SOUTH DAKOTA PUBLIC UTILITIES COMMISSION

CASE NO. EL05-022

IN THE MATTER OF THE APPLICATION BY OTTER TAIL POWER COMPANY

ON BEHALF OF THE BIG STONE II CO-OWNERS

FOR AN ENERGY CONVERSION FACILITY SITING PERMIT FOR THE

CONSTRUCTION OF THE BIG STONE II PROJECT

PREFILED REBUTTAL TESTIMONY

OF

RAYMOND J. WAHLE

DIRECTOR, POWER SUPPLY AND OPERATIONS

MISSOURI RIVER ENERGY SERVICES

JUNE 9, 2006

PREFILED REBUTTAL TESTIMONY OF RAYMOND J. WAHLE

TABLE OF CONTENTS

I. INTRODUCTION 1

II. ISSUES IN GOLDBERG TESTIMONY 1

III. DENNEY TESTIMONY 8

BEFORE THE SOUTH DAKOTA UTILITIES COMMISSION

PREFILED REBUTTAL TESTIMONY OF RAYMOND J. WAHLE

I. INTRODUCTION

Q: Please state your name and occupation.

A: Raymond J. Wahle. I am the Power Supply & Operations Director for Missouri River Energy Services ("MRES").

Q: Did you provide direct testimony in this proceeding?

A: Yes. My direct testimony has been marked as Applicants' Exhibit 3.

Q: In rebuttal, to who's direct testimony are you responding?

A: I am responding primarily to the direct testimony of Marshall R. Goldberg offered by the Environmental Joint Intervenors. I am also responding to the direct testimony of Dr. Olesya Denney offered by the Staff of the South Dakota Public Utilities Commission.

II. ISSUES IN GOLDBERG TESTIMONY

Q: Have you read the direct testimony of Marshall R. Goldberg, offered on behalf of the Joint Intervenors, which addresses the economic impacts of South Dakota wind power plant modeling in comparison to the Big Stone Unit II project?

A: Yes, I have read it, and I am familiar with the claims he makes.

Q: In Mr. Goldberg's testimony, on page 3, at lines 23-25, he states that "...constructing and operating 1,320 MW of wind power in South Dakota, which would provide the equivalent amount of electricity generation as a 600 megawatt coal-fired power plant... ." Please comment on this aspect of Mr. Goldberg's testimony.

A: As also noted in Mr. Bryan Morlock's rebuttal testimony (Applicants' Exhibit 32), it is not clear in Mr. Goldberg's testimony if he views 1,320 MW of wind power as an alternative to the Big Stone Unit II project or simply an assumption in comparing the relative economic benefits of wind power to a coal plant.

Q: In your opinion as a professional electrical engineer, is 1,320 MW of wind power actually equivalent to the 600 MW of power that will be produced by Big Stone Unit II?

A: No, they are not equivalent, for several important reasons. 1,320 MW of wind turbines, even if they were dispersed across several counties in South Dakota, absolutely will not provide "...the equivalent amount of electricity generation..." as the proposed Big Stone Unit II. While 1,320 MW wind farm may produce an equivalent amount of electric energy as 600 MW pulverized coal unit, it would not produce an equivalent amount of accredited capability or capacity, nor would it be capable of providing ancillary services. If it is Mr. Goldberg's opinion that 1,320 MW of wind is equivalent to 600 MW of coal-fired generation, it is an opinion not supported by any professional engineering standard.

Q: Why is it important to be concerned with both capacity *and* energy?

A: There is no practical way to store electricity in the quantities that are consumed. Therefore, electricity has to be produced at the exact time it is needed and in the exact quantities that are required. In the electric system, the energy produced will always equal the energy consumed. For this reason, utilities must have enough capacity, also referred to as accredited capability, available to meet the instantaneous peak demand of its customers. Accredited capability is not the same as the name-plate capacity of the generator. Accredited capability is based on the performance of a generation technology. Because wind generation is an

intermittent resource, which only produces energy when the wind blows, its accredited capability is much lower than that of a coal-fired generator.

Q: Does the utility industry have rules on how much accredited capacity each utility must have?

A: Yes. The Midwest Reliability Organization ("MRO") sets out the rules that the utilities must follow. Each of the owners in the Big Stone Unit II project must have enough accredited capability to meet their individual peak demands, plus an additional 15%.

Q: What is the MRO and what does it do?

A: As explained by Peter Koegel in his direct testimony, Applicants' Exhibit 9, the MRO is one of eight Regional Reliability Organizations (RROs) that comprise the North American Electric Reliability Council (NERC). The MRO is a voluntary association committed to safeguarding the reliability of the electric power system in the upper Midwest part of North America. The essential purposes of the MRO are: (1) the development and implementation of regional and NERC Reliability Standards, and (2) determining compliance with those standards, including enforcement mechanisms.

Q: Why is it important to have accredited capability equal to a utility's peak demand plus 15%?

A: Reliability standards are essential to help prevent massive, cascading blackouts, such as the August 2004 blackout that crippled the northeastern United States. The MRO is concerned about reliable operation of the electric system. The MRO has determined that a 15% reserve margin is needed to account for unexpected events, such as storms, very hot or very cold weather

and at the same time maintain adequate capacity available to the regional, interconnected utility system to meet the peak demand of the customers.

Q: What happens if a utility does not meet the accreditation standards established by the MRO?

A: A utility will be charged what amounts to a large fine. The current charge is $96,940 per MW in any season in which that utility has inadequate accredited capacity.

