UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

PRIORITIES FOR ADDRESSING RISKS TO THE RELIABILITY OF THE BULK-POWER SYSTEM	**)** **)**	**Docket No. AD11-6-000**

COMMENTS OF THE NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION FOLLOWING THE FEBRUARY 8, 2011 TECHNICAL CONFERENCE

Gerald W. Cauley
President and Chief Executive Officer
David N. Cook
Senior Vice President and
General Counsel
North American Electric Reliability
Corporation
116-390 Village Boulevard
Princeton, NJ 08540-5721
(609) 452-8060
(609) 452-9550 – facsimile
david.cook@nerc.net

Rebecca J. Michael
Associate General Counsel
Sonia C. Mendonça
Attorney
North American Electric Reliability
Corporation
1120 G Street, N.W., Suite 990
Washington, D.C. 20005-3801
(202) 393-3998
(202) 393-3955 – facsimile
rebecca.michael@nerc.net
sonia.mendonca@nerc.net

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I. INTRODUCTION

Pursuant to the notice issued on February 17, 2011 in the above docket, the North American Electric Reliability Corporation ("NERC") submits comments concerning the matters discussed in the February 8, 2011 technical conference on Priorities for Addressing Risks to the Reliability of the Bulk-Power System (the "technical conference"). NERC expresses its appreciation to the Federal Energy Regulatory Commission ("FERC" or "Commission") Chairman, each Commissioner and Senior Staff for the serious attention paid to the issue of setting and updating priorities for addressing risks to the reliability of the bulk power system ("BPS") as well as for addressing emerging issues.

NERC also appreciates the Commission's commitment to maintain periodic, face-to-face dialogue involving FERC Commissioners, applicable governmental authorities, NERC officials, and industry and other stakeholders. The technical conference held in this docket is another example of such commitment.

In these comments, NERC reiterates its recommendation that a risk-based analysis be employed to set priorities for addressing BPS reliability risks and for updating such priorities to

accommodate both emerging issues and changing circumstances. NERC also encourages the Commission to consider the ranking of issues discussed during the technical conference and referenced in these comments and requests that the Commission provide clear and specific guidance to allow NERC to focus its efforts in a manner that most efficiently and effectively allows it to perform its mission of developing and enforcing mandatory reliability standards.

II. NOTICES AND COMMUNICATIONS

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

Gerald W. Cauley
President and Chief Executive Officer
David N. Cook*
Senior Vice President and
General Counsel
North American Electric Reliability
Corporation
116-390 Village Boulevard
Princeton, NJ 08540-5721
(609) 452-8060
(609) 452-9550 – facsimile
david.cook@nerc.net

Rebecca J. Michael*
Associate General Counsel
Sonia C. Mendonça
Attorney
North American Electric Reliability
Corporation
1120 G Street, N.W., Suite 990
Washington, D.C. 20005-3801
(202) 393-3998
(202) 393-3955 – facsimile
rebecca.michael@nerc.net
sonia.mendonca@nerc.net

*Persons to be included on the Commission's service list are indicated with an asterisk.

III. COMMENTS

A. Setting Priorities for Addressing Risks to the Reliability of the BPS

1. Introduction

During the technical conference, NERC's president and CEO, Gerry Cauley, and the chairman of the NERC Board of Trustees, John Q. Anderson, discussed the need to focus on high priority issues and how to best determine what such priority issues ought to be. In these

comments, NERC seeks to build upon that discussion and supplement the record with an update on actions it has taken since the technical conference.

NERC has operated for the last four years as the Electric Reliability Organization ("ERO") authorized under the Energy Policy Act of 2005 and certified by the Commission's July 20, 2006 Order.[1] While NERC's initial focus was to build the organization and to ensure that mandatory and enforceable standards were in place, NERC's vision for the bulk power system now focuses on: 1) reliability; 2) accountability; and 3) affordability. NERC's efforts to prioritize issues are intended to allow it to develop this vision.

