

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

Interconnection for Wind Energy
and Other Alternative Technologies

Docket No. RM05-4-000

COMMENTS OF THE
NORTH AMERICAN ELECTRIC RELIABILITY COUNCIL

The North American Electric Reliability Council, a New Jersey nonprofit corporation (“NERC”)¹, is pleased to provide these comments in response to the issues and questions raised in the Commission’s January 24, 2005 Notice of Proposed Rulemaking, Interconnection for Wind Energy and Other Alternative Technologies. NERC supports the Commission’s initiatives to ensure that wind generation plays an appropriate role in the Nation’s mix of generation resources. NERC believes that significant amounts of wind generation can reliably be added to the bulk electric system, so long as all those involved in the planning and operation of these wind plants (generator owners, generator operators, transmission owners, transmission planners and transmission operators) adhere to established reliability standards.

¹ NERC was formed after the Northeast blackout in 1965 to promote the reliability of the interconnected electric systems in North America. Its mission is to ensure that the bulk electric systems that serve North America are adequate, reliable, and secure. It works with all segments of the electric industry as well as customers to “keep the lights on” by developing and encouraging compliance with rules for the reliable operation and adequacy of supply of these systems. NERC comprises ten regional reliability councils that account for virtually all the electricity supplied in the United States, Canada, and a portion of Baja California Norte, Mexico.

NERC's comments address several technical questions² raised in the NOPR:

1. Low Voltage Ride Through Standard
2. Supervisory Control and Data Acquisition ("SCADA") Capability
3. Power Factor Design Criteria (Reactive Power)
4. Other Generating Technologies

As a general matter, NERC believes that standards for the reliable planning and operation of bulk electric system facilities should be contained in the standards set by NERC and the regional reliability councils. Such standards may then be incorporated by reference into various agreements as appropriate. The Commission has already followed that approach in the pro forma Large Generator Interconnection Agreement adopted in Order No. 2003, by including provisions requiring the Parties to abide by Good Utility Practice. The Commission recently concluded that the term Good Utility Practice includes compliance with NERC's new reliability standards.³

1. Low Voltage Ride Through Standard

The NOPR would require wind generator plants to have the low voltage ride through capabilities described in Figure 1 of the proposed Appendix G of the Interconnection Requirements for Wind Generators. NERC agrees with a requirement that wind generator plants have the ability to remain interconnected during low-voltage transients, but NERC does not agree that Figure 1 properly states the requirement.

NERC Reliability Standard TPL-002-0, System Performance Following Loss of a Single BES [Bulk Electric System] Element, requires the planning authority and the

² NERC is not providing comments on the questions related to requiring the transmission provider to participate in updating the models for assessing the interconnection impacts and the wind plant's self-study of the feasibility of an interconnection.

³ Supplement to Policy Statement on Matters Relating to Bulk Power System Reliability, Docket No. PL04-5-001, issued February 9, 2005.

transmission planner to ensure that the bulk electric system will remain stable with thermal and voltage limits within applicable ratings, and with no loss of demand or curtailed firm transfers, for a normally cleared fault on a single element (an interval of several cycles). If a fault occurs on a transmission line near a wind plant, the voltage measured at that point could drop instantaneously to 0 for the short interval required to clear the fault. Figure 1 would permit a wind generator to trip offline if voltage drops below 15% of nominal voltage. Unless the wind plant stays on line through a normally cleared fault, its capacity will be lost to the system, in effect creating a double contingency (loss of the line and loss of the plant) and a violation of TPL-002-0.

Including Figure 1 in the Commission's regulations has other disadvantages. NERC understands that the intent of Figure 1 is to have a reasonable requirement for system reliability and also meet the physical capabilities of existing generation technology. But wind technology is advancing rapidly. If Figure 1 is included in the Commission's rule, it is likely to be static over time and may limit technological development. Figure 1 also may not be appropriate for every application of wind generation at every wind plant location, because reliability needs may require different engineering or operating procedures over the North American electric system. Protection schemes especially must be coordinated across regional areas.

For these reasons, NERC does not believe that Figure 1 should be part of Appendix G. Instead, it should be replaced with a requirement that wind plants directly connected to the bulk transmission system meet the requirements of NERC and regional council reliability standards.

2. Supervisory Control and Data Acquisition (“SCADA”) Capability

The NOPR would require the transmission provider⁴ and the wind generator owner to determine the SCADA requirements for each interconnection of a wind generator to the transmission system. SCADA capability is necessary to facilitate the required exchange of data and control between the wind generation plant and the transmission provider. SCADA also provides critical information that the balancing authority needs to minimize the balancing area’s area control error and that the transmission operator needs to maintain transmission voltage within acceptable limits. NERC agrees with the requirement that the wind generator owner provide SCADA information to the transmission provider. The requirement should be extended to include the balancing authority as well. The specific SCADA requirements should be established between the wind generator owner and the transmission provider and the balancing authority, which would make it unnecessary to establish a minimum SCADA requirement for Appendix G.

3. Power Factor Design Criteria (Reactive Power)

The NOPR would require a wind generator (1) to maintain a power factor range from 0.95 lagging to 0.95 leading, measured at the high voltage side of the substation transformer, and (2) to have sufficient dynamic reactive support to interconnect to the transmission system, based on the results of the System Impact Study. NERC agrees with the requirement that a wind generator plant be able to operate at a power factor range between 0.95 lagging and 0.95 leading, measured at the high side of the step-up

⁴ NERC considers the FERC-defined Transmission Provider as the combination of the transmission operator, transmission owner, and the transmission service provider, or tariff administrator.

transformer. This requirement is consistent with NERC guidelines for synchronous generators and the requirements the Commission has already adopted in Order No. 2003 for large generators. The wind generator plant should also maintain the voltage schedule requirements of the transmission system operator. The wind generation plant should have adequate dynamic reactive capability to respond dynamically to transient voltages on the transmission system.

The transmission provider's decision to waive dynamic support requirements can be viewed as a commercial decision between the transmission provider and the wind generator owner, and NERC has no comment on this issue. However, that transmission provider, in conjunction with the transmission owner, continues to be responsible for ensuring that the dynamic reactive support requirements of the transmission system are provided to meet NERC and regional council reliability standards.

4. Other Generating Technologies

The NOPR asks if there are other generation technologies that should comply with the provisions of the proposed Appendix G. NERC believes that the proposed Appendix G, with the recommendations NERC has provided in this document, could be appropriate for any generation device other than a synchronous generator. However, NERC will reserve judgment on this question, preferring to review the other generation technologies as they develop before providing a definitive answer.

Conclusion

NERC is dedicated to improving the reliability and security of the bulk power system and looks forward to working with FERC and electric industry stakeholders in the

development of appropriate interconnection requirements for groupings of wind generators.

Respectfully submitted,

NORTH AMERICAN
ELECTRIC RELIABILITY COUNCIL

By:

A handwritten signature in black ink, appearing to read "D. N. Cook". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

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