Q: How much accredited capability could a utility expect from 1,320 MW of wind turbines?

A: The accredited capability of wind would be based on the actual performance of the wind turbines. The MRO has detailed rules that all industry participants must follow in determining accredited capability of any generating equipment. While the rules are somewhat complex, the experience in this region is that wind generation is typically accredited between 5% and 18% of its name-plate capacity during the peak months of July and August. Thus 1,320 MW of wind turbines would likely have an accredited capability of between 66 MW and 238 MW for those months. Big Stone Unit II, on the other hand, will receive accredited capability of 600 MW. This is a substantial difference. Under the best-case scenario, the 1,320 MW of wind turbines would only receive accreditation equal to approximately 40% of the accredited capability as the proposed Big Stone Unit II.

Q: You stated that the accredited capability of 1,320 MW of wind turbines would likely have between 66 MW and 238 MW during July and August. Do wind turbines have accredited capability in other months?

A: Yes. The accredited capability of wind turbines varies by month, again depending on the actual performance of the wind turbines. This is in contrast to what the proposed Big Stone Unit II's accreditation will be, which will be constant in all months.

Q: Does other generation accredited capability vary by month?

A: Yes. Simple cycle combustion turbines can also vary by month, depending on the plant configuration.

Q: Why are you most concerned with a plant's accreditation in July and August?

A: This region peaks in the summer time. July and August are typically the peak months of the year. Thus the need for capacity is most critical during July and August.

Q: When you say, then, that the 1,320 MW of wind referred to in Mr. Goldberg's testimony would have an accredited capability of between 66 MW and 23 MW, what is that opinion based on?

A: These numbers are derived from the actual results of the 2005 accreditation requests by various utilities in the MRO region. These results come from 15 different wind projects having a nameplate capacity of 320 MW that extend from Minot, North Dakota into central Iowa. The average accreditation amount is just a little over 11% of the name-plate capacity of the wind turbines.

Q: Why does 1,320 MW of wind turbines only have an accredited capability of 66 MW to 23 MW and the proposed Big Stone Unit II will have an accredited capability of 600 MW?

A: Even though a 1,320 MW of wind turbines have more than twice the name-plate capacity as Big Stone Unit II, its accreditation will be substantially smaller because its "fuel source," the

wind, is very intermittent. Unlike a wind turbine, a coal plant can be available to produce electric energy around the clock at a constant output, or its output could be varied by the operator based on the demands of the customers. Also, wind turbine output varies from minute-to-minute and its output is rarely, if ever, constant. Although the difference between energy and capacity is a technical one, it is an important one when planning to meet the growing demand for electricity throughout the region.

Q: You said that Big Stone Unit II can provide ancillary services. Generally, what are ancillary services and what ancillary services will Big Stone Unit II be capable of providing?

A: Ancillary services are things that are needed to provide, reliable, high quality electric service. This includes such things as VAR support. VAR support is needed to maintain adequate voltage of the system. If voltages become too low, it could cause motors in washing machines, dishwashers and other appliances or machines to burn out or not function. Another ancillary service is regulation. Regulation is needed to meet the second-to-second changes in load of the customers. As I noted earlier, because electricity cannot be stored, generation on the system must be constantly regulated or varied to match the generation to load. A third ancillary service is load following. Customers' need for electric power at midnight, for instance, is much lower that at noon. Again, generation must change over a wide range to match the changes in customer demand on a daily basis. Big Stone Unit II will be capable of providing regulation, load following, and VAR support. Wind turbines are not capable of providing these ancillary services. In fact, wind turbines are typically a large user of these ancillary services.

Q: What would be the impact on reliability of substituting wind for coal as Mr. Goldberg suggests?

A: First, as I stated earlier, it isn't certain Mr. Goldberg is suggesting wind as a "substitute" for Big Stone Unit II. There are, however, costs both in terms of the ability to produce and deliver electricity within the standards of reliability required by the MRO, and in terms of actual dollars that will ultimately be the cost to consumers. Mr. Goldberg's conclusions do not take into account the cost of not having adequate capacity, the cost of reserves, the cost of ancillary services and the increased cost of having to add additional transmission to be able to deliver the 1,320 MW of wind turbines versus the 600 MW of Big Stone Unit II.

Q: Is this just a choice between coal and wind as Mr. Goldberg perhaps implies?

A: No. There are a large number of interconnection requests by wind developers to site wind units in South Dakota. The total "active" wind requests in South Dakota are 1,860 MW ("active" meaning not withdrawn). Mr. Goldberg's analysis implies that the only path to the development of wind power in South Dakota is making an exclusive choice between coal and wind. South Dakota wind resources are not an either/or proposition. Utilities have need for renewable energy as part of their resource mix, and the markets continue to be robust, particularly with the extension by the federal production tax credit through the end of 2007. South Dakota will obviously be a valuable site for wind generation into the future.

Q: Are you suggesting that wind is an inferior resource?

A: Absolutely not. Wind has a place in the resource mix, but it cannot replace baseload generation.

III. DENNEY TESTIMONY

Q: Have you read the direct testimony of Olesya Denney, offered on behalf of the Staff of the Public Utilities Commission of South Dakota?

A: Yes, I have read it and I am familiar with the claims she makes in her testimony.

Q: On page 51, lines 13 to 15, Ms. Denney states: "These ratepayers do not play a direct role in making the determination to build Big Stone II, yet, in the end, they may be held responsible for those decisions." Is this a correct statement for MRES or the other municipal utilities that are a part of this Application?

No. MRES is a not-for-profit joint-action