2. Setting Priorities through a Risk-Based Analysis Requires a Common Understanding of an "Adequate Level of Reliability" as Well as Effective Communication.

Recognizing that NERC's resources, as well as the resources available to the Commission and industry stakeholders are limited, priorities must be driven by a clear understanding of risks, consequences and mitigation. The assessment of such risk includes arriving at a common, shared understanding of what is an "adequate level of reliability," as that term is used in section 215 of the Federal Power Act. As discussed during the technical conference, for several decades, reliability meant preventing cascading failures, preserving the integrity of the grid, avoiding major equipment damage, and providing an adequate bulk power supply. While these topics remain important, the grid is changing, facing more dynamic demands and threats. In order to be adaptive to the changes, priorities need to be identified factoring in risk, consequences, and mitigation efforts. The Commission has, in several instances, raised the notion of continuity of service to customers as an additional factor.[2]

[1] *North American Electric Reliability Corporation*, 116 FERC ¶ 61,062 (2006).
[2] NERC believes that this is an appropriate consideration as long as the Commission continues to distinguish between unintentional load loss caused by grid failures and intentional load shedding used as an essential operational tool.

Because defining an adequate level of reliability is so important to setting priorities, NERC's president and CEO has directed a review of this question. Current project timeline estimates a report on the adequate level of reliability of the BPS to be submitted to the NERC Board of Trustees for approval in 2012.

The discussions on priority-setting and risk-assessment also must include asset owners and operators, as well as policymakers and customers throughout North America. The interconnected grids are international in nature, and must operate to a common set of reliability standards. NERC and the industry will continue to seek guidance from policymakers and stakeholders throughout North America. Consequently, it is important that applicable governmental authorities participate in these discussions. NERC reiterates its willingness to be a resource for those discussions.

3. NERC Has Already Begun to Determine Priorities Through a Risk-Based Analysis.

At the technical conference, NERC's chairman of the board mentioned recent initiatives that exemplify NERC's recommended approach to determining priorities through risk-based analysis. Commission feedback on these initiatives would greatly assist NERC and the industry in continuing to enhance these processes.

(a) Standards Oversight and Technology Committee

In November 2010, the NERC Board of Trustees established a Trustee Standards Oversight and Technology Committee ("SOTC") to provide policy guidance and oversight to the standards process. One of the committee's foremost roles is ensuring priorities are set and adequate resources are directed to high-priority standards projects. The SOTC will work closely with NERC's standards and information technology staff, the Standards Committee, and the

Board of Trustees in order to maintain more oversight over NERC's standard development activities and the NERC standards process. In order to accomplish its objectives, among other things, the SOTC will identify strategic priorities for reliability standards development, and respond to requests for advice and recommendations on the development of reliability standards from the Standards Committee and NERC staff.

(b) Enhancements to the Standard Development Processes and Role of FERC Directives in the Ranking of Issues to be Addressed through the Standard Development Processes.

NERC is also considering how it can further expedite the standard development processes. NERC's goal is to modify the standard development processes to allow rapid development of an initial draft standard by a small professional team with requisite expertise and skills, including legal and compliance staff, followed by subsequent stakeholder consensus review, comment, and balloting. The process will provide early consultation, including with regulatory staff, to determine a clear set of objectives for the standard, thereby facilitating more expedited delivery of proposed standards addressing higher reliability risks to the BPS.

As part of this effort, on February 17, 2011, NERC's Board of Trustees endorsed a standards project prioritization tool developed by the Standards Committee in coordination with NERC staff. As part of the development of the prioritization tool, the NERC Standards Committee solicited feedback from the industry, and refined the prioritization tool based on that feedback. Using the prioritization tool, NERC staff and the NERC Standards Committee developed a revised *Reliability Standards Development Plan: 2011-2013*, which includes a list of the top reliability standards development projects. The top twelve projects were ranked based on factors that included their ability to address significant risk to the reliability of the bulk power system, while taking into account those projects that were specifically directed to be addressed

by FERC. Significantly, the list of the top standards development projects is meant to be dynamic – that is, the ranking of projects is intended to be modified as new risks to the BPS are identified in order to continually ensure that NERC's standards development process is working to protect BPS reliability.

