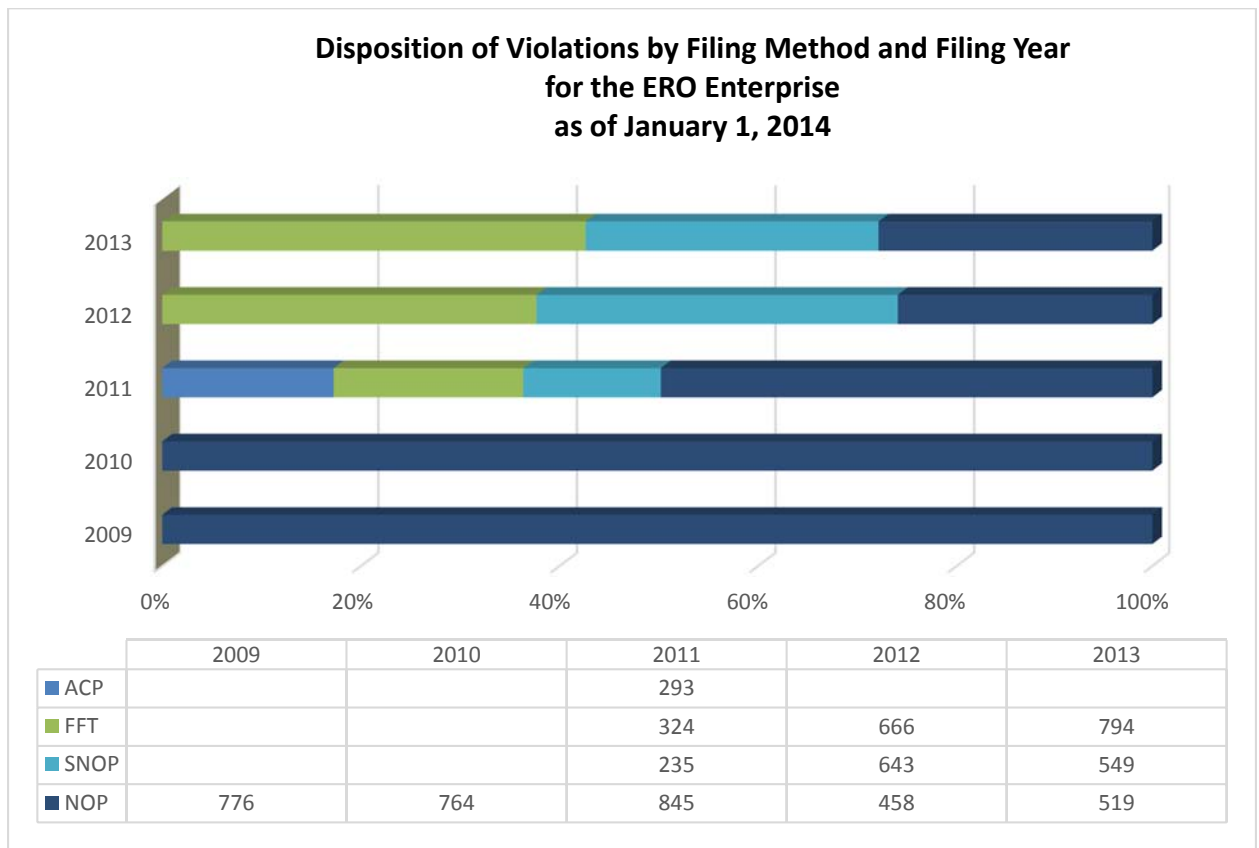


³² This number includes two violations that were pending closure.

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Further, NERC continues to work with the Regional Entities toward reducing the average time to processing. In 2013, NERC reduced the average age of violations in the ERO caseload to 11.2 months as compared to 11.86 months in 2012.

NERC’s successes in improving the efficiency of violation processing can be attributed to several factors, including the implementation and use of streamlined enforcement processing mechanisms, such as FFT and the spreadsheet notice of penalty. As indicated in the chart below, use of streamlined enforcement processing mechanisms has allowed NERC to increase substantially the number of violations filed in a given year, reducing the caseload and in turn, improving processing times.



In 2009 and 2010, NERC filed a combined total of 1,540 violations. In 2011, after implementing the use of streamlined enforcement processing mechanisms, NERC filed a total of 1,697 violations – more than the two previous years combined. In 2012, NERC filed a total of

1,767 violations. In 2013, NERC filed a total of 1,862 violations. Of the violations filed in 2013, NERC processed approximately 43 percent of violations using the FFT mechanism. In the coming years, NERC expects to build on its successes with the FFT program and expand it to the desired end state in which Regional Entities address certain lower-risk violations without triggering an enforcement action.³³

In addition to the use of streamlined enforcement mechanisms, NERC has dedicated substantial resources to improving its enforcement processing activities and performance. In fact, NERC has more than doubled the size of its enforcement processing staff, going from four full time equivalent personnel (FTEs) in 2010 to nine FTEs as of January 1, 2014.

Lastly, NERC has taken several steps to enhance collaboration and consistency across the entire ERO Enterprise. NERC enforcement processing has assigned staff to build relationships with each Regional Entity in order to develop expertise surrounding that Regional Entity and identify areas for collaboration and process enhancement. In addition, NERC is providing training to the Regional Entities with the goal of increasing the consistency of enforcement processes and documents. Through collaboration with the Regional Entities, NERC expects to build on its past successes and continue to work toward reducing aging caseload, reducing enforcement processing times, and ensuring consistency in enforcement processes and procedures.

i. *Continue Analyzing Violations and Violation Processing Information*

The purpose of analyzing violations and violation processing information is to identify trends and emerging risks. This analysis will provide NERC with insight into the effectiveness of NERC and the Regional Entities' processes and programs. The analysis informs the development of enforcement policies and processes and offers feedback for other departments such as standards.

