UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

Reliability Standards Development and NERC and Regional Entity Enforcement	**)** **)**	**Docket No. AD10-14-000**

COMMENTS OF THE NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION FOLLOWING JULY 6 TECHNICAL CONFERENCE

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I. INTRODUCTION

The North American Electric Reliability Corporation ("NERC") submits these comments following the July 6, 2010 technical conference held in the above-referenced docket. NERC expresses its great appreciation to the Federal Energy Regulatory Commission ("FERC" or "the Commission") Chairman, each Commissioner and Senior Staff for the serious attention paid to reliability issues during the conference. It is clear from the discussion that periodic, face-to-face dialogue between Commissioners, counterpart governmental authorities in Canada, NERC officials, and industry and other stakeholder Chief Executive Officers regarding the state of reliability and reliability oversight implementation will be of immense value as we work together to improve the reliability of the bulk power system of North America.

To that end, NERC has scheduled discussions among NERC stakeholders and NERC Board of Trustees on what the nature, structure and participation in such an ongoing dialogue might be, which are to be held during NERC's Member Representatives Committee and Board of Trustees meetings in Toronto, Ontario on August 4 and 5, 2010.

NERC will share the results of those discussions with the Commission promptly after the conclusion of those meetings.

II. NOTICES AND COMMUNICATIONS

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

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III. BROAD THEMES FROM THE CONFERENCE

A. Conference Participants Expressed Strong Support for the ERO Model in Developing Reliability Standards.

Conference participants uniformly and strongly supported the standard-setting approach of the electric reliability organization ("ERO") model outlined in Section 215 of the Federal Power Act. The ERO model provides the opportunity to engage and draw on the unmatched technical expertise of many hundreds of industry subject matter experts, along with other stakeholders such as large and small customers and governmental authorities with expertise on the "receiving" end of reliability (*i.e.*, those who depend upon and pay for that level of reliability), in developing standards that best serve the reliability of the bulk power system in North America. The ERO model also provides the opportunity for government input at various stages in the development of Reliability Standards as to priorities, technical content, and potential impact on competition.

Reliability does not come without cost and other tradeoffs, and the crucible of the standard-setting process is the place where the reliability goals, the reliability costs, and other

factors in this complicated system can best be evaluated. The use of the collective technical expertise of the industry for decision making, to implement a "do no harm" decision making process, is critical to the successful management of reliability.

The ERO model also provides the opportunity to recognize that the interconnected bulk power system is international in scope. The bulk power systems that span the U.S.-Canada border are very large, very complex machines that must be planned and operated to a common set of standards. Under the ERO model, interests from both countries can come together in a single forum to develop common reliability solutions, which can then be taken back to their respective regulators for the approvals needed to make the standards mandatory and enforceable within their jurisdictions. In 2005, the U.S. Department of Energy and the Canadian Federal/Provincial/Territorial Working Group endorsed principles for an ERO that can function on an international basis. NERC followed those principles in developing its governance structure and standards development procedures.

Finally, the ERO model provides for strong government oversight. No standard can take effect in the U.S. without the approval of the Commission. No enforcement action can take effect without the approval of the Commission. The ERO model offers the best opportunity for the Commission and other governmental authorities to participate in shaping appropriate priorities for future standards development and implementation activity. The ERO model also provides the Commission with independent enforcement authority.

Based on the discussions at the technical conference, the Commission should reconsider its March 18, 2010 order directing NERC to make modifications to the standards setting process the Commission previously approved. Industry leaders expressed their commitment to making the standards process work to develop the Reliability Standards needed to support the reliability

of the bulk power system of North America. The Commission should allow that process to go forward.

B. The Commission Should Reconsider the Manner in which it Uses Section 215 (d)(5) Directives.

No one questions that the Commission has the authority under Section 215 to direct the ERO to develop a Reliability Standard that addresses a specific matter if the Commission considers such a standard appropriate for reliability. NERC believes it would be beneficial if the Commission would reduce the number of directives that it issues and the circumstances under which those directives are issued. A theme running throughout the discussions on July 6th was the need to set priorities for developing standards due to the limited industry technical resources available to faithfully and comprehensively consider proposals. In the words of one speaker, "If everything is a priority, then nothing is a priority." Accordingly, NERC believes the Commission should reserve the use of Section 215(d)(5) directives to circumstances presenting a high priority need for a new or revised standard to preserve or improve reliability. Section 215(d)(5) authority should be reserved to address priority items that the ERO may not already be addressing.

The experience of the past three years has also taught us that the rehearing process is a poor substitute for the dialogue that needs to take place between Commission staff, NERC, and industry stakeholders about the wisdom of and need for particular directives. For some directives, problems can only be identified after significant technical work has been done – that work cannot be completed within a short, 30-day rehearing window. NERC urges the Commission to explore ways of releasing a proposed directive, accompanied by a technical justification for the directive, in a manner that NERC and industry stakeholders can evaluate the directive, consider options, and discuss the matter with Commission staff, before the directive is

issued in a formal order. To the extent those directives can identify the problem to be solved, but be less prescriptive in dictating the manner in which it is solved, NERC believes its stakeholders will be more likely to develop creative solutions that address the Commission's concerns.

NERC recognizes that the Commission and its staff may also have suggestions or observations that would improve a Reliability Standard NERC has filed with the Commission. If those suggestions and observations do not rise to the level of needing to be remedied on a priority basis, NERC urges the Commission to include the suggestions and observations in its Order, but not under the authority of Section 215(d)(5). Those observations and suggestions for improvement could be carried forward to the next time a standard is reviewed. NERC would integrate such proposals within its standards development plan to be prioritized and scheduled.

NERC also recognizes that a substantial number of directives from Order No. 693 and later Commission Orders approving NERC Reliability Standards remain outstanding. The NERC Standards Committee is pursuing strategies with the goal of having all current remaining directives addressed by the end of 2011. Further, the Standards Committee is reviewing its processes to enable the addressing of future directives within one year of their issuance. To this end, the Standards Committee has assembled a "Directive Task Force," made up stakeholders and NERC staff, to analyze all existing directives to determine their relative priority, complexity, and urgency. The task force will develop plans to address each directive based on this analysis. NERC will provide a status report to the Commission by the end of the fourth quarter 2010. Additionally, NERC is working to develop more effective tracking and managing of directives to provide more timely responses in the future.

C. NERC Has Introduced the Concept of Results-Based Reliability Standards.

NERC has refined its approach to developing Reliability Standards, with a goal of improving project prioritization, adherence to project completion schedules, improving clarity of the prioritization process for projects, and improving the technical content of the standards. NERC staff is working with the Standards Committee to implement improvements in the priority of existing and planned standards development projects. In addition, to improve the overall quality of standards, NERC has introduced "results-based" principles into the standards development process. These principles require the standard drafting teams to achieve a portfolio of performance, risk, and competency-based requirements within the set of NERC Reliability Standards that support an effective "defense-in-depth" strategy for ensuring the reliability of the bulk power system. This concept bolsters NERC's capability to provide effective guidance to drafting teams and industry regarding the structure of standards that build on the core entity competencies verified during NERC's registered entity certification processes.

The term "results based" is sometimes confused with the term "performance-based" when combined with the terms "standards" and "requirements". Performance-based standards can have the connotation of measuring only ultimate performance – no oil spills, no mine disasters, no plane crashes, *etc*. The problem with a purely performance-based approach is that if the system fails, the consequences are unacceptable. NERC is not implementing performance-based standards that focus only on ultimate outcomes. NERC is implementing results-based requirements to achieve reliability through one of the following approaches: a) the use of objective metrics to verify that reliable system behavior occurs as expected; b) the mandating of preventative actions that reduce a specified reliability risk; or c) the establishment of minimum competencies and capabilities for entities that operate the system.

