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 National Rural Electric Cooperative Association and the American Public Power Association On the Commission's Notice of Proposed Rulemaking on Interconnection for Wind Energy and Other Alternative Technologies

The National Rural Electric Cooperative Association ("NRECA") and the American Public Power Association ("APPA") are largely pleased with the Commission's proposed Appendix G, but comment here in an effort to address certain important shortcomings in the proposal.

As strong proponents of wind energy, NRECA and APPA are pleased that the Commission has issued a proposed rule that should help the wind industry transform wind generation from a niche technology to a mainstream resource. Certainly, wind continues to have some unique technical characteristics, and NRECA and APPA support limited modifications to the interconnection standards to accommodate those characteristics. At the same time, NRECA and APPA believe that it is in the interest of reliability, consumers, and wholesale markets for the Commission to ensure that wind generating plants maintain certain minimum performance standards.

NRECA's Interest

NRECA is the not-for-profit national service organization representing 930 not-for-profit customer-owned rural electric cooperatives that serve load located in 47 states. NRECA's members serve more than 36 million end use customers in 2,500 of

the nation's 3,128 counties. Kilowatt-hour sales by rural electric cooperatives account for approximately ten percent of total retail electricity sales in the United States.

A cooperative's principle mission is to provide its consumer-owners with safe, reliable, and affordable electric energy. Cooperatives believe that wind energy and other alternative generation options can play an important role in that mission. More than 15 cooperatives are deeply involved in wind projects, and several cooperatives, including Basin Electric Power Cooperative, Great River Energy, and Dairyland Power Cooperative have been on the forefront of the industry installing or contracting for renewable energy resources for their consumers. Nationwide, nearly 300 electric cooperatives offer their consumers a green power option.

At the national level, NRECA and its research arm, the Cooperative Research Network ("CRN"), are investigating ways that wind can be integrated effectively with electric cooperative systems.

For all of these reasons, NRECA's members have a significant interest in the rules governing interconnection of wind generation to the grid and in achieving a balanced outcome that enables the development of wind resources without threatening safety, reliability or power quality on their systems and without shifting costs or risks to other consumers.

APPA's Interest

APPA is the national service organization representing the interests of not-for-profit, publicly owned electric utilities throughout the United States. More than 2,000 public power systems provide over 16 percent of all kilowatt-hour ("kWh") sales to

ultimate customers in the United States. Approximately 1,840 of these systems are cities and municipal governments that currently own and control the day-to-day operation of their electric utility systems. Public power systems own about 10 percent of the nation's electric generating capacity, but purchase nearly 70 percent of the power used to serve their ultimate consumers.

All APPA members are Load-Serving Entities ("LSEs"), with the primary goal of providing customers in the communities they serve with reliable electric power and energy at the lowest reasonable cost, consistent with good environmental stewardship. This orientation aligns the interests of APPA-member electric utilities with the long-term interests of the residents and businesses in their communities. APPA members are located throughout the United States, in every state except Hawaii. Many public power systems are located in regions with significant wind generation potential, particularly in the western United States and in the Great Plains.

APPA's utility membership has been strongly supportive of the development of renewable resources, including wind generation. Environmental stewardship is important to public power systems. They have stepped up to this obligation in part through the development and purchase of wind generation as a significant element of their generation resource portfolios. Twenty-eight different public power systems own their own wind generation facilities (totaling approximately 114 megawatts ("MW") as of December 31, 2003)[1] and many other public power systems purchase wind energy owned by joint action agencies, investor owned utilities, or non-utility generators.

[1] Energy Information Administration ("EIA"), Form EIA-860, as of December 31, 2003 (available at: www.eia.doe.gov). Data are the latest available.

APPA and its members, working through the Association's research program, Demonstration of Energy-Efficient Developments ("DEED"), have attempted to foster advances in research and technology to make the use of wind generation more cost-effective and feasible, especially for smaller utilities. The program has helped to fund and promote numerous projects related to wind energy through grants, scholarships, and information dissemination. DEED produced its first wind-related research report in 1981.[2] APPA continues to support wind energy projects through DEED. Currently, DEED is providing funding for three projects related to wind energy. APPA is also a member of the Utility Wind Interest Group.

Introduction

NRECA and APPA are pleased that the Commission has undertaken to propose a new Appendix G to establish interconnection requirements for wind generators. As AWEA noted in its May 20, 2004 filing, the wind industry's increasing market share "carries with it a responsibility to assist system planners and operators in maintaining reliable operation of the grid." As the penetration of wind on the system increases, so also does its impact on the reliability of the system.

The better the wind industry is able to work with system planners and operators, the more likely it will be able to increase its market share. By building its technologies to the same technical standards as other generators, the wind industry reduces opposition and increases market interest in its product. While there continue to be some technical differences between wind generators and other generation technologies that justify certain accommodations, the Commission must not grant

[2] This report, *Vertical Axis Wind Turbine Generator Demonstration*, was sponsored by the Eugene, Oregon, Water & Electric Board.

wind generators preferential treatment unwarranted by the technical limitations of wind generation that would appear in the short term to benefit the wind industry, at potential cost to reliability, consumers, wholesale markets, and the long term interests of the wind industry itself.

Comments on the Proposed Appendix G

1. Low Voltage Ride-Through Standard

NRECA and APPA support the Commission's proposed low voltage ride-through ("LVRT") standard. The Commission is correct that LVRT capability has become increasingly important as wind plants get larger and achieve greater penetration levels on Transmission Providers' systems.