³³ Additional information regarding the FFT program is discussed in Section B.1, above.

NERC's departments collaborate to leverage analytics as a risk management and resource allocation tool.

As an example of this effort, NERC is closely monitoring the status of mitigation activity completion, regardless of whether the violation is held by appeal, a regulator, or a court. NERC aims to work with the Regional Entities to reduce the amount of time from discovery of violation to completion of mitigation activity, thereby reducing the ongoing risk that these violations may pose to reliability.

D. The ERO Appropriately Identifies and Prioritizes Risk.

NERC is an expert resource for industry because it is uniquely positioned to assess potential impacts to reliability and raising awareness of threats to reliability. NERC draws upon a plethora of resources, discussed below, to make its assessments, including the RISC priorities, robust databases of information on transmission, generator and demand-response availability, the NERC State of Reliability report and other assessments and reports, as well as internal core analysis of events. The 2013 Long-Term Reliability Assessment, for example, identifies significant emerging reliability issues that industry will face over the next decade. These challenges stem from, among other things, a changing resource mix comprised of significant increases in variable energy resources to meet renewable portfolio standards, increased reliance on natural gas-fired generation and demand-side management primarily driven by economics, and the retirement of nearly 10% of North America's generation capacity. Another premier resource for identifying and prioritizing risks is NERC's event analysis program. This program establishes a systematic approach to capturing details about all BPS events, from minor Category 0 and 1 events that rarely affect customers, to Category 4 and 5 events that can result in wide area outages. For each event, NERC records rigorous cause-code information to enable analysis of patterns and

trends. Together, these resources provide an independent and complete picture of risks to reliability and key BPS reliability indicators such as resource adequacy, peak demand, energy forecasts and transmission developments. These efforts and well-developed resources are critical to how NERC approaches reliability, learns from events on the system and prioritizes resources.

NERC draws upon these resources to inform industry and policymakers about trends and challenges to reliability. One example is the work of the NERC Integration of Variable Generation Task Force that developed several recommendations that support the reliability considerations for accommodating large amounts of variable generation. These recommendations guided the California Independent System Operator (“CAISO”) in finding solutions to how it will ensure reliability given the large penetration of variable energy resources in that region of the country. Another example is the “Accommodating an Increased Dependence on Natural Gas for Electric Power” report that examined the different risks that can affect reliability. That report also helped CAISO identify approaches to minimize vulnerabilities and areas where coordinated inter-industry efforts could provide enhanced system reliability. The recommendations from this report focused the attention of the Western Interstate Energy Board and the Midcontinent Independent System Operator, Inc., among others.

NERC’s performance analysis, solid technical foundation, sophisticated statistical analyses, and integrated validation with actual system events demonstrate the strengths of the risk-informed approach that NERC promotes as the ERO to enhance BPS reliability.

1. Reliability Risk Management Process

In response to direction from the Board of Trustees, NERC developed a reliability risk management process to create and execute plans for managing reliability risk. This process leverages (i) the business acumen of the RISC; (ii) the technical knowledge of the Operating

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Committee, Planning Committee, and Critical Infrastructure Protection Committee; (iii) the diverse set of tools that can be employed by the ERO to manage risk; and (iv) the open and transparent nature of the ERO. The process is comprised of the following stages:

- 1) Strategic Planning: In this phase, the RISC works to collection information and to identify broad areas of reliability risk they can recommend to the NERC Board for further analysis and study.
- 2) Analysis: In this phase, members of the RISC work with the Technical Committees they represent to identify specific risks within the broad areas accepted by the Board. This phase includes problem definition, gap analysis, and selection of measurement approaches.
- 3) Solution Design: In this phase, members of the RISC develop potential solutions to the problems identified in the previous stage. NERC uses this information to develop the ERO Top Priority Reliability Risks for the upcoming business planning and budget cycle.
- 4) Business Planning and Budgeting: In this phase, NERC staff and the Regional Entities work together to publish and file a business plan and budget that includes a description of the reliability risks that are intended to be addressed in the coming year and the resources needed to support those efforts.
- 5) Preparation: In this phase, stakeholders, staff, and third parties discuss the plans identified in the Business Plan and Budget. At this junction, NERC's committees have an opportunity to align their work plans with the Business Plan and Budget.
- 6) Execution: In this phase, stakeholders, staff, and third parties execute the detailed plans developed in the prior phase.

Specific artifacts and document templates, as well as detailed instructions and training, are being developed to support the execution of this process, such that it will become an integral part of ERO operations.

2. ERO Top Priority Reliability Risks 2014-2017

NERC developed a set of ten, top priority reliability risks for use in the development of the 2014-2017 ERO Enterprise Strategic Plan. Starting with the RISC's gap analyses presented to the Board in August 2013, staff undertook further review and analysis to identify any additional reliability risk areas of strategic importance for the ERO. Next, qualitative estimates of probability, consequence, and current level of risk management were prepared for each of the identified reliability risks within the chosen areas. NERC used this information to identify ten, top priority reliability risks requiring increased attention or additional activity. Following this analysis, recommendations were developed based on previous committee discussions; industry dialogue at the Reliability Leadership Summit; and past committee work products, such as the Long Term Reliability Assessment, the State of Reliability Report, and various special reports and assessments. Below is a list of the ten, high priority reliability risks intended to focus ERO Enterprise program areas, including training and education, Reliability Standards setting, and compliance:

- 1) Changing Resource Mix: As the generation and load on the power system changes (e.g. integrated variable resources, increased dependence on natural gas, increased demand-side management, new technologies deployed), the system is being brought into states that are significantly different than those considered when the system was designed and planned, exposing new vulnerabilities not previously considered. Fundamental operating characteristics and behaviors are no longer a certainty.