Results-based standards identify a clear and measurable expected outcome, such as: a) a stated level of reliability performance; b) a reduction in a specified reliability risk; or c) a necessary competency. These Reliability Standards work collectively in support of NERC's reliability principles to prevent instability, uncontrolled separation and cascading.

Performance based standards are useful in situations where tracking and managing the "results" are the only way to manage, incentivize and correct undesirable outcomes. For the bulk power system, only a small percentage of NERC requirements will be performance-based. Control performance (BAL-001 – Real Power Balancing Control Performance) is a good example of a standard that contains performance-based requirements. The goal of the standard is to maintain frequency within defined limits by balancing real power demand and supply in real-time, and the requirements identify specific actions a Balancing Authority must take to achieve that goal. Following these requirements alone will not result in the goal of maintaining frequency within defined limits. This standard is supported by the Balancing Authority certification process where NERC verifies that prospective Balancing Authorities have the processes, procedures and tools needed to monitor and act to meet the requirements in BAL-001, and is also supported by many other standards.

A majority of NERC's requirements are and will continue to contain risk-based or preventative requirements that, if followed, reduce the risk of cascading failures. For example the requirement to maintain protection systems is one such standard. But the definition of what components constitute a protection system is currently under development as a standard modification, to further refine the application of the requirements. The requirement to operate the system only within known, studied parameters is another such forward looking standard, as is the requirement to promptly return the system to a stable condition following a disturbance. In

the event that a risk condition does occur, NERC restoration related-standards are designed to ensure quick recovery and restoration of essential services.

Another category evident in NERC standards is "competency-based". These standards define appropriate tools, training, communications, and backup facilities required to successfully comply with the standard. The performance-based requirements in the BAL-001 standard are supported by competency-based requirements in standards such as PER-003—Operating Personnel Credentials, where the Balancing Authority is required to staff its real-time operating positions with only certified system operators.

It is most likely that Captain Sullenberger and his copilot Jeff Skiles did not wake up on the morning of January 15, 2009 and think about what each was going to do if their aircraft hit a flock of geese soon after take-off. Their years of training and experience provided them with the skills to snatch success from potential disaster. [1] Similarly, NERC's "competency-based" standards recognize that requiring real-time operating positions be staffed with trained and certified system operators will help to ensure the right skills and expertise necessary to achieve a reliable bulk power system.

Results-based standards do not represent lax rules for industry. NERC is developing a strong portfolio of interdependent and overlapping standards that address performance measurement, risk containment, and competency elements. While the standards cannot guarantee there will never be another blackout, NERC is strategically applying a "defense in depth" strategy that has proven successful in managing risks in many other industries, including nuclear, aerospace, and airline safety.

[1] *See, generally,* Fly By Wire – The Geese, The Glide, The Miracle On The Hudson, by William Langewiesche (Farrar, Strauss and Giroux, 2009).

IV. PARTICULAR ISSUES RAISED DURING CONFERENCE

During the technical conference, several questions were raised that warrant further discussion. In the following sections, NERC provides additional details and further explanation regarding a number of those questions.

A. How should Reliability Standards projects be prioritized?

The need to establish priorities for NERC's standards development projects was a recurrent theme during the technical conference. As of July 22, 2010, NERC has 41 separate standards development projects either active or planned. That is too many projects for NERC, stakeholders, and the Commission to deal with if there are certain of those that need to be completed on a priority basis. From before the time of its certification as the ERO, NERC, working with its Standards Committee, has prepared the *Reliability Standards Development Plan* on an annual basis. The plan provides a schedule of the standards projects to be worked on over the ensuing three years. If the Commission directs NERC to undertake a standards development project, as it did for example with the Available Transfer Capability series of standards, the *Reliability Standards Development Plan* for the following year is modified to include that additional project. Sometimes an existing project will be shifted to begin later than originally proposed to make room for new projects based on Commission directives. NERC files the *Reliability Standards Development Plan* with the Commission and applicable government authorities in Canada on an informational basis. NERC has received no formal written feedback on the contents of any of the annual plans from any applicable government authorities.

The time has come to shift how we think about prioritizing standards projects. NERC, the stakeholders, and the Commission should consider an approach that recognizes stakeholder

resource constraints and establishes a maximum number of projects that can reasonably be in development at any particular point in time.

During their meeting of June 10, 2010, the NERC Standards Committee approved the following list of top priority standards development projects:

- Project 2006-02 Assess Transmission and Future Needs
- Project 2006-06 Reliability Coordination
- Project 2007-01 Underfrequency Load Shedding
- Project 2007-02 Operating Personnel Communications Protocols Project
- 2007-03 Real-time Transmission Operations
- Project 2007-07 Vegetation Management
- Project 2007-09 Generator Verification
- Project 2007-12 Frequency Response
- Project 2007-17 Protection System Maintenance and Testing
- Project 2008-01 Voltage and Reactive Planning and Control
- Project 2008-06 Cyber Security - Order No. 706
- Project 2009-01 Disturbance and Sabotage Reporting
- Project 2009-02: Real-time Reliability Monitoring and Analysis Capabilities
- Project 2009-03 Emergency Operations
- Project 2010-06 Results-based Reliability Standards[2]
- Project 2010-10 FAC Order 729
- Project 2010-11 TPL Table 1 Order

[2] Results-based Reliability Standards is currently in proof-of-concept testing as part of the 2007-07 Vegetation Management standards development project. Results-based Reliability Standards will not, in themselves, lead to a new Reliability Standard, but will be used as a methodology for developing other Reliability Standards.

- Project 2010-13 Relay Loadability Order

The industry, NERC, and governmental authorities collectively need to come to a common understanding of what the standards development priorities need to be. Once that is accomplished, we also need to understand that this will result in some of the lower priority standards development projects being delayed until the higher priority projects are completed.

NERC suggests that the development of the annual *Reliability Standards Development Plan* should be the vehicle for the prioritization effort. Inputs to that plan need to come from the policy makers (industry and stakeholder leaders and Commissioners) as well as from the technical experts. A forum where decisions about the priorities can be made on a collaborative basis should be established. Perhaps that can be the senior-level forum that was discussed at the conference. Perhaps it could be a technical conference on a draft of the annual work plan before it is approved by the NERC board. Perhaps NERC should ask for confirmation from the applicable governmental authorities that those are the right priorities rather than simply filing the *Reliability Standards Development Plan* as an informational item.

B. What is the right amount of reliability? Who gets to decide? Should it be the same for everyone?

During the course of the technical conference, questions were raised about what amount of reliability is the right amount, who gets to decide what is the right amount, and whether it should be the same reliability for everyone. "Adequate level of reliability" is a term directly from section 215 of the Federal Power Act. Section 215(c)(1) states that the electric reliability organization certified by the Commission must have the "ability to develop and enforce, subject to subsection (e)(2), reliability standards that provide for an adequate level of reliability of the bulk power system." The law does not, however, define "adequate level of reliability." The Commission's Order certifying NERC as the ERO directed NERC "to consider and propose

methods for ensuring that Reliability Standards provide for an adequate level of reliability and defining 'an adequate level of reliability'."[3] On May 5, 2008, NERC filed its definition of adequate level of reliability as an information item with the Commission, along with a technical paper supporting the definition. NERC reproduces that definition here and has attached the entire filing, including the technical paper, as **Exhibit A** to this filing.