In the immediate future, the NERC standards development process will continue to focus on the highest priority standards projects identified as having the greatest reliability benefit. Projects that are underway, but were not identified as having the highest priority, will shift into an informal development stage. In these cases, drafting teams may function as self-directed teams that will work on the subject matter without formal NERC staff support. In the future, the prioritization tool will continue to be refined and applied to new projects presented to the Standards Committee, and the Standards Committee will look for new ways to make the standard process more efficient, while ensuring industry consensus in support of technically excellent standards.[3]

In the area of reliability standards development, the setting of priorities for NERC also takes into consideration the need to be responsive to regulatory directives, such as those on frequency response, personnel training, planning standard footnote b regarding use of load shedding following a contingency, the definition of bulk electric system, and dozens of other projects. In this regard, NERC encourages the Commission to recognize the weight of such directives, and how each one fits within other priorities to be addressed by NERC. As discussed in the technical conference, NERC encourages the Commission to consider other effective but less formal ways to communicate with NERC on standards issues without issuing formal directives.

[3] The tool is available in its most recent form on NERC's website at http://www.nerc.com/docs/standards/sc/SCEC_021011a_att_2b_Project_Prioritization_Worksheet.xlsm.

4. NERC Has Proposed a List of Priorities for Conventional Risk Issues.

At the technical conference, NERC's president and CEO listed four top reliability priorities related to conventional risk management. This list, in addition to the top priorities outlined on January 7, 2011,[4] focuses work by the ERO in the one to three year horizon on those areas most likely to have a positive impact on the reliability of the BPS. These priorities are:

- Ensuring relay protection systems operate as expected and faults are cleared without unnecessarily tripping other equipment.
- Ensuring field engineers and technicians modify system configuration, including protection and control settings, only after assessment of the consequences and after informing operating personnel when a change in configuration could temporarily set up a common mode failure.
- Ensuring operating personnel use clear, unambiguous communications when issuing directives and communicating other operational information.
- Preventing, non-random equipment outages, such as those caused by vegetation or objects within the safe clearance distance from energized lines, and common mode issues with generation, such as we saw in early February 2011, during the extreme cold weather that occurred in the southwestern U.S.

NERC encourages feedback from the Commission and industry stakeholders on these items. In addition, during the technical conference NERC mentioned the possibility of proposing

[4] The list is consistent with a broader outline of priorities contained in NERC's January 7, 2011 *Top Priority Issues for Bulk Power System Reliability* < http://www.nerc.com/fileUploads/File/News/NERC%20President%20Top%20Priority%20BPS%20Reliability%20Issues%201-7-11.pdf>. The January 7, 2011 list also discusses priority emerging issues that are addressed in section III.B of these comments.

a timeline to address different priorities that the Commission could review and approve. Commission guidance regarding what parameters would likely be acceptable for such a timeline would greatly assist with the process.