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- 2) Resource Planning: Plant retirements (largely due to implemented environmental regulations; increased uncertainty in future resources due to other potential environmental regulations; and lower natural gas prices, which significantly affect power plant economics) are leading to cases where resources may be inadequate to ensure firm demand is served at all times. As the system continues to change, some regional assessments identify concerns with insufficient reserve margins as early as 2014 and 2015 in the ERCOT and Midcontinent ISOs.
- 3) Protection System Reliability: A fault accompanied by a failure of any Protection System component could in some cases result in instability, violation of applicable thermal or voltage ratings, unplanned or uncontrolled loss of demand or curtailment of firm transfers, or cascading outages.
- 4) Uncoordinated Protection Systems: A lack of protection system coordination has the potential to increase the size and magnitude of events due to unnecessary trips. Uncoordinated protection systems were identified as contributing to the September 8, 2011 and August 14, 2003 events.
- 5) Extreme Physical Events: While the probability of physical events (such as physical attack, geomagnetic disturbance, or severe weather) that lead to extensive damage is low, the potential consequences are high enough that risk avoidance (reducing the probability) is insufficient as a sole risk management strategy.
- 6) Availability of Real-Time Tools and Monitoring: Not having the right tools and monitoring available to manage reliability in real time is a latent problem waiting for the right combination of events.

- 7) Protection System Misoperations: NERC's 2012 and 2013 State of Reliability Reports identified protection system misoperations as a significant threat to BPS reliability.
- 8) Cold Weather Preparedness: Lack of generator preparedness for cold weather extremes may result in forced outages, de-ratings, and failures to start. Insufficient availability of intra-regional generation and limits on import transfer capability may result in insufficient generation to serve forecasted load, resulting in load shedding.
- 9) Right-of-Way Clearances: Transmission Owners and applicable Generation Owners may have established incorrect ratings based on design documents, rather than on the actual facilities built. Managing to stay within SOL and IROL limits that are based on incorrect ratings may be inadequate to prevent equipment damage and/or cascading, instability, or separation.
- 10) 345-kV Breaker Failures: NERC has identified a potential trend of 345 kV SF6 puffer type breakers failing. Circuit breaker failures, in conjunction with another fault, may lead to more BES Facilities removed from service than required to clear the original fault.

3. Event Analysis Process

NERC's Event Analysis Subcommittee ("EAS"),³⁴ a cross-functional group of industry experts, developed a voluntary event analysis process that delivers quality, timely and actionable lessons learned to registered entities. The event analysis process begins with a registered entity making an initial assessment of an occurrence and determining if the occurrence falls within one of five qualifying event categories.³⁵ An event category is established by weighing a qualifying

³⁴ The EAS is part of NERC's Operating Committee.

³⁵ A description of each event category is included in the *Electric Reliability Organization Event Analysis Process* Version 2 document. <http://www.nerc.com/pa/rm/ea/Pages/EA-Program.aspx>.

event's level of significance and its impact on the interconnected BPS. After a qualifying event occurs, a Regional Entity holds a planning meeting with all involved parties, including other registered entities. If a qualifying event is categorized as three or higher, the registered entity will prepare an Event Analysis Report ("EAR"). In the EAR, the registered entity describes the sequence of events and identifies causal factors and appropriate corrective actions. The registered entity then submits the EAR to applicable Regional Entities for review and then to NERC. Once the event analysis is complete, NERC shares any lessons learned with industry by publishing it as soon as practical. In collaboration with the ERO, the registered entity drafts the proposed lessons learned from the event and submits them to the applicable Regional Entity.

NERC staff analyzes event reports to identify reliability risks, trends, and potential gaps in Reliability Standards, compliance, and other programs. NERC also reviews the event reports to assign descriptive cause codes to identify trends and corrective actions that will prevent recurrence of similar events. Since its initial implementation in 2010, the process has yielded more than 388 qualified events reported to the ERO and more than 77 lessons learned, including 14 published in 2013.



Event Counts

| Event Category | Count (Total) | Count (2013) | Comments |
|---|---------------|--------------|--|
| CAT 1 | 256 | 91 | |
| CAT 2 | 114 | 33 | |
| CAT 3 | 14 | 6 | |
| CAT 4 | 3 | 0 | SW Winter Weather (2011) SW Blackout (2011) Derecho (2012) |
| CAT 5 | 1 | 0 | Hurricane Sandy (2012) |
| Total CAT 1-5 Events | 388 | 130 | |
| Non-Qualified Occurrences reported | 1711 | 338 | |

RELIABILITY | ACCOUNTABILITY

The voluntary event analysis process does not relieve registered entities of their obligation to comply with NERC Reliability Standards. While performing the steps of the event analysis process, registered entities are encouraged to continue performing critical self-assessment of compliance with Reliability Standards per NERC’s CMEP. They are also encouraged to conduct compliance self-assessments for review by Regional Entities per NERC’s current CMEP Implementation Plan. If a registered entity discovers a possible violation in the process of analyzing an event, it is encouraged to self-report that Possible Violation to the applicable Regional Entity.

NERC is continuously improving how it defines, catalogs and trends the causes of system events. NERC assesses every event submitted through the voluntary event analysis process to identify and share possible risks to reliability with industry. Cause code assignment allows for greater historical trending and predictive analysis. NERC provides Regional Entity and registered

entity staff with cause analysis training. As of December 2012, personnel from all eight Regional Entities and over 500 people from 115 different registered entities have received more than 4,000 hours of cause analysis training, with 432 hours of continuing education hours awarded to 54 NERC-Certified system operators. NERC is adding a training and education component to the event analysis process to increase the relevance and impact of lessons learned for the Regional Entities, industry, and other stakeholders. Through the event analysis process, NERC continues to establish the appropriate balance of data reporting for analysis and use by industry.