Certainly, there will be times when low-voltage ride through will be neither necessary nor even desirable. The system operator, for example, may need a small wind installation on a radial feeder to disconnect when the system faults. The proposed rule handles these situations correctly by allowing Transmission Providers to waive LVRT on a comparable and not unduly discriminatory basis. This is a far better approach than that proposed by AWEA.

AWEA's proposal would simply have voided the LVRT requirement in a broad range of circumstances. It would not have permitted the Transmission Provider to require adherence to the LVRT standards where the capability would "only" contribute to the Transmission Provider's ability to meet applicable reliability requirements but was not strictly "necessary" because other generators could make up the difference (at the expense of those other generators), or because the Transmission Provider could make up the difference itself (at its own consumers' expense). The

Commission's approach ensures wind generators are treated fairly, without unduly shifting costs or risks to other users of the system.

2. SCADA Capability

NRECA and APPA support the Commission's proposed requirement for SCADA capability. APPA and NRECA nevertheless question the Commission's statement in footnote 13 that it is difficult for the Transmission Provider to limit the output of a wind plant when necessary for system reliability. As General Electric has noted in its report to the New York Public Service Commission, wind farms in Europe are increasingly installing communications and control equipment that permit them to cut back the output of wind farms. The blades on these wind turbines can be rotated to reduce the output of each wind generator at a given wind speed. Although NRECA and APPA are not requesting that such capability be required of all wind generation to be interconnected in the U.S., that capability may be necessary in certain instances given the size of the wind farms to be installed, the penetration of wind on the system, and other system characteristics.

3. Reactive Power

NRECA and APPA support the Commission's proposed requirements that: wind generators meet a +/- 95 % power factor at the point of interconnection; interconnection customers not disable power factor equipment after the wind plant is in operation; and, wind plants have the capability to provide dynamic voltage support if the System Impact Study shows that such dynamic capability is required. They also support the Commission's proposed waiver provisions. The provision appropriately grants Transmission Providers the flexibility to waive requirements that

they believe will not help them preserve the reliability of the system. The Commission appropriately declined AWEA's invitation to shift the burden to Transmission Providers to prove at the time of the interconnection that the reactive power capability requirements are necessary in every instance to meet reliability standards.

The proposed reactive power requirement, however, does need some improvements to ensure that it adequately preserves the reliability of the transmission grid.

First, the Commission should clarify that wind generators must meet the same reactive power requirements as other generators, provided the requirements are imposed in a nondiscriminatory manner. While most transmission providers impose a +/- 95% power factor requirement on all new generation, some Transmission Providers need to impose a larger range on all new generation in order to maintain the reliability of the system. Where, for example, other new generators must have the capability of meeting 90% leading or 95% lagging, wind generators should be subject to the same requirement. This clarity can be easily provided by adding a new sentence at the beginning of the second paragraph of the proposed Appendix G, subsection iii (on power factor) that reads: "The Transmission Provider may establish a different power factor range applicable on a comparable and not unduly discriminatory basis to all new generators including wind facilities, where required to meet reliability criteria." If the Commission were to permit wind generators to avoid compliance with power factor requirements imposed on other generation it could impose risks to reliability, or more likely, would shift the costs of preserving

reliability to the Transmission Provider's consumers or to other generators competing with wind. In the long run, such discriminatory standards do wind generation development no favors.

Second, the Commission should add a clause at the end of the first sentence of proposed Appendix G, subsection iii (on power factor), so that the sentence reads: "A wind plant shall maintain a power factor within the range of 0.95 leading to 0.95 lagging, measured at the high voltage side of the wind plant substation transformer(s) and shall comply with the voltage schedule directives of the Transmission Provider." Otherwise, the proposed Appendix G makes it look like the wind plant may appropriately, even intentionally, vacillate anywhere within the power factor range at any particular time. That could seriously harm the reliability of the system. It would suggest, for example, that the wind plant could lag behind the system when the system actually needs reactive power, so long as the plant remains within the specified range. The reason that generators are asked to have the capability of maintaining a range of power factors is so that they can be directed to provide voltage support to the system as necessitated by changing system conditions.

Third, the Commission should delete the sentence: "The power factor range requirement shall be met via the design based reactive capability of the wind turbines used for that project (taking into account any limitations due to voltage level, real power output, etc.) plus fixed and/or switched capacitors." It is generally unsound regulatory policy to mandate a specific technical approach within a regulation because technological changes move faster than regulatory bodies. There may be many additional approaches for meeting the power factor range requirement that

would be better for all than fixed and/or switched capacitors. Indeed, several witnesses testified that there are dynamic tools available today that are more effective in preserving system reliability than fixed and/or switched capacitors. The Commission should not limit the creativity and ingenuity of engineers by adopting limiting language.

4. Models

The Commission appropriately declined to require Transmission Providers to participate in a formal process to update and improve wind turbine modeling. That process is already ongoing through the Utility Wind Interest Group and other industry efforts. The Commission's Open Access Transmission Tariff is not the right place to codify such a process.

5. Self-Study of Feasibility

NRECA and APPA were willing to accept AWEA's proposal to permit wind generators to perform their own feasibility studies if they wish, provided that the Transmission Provider retains the ability to perform system impact and facilities studies. This was a reasonable accommodation to the special nature of wind generation. Nevertheless, NRECA and APPA understand the Commission's concern that all Interconnection Customers be treated equally and does not object to the Commission's resolution of the issue.

CONCLUSION

For the foregoing reasons, NRECA and APPA respectfully request that the Commission accept the proposed Appendix G with the changes described above.

Respectfully submitted,

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