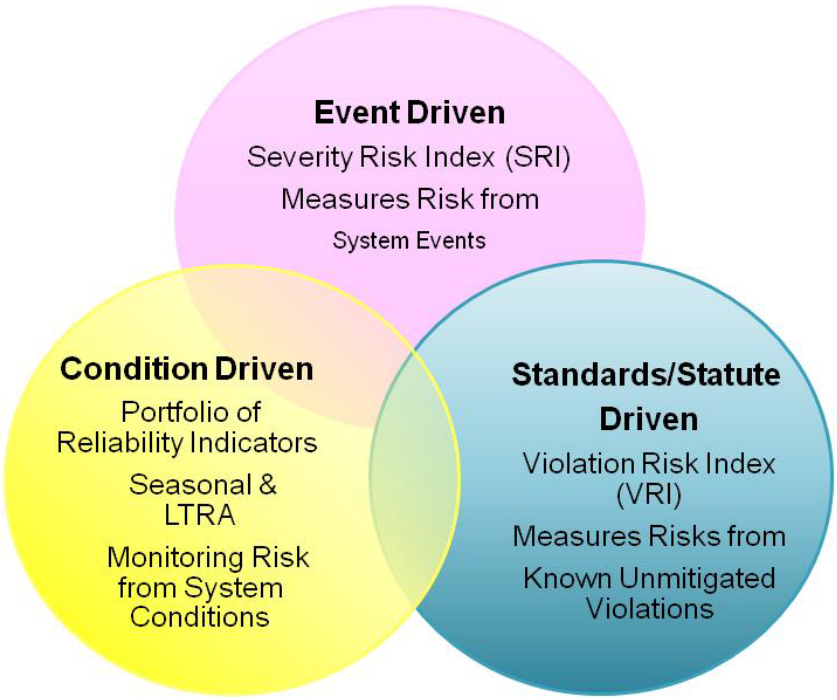
5. Measurement of Reliability Performance Plays an Important Role in Ensuring that Priorities Evolve to Reflect Current Circumstances.

Any list of priorities developed to focus NERC's efforts will not be static. Therefore, the continuous and systematic approach for analyzing risks will be revisited as circumstances evolve. To accomplish this goal, NERC has introduced, among other measures, quantitative measures of reliability performance and root cause analysis. As noted in the technical conference, NERC is beginning to see benefits from its transmission and generation outage databases. It also created a database to monitor the performance of demand-side management programs. Finally, it recently formalized criteria for five event categories and engaged registered entities and regions in conducting cause analysis of reportable events. This data and analysis will provide a basis for prioritizing reliability issues in the future.

Risk assessment is an essential tool for achieving the alignment between organizations, people and technology in quantifying inherent risks, identifying where potential high risks exist, and evaluating where the most significant lowering of risks can be achieved. Being learning organizations, the ERO along with the regional entities and the registered entities can use these tools to focus on the areas of highest risk to reliability and provide a sound basis for developing results-based standards and compliance programs. Risk assessment also serves to engage all stakeholders in a dialogue about specific risk factors, and helps direct a strategic plan for early detection and reduction of risk. NERC is developing methods for measuring integrated system risks, evaluating risk events and complementary initiatives currently under way, such as standard development, root cause analysis, events analysis, metrics and prioritization.

NERC is developing a portfolio of risk information to quantify bulk power system reliability, including condition-driven reliability indicators standards/statute-driven violation risk measures, and event-driven risk indices, illustrated in the figure below. This model attempts to capture the "universe of risk" to the bulk power system for which risk measurement methods are developed.

Conceptual Risk Model for Bulk Power System



The concept and framework being developed provides a basic platform for NERC and stakeholders to make informed decisions, identify trends to lower overall system risk, and communicate the effectiveness of reliability programs.

6. Risk Mitigation and Cost

At the technical conference, several parties were understandably concerned with the relationship between enhancing reliability and cost. NERC realizes that it is important to

achieve reliability risk mitigation in a manner that balances affordability of electricity in a competitive global market with the need to ensure the reliability and security of the North American electricity infrastructure. Priorities must be driven by a clear understanding of risks and consequences, and the costs and benefits associated with addressing them. Historically, the approach for balancing cost and reliability has been set by requiring operation of the grid to an N-1 standard (maintaining all remaining facilities and the system within acceptable thermal, voltage and stability limits) as well as maintaining an electricity supply capability so as to achieve a loss of load expectation of no more than the "once in 10 years." As it was pointed out during the technical conference, some regions and some specific users have stricter reliability requirements, but, in general, this has been the measurement used. Improvements in how NERC measures reliability performance will help provide a greater understanding of the value and benefits that are associated with particular requirements, which will further help the prioritization process. However, NERC believes it would be counterproductive to adopt any requirements that would involve accounting-style project justification.