4. Data System Enhancements

a. Events Information Data System Tool

NERC and the Regional Entities worked together to develop a new software application called the Events Information Data System (“EIDS”) tool. It is an ERO-wide, robust tool used to collect, analyze, and report on detailed information regarding events that affect the reliability of the BPS in North America. The EIDS tool provides registered entities with a single entry point to provide data in compliance with mandatory requirements as well as in response to the voluntary ERO processes. Having a single tool for data submission eliminates redundant processes and assists with reporting and data reconciliation. NERC also uses the EIDS tool as a platform for registered entity users to submit and track event reports in a single place as well as to receive status updates directly from the ERO.

To support the ERO and industry in performance assessment and risk cluster identifications, the EIDS tool will connect with other ERO reliability data sources (e.g., TADS and GADS). This will enable NERC to determine accurate and complete risk trends and to improve consistency and efficiency of data checking and validation. With an integrated platform that actively shares reliability trends, NERC will gain many insights and analyses. Specifically,

the integrated platform will provide NERC with a foundation to analyze trends and develop recommendations and guidance needed to align reliability objectives and priorities as contemplated by the RISC.

b. Transmission Availability Data System Enhancement

TADS is a data system at NERC designed to record transmission automatic or protection system outages, operational outages and planned outages. NERC uses this data for availability analysis as well as for transmission event analysis. Prior to 2008, no systematic transmission outage data was collected for all of North America. NERC uses TADS to develop automatic outage causes and aids with event analysis, planning, operations, and improved Reliability Standards. Each Regional Entity can use TADS to trend its performance against its own history.

NERC has been working with industry to enhance data collection for TADS since 2008. Beginning in the first quarter of 2013, NERC moved from annual to quarterly collection of TADS data allowing for a more consistent reporting and timely metric trending across all NERC data. On December 19, 2012, NERC's Board approved NERC's ability to issue data requests for BES elements operated at less than 200 kV pursuant to Section 1600 of NERC's Rules of Procedure. BES elements operated between 100 kV and 199 kV make up approximately 47 percent of total BES circuit miles. Studies indicate that 66 percent of protection system misoperations occurred on 100-199 kV BES circuits. Collecting this additional information makes the TADS outage data consistent with misoperations and disturbance event reporting, and provides visibility of the performance of all elements within the revised BES definition.

c. Reliability Assessment Data System

NERC's seasonal and long-term reliability assessments provide an independent view of the reliability for the North American BPS, while identifying trends, emerging issues, and potential

concerns. These assessments also describe seasonal resource adequacy and operating reliability and provide an overview of projected electricity demand growth. NERC incorporates provide data submitted by the Regional Entities into these assessments. NERC uses this data to coordinate forecast reliability data between planning areas, the eight Regional Entities, and governmental organizations. NERC submits this data to the Energy Information Administration on behalf of the industry in an effort to eliminate duplicative reporting.

NERC has been collecting reliability assessment information from the Regional Entities using multiple Microsoft Excel spreadsheets. To improve the process, NERC is developing a flexible, web-based application called Reliability Assessment Data System (“RADS”). RADS is designed to automate the process of collecting and validating data used in the development of the long-term and seasonal (i.e., summer and winter) reliability assessments. Using RADS, NERC can quantify and analyze the reliability of the BPS in a standard, consistent and transparent manner. It also improves the accuracy and completeness of this data, while enabling all users of NERC data, including registered entities, to leverage the data.³⁶ RADS should be available for use in 2015.

5. Southwest Cold Weather Event

In February 2011, a series of rolling blackouts and natural gas curtailments by customers occurred in the Southwest during extreme cold weather. In total, approximately 1.3 million electric customers were out of service at the peak of the event on February 2, 2011. Approximately 4.4 million electric customers were affected over the course of the event from February 2, 2011

³⁶ The use of RADS data across the industry is extensive. The Electricity Supply and Demand Database (ES&D)—which is a product of the reliability assessment process—is downloaded over 300 times each year by various organizations, including Registered Entities, governmental organizations, government labs, academic institutions, and other researchers.

through February 4, 2011. On August 16, 2011, following a six month inquiry, the joint FERC-NERC task force released a report making recommendations to help prevent a similar occurrence. In the report, the task force made a series of recommendations relating to the following five areas: (i) planning and reserves; (ii) coordination with generator owners and operators; (iii) winterization; (iv) communications; and (v) load shedding. Since the event, NERC issued thirteen lessons learned to industry and presented three webinars in 2012 to educate industry.

In December 2012, NERC staff requested that FRCC, SERC, SPP RE, Texas RE, and WECC survey their members on actions taken to address the 26 recommendations from the report. In the surveys, the Regional Entities requested targeted information from generator owners and operators as well as transmission owners and operators. The surveys focused on winter preparedness, process improvements, procedures, and coordination because of the Cold Weather Event and subsequent lessons learned. The task force used industry responses from the surveys to assess the adequacy of registered entities' cold weather preparedness to maintain BPS reliability during the upcoming winter season and to inform NERC's next steps. In February 2013, the NERC Operating Committee drafted and published the *Generating Unit Winter Weather Readiness – Current Industry Practices* reliability guideline³⁷ which outlines the elements of a winter weather preparation procedure.

6. Southwest Blackout Event

On September 8, 2011, an eleven-minute disturbance occurred in the Pacific Southwest that led to cascading outages. Approximately 2.7 million customers had no power due to these outages. The widespread outage was partly initiated by the loss of a single 500 kV transmission

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http://www.nerc.com/comm/OC/Reliability%20Guideline%20DL/Generating_Unit_Winter_Weather_Readiness_final.pdf.

line. On May 1, 2012, NERC and FERC combined their efforts to issue a joint report in which they identified the causes of the various generator failures, gas shortages and rolling blackouts, and made recommendations to help prevent a recurrence of similar events. The report identified 27 recommendations for preventing similar future events in the West.