Characteristics of a System With an Adequate Level of Reliability

1. The System is controlled to stay within acceptable limits during normal conditions.
2. The System performs acceptably after credible Contingencies.
3. The System limits the impact and scope of instability and cascading outages when they occur.
4. The System's Facilities are protected from unacceptable damage by operating them within Facility Ratings.
5. The System's integrity can be restored promptly if it is lost.
6. The System has the ability to supply the aggregate electric power and energy requirements of the electricity consumers at all times, taking into account scheduled and reasonably expected unscheduled outages of system components.

It is not possible to protect against all conditions on the bulk power system that result in loss of customer load, at least not without adding substantially more redundancy to the system, at an enormous cost. (Even if this were done, customers would continue to experience nearly the same frequency, duration, and magnitude of loss of electricity service due to failures in the distribution system.) Note that a number of places in the definition of "adequate level of reliability" call for the exercise of discretion and judgment: "within acceptable limits", "performs acceptably", "unacceptable damage", "restored promptly", and "reasonably expected". These

[3] *North American Electric Reliability Corporation*, "Order Certifying North American Electric Reliability Organization as the Electric Reliability Organization and Requiring Compliance Filing," 116 FERC ¶61,062 at P 240 (July 20, 2006).

are not legal questions or technical questions (at least once one reaches a minimum level needed to maintain an interconnected system). They are policy questions. In the past, utilities have made these judgments in consultation with and with approval from their customers and regulators. Because the systems are interconnected, disturbances on one system can have substantial adverse consequences on other systems. Therefore such judgments about acceptable levels of mutual risk are also made collaboratively among utilities. Some of these judgments are embodied in NERC's Reliability Standards. Others end up in the planning criteria that policymakers authorize regulated utilities to follow.

One very important aspect of an acceptable level of reliability is that utilities, customers and other stakeholders, and regulators have a shared understanding of what that level is. Utilities must know to what level the power systems they build and operate will be expected to perform. Customers must be willing to pay for the level of reliability they demand. Regulators must be willing to allow recovery in rates for the costs of the power systems they and customers expect. The senior level forum discussed at the technical conference could be an excellent forum in which to have such discussions.

C. What is the significance of lost load? What is the difference between outages and cascading outages?

During the course of the technical conference, loss of load was discussed in several different ways. It is important to distinguish the various ways loss of load occurs on the system when analyzing the related policy issues.

The most important loss of load from a reliability perspective is the intentional, controlled load-shedding that is necessary to protect the reliability of the bulk power system. That load-shedding may either be automatic (in the case of pre-planned automated under-frequency or under-voltage load-shedding if system conditions reach a pre-determined trigger

point) or operator-directed or initiated (load shed by the intentional action of a system operator) when that course of action is necessary to preserve the reliability of the bulk power system. It was the failure to manually shed load on a timely basis that led to the widespread blackout of New York City in July 1977. The decision to shed load in the downstate New York area by New York Power Pool operators observing the unfolding situation protected the region beyond New York City from an even wider ranging uncontrolled blackout. The Report on the August 2003 Blackout identified the need to reassure system operators that they would not be held liable if they intentionally shed load when, in their judgment based on the facts before them, it was necessary for the preservation of the wider system. NERC, Regional Entities and industry stakeholders have worked for decades to educate system operators on the importance of shedding load in a timely fashion when that is what is necessary to preserve the reliability of the bulk power system and prevent a widespread, uncontrolled blackout.

A second facet of loss of load involves the question of whether the system should be designed, built and operated so that all firm load is served under all N-1 conditions. This issue is at the heart of the Commission's March 18 Order requiring a modification to Table 1, footnote b of the TPL-002-0 Reliability Standard to comply with the Commission's directive in Order No. 693 regarding the loss of non-consequential load in the event of a single contingency.[4] In its June 11, 2010 order denying rehearing and clarifying the March 18 Order, the Commission provided a clarification that an entity may seek a regional difference to the Reliability Standard from the ERO for case-specific circumstances.[5] The Commission stated that a regional difference, or a case-specific exception process that can be technically justified, to plan for the

[4] *Mandatory Reliability Standards for the Bulk Power System*, "Order Setting Deadline for Compliance" (TPL-002-0 Reliability Standard), 130 FERC¶61,200 (March 18, 2010).
[5] *Mandatory Reliability Standards for the Bulk Power System*, "Order Denying Rehearing and Granting Partial Clarification, Denying Request for Stay, and Granting Extension of Time," 131 FERC ¶61,231 at P21 (June 11, 2010).

loss of firm service "at the fringes of various systems" would be an acceptable approach.[6] With that clarification, NERC believes that the industry and its regulators, through the open dialogue called for in the standards development process, has the best possibility to fashion an appropriate response on this issue. A NERC-sponsored conference on this topic is scheduled to be held on August 10, 2010.

The third manner in which loss of load has been discussed is in the recently issued FERC Penalty Guidelines, where loss of load is used as one element in calculating the penalties for violations of Reliability Standards. NERC and others in the industry are particularly concerned about this third use of loss of load, because the threat of higher penalties for loss of load can undermine the willingness of system operators to shed load when that is the necessary thing to do to protect the reliability of the bulk power system. NERC recognizes that the Commission has said it will not penalize for loss of load in all cases, but only where there has been a violation of a Reliability Standard. But system operators must make decisions in real-time, based on the information then available. Decisions about whether or not a violation has occurred are only made long after the fact, following what may be extensive analysis and investigation. NERC believes it unwise to have the potential for large penalties based on loss of load be a part of the calculus in the real-time world of the control room – that approach could well lead system operators to hesitate when they need to act to avoid larger cascading outages.

Using loss of load to calculate penalties is also not necessary. NERC's approach to setting penalties is to base them on the seriousness of the risk to the bulk power system presented by a particular violation. That is the basis for the Violation Risk Factors identified in the NERC Sanction Guidelines. Those violations that present a high risk of cascading outage in real time

[6] *Id.*

are assigned a "High" Violation Risk Factor. That "High" Violation Risk Factor leads to higher potential penalties in the event of violations.

The goal of the NERC enforcement program is to drive down the number of actions and inactions that we know lead to risk to the bulk power system, at least the ones that are within human control. Whether or not the consequence of risky action or failure to act occurs, it is the occasion of risky action that is penalized, with higher penalties for more violations that pose more risk.

The discussion of loss of load at the conference prompted a question concerning the difference between an outage and a cascading outage. "Outage" is not a defined term and can refer to a piece of equipment being out of service (either on a planned or unplanned basis). It can also refer to the interruption of electric service customers experience when an event happens on the system. Most customer outages occur on the distribution system, not the bulk power system.

A principal focus of NERC's Reliability Standards is on preventing "cascading" outages on the bulk power system. "Cascading" is a defined term in the NERC Glossary of Terms:

> The uncontrolled successive loss of system elements triggered by an incident at any location. Cascading results in widespread electric service interruption that cannot be restrained from sequentially spreading beyond an area predetermined by studies.

The August 2003 blackout in the northeast United States and eastern Canada was a cascading outage, as were the July 1996 and August 1996 events in the Western Interconnection.

The term "cascading" keys directly to the definition of "reliable operation" in Section 215 of the Federal Power Act, which provides:

> The term "reliable operation" means operating the elements of the bulk-power system within equipment and electric system thermal, voltage, and stability limits so that instability, uncontrolled separation, or cascading

failures of such system will not occur as a result of a sudden disturbance, including a cybersecurity incident, or unanticipated failure of system elements.[7]

D. Who makes up the registered ballot body? How many small customers and government agencies are involved in NERC's standards development activity? Who are members of NERC's Standards Committee?

