UNITED STATES OF AMERICA
BEFORE THE
U.S. DEPARTMENT OF ENERGY

COMMENTS OF THE NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION IN RESPONSE TO DEPARTMENT OF ENERGY 2009 NATIONAL ELECTRIC TRANSMISSION CONGESTION STUDY

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I. INTRODUCTION

The North American Electric Reliability Corporation ("NERC") is pleased to provide these comments in response to the Department of Energy ("DOE") *2009 National Electric Transmission Congestion Study* ("DOE Study").[1] NERC has been certified by the Federal Energy Regulatory Commission ("FERC" or the "Commission") as the "electric reliability organization" ("ERO") under Section 215 of the Federal Power Act[2] and is similarly recognized by applicable governmental authorities in Canada. NERC's mission is to ensure the reliability of the bulk power system in North America by, in part, developing and enforcing mandatory Reliability Standards.

II. NOTICES AND COMMUNICATIONS

Notices and communications with respect to these comments may be addressed to the following:

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[1] *National Electric Transmission Congestion Study*, December 2009, U.S. Department of Energy ("DOE Report").
[2] *See North American Electric Reliability Corporation*, "Order Certifying North American Electric Reliability Corporation as the Electric Reliability Organization and Ordering Compliance Filing." 116 FERC ¶ 61,062 (July 20, 2006).

III. BACKGROUND

The DOE recently released the DOE Study dated December 2009 on April 26, 2010,[3] in accordance with its obligation under the Energy Policy Act of 2005 to conduct a study every three years on electric transmission congestion and constraints within the Eastern and Western Interconnections.[4] The DOE Study identifies areas that are transmission-constrained, but does not make recommendations concerning existing or new National Corridor designations.[5] While the focus of the DOE Study is on electricity congestion and transmission constraints that are occurring across the eastern and western portions of the United States bulk power system, the DOE Study also examines significant potential sources of renewable energy that are constrained in accessing appropriate market areas by lack of adequate transmission capacity, and explains why adequate transmission capacity has not been developed.[6]

The DOE requested comments on the report within sixty (60) days of publication in the *Federal Register*, or by June 29, 2010. NERC, as the ERO for North America whose mission is to ensure the reliability of the bulk power system, herein focuses its comments on reliability-related issues addressed in the report.

IV. DISCUSSION

A. The DOE Study Should Separate Congestion from Reliability

In a number of sections of the DOE Study, reliability is mentioned in the context of congestion. For example, the report states that "[t]he term 'transmission constraint' can refer to

[3] http://congestion09.anl.gov/documents/docs/Congestion_Study_2009.pdf.
[4] DOE Study at Executive Summary, p. vii.
[5] Based on the DOE Study and comments concerning it from states and other stakeholders, the Secretary of Energy may designate any geographic area experiencing electric transmission capacity constraints or congestion as a national interest electric transmission corridor ("National Corridor").
[6] DOE Study at Executive Summary, p. vii.

a piece of equipment that restricts power flows, to an operational limit imposed to protect *reliability*, or to a lack of adequate transmission capacity to deliver potential sources of generation without violating *reliability* requirements."[7] However, nowhere in the DOE's Study is "reliability" defined. Additionally, discussions of bulk power system operational congestion, generally an economic issue, should be separated from reliability, commonly not an economic issue.

For example, the DOE Study explains that "the need for project interconnection and the lack of adequate transmission capacity are frequently a major obstacle to the development of large scale renewable energy projects."[8] While there may not be enough transmission to accommodate all desired transmission flows as indicated by requests for service, this condition does not imply that existing transmission will not be operated reliably.

NERC's traditional definition of "reliability" is 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.[9]
>
> **Operating reliability** is the ability of the electric system to withstand sudden disturbances such as electric short circuits or unanticipated loss of system components.[10]

These concepts are based upon the original NERC Operating Policies and Planning Standards, and have been translated into the current NERC Reliability Standards. The bulk power system

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[7] DOE Study at Executive Summary, p. vii; (*emphasis added*).
[8] DOE Study at p. 14.
[9] NERC's Glossary of Terms at http://www.nerc.com/docs/standards/rs/Glossary_of_Terms_2010April20.pdf , April 2010.
[10] NERC 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, NERC replaced the term "security" with "operating reliability." "Operating reliability" is not a defined term in the NERC Glossary of Terms, but is a reliability concept that predates the ERO.