Since publishing the report, NERC and WECC have been working to address the report findings. There are 51 WECC activities currently underway with defined timelines that reflect a sense of urgency. These various activities will be complete by 2015. In addition to WECC's efforts, the seven other Regional Entities and the NERC Operating and Planning Committees have worked to address the findings and recommendations in the joint report.

Three recommendations that are critical to real-time operations were implemented in the Western interconnection. First, transmission operators now have procedures and training in place to notify reliability coordinators and neighboring transmission operators and balancing authorities promptly after losing Real Time Contingency Analysis capabilities. Second, all transmission operators conduct next day studies and share results with both neighboring transmission operators and reliability coordinators. Third, transmission operators and balancing authorities ensure next-day studies are updated to reflect next-day operating conditions external to their systems. Furthermore, all WECC registered entities have finalized data sharing, non-disclosure and data confidentiality agreements among themselves.³⁸

In the joint report, FERC and NERC underscored weaknesses in two broad areas – operations planning and real-time situational awareness. WECC's organizational structure at the time of the outage created a conflict of interest and highlighted underlying systemic or institutional

³⁸ See

<http://www.wecc.biz/About/sept8/Documents/Progress%20Dashboard%20June%202013.pdf> for up to date information on mitigation tasks and completion information for WECC.

issues with the management of reliable interconnected operations and planning.³⁹ As a result, NERC recommended the following remedial actions:

- 1) Separate governance of functions delegated by NERC from registered entity functions;
- 2) Establish a smaller board for the Regional Entity functions; and
- 3) Ensure that additional roles for the Regional Entity (*i.e.*, Reliability Coordinator) are separated from NERC delegated functions.

Following these recommendations, WECC filed a petition with the Commission that sought approval to establish a separate, independent reliability coordinator Company (“Peak Reliability”) to perform WECC’s Reliability Coordinator function in the Western Interconnection. On June 20, 2013, the Commission conditionally approved the petition. In the Order, the Commission found that Peak Reliability is eligible for Section 215 funding and approved the budgeting processes for Peak Reliability. The Commission rejected arguments that WECC’s collection of assessments on behalf of Peak Reliability and its ability to propose termination of the sub-delegation agreement with Peak Reliability would undermine Peak Reliability’s independence. The Commission has also approved governance documents for Peak Reliability, which include bylaws, a reliability coordinator agreement between WECC and Peak Reliability, and a draft termination agreement between WECC and Northeast Power Coordinating Council, Inc.⁴⁰ The Commission also authorized Peak Reliability to issue billing invoices to fund its fiscal operations.

³⁹ On January 22, 2014, FERC’s Office of Enforcement issued a Staff Notice of Alleged Violations in connection with its non-public, preliminary investigations into the events surrounding the Southwest Blackout Event. In the Notice, staff stated, among other things, that it had preliminarily determined that WECC RC violated FAC-011-2 R3, FAC-014-2 R1, IRO-003-2 R1 and R2, IRO-004-1 R1, and IRO-005-2 R5, R9, R12, and R15.

⁴⁰ *Order on Compliance*, 146 FERC ¶ 61,092 (2014).

7. Key Reliability Reports

In May 2012, NERC released its first *State of Reliability* report assessing grid reliability based on performance trends identified through data and analysis of system disturbance events. The report presented NERC's integrated view of ongoing BPS reliability and performance trends. It assessed 18 reliability performance metrics that measure whether an adequate level of reliability exists in North America. The report also included an analysis from the frequency response initiative, the 2011 demand response availability assessment, event analysis trends, and post-seasonal assessments. In it, NERC made the following key findings:

- 1) Reliability of the BPS remains adequate with little change in trends between 2008 and 2011;
- 2) Frequency response is stable with no deterioration;
- 3) Protection system misoperations are a significant reliability issue;
- 4) Equipment failure warrants further analysis; and
- 5) Resource mix changes necessitate new metrics.

In November 2012, NERC issued its annual 10-year reliability outlook the Long-Term Reliability Assessment that provides an independent view of the reliability of the BPS. This annual report identified trends, emerging issues, and potential concerns. In the report, NERC found that over the next 10 years, the electricity industry faces a number of emerging reliability issues driven by changes in the industry. The changes include a resource mix with more reliance on natural gas-fired generation, a reduction in coal-fired capacity, lower than targeted planning reserve margins in the Electric Reliability Council of Texas assessment area, and significantly larger amounts of variable generation and demand-side management.

NERC issues two seasonal (i.e., summer and winter) assessments every year in which it identifies, assesses, and reports on the industry's preparations to manage potential seasonal issues such as significant generation or transmission constraints or potential fuel-related impacts. NERC also issues other key reports that focus on a technical committee's strategic area of focus such as changing resource mix, misoperations, HILF concerns, and smart grid considerations.

8. Looking Ahead

- a. *Continue to Keep Industry Abreast of System Events, Emerging Trends, Risk Analysis, Lessons Learned and Expected Actions*

NERC is working with the Regional Entities to obtain from and review with the registered entities information regarding qualifying events and disturbances. The primary goal in this process is to identify reliability risks through robust data gathering, validation, rigorous analysis, and rapid dissemination to industry of the risk and remediation options. NERC works collaboratively with the Regional Entities to prioritize analytical efforts based on the event analysis process categories. Determining root and contributing causes for each event allows for trend and risk identification.

NERC will further facilitate event analysis by merging event-driven databases and defining the relationships between various system cause codes (i.e., event analysis, TADS, GADS and relay misoperations). This analysis of system events will inform NERC of any gaps in Reliability Standards, compliance effectiveness, registration and risk controls effectiveness. NERC is collaborating with the North American Transmission Forum and the North American Generator Forum to enhance the event analysis process and Lessons Learned to identify risks to the BPS. NERC will improve timely access to final event reports by creating a secure portal accessible by industry.