As stated in NERC's written comments filed prior to the technical conference, over 850 entities have enrolled in NERC's registered ballot body. The registered ballot body is divided into ten different segments, based on the type of organization or individual. What follows is a list of the ten segments of the registered ballot body (the numbers in parentheses indicate the number of entities or individuals registered in each segment).

Segment 1. Transmission Owners (156)
Segment 2. Regional Transmission Organizations and Independent System Operators (11)
Segment 3. Load-Serving Entities (191)
Segment 4. Transmission Dependent Utilities (67)
Segment 5. Electric Generators (172)
Segment 6. Electricity Brokers, Aggregators, and Marketers (93)
Segment 7. Large Electricity End Users (26)
Segment 8. Small Electricity Users (101)
Segment 9. Federal, State, and Provincial Regulatory or other Government Entities (32)
Segment 10. Regional Reliability Organizations and Regional Entities (8)

In particular, a question was raised about the make-up of the Small Electricity Users and Federal, State, and Provincial Regulatory or other Government Entities segments. The membership of those two segments is included in **Exhibit B** to this filing. The full listing of the NERC registered ballot body is available at: https://standards.nerc.net/rbb.aspx.

NERC creates a self-selected ballot pool for each standards development project, based on the interests of the entities involved. The average size of the ballot pool for NERC's standards projects is 217 entities.

[7] 16 U.S.C. §824o (a)(4) (2005).

NERC's Standards Committee is responsible for overseeing the standards development process. Two representatives are elected by each of the 10 stakeholder segments, and there is a special provision to ensure that there are at least two representatives from Canada. The current roster of the NERC Standards Committee is as follows:

Segment 1 - Transmission Owners

- Carol A. Sedewitz Director, Transmission Planning, National Grid
- Jason Shaver, Reliability Standards and Performance Manager, American Transmission Company, LLC

Segment 2 - Regional Transmission Organizations and Independent System Operators

- P.S. (Ben) Li, President, Ben Li Associates, Inc., (also representing Canada) vice chair
- Terry Bilke, Director of Standards and Compliance, Midwest ISO, Inc.

Segment 3 - Load-Serving Entities

- Ronald G. Parsons, Manager of Transmission Interconnections and Operations, Alabama Power Company
- Raj Rana, Director - RTO Policy and NERC Compliance, American Electric Power

Segment 4 - Transmission Dependent Utilities

- Allen Mosher, Senior Director of Policy Analysis and Reliability, American Public Power Association, chair
- John D. Martinsen, P.E., Senior Manager, Reliability Compliance and Regional Transmission, Snohomish County PUD No. 1

Segment 5 - Electric Generators

- Thomas J. Bradish, Director of Reliability Standards, RRI
- Michael F. Gildea, Director of NERC Compliance, Dominion Resources Services

Segment 6 - Electricity Brokers, Aggregators, and Marketers

- Alice Murdock, Reliability Standard Analyst, Xcel Energy, Inc.
- Robert S. Walker, Director of Transmission Management, Cargill Power Markets, LLC

Segment 7 - Large Electricity End Users

- John A. Anderson, President & CEO, Electricity Consumers Resource Council
- Frank McElvain, Senior Consulting Manager, Siemens Energy, Inc.

Segment 8 - Small Electricity Users

- Brendan Kirby, Consultant, American Wind Energy Association
- Jim R Stanton, SPS Consulting Group Inc.

Segment 9 - Federal, State, and Provincial Regulatory or other Government Entities

- Diane J. Barney, Planning Engineer, New York State Public Service Commission
- Klaus Lambeck, Chief Facilities, Siting and Environmental Analysis, Public Utilities Commission of Ohio/the Ohio Power Siting Board

Segment 10 - Regional Reliability Organizations and Regional Entities

- Linda Campbell, Vice President and Executive Director, Standards and Compliance, Florida Reliability Coordinating Council
- Steve Rueckert, Director of Standards, Western Electricity Coordinating Council

Canada

- David Kiguel, Manager of Reliability Standards, Hydro One Networks, Inc.

E. What improvements does NERC have planned for its standards development process?

On June 10, 2010, NERC filed with the Commission a series of improvements to NERC's Reliability Standards development process as contained in its Rules of Procedure. During the Technical Conference, a question was asked about the nature of the improvements in the standards development process that NERC expects to come from the changes. A summary of the changes identified in NERC's June 10 filing follows below. To the extent possible within NERC's existing Rules of Procedure, NERC has already begun to implement certain of these items.

(1) Improved control on timing for initiation of new projects by giving the Standards Committee the authority to prioritize standards development activity so that some projects may be deferred to focus on higher priority projects, to require technical justification and documentation when a standard request is submitted, and to evaluate unplanned project proposals to assign an appropriate priority relative to planned project activities.

(2) More efficient processing of new project requests by allowing informal comment periods for project proposals where the need to modify or develop the identified standard(s) has already been established.

(3) More extensive use of "informal" stakeholder feedback by allowing drafting teams to use a variety of means to collect feedback in the early stages of standards development.

(4) Enhanced technical writing support during the drafting of standards to make better use of subject matter experts.

(5) Ensuring a standard meets specific "quality" attributes by adding a step to the process for a formal "quality review" before the final draft of a standard is posted for formal stakeholder review.

(6) Concurrent formal commenting and balloting to involve more participants in determining the final wording of a standard.

(7) New process to expedite development of a new or revised standard where specific time constraints are associated with its completion.

(8) Improved clarity in the description of the processes for developing definitions; conducting field tests and collecting and analyzing data; interpretations; appeals; variances; standards developed to address confidential issues; and process for approving supporting references.

F. Can NERC and the North American Transmission Forum work constructively together to improve reliability?

During the technical conference the question was asked whether NERC and the North American Transmission Forum had duplicative or incompatible roles. NERC responded that it

believed the two organizations were complementary and that each brought value to the process of ensuring the reliability of the bulk power system. NERC and the North American Transmission Forum have recently signed a memorandum of understanding that explains the roles of each organization and describes ways in which their complementary missions will be accomplished. A copy of this memorandum of understanding is attached as **Exhibit C.**

V. RECOMMENDATIONS FOR NEXT STEPS

A. Implement the senior level forum for consideration of policy issues.

As mentioned above, NERC has scheduled discussion of this subject for both its Member Representatives Committee meeting and its Board of Trustees meeting in Toronto, Ontario on August 4 and 5, 2010. At least three different models for the ongoing, high-level dialogue are being considered:

(1) A larger group that is representative of the various stakeholder interests that meet on a periodic basis with NERC leadership and the Commissioners;

(2) A smaller group of a few key leaders that interacts with the Commissioners and NERC leadership on a regular basis;

(3) A technical conference with a format similar to the July 6th conference that would be held periodically (perhaps every 6 months) to discuss significant policy issues related to reliability and to assess the status of the reliability program.

Such a forum could be used to better understand the scope and meaning of reliability (*e.g.*, cascading versus load loss), tradeoffs between reliability and cost to customers, strategic objectives with regard to critical infrastructure security, reliability impacts of new technologies,

and priorities for addressing risks to reliability. The forum could also clarify roles and expectations with regard to establishing Reliability Standards.

NERC will file further suggestions on this matter promptly following the discussions in Toronto.