B. Addressing Emerging Issues

1. Emerging Issues Must Be Well Researched and Understood in Order to Be Addressed.

The challenges regarding emerging issues are different than those that relate to addressing conventional risks to the BPS. With respect to conventional risks, NERC can measure actual reliability performance and identify opportunities to improve. Emerging risks may not be as well understood and need to be well researched and understood in order to be properly addressed.

To accomplish that, each year, the NERC Board of Trustees directs staff to develop a long-term reliability assessment that includes emerging issues. Issues like a changing resource

mix, integration of new technologies, and preparedness for high-impact, low frequency events were identified as part of the 2010 long-term reliability assessment. The Board of Trustees also directs more detailed and specific assessments to be developed for the highest risk issue areas.[5]

Among the high-impact, low frequency threats, the greatest effort is currently being directed to possible events that could debilitate the BPS for extended periods, such as widespread coordinated physical or cyber attacks or geomagnetic disturbances. These issues are discussed in more detail below. The Board of Trustees has approved the *Critical Infrastructure Strategic Roadmap* and the *Critical Infrastructure Strategic Initiatives Coordinated Action Plan*. The Roadmap gives a prioritized framework to develop protective and mitigating solutions that will enhance the resilience of the BPS. The Action Plan details the technical committee actions to address these topics. NERC's technical committees have launched four task forces made up of industry experts to address risks from physical, cyber and geomagnetic events: Geomagnetic Disturbance, Spare Equipment Database, Cyber Attack and Severe Impact Resilience. Further, NERC is continuing discussions with U.S. and Canadian government policymakers, regulators and governmental authorities to build vital bridges and to eliminate potential barriers to respond to high impact, low frequency events. NERC will continue to publish assessments on certain specific emerging issues that could have a high impact on reliability to contribute to the debate by industry and regulators regarding such issues.

[5] *See e.g. High-Impact, Low-Frequency Event Risk to the North American Bulk Power System* < http://www.nerc.com/files/HILF.pdf>.

2. NERC Has Identified Certain High Priority Emerging Issues.

Through the efforts discussed above, NERC has identified certain categories of emerging risks that should be prioritized. These categories were discussed in the technical conference and referenced in the January 7, 2011 paper *Top Priority Issues for Bulk Power System Reliability*.

The emerging risk with the highest priority is coordinated physical and cyber attacks intended to disable elements of the power grid or deny electric service to specific targets, such as government or business centers, military installations, or other infrastructures. These threats differ from conventional risks in that they result from intentional actions by adversaries and are not simply random failures or acts of nature.

It is difficult to address such risks through a traditional regulatory model that relies mainly on mandatory standards, regulations, and directives. The defensive barriers mandated by the reliability standards will make it more difficult for those seeking to cause harm to the grid, frustrating ordinary hackers or copper thieves, but may not be completely effective in stopping the determined efforts of the adaptable adversaries supported by nation states or more sophisticated terrorist organizations.

The most effective approach against such adversaries is to apply resiliency principles to the grid, as outlined in a report by the Department of Homeland Security's National Infrastructure Advisory Council ("NIAC") and delivered to the White House in October 2010.[6] Resiliency requires proactive readiness. It includes: 1) robustness; 2) the ability to minimize consequences in real-time; 3) the ability to restore essential services; and 4) the ability to adapt

[6] NIAC is composed of not more than 30 members, appointed by the President of the United States, who are selected from the private sector, academia, and state and local government, representing senior executive leadership expertise from the critical infrastructure and key resource areas. NERC's president and CEO participated on the NIAC and contributed to this report.

and learn. Examples of the NIAC team's recommendations include: 1) a national response plan that clarifies the roles and responsibilities between industry and government; 2) improved sharing of actionable information by government regarding threats and vulnerabilities; 3) cost recovery for security investments driven by national policy; and 4) a strategy on spare equipment with long lead times, such as electric power transformers. NERC strongly supports these recommendations and continues to incorporate them into ongoing programs including improving information sharing between government and industry and, as noted, forming a task force on spare transformers.