- b. Refine Risk-based Methodologies to Support More Effective and Efficient Identification of Reliability Risks, Including the Use of More Sophisticated Cause Codes for Analysis

NERC will continue the work of RISC to develop risk profiles for the ERO, which include HILF issues. These profiles of the BPS will inform how the ERO prioritizes and ranks reliability risks. For high priority risks, NERC will develop project plans and business case assessments outlining initiatives to address those risks. NERC will continue preparing its annual State of Reliability report and the associated reliability metrics.

- c. Create Consistency in Regional Entity Reporting and Analysis to Support Wide Area Assessments of Significant Reliability Trends and Risks
- d. Track Industry Accountability for Critical Reliability Recommendations

E. ERO Enterprise Software Applications and Infrastructure.

NERC is aligning and consolidating ERO Enterprise applications with similar business process and functions across NERC and the Regional Entities. In late 2012, NERC and the Regional Entities collectively formed an ERO Project Management Office (“ERO PMO”) to oversee and manage the implementation of ERO Enterprise Applications. The ERO PMO follows well-established project management methodologies to design, build, and implement programs.

Each proposed ERO Enterprise Application goes through a multi-step process to define the application’s purpose and parameters, obtain executive sponsorship and funding approval, define business and functional requirements, and manage vendor selection. The ERO PMO processes also include well-defined tollgates and status reporting to ensure that a project is meeting objectives during the execution. Each tollgate requires review and approval by the executive sponsor (typically, an ERO executive or executive designee) and a NERC program area officer for

the lead program area. At any point in the tollgate process, the project can be stopped for further review and remediation of issues.

NERC designs each ERO Enterprise application with the Regional Entities to facilitate business intelligence and analytic capability with the appropriate level of security. In addition to providing a more cohesive view of data across applications and databases by NERC and Regional Entity staffs, the new applications will provide access to reporting and analytics. They will be hosted and centrally managed from a dedicated state-of-the-art data center facility. The to-be-determined facility will incorporate all elements of infrastructure support to include system administration functions, help desk support, security, monitoring and back up and recovery capability. Having a centrally-hosted facility creates a single point of accountability, reduces security exposure by leveraging best in class security practices and technology, and standardizes tools and technologies for use by NERC and the Regional Entities.

Two business processes, the BES exceptions process and the event information data system (“EIDS”) analysis, were chosen by NERC and the Regional Entity Management Group as having enough similarities of business process and function to be deemed ERO Enterprise applications. These applications will be used by both NERC and the Regional Entities to eliminate disparate applications across the ERO.

Another new ERO Enterprise application (i.e., reliability assessment database application “RADS”) will replace the reliability assessment database which manually processes data to develop the summer and winter seasonal reliability assessments. This new application will allow Regional Entity staffs to input data into forms that automatically populate a central database for immediate creation of data needed for seasonal assessments. This will significantly reduce person hours, potential for error and labor intensive efforts needed to create these reports.

A centralized compliance application is another new ERO Enterprise application. This centralized compliance application will provide a secure, logically or physically segregated central database for management and reporting, and will reduce the number of system touch points required to synchronize and manage the integrity of multiple databases. This compliance application will foster process efficiency when used by compliance and enforcement staff.

F. The ERO Facilitates Sharing of Information among Industry, Regional Entities, and the Government.

The Electricity Sector Information Sharing and Analysis Center (“ES-ISAC”) has seen a tremendous leap in its user base since its inception in 1998 with more reporting from organizations and more information sharing between members of industry. The ES-ISAC portal is the first and often primary interface with the ES-ISAC. It allows the ES-ISAC to reach thousands of users and hundreds of organizations across industry to discuss and exchange security-related information. ES-ISAC is concentrating its efforts on increasing the user base of this important portal. The success of this effort relies on the value of information available on the portal as well as the timeliness with which information reaches users. To achieve this goal, the ES-ISAC is making portal capability improvements to enhance user experience and to provide a cross-sector information-sharing solution for improved analytic collaboration. The ES-ISAC is also working to expand cybersecurity response capabilities by conducting Cyber Risk Preparedness Assessments and offering training to industry to conduct these assessments themselves.

The ES-ISAC is also collaborating with the Department of Homeland Security, the Department of Energy and the Federal Bureau of Investigations to host a series of briefings focused on tactics and tools of emerging cyber threat actors. In the wake of the April 16, 2013 Metcalf substation incident in California, the ES-ISAC is also collaborating with these agencies and other

organizations and governmental partners to raise awareness of physical attack threats, to increase local, regional and federal security partnerships and to support mitigation efforts. These series kicked off in December 2013 and run through the first quarter of 2014.

1. Electricity Sector Information Sharing and Analysis Center

NERC formed the ES-ISAC to gather information from industry participants about security-related events, disturbances, and off-normal occurrences in the industry. The ES-ISAC shares that information with industry as a whole and with government partners. In turn, the government provides information regarding risks, threats, and warnings to the ES-ISAC. The ES-ISAC adds analytic value to shared information and coordinates with other sectors. It is also responsible for developing industry and government products, including the NERC Crisis Action Plan and the government Incident Responses Analysis.

The ES-ISAC added capabilities to aid in information sharing and incident analysis. The ES-ISAC secure members' portal, which became functional in April 2012, is continuously updated with technical and trend reports, watch lists, advanced sector information sharing tools, and other relevant resources. The portal receives "Indicators of Compromise" from various sources, including U.S. government departments and agencies, and NERC distributes them to sector entities.

The ES-ISAC improved its analytic capabilities by building out its operations room to include data feeds from multiple sources, such as NERC's situation awareness monitoring tool, and procuring services that deliver cyber awareness. As a result, the ES-ISAC is in a unique position to enhance grid- and sector-level resilience by quickly evaluating and addressing potential cybersecurity impacts to BPS operations.