B. Prioritization of Standards Development Projects

NERC recommends building upon the existing annual process for drafting the *Reliability Standards Development Plan* to establish a more robust means for coming to common agreement on standards development priorities. Applicable governmental authorities should participate in determination of those priorities. As a corollary to establishing priorities, NERC also recommends identifying those projects that will necessarily be deferred to make sure the effort to work on priority items can move forward efficiently. One approach to accomplishing this prioritization would be to hold a technical conference, with participation by applicable governmental authorities from the U.S. and Canada, to discuss a draft of the annual *Reliability Standards Development Plan*. With that input, the final plan submitted to the NERC Board of Trustees for approval would include the views from governmental authorities on the appropriate priorities.

C. The Commission should review its use of its authority under Section 215(d)(5)

As discussed above, the Commission should reserve exercise of its authority to direct NERC to submit a new or modified Reliability Standard to address a specific matter to circumstances where there are serious reliability issues at stake. NERC understands that the Commission and its staff have many suggestions for specific ways in which the Reliability Standards can be improved. NERC does not believe the Commission is restricted to ordering such improvements pursuant to section 215(d)(5). NERC believes it is consistent with the statute

for the Commission to provide those improvements as suggestions for consideration when the standard is next being reviewed in its normal review cycle. Where the Commission does exercise its section 215(d)(5) authority, the Commission should provide a technical explanation for its directive and focus on the reliability intent of the directive rather than proposing a specific method of achieving that reliability intent, so that NERC and its standards drafting teams can understand the nature and basis for the concern that led to the directive. It would also be useful to develop mechanisms for informal discussion of directives, both before and after they are issued in an order.

Respectfully submitted,

/s/ David N. Cook

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David N. Cook
Senior Vice President and
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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 26th day of July, 2010.

/s/ Holly A. Hawkins
Holly A Hawkins
Attorney for North American Electric Reliability Corporation

EXHIBIT A

NERC May 5, 2008 Definition of "Adequate Level of Reliability"

NERC

NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

May 5, 2008

Honorable Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

RE: Definition of "Adequate Level of Reliability"

Dear Secretary Bose:

The North American Electric Reliability Corporation (NERC) submits solely as an informational filing the definition of "adequate level of reliability" that the NERC Board of Trustees approved on February 12, 2008 (Attachment A). NERC also submits a background paper prepared by the NERC Planning and Operating Committees the board considered in the process of approving the definition (Attachment B). NERC is not requesting the Commission to take any action on this definition.

The Commission directed NERC to consider and propose methods for ensuring Reliability Standards provide for an adequate level of reliability and for defining "an adequate level of reliability" in its "Order Certifying North American Electric Reliability Corporation as the Electric Reliability Organization and Ordering Compliance Filing" (July 20, 2006; 116 FERC ¶ 61,062, P 240). This letter explains the status of that effort.

The officers of NERC's Planning and Operating Committees and NERC staff developed a strawman definition of "adequate level of reliability" that NERC posted for industry comment on October 1, 2007. NERC received comments from 44 organizations and individuals during the 30-day comment period. NERC's Member Representatives Committee discussed the definition during its October 22, 2007 meeting. Based upon the comments received, the committee officers and NERC staff revised the definition and submitted it to the Planning and Operating Committees for approval. Those two committees approved the revised definition at their December 12–13, 2007 meetings. Following further discussion at the February 11, 2008 Member Representatives Committee meeting and consideration of a written minority opinion, the NERC Board of Trustees approved the revised definition on February 12, 2008.

NERC expects to include the definition in its three-year reliability standards work plan and use the definition when considering gaps or shortcomings that might exist in the set of currently effective reliability standards. NERC does not expect to use the definition to determine whether an individual reliability standard being developed through the NERC standards development process meets the requirements for reliability standards stated in section 215 of the Federal Power Act and the Commission's regulations and orders. In short, NERC will use the definition as a guide to whether or not the standards, taken as a whole, promote "an adequate level of reliability."

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As directed by the Commission in its January 18, 2007 Order on Compliance Filing (118 FERC ¶ 61,030 (2007), P 16), NERC is also working with industry stakeholders to develop and apply metrics for identifying and tracking key reliability indicators, including general metrics for the characteristics of "adequate level of reliability." This will enable NERC to benchmark reliability performance and measure reliability improvements that result from its other programs.

Sincerely,

David N. Cook
Vice President & General Counsel

NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Attachment A

Characteristics of a System With an Adequate Level of Reliability

1. The System is controlled to stay within acceptable limits during normal conditions.

2. The System performs acceptably after credible Contingencies.

3. The System limits the impact and scope of instability and cascading outages when they occur.

4. The System's Facilities are protected from unacceptable damage by operating them within Facility Ratings.

5. The System's integrity can be restored promptly if it is lost.

6. The System has the ability to supply the aggregate electric power and energy requirements of the electricity consumers at all times, taking into account scheduled and reasonably expected unscheduled outages of system components.

(Note: Capitalized terms are taken from the NERC Glossary of Terms Used in Reliability Standards.)

Approved by NERC Board of Trustees
February 12, 2008

Attachment B

NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Definition of "Adequate Level of Reliability"

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Table of Contents

Preface

In its January 18, 2007 Order on Compliance Filing, the Federal Energy Regulatory Commission directed NERC to file a plan for defining the term "adequate level of reliability."[1] The Commission explained that it intended to use this definition when judging the merits of NERC's Reliability Standards against the requirements of Section 215 (c) of the Federal Power Act. The Act requires Reliability Standards "that provide for an ***adequate level of reliability*** of the ***bulk-power system*** [emphasis added]."[2]

The Commission required NERC's plan to include two broad objectives and address several questions:

- First, the plan needed to develop a definition of adequate level of reliability using a stakeholder process. The Commission asked whether the proposed definition be applied to all Reliability Standards, certain sets of standards, or, in some cases, be tailored for each standard. The Commission also asked NERC to consider opportunities to develop and apply metrics that can form the basis for broadly defining an adequate level of reliability.
- Second, the plan needed to "propose a continuing improvement process to consider 'adequate level of reliability' when developing new or modified Reliability Standards."

In its March 19, 2007 response to the order, NERC explained that it directed its Operating Committee and Planning Committee to develop the definition of adequate level of reliability through a stakeholder process and provide that definition to the NERC Board of Trustees.[3] NERC also explained that it would "integrate the approved definition into its three-year standards work plan and standards development process, as well as its compliance monitoring and enforcement program as appropriate."

This document, prepared by the NERC Operating Committee and Planning Committee, fulfills NERC's commitment to provide a definition of adequate level of reliability to the Board of Trustees.

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[1] *Order on Compliance Filing*, 118 FERC ¶61,030, paragraph 16.

[2] The definition of Bulk-Power System, as it appears in Section 215(a)(1) is: "the facilities and control systems necessary for operating an interconnected electric energy transmission network or any portion thereof; and the electric energy from generation facilities needed to maintain transmission system reliability."

[3] *Compliance Filing of the North American Reliability Corporation in Response to January 18, 2007 Order and March 9, 2007 Order,* March 19, 2007, Docket Nos. RR06-01-003 and RR06-01-005, pp. 4-7.

Introduction

NERC prepared this document to define the term "adequate level of reliability" as requested by the Federal Energy Regulatory Commission. While the definition itself is succinct, the fundamental concepts from which NERC derived the definition are complex and deserve discussion, which we have provided in this document.