will achieve an adequate level of reliability ("ALR") when it possesses the following characteristics:[11]

1. *The bulk power system is controlled to stay within acceptable limits during normal conditions;*
2. *The bulk power system performs acceptably after credible Contingencies;*
3. *The bulk power system limits the impact and scope of instability and cascading outages s when they occur;*
4. *The bulk power system's Facilities are protected from unacceptable damage by operating them within Facility Ratings;*
5. *The bulk power system's integrity can be restored promptly if it is lost; and*
6. *The bulk power 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.*

Accordingly, NERC recommends that the DOE Study not define bulk power system reliability in the context of congestion. Because congestion generally is an economic issue, the discussion of system congestion should be separated from bulk power system reliability.

B. The DOE Study Identifies the Need for Transmission to Support Variable Energy Resource Integration

Chapter Three of the DOE Study – Renewable Energy Development and Transmission Availability discusses the need for additional transmission to support the development of variable energy resources. The report states that "the need for project interconnection and the lack of adequate transmission capacity are frequently a major obstacle to the development of large scale renewable energy projects," and that "[w]hile some progress has been made, much more work is needed to address the challenges to new transmission projects to support a build-out of renewable energy."[12]

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[11] See NERC's document, entitled, " *Definition of Adequate Level of Reliability*," available at http://www.nerc.com/files/Adequate_Level_of_Reliability_Defintion_05052008.pdf. http://www.nerc.com/files/Adequate_Level_of_Reliability_Defintion_05052008.pdf

[12] DOE Study at p. 14.

While NERC does not dispute the DOE's findings in the study, NERC submits that the study does not mention other necessary changes that are required to successfully integrate variable energy resources into the bulk power system. A number of other requirements are needed to support variable resource integration, for example:

- The integration of high levels of variable resources, like wind, not only requires transmission to deliver energy, but also to provide access to, and provision of ancillary services necessary to manage power output variability. This could be further addressed by structural/organizational changes, such as balancing area size considerations, and shortened dispatch schedule intervals.

- Sufficient system flexibility must be available to deal with increased variability. This can come in many forms, including quick-start generation, generation that can quickly change output, energy storage, and demand response. System planning, design and operation will need to include measurement and provision of this flexibility.

- Better forecasting of fuel sources (such as wind and solar) to address energy resource uncertainty, supporting balancing of demand and generation, which is necessary for reliable bulk power system operations.

- Acquisition and replacement frequency and inertial response capability, either through interconnection agreements or through other mechanisms that ensure sufficient frequency and inertial response capability exists when variable resources are generating electricity.

Although transmission expansion, along with the aforementioned system characteristics, may be necessary for variable energy resource growth, NERC's Reliability Standards have been developed to ensure the reliability of the bulk power system. Reliability will continue to be maintained through the efforts of the industry to improve standards and the enforcement of NERC's mandatory Reliability Standards on users, owners and operators of the bulk power system. As variable energy resources are interconnected, any associated operational issues must be addressed and bulk power system reliability must be maintained.

C. The 2006 National Electric Transmission Congestion Study Report Expressed Concern That Sufficient Transmission Construction to Site New Nuclear Power Plants Might Not Be Built. The 2009 DOE Report Recognizes This Transmission is Expected to be Constructed.

The 2006 report[13] suggested that transmission might limit the ability of industry to integrate the next generation of nuclear facilities. The current report recognizes that sufficient transmission will be built and will not present a barrier to the construction of these facilities. NERC Reliability Standards require that reliability be maintained at all times with every addition, retirement, and change to the bulk power system, including the interconnection of new generation. Therefore the transmission construction associated with new nuclear plants will be designed to integrate the output of these plants into the power systems while meeting NERC Reliability Standards and maintaining the reliability of the bulk power system.

[13] http://nietc.anl.gov/documents/docs/Congestion_Study_2006-9MB.pdf.

V. CONCLUSION

For the reasons stated above, NERC respectfully requests DOE's consideration of the comments submitted above, and looks forward to working with DOE in the finalization of its study.

Respectfully submitted,

/s/ Holly A. Hawkins

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