NERC is enhancing the ES-ISAC communication portal. Its current capabilities include publishing alerts and other informational products, exchanging threat indicator information, and providing self-service access to portal users. Upgrades underway will increase flexibility to support additional functionality and capacity using a cloud-based, secure platform solution. The improved portal will facilitate direct data exchange with other ISACs and government partners. The portal will also support ES-ISAC analysts in their information analysis functions and tie the ES-ISAC analysts together with their counterparts in other sectors and national laboratories. Finally, the portal will add private social media information sharing tools, automated access to enhanced cybersecurity information flows, and predictive analytics.

2. Cyber Risk Preparedness Assessments

The Cyber Risk Preparedness Assessment (“CRPA”) program is an ES-ISAC program to assess the cybersecurity capabilities of registered entities through facilitated tabletop exercises. Conducting these assessments allows the ES-ISAC staff to gain a better understanding of industry capabilities, identify key sector level areas for improvement, and share best practices across industry. Through CRPA exercises, participants gain an improved understanding of their cybersecurity programs and capabilities. These exercises also help participants identify areas for improvement and enhance their abilities to respond to and recover from cybersecurity events. The CRPA also educates participants through defined deliverables and best practices. During 2013, the ES-ISAC incorporated elements of the Electricity Sub-Sector Cybersecurity Capability Maturity Model program into the CRPA.

The ES-ISAC has developed a CRPA “kit” for entities to use in developing and running their own CRPAs. This “kit” allows more sector members to leverage the CRPA methodology to enhance preparedness. In February 2013, ES-ISAC staff hosted initial training and education

sessions on the “kit” to accelerate adoption of the methodology across the sector and move the program towards self-sustainment within the industry.

3. NERC Critical Infrastructure Protection Committee

The NERC Critical Infrastructure Protection Committee (“CIPC”) focuses on advancing the physical and cybersecurity of the critical electricity infrastructure of North America. The committee consists of both NERC–appointed regional representatives and technical subject matter experts. CIPC coordinates NERC’s security initiatives and serves as an expert advisory panel to the NERC Board, standing committees in the areas of cybersecurity and physical security, and the ES-ISAC. To address issues related to cybersecurity and physical security, CIPC establishes working groups or task forces made up of subject matter experts who review and examine specific issues and develop reports and recommendations.

In 2012, CIPC reorganized and expanded to allow it to produce more deliverables. This reorganization established new subcommittees and created new task forces and working groups to address emerging issues and initiative requests from the NERC chief executive office and Board. Part of this reorganization included forming task forces to address cybersecurity-related subjects identified in the 2010 *High-Impact, Low-Frequency (“HILF”) Event Risk to the North American Bulk Power System* report. One CIPC task force, the Cyber Attack Task Force (“CATF”), considered the impact of a coordinated cyber-attack on the BPS and developed flexible options for detecting, operating, and recovering from such an attack. A key component of the resulting CATF report was the development and use of an attack tree tool that provided key insight to the attack surface of the interconnected BPS of North America.

Following NERC Board approval of the CATF report, CIPC established a HILF Implementation Task Force to review the recommendations in this and other related reports, and

to determine which recommendations CIPC should address. The HILF Implementation Task Force determined that CIPC should continue its analysis of cyber attack trees and analyze issues relating to information sharing, security clearances, security metrics, and physical security guidelines. CIPC established task forces for all of these issue areas, and most groups have completed their reviews and issued recommendations.

4. Grid Security Conference

In 2011, NERC hosted its first-ever Grid Security Conference (“GridSecCon”) focusing on physical security and cybersecurity issues facing the Electricity Sub-sector. NERC holds the annual conference to achieve the following:

- 1) Build on NERC’s mission to ensure the reliability of the North American BPS through education and training;
- 2) Discuss and provide solutions to emerging industrial control system security issues;
- 3) Deliver expert analysis on social engineering and phishing attacks;
- 4) Focus strategically on public-private partnerships; and
- 5) Provide an update on ES-ISAC activities and issue a call for increased industry participation and communication.

Over 325 industry and government stakeholders attended GridSecCon 2013 from October 15-17, 2013, in Jacksonville, Florida. More than 20 speakers led discussions focused on industry being transformational, strategic, and tactical in its approach to securing systems. Specifically, participants were asked to consider different information sharing techniques; determine if their organizations are resilient through self-assessments; test response activities through exercises; work to ensure that security is built into operations; and enhance the workforce by recruiting,

training, and retaining individuals who can address these and other issues. Additionally, almost 200 stakeholders attended credentialed training sessions in cybersecurity and physical security.

5. Grid Security Exercise

In 2011, NERC hosted the first-ever Grid Security Exercise (“GridEx”) focusing on analyzing industry’s response to a physical and cybersecurity scenario. NERC now holds a biennial distributed play exercise and executive tabletop discussion to achieve the following:

- 1) Exercise the current readiness of the electricity industry to respond to a security incident, incorporating lessons learned;
- 2) Review existing command, control, and communication plans and tools for NERC and its stakeholders;
- 3) Identify potential improvements in cybersecurity and physical security plans, programs, and responder skills; and
- 4) Explore senior leadership policy decisions and triggers in response to a coordinated cyber and physical event of national significance with long-term grid reliability issues.

Over 231 organizations participated in GridEx II, which took place on November 13-14, 2013.

During the exercise, players identified five key lessons learned:

- Information sharing has increased;
- NERC has improved ES-ISAC and BPSA coordination functions;
- Simultaneous cyber and physical attacks pose significant challenges;
- Industry continues to refine and enhance its all-hazard incidence response plans and protocols; and
- Industry and government information sharing stakeholders can better inform incident response through coordination and consolidation of content.