The document begins by discussing the term "reliability" that NERC has used since its creation in 1968. It then explains how the Federal Power Act's definition of "reliability" as it pertains to NERC's standards differs from NERC's broader, traditional definition.

The definition of adequate level of reliability follows. Then the document explains the concepts behind each statement in the definition.

Capitalized terms are terms defined in the NERC Glossary of Terms or in Section 215 of the Federal Power Act.

Definition of "Reliability"

NERC's traditional definition of "reliability" was ubiquitous throughout the electric utility industry, and consists of two fundamental concepts—adequacy and operating reliability:

> **Adequacy** is the ability of the electric system to supply the aggregate electric power and energy requirements of the electricity consumers at all times, taking into account scheduled and reasonably expected unscheduled outages of system components.[4]
>
> **Operating reliability**[5] is the ability of the electric system to withstand sudden disturbances such as electric short circuits or unanticipated loss of system components.

The NERC Operating Policies and Planning Standards were based on these concepts, and most of those policies and standards were translated into NERC's Reliability Standards.

We will be using the Section 215 term "Bulk-Power System" instead of the NERC Glossary of Terms definition "Bulk Electric System" because, as cited in the preface, the first expression is specifically used in Section 215(c) in the context of "adequate level of reliability." However, in Order 693 (March 16, 2007), the Commission stated that "for at least an initial period, the Commission will rely on the NERC definition of bulk electric system and NERC's registration process to provide as much certainty as possible regarding the applicability to and the responsibility of specific entities to comply with the Reliability Standards in the start-up phase of a mandatory Reliability Standard regime."

More recently, the term *adequacy* has prompted considerable discussion among NERC members. In Section 215 to the Federal Power Act, NERC and FERC are not authorized "to set and enforce compliance with standards for adequacy … of electric facilities or services."[6] In the U.S., states may set adequacy requirements. On the other hand, the Act requires NERC to *assess* the future adequacy and reliability of the Bulk-Power System.

NERC continues to believe the term *reliability* must include the concept of adequacy. Therefore, our definition addresses adequacy.

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[4] From the May 2007 NERC Glossary of Terms

[5] NERC had used the term "security" until September 2001 when security became synonymous with homeland protection in general and critical infrastructure protection in particular. To remedy the increasing confusion over what we meant by security, NERC replaced that term with "operating reliability." Operating reliability is not a definition in the NERC Glossary of Terms but instead is a reliability concept that predates the ERO.

[6] Section 215(h)(i)(2). The term "adequacy" is not defined in the Section 215. For this reason, we are not capitalizing the term in this document even though it is defined in the NERC Glossary of Terms.

Definition of "Adequate Level of Reliability"

The Bulk-Power System ("System") will achieve an adequate level of reliability when it possesses following characteristics:

1. The System is controlled to stay within acceptable limits during normal conditions;
2. The System performs acceptably after credible Contingencies;
3. The System limits the impact and scope of instability and Cascading Outages when they occur;
4. The System's Facilities are protected from unacceptable damage by operating them within Facility Ratings;
5. The System's integrity can be restored promptly if it is lost; and
6. The System has the ability to supply the aggregate electric power and energy requirements of the electricity consumers at all times, taking into account scheduled and reasonably expected unscheduled outages of system components

General Discussion

The System exhibits an adequate level of reliability when it possesses these six characteristics. Some of the terms such as "acceptable limits" and "acceptable performance" require specificity in order to be applied. These specifics will be included in the Reliability Standards that support each objective. We recognize that NERC's standards cannot require a specific level of adequacy for "electric facilities or services."[7]

Metrics

The definition of adequate level of reliability is broad enough to apply to all possible NERC standards, and therefore it is not based on specific metrics. However, NERC will develop metrics at the System level that will track performance of these characteristics. These System performance metrics will be different from metrics in a standard which are used to determine compliance. System performance metrics will provide feedback for improving the Reliability Standards. They will help identify reliability gaps and point to existing standards that need to be modified or new standards that need to be developed.

Cost effectiveness

The definition of adequate level of reliability does not mention any specific measure of "cost effectiveness" because costs versus benefits, including societal benefits, can only be determined by the individual users, owners, and operators. They will have different perspectives on what is "cost effective" for them, and they will exercise their judgments by participating in the standards

[7] Ibid.

drafting process, and ultimately, when they cast their ballots to approve or reject a standard.[8] A goal of the standards is to achieve an adequate level of reliability across North America. For various reasons, some users, owners or operators may choose to plan and operate their portion of the System to achieve a level of reliability that is above the standards.

[8] In the NERC Rules of Procedure, Section 302 (3) addresses performance requirements for standards and references "costs and benefits." It states: "Each [performance] requirement is not a "lowest common denominator" compromise, but instead achieves an objective that is the best approach for bulk power system reliability, taking account of the costs and benefits of implementing the proposal." These "cost and benefits" are not explicitly developed. Ultimately, the ballot body, which decides on standards, decides on its cost effectiveness.

Technical Discussion

This section explains each characteristic in the definition.

1. The System is controlled to stay within acceptable limits during normal conditions.

Acceptable limits include voltage and frequency limits as well as System Operating Limits. System Operating Limits specify the ranges of line flows, system voltages, and generator loading that must be followed to maintain operating reliability. The system planner must design the System so it can be operated within all limits (voltage, frequency, and System Operating), but the operator must operate within limits in real time that are based upon existing conditions.

2. The System performs acceptably after credible Contingencies.

System planners and operators cannot prevent Contingencies from happening. But they can plan and operate the System so that when credible Contingencies do occur, their effects are manageable, and the consequences are acceptable. In essence, planners and operators design and operate the System to minimize the risk that credible Contingencies (as defined by NERC's standards) will result in unacceptable performance.

Are acts of nature Contingencies? Not per se. They are events that trigger Contingencies. Lightning, a contaminated insulator, a brush fire, or an airplane crash can all trigger a line fault. Depending upon the probability of occurrence, the triggered Contingencies may or may not be classified as "credible."

The generation and transmission systems are finite and limited and always will be. At some point, the failure of a significant number of transmission Elements will cause part of the System to become unstable and lose its integrity[9], regardless of automatic protection systems or system operator actions that attempt to contain the event. Such extreme events are generally not considered credible. While managing (or minimizing) risk is the goal, it is unreasonable to assume that utilities can build or operate the System to eliminate *all* risks. However, by focusing on credible Contingencies, we define the risks we want to manage.

It is also unreasonable to assume that every disturbance, event, or equipment failure will result in unacceptable performance. For example, if we know (not simply assume) the failure of a particular Element (line, breaker, transformer, etc.) has little or no effect on the integrity of the surrounding transmission network and does not impact service (except for service directly associated with the failed Element), then the risk if the Element fails is acceptable. Likewise, the loss of firm load does not always equate to unacceptable performance. At times, operators must shed firm load to maintain the integrity of the System or protect equipment from unacceptable damage. The measures of acceptable performance and categories of credible Contingencies, and

[9] By "integrity," we mean the synchronous connectivity of the generators and network connectivity of the transmission lines.

how they relate to each other, are specified in the Reliability Standards. The standards will define what is "credible" and "acceptable" and what is not.

3. The System limits the impact and scope of instability and Cascading Outages when they occur.

System planners design the System so that events such as transmission line and transformer faults, breaker and switch failures, and generator trips are contained to prevent these events from Cascading and causing the system to lose its integrity. For example, substation circuit breaker configurations are designed to isolate transmission equipment failures so their impact is limited and the failures do not cascade into widespread System failures. Back-up relays are employed to isolate an Element in the event that the primary protection scheme fails. Underfrequency and undervoltage load shedding systems help limit instability and Cascading Outages.