NERC is moving forward with a number of actions to complement mandatory CIP standards and provide enhanced resilience for the grid, including:

- NERC's Board of Trustees approved a new version of NERC's cybersecurity standard, the Critical Cyber Asset Identification (CIP-002-4). The proposed changes provide significant improvements to the existing standard by including a specific list of criteria for entities to identify their critical assets.
- A joint partnership announced on February 1, 2011 with the Department of Energy and National Institute of Standards and Technology to develop comprehensive cyber security risk management guidelines for the entire electric system.
- Alerts issued in 2010 on Aurora mitigation, the Stuxnet malware, and a VPN tunneling vulnerability.
- In 2010, NERC successfully piloted a program to conduct onsite cyber security sufficiency reviews and will continue that program in 2011.

- NERC is developing a North American cyber security exercise to prepare for and test a national response plan.
- NERC is working with the Department of Defense to assess worst-case scenarios and ensure that the essential requirements for National security are being addressed.
- NERC is working with vendors and industry to demonstrate enhanced physical security systems.

A second category of emerging risk that is urgent because of the potential consequences of physically damaging bulk power equipment and controls is that of geomagnetic disturbances caused by solar flares. NERC will convene industry experts at a conference in April 2011 to validate near-term, cost-effective actions that can be taken to better prepare the North American grid for large scale interference with the Earth's magnetic field. NERC will leverage the mitigation strategies completed in Canada and the Northeast to mitigate these risks after the 1989 Quebec disturbance. NERC will issue an industry advisory alert with specific near-term guidance for industry response to geomagnetic disturbances and a timetable for responses.

A third category of emerging risks is the reliable integration of alternative resources, including renewables and demand response, as well as smart grid technologies.

In addition to their societal benefits, these new resources and technologies will alter the operating characteristics of generators and loads, changing how we manage the reliability of the grid. NERC's responsibility is to ensure that the industry is adapting its reliability models and operating protocols to accurately reflect actual characteristics of loads and generators in the new world. We are also responsible for ensuring that essential reliability services, such as

contingency reserves, voltage control and reactive reserves, generator ride-through capability following faults or frequency/voltage excursions, frequency response, and other reliability services remain available and deployable across the grid. NERC views this work as part of its core business over a long period of time. NERC also has been a leader in demonstrating synchrophasor applications for a smarter power grid. Changing resources and technologies do not pose a crisis, but require a coordinated evolution of change.

NERC encourages feedback from the Commission and industry stakeholders on these items.

IV. RECOMMENDATIONS FOR NEXT STEPS

In this proceeding, NERC has outlined what it considers to be the highest priorities both with respect to conventional risk and emerging issues. At this stage, it would request feedback from the Commission and stakeholders on the ranking of issues as well as the proposed methods for establishing and revising priorities. The need to focus efforts in light of limited resources is clear. NERC looks forward to continuing an open and broad dialogue will all interested parties to ensure that the right priorities are established.

Respectfully submitted,

/s/ Rebecca J. Michael

Gerald W. Cauley
President and Chief Executive Officer
David N. Cook
Senior Vice President and
General Counsel
North American Electric Reliability
Corporation
116-390 Village Boulevard
Princeton, NJ 08540-5721
(609) 452-8060
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Washington, D.C. 20005-3801
(202) 393-3998
(202) 393-3955 – facsimile
rebecca.michael@nerc.net
sonia.mendonca@nerc.net

Dated: March 21, 2011

CERTIFICATE OF SERVICE

I hereby certify that I have served a copy of the foregoing document upon all parties listed on the official service list compiled by the Secretary in this proceeding.

Dated at Washington, D.C. this 21st day of March, 2011.

/s/ Sonia C. Mendonça
Sonia C. Mendonça
Attorney for North American Electric Reliability Corporation