6. Sufficiency Review Program

NERC runs the Sufficiency Review Program (“SRP”), which consists of visits to registered entities to focus on the sufficiency of industry implementation of the CIP Standards. Rather than limiting attention to CIP Version 3 compliance in a retrospective review, an SRP visit helps registered entities address transitioning from CIP Version 3 to CIP Version 4 and CIP Version 5 in a prospective view. While compliance with CIP Version 3 and its risk-based assessment methodology remains mandatory until March 31, 2016, many registered entities are concerned about how to transition their compliance and security efforts to Version 5 to meet the April 1, 2016, compliance deadline. CIP Version 3 has few specific or technical requirements placed on the content of the risk-based assessment methodology, so registered entities are exploring how to best manage the transition process to CIP Version 5 while remaining compliant with CIP Version 3. NERC invites Regional Entity representatives to participate in SRP discussions; however, no content from those discussions may be used during a subsequent audit. NERC staff, Regional Entity representatives, and outside consultants sign non-disclosure agreements to ensure strict confidentiality of all discussions and materials.

7. Looking Ahead

- a. *Provide Rapid Dissemination of Cybersecurity Threat and Vulnerability Information, and Mitigation Strategies to Industry, including Disseminating Information Derived from Classified Sources through ES-ISAC*
- b. *Conduct Security Incident Analysis and Work with Industry Experts to Evaluate, Track, and Identify Lessons Learned and Security Metrics that Enhance the Sector’s Security Posture*

- c. Continue to Conduct CRPA and Sufficiency Reviews and Develop CRPA Tools for Industry to Conduct Self-Assessments
- d. Contribute Technical Expertise to Establish a NERC Enterprise-wide Cause Coding Effort Designed to Inform Sector Risk-based Analytics
- e. Support CIP Reliability Standards Development and Implementation through Outreach Presentations, Webinars, and Other Training Opportunities
- f. Facilitate Access to Secured Briefings through Local Fusion Centers

G. Coordination and Collaboration with Regional Entities and Stakeholders.

1. NERC's Strategic Direction

In its strategic plans, NERC describes its internal planning processes, refines its organizational goals and reliability priorities, and identifies associated deliverables to meet those goals and priorities. Using these goals and priorities, NERC develops projections of anticipated resource requirements and expenditures for every fiscal year as part of its annual Business Plan and Budget filing. Each Regional Entity also develops its own resources projections and budget forecasts for the upcoming fiscal year, which are, incorporated into NERC's Business Plan and Budget filing.

2. Section 215 Criteria

Beginning in August 2011 and continuing into 2012, the Division of Audits ("DA") of FERC's Office of Enforcement conducted a financial performance audit to evaluate NERC's budget formulation, administration, and execution. The DA's Final Audit Report, FERC stated that "NERC did not have written criteria to determine whether activities should be funded under the [FPA] section 215" and that "NERC has not developed any policies, procedures, processes or

practices (*i.e.*, criteria) to guide its staff in the types of activities permissible under section 215.”⁴¹

The Commission further observed that NERC had not established “written criteria to determine whether its activities are statutory” given its “new or expanded programs . . . [to] maintain and improve the reliability and security of the BPS.”⁴² As a result, the Commission directed NERC to develop and file written criteria to determine whether a NERC reliability activity is eligible for FPA section 215 funding.⁴³ The Commission concluded that the criteria should be specific enough so that when they are applied to NERC’s future business plans and budgets, the Commission can ensure that all NERC’s activities funded pursuant to FPA section 215 are statutory.⁴⁴

On April 19, 2013, the Commission approved all major activities that NERC proposed to undertake, with certain modifications, pursuant to FPA section 215.⁴⁵ NERC views these FPA section 215 criteria as a management tool to screen proposed activities in the annual business plan and budget. All major activities that NERC proposes to undertake in its 2014 Business Plan and Budget are within the Section 215 guidelines.

⁴¹ The Final Audit Report was issued by the Office of Enforcement, Division of Audits on May 4, 2012 in

Docket No. FA11-21-000. *Performance Audit of the North American Electric Reliability Corporation for*

Budget Formulation, Administration, and Execution (Final Audit Report).

⁴² Final Audit Report at 77.

⁴³ *Id.*

⁴⁴ *Id.* P 31. The ERO is required to file with the Commission its proposed entire annual budget for statutory and non-statutory activities. 18 C.F.R. §39.4 (2012).

⁴⁵ *Order on Compliance*, 143 FERC ¶ 61,052 (2013).

3. Looking Ahead

- a. Continue to Engage the Support and Expertise of Stakeholders in Prioritizing and Resourcing Reliability Initiatives
- b. Clarify and Refine the Respective Roles and Responsibilities of NERC and the Regional Entities through the Renegotiation of the Regional Delegation Agreements, Emphasizing Collaborative Governance
- c. Implement Employee Climate Surveys and Succession Planning and Promote Favorable Hiring and Retention of Staff
- d. Continue Participating in Trilateral Regulators Meeting (between Canadian Governmental Authorities, FERC and Mexico) to Facilitate Coordination Opportunities with Canadian Entities

III. CONCLUSION

In the short time that NERC has served as the ERO, it has reached an important level of maturity in its path towards better understanding and addressing reliability risks to the BPS. NERC has implemented targeted initiatives that benefit electricity customers through improved BPS performance. These initiatives also allow NERC to measure and be accountable for the effectiveness and value of the investments made by industry on behalf of their customers. NERC is on a path to better understand and communicate reliability risks. Our approach allows us to target results around specific issues that benefit electricity customers through improved BPS performance. It also allows us to measure and be accountable for the effectiveness and value of the investments made by industry on behalf of their customers. NERC is constantly evolving which sharpens our focus on reliability and accountability through risk-based processes. This evolution also encourages us to learn and strengthen the pillars upon NERC's foundation.