It does not matter whether the triggering event causing instability and Cascading Outages was a credible Contingency (that should have been contained) or an extreme event. We still want to limit its impact and scope.

4. The System's Facilities are protected from unacceptable damage by operating them within Facility Ratings.

Protecting generation and transmission equipment from unacceptable damage may be obvious because NERC establishes standards on operating within Facility Ratings. The definition of adequate level of reliability specifically states this important characteristic because failure to protect equipment could result in unacceptable reliability for weeks or months due to the long-lead time for replacing or repairing equipment.

Not withstanding characteristics 1 and 2, this characteristic is necessary. Extreme events not addressed in other characteristics can destroy or severely damage Facilities unless properly designed and maintained protection and control systems are employed. If necessary, operators must be able to shed firm load to protect Facilities from unacceptable damage.

5. The System's integrity can be restored promptly if it is lost.

The System must be planned and operated so that it can also be restored promptly, whether after a Cascading Outage or widespread damage from natural disasters. System planners must include blackstart and synchronizing facilities in their plans. System operators must have a restoration plan ahead of time, and know from studies, training, on-line tools, and experience the operating limits they need to stay within while restoring the system, and how those limits change through the stages of reestablishing system integrity, and up to normal interconnected operations. During the restoration process, they must protect generation and transmission system equipment from unacceptable damage by operating within Facility Ratings, not jeopardize adjacent parts of the System that are operating normally, and coordinate their restoration efforts with other interconnected entities, including Load-Serving Entities.

6. The System has the ability to supply the aggregate electric power and energy requirements of the electricity consumers at all times, taking into account scheduled and reasonably expected unscheduled outages of system components.

This characteristic implies the concept of "adequacy" as defined in NERC's Glossary of Terms, and includes generation and transmission assets as well as Demand-Side Management. As written, the use of the phrase "at all times" does not imply 100% reliability since it is premised upon "scheduled and ***reasonably expected*** unscheduled outages of system components [emphasis added]." A System that has adequate resources (generation, Demand-Side Management, and transmission) and that also meets the other five characteristics above would have an "adequate level of reliability." NERC is required to assess and report on the adequacy and reliability of the System under Section 215(g).

EXHIBIT B

Small Electricity Users and
Federal, State, and Provincial Regulatory or other Government Entities
NERC Registered Ballot Body Members

Members of Segment 8 – Small Electricity Users

Segment	Company	Balloter
8	Amperion, Inc.	Jeffrey C Vandegrift
8	AREVA T&D	Christian Ziegler
8	Ascendant Energy Services, LLC	Raymond Tran
8	Basler Electric Company	Todd Martin
8	Battelle	David C. Applebaum
8	California Public Utilities Commission	Aaron J. Johnson
8	Cape Power Systems Consulting, LLC	Charles Salamone
8	Corporate Risk Solutions, Inc.	Philip Sobol
8	Electric Power Research Institute	Stephen Lee
8	EMC Corporation	Ernesto J. Anaya
8	Encari	Matthew E. Luallen
8	Energy Engineering and Consulting Services, Inc.	Leslie Roberts
8	Energy Mark, Inc.	Howard F. Illian
8	EnerVision, Inc.	Thomas W Siegrist
8	Eureka Software, Inc.	Tina Ochs
8	GE Energy	Brian Thomas
8	Illinois Citizens Utility Board	Christopher C. Thomas
8	IOS	Arif Cubukcu
8	Iowa Office of Consumer Advocate	Larry Shi
8	JDRJC Associates	Jim D. Cyrulewski
8	Kit Carson Electric Cooperative Inc.	Cecilia Quintana
8	Maryland Office of People's Counsel	William F. Fields
8	Missouri Office of Public Counsel	Ryan Kind
8	Montana Consumer Counsel	Lawrence P Nordell
8	Network & Security Technologies	Nicholas Lauriat
8	North American Electric Reliability Corporation	Shaun Streeter
8	North Carolina Department Of Justice	Leonard Green
8	North Carolina Utilities Commission Public Staff	Jack Floyd
8	Other	Michehl R. Gent
8	Pacific Northwest Generating Cooperative	Margaret Ryan
8	Paliza Consulting, LLC	Roberto Paliza
8	Pennsylvania Office of Consumer Advocate	Sonny Popowsky
8	Phoenix Power Control	James S. Alexander
8	PJM Interconnection, L.L.C.	Yingtao Wang
8	Power Energy Group LLC	Peggy Abbadini
8	Roger M Lohrman	Roger M. Lohrman
8	Schweitzer Engineering Laboratories, Inc.	Joe Mooney
8	Shafer, Kline, & Warren Inc. (SKW)	Michael J Bequette, P.E.
8	Space Time Insight	Trey Beasley
8	Spiegel & McDiarmid	Robert C McDiarmid
8	SPS Consulting Group Inc.	Jim R Stanton
8	State of Maine	Eric Bryant
8	Transmission Strategies, LLC	Bernie M Pasternack
8	TRC	Gary L Beane
8	Utilimap Corporation	Deacon Patient
8	Utility Services, Inc.	Brian Evans-Mongeon
8	Utility System Effeciencies, Inc. (USE)	Robert L Dintelman
8	Verano	Walter Sikora
8	Volkmann Consulting, Inc.	Terry Volkmann

8	Wonderware, a business unit of Invensys	Niels E. Andersen
8		Allan Enrico
8		Brad Hanauer
8		Brandon Walker
8		Brendan Kirby
8		Brian J. Eife
8		David Bishop
8		David Staley
8		Dean Mattson
8		Desaraju Prasd
8		Edward C Stein
8		Elizabeth Salerno
8		Elle Morrison
8		J. Ken Wiley
8		James A Maenner
8		James C Costello
8		James Holler
8		Jessica Lohrman
8		John J. Dorr
8		Kathi Stevenson
8		Kathy Belyeu
8		Kenny L Parrish
8		Kristina M. Loudermilk
8		Lane Robinson
8		Laura Miner
8		Lawrence W. Venner
8		Linda S. Morris
8		Lois Bloom
8		Mark W Monaghan
8		Melody Kirby
8		Merle Ashton
8		Michael C McConnell
8		Michael Goggin
8		Michele A Sullivan
8		Pete Conrad
8		Phillip Clark
8		Ramiro Garza
8		Robert Blohm
8		Robert J. Aylward
8		Roger C Zaklukiewicz
8		Satsuki Sokol
8		Scott Eigenhuis
8		Sowmya Holla
8		Thomas Blais
8		Tingting Wang
8		Vicki Kuo
8		Vijay Sankar
8		Vivianne Moore
8		Wally Vahlstrom
8		Walter S. Zulch
8		William Worrell
8		Zuyi Li

Members of Segment 9 – Federal, State, and Provincial Regulatory or other Government Entities

Segment	Company	Balloter
9	Brownsville Public Utilities Board	Albert Gomez
9	CA Dept. of Water Resources, Division of CERS	Jain Fong
9	California Energy Commission	William Mitchell Chamberlain
9	California Public Utilities Commission	Laurence Chaset
9	Colorado Public Utilities Commission	Jeffrey (Jeff) Hein
9	Commonwealth of Massachusetts Department of Public Utilities	Donald E. Nelson
9	Gainesville Regional Utilities	Gary L Baysinger
9	Indiana Office of Utility Consumer Counselor	Robert Gordon Mork
9	Kentucky Public Service Commission	Jorge Valladares
9	Maine Public Utilities Commission	Jacob A McDermott
9	Maryland Public Service Commission	James Schafer
9	Michigan Public Service Commission	Paul A Proudfoot
9	Minnesota Public Utilities Commission	Ken Wolf
9	National Association of Regulatory Utility Commissioners	Diane J. Barney
9	National Renewable Energy Laboratory	Michael Milligan
9	New York State Department of Public Service	Thomas G Dvorsky
9	North Carolina Utilities Commission	Kimberly J. Jones
9	Nuclear Regulatory Commission	Kenneth A. Miller
9	Oak Ridge National Laboratory	Michael Starke
9	Oregon Public Utility Commission	Jerome Murray
9	Public Service Commission of South Carolina	Philip Riley
9	Public Service Commission of West Virginia	James W. Ellars
9	Public Utilities Board	Robert Adam
9	Public Utilities Commission of Nevada	John E. Candelaria
9	Public Utilities Commission of Ohio	Klaus Lambeck
9	Public Utility Commission of Texas	Mohammed Ally
9	Public Utility District No. 1 of Pend Oreille County	Sandra J Pea
9	Utah Associated Municipal Power Systems	Tom Florence
9	Utah Public Service Commission	Ric Campbell
9	Vermont Public Service Board	William Jordan
9	Washington Utilities & Transportation Commission	Mark Sidran
9	Wyoming Public Service Commission	Steve Oxley

EXHIBIT C

Memorandum of Understanding between the North American Transmission Forum, Inc., and the North American Electric Reliability Corporation

Memorandum of Understanding between the North American Transmission Forum, Inc., and North American Electric Reliability Corporation

1. This Memorandum of Understanding (MOU) is entered into on June 1, 2010, by the North American Transmission Forum, Inc. (“Forum”) and the North American Electric Reliability Corporation (NERC) (hereafter "Party" or "Parties"), and reflects the desire for a continuing and cooperative relationship in the exchange of experience, information, and data related to reliability of the U.S. electric bulk power system.

2. The Forum’s purpose is to improve the reliability of the bulk power system through a forum in which transmission owners and operators can identify and exchange information regarding items including but not limited to best practices for reliable operations, evaluation of performance as compared to such best practices, and the exchange of information related to operating events to improve the provision of energy to the general public. NERC is an international regulatory authority for the reliability of the bulk power system in North America. NERC develops and enforces reliability standards; assesses adequacy annually via a 10-year forecast and winter and summer forecasts; monitors the bulk power system; analyzes bulk power system events for lessons learned; and educates, trains, and certifies electric industry personnel. NERC is subject to oversight by the U.S. Federal Energy Regulatory Commission and governmental authorities in Canada. As such, The Forum and NERC undertake related activities, as defined in the several “Coordination Plans” attached as appendices to this MOU. These plans will help ensure that the goals of both organizations are achieved in the most efficient and effective manner without diminishing or interfering with either the mission of the Forum or the responsibilities and authorities of NERC.

3. This MOU is not intended to be an enforceable agreement or contract on either party, notwithstanding the occasional use of the term "agree" or the use of mandatory language such as "shall" or "will" in either the MOU or its appendices. **Both parties agree that the respective provisions within this MOU may be carried out only within the existing rules, bylaws, policies, and procedures of each party’s organization.**

4. The Forum and NERC agree to consult with each other with regard to the availability of technical information that would be useful in areas of mutual interest, and to promote and encourage a free flow of such information. **However, both parties recognize the need for excluding from this MOU exchange of information that either party considers confidential.**

5. This MOU and its companion appendices complement one another. Appendices are used to delineate detailed and specific areas for coordination and cooperation, which exist between the parties of this MOU and which may be amended from time to time. The appendices are not interpreted as restrictive to only those areas specified in the document, but serve as keystones of the MOU for the exchange of experience, information, and data to support the common goals of both organizations.

6. The Forum and NERC will specify their respective primary contacts, and agree that these contacts will be officers of their organizations.

7. The Forum will provide reports, in person whenever possible, to the NERC Board of Trustees at regular board meetings. NERC will provide an opportunity, whenever possible, on its board meeting agendas for these reports.

Memorandum of Understanding between the
North American Transmission Forum, Inc., and
North American Electric Reliability Corporation

To facilitate coordination and cooperation between the Forum and NERC, the following kinds of information and access will be provided, as appropriate, taking into account confidentiality restrictions:

- Access to conference calls and WebEx's;
- Information on on-going initiatives; and
- Alerts, bulletins, and advisories.

For the North American Transmission Forum	**For the North American Electric Reliability Corporation**
10628DB1EE75424... Donald M. Benjamin DocuSigned By: Donald M. Benjamin	AC1CC030AAF3423... Gerry Cauley DocuSigned By: Gerry Cauley
Name: Donald M. Benjamin	Name: Gerry Cauley
Title: Executive Director	Title: President and CEO
Date: 7/7/2010	Date: 7/20/2010

Appendix 1 – Coordination Plan for Critical Infrastructure Protection

This appendix has been developed under the framework of the Memorandum of Understanding (MOU) between the North American Transmission Forum, Inc. (Forum) and the North American Electric Reliability Corporation (NERC) dated July 7, 2010. The appendix will be implemented consistent with the terms and conditions of the MOU.

1. This appendix describes how the Forum and NERC will communicate and share information pertaining to physical and cyber security.
2. NERC, in its capacity as the Electricity Sector Coordinator and the operator of the Information Sharing and Analysis Center (ESISAC), has established a "Network Hydra" for seeking industry expertise when developing NERC Security Alerts, and for other purposes as needs arise. The Forum maintains a Security Practices Group comprising experts in physical and cyber security from the Forum's members who are willing to assist NERC in developing Security Alerts, and receiving timely information on physical and cyber security events from the ES-ISAC.
3. To accomplish these related objectives, NERC will:
    a. Provide the Forum staff with access to the NERC Secure Notification System
    b. Provide Hydra WebEx and conference call announcements to the Forum
        i Via the Forum staff or
        ii Via the Forum's e-mail list server in those cases when the Forum staff may be unavailable
    c. Conduct Internet meetings and conference calls with the Forum's Security Practices Group
    d. Provide Forum staff access to the final Security Alerts so that the Forum staff can post these Alerts on its private, secure password protected Web site
    e. Keep all Forum information confidential, including all e-mail lists and rosters of Forum participants.
4. Furthermore, the Forum will:
    a. Provide the Forum's Security Practices Group as subject matter experts to NERC.
    b. Forward all NERC Alert WebEx and conference call announcements to the Forum's Security Practices Group
    c. Provide NERC with a current roster of the Forum's Security Practices Group members
    d. Maintain all NERC Alerts and ES-ISAC information on the Forum's password-protected Web portal pages that are secured with Secure Socket Layer protection.
        i The Web pages will clearly display document restrictions, NERC Alert restrictions, and For Official Use Only procedures.

ii The Forum staff will not send as e-mail attachments any sensitive information, such as NERC alerts or any document marked FOUO. These will only be posted on the Forum's private Web portal with e-mails to announce availability for download.

For the North American Transmission Forum	For the North American Electric Reliability Corporation
10628DB1EE75424... Donald M. Benjamin DocuSigned By: Donald M. Benjamin	AC1CC030AAF3423... Gerry Cauley DocuSigned By: Gerry Cauley
Name: Donald M. Benjamin	Name: Gerry Cauley
Title: Executive Director	Title: President and CEO
Date: 7/7/2010	Date: 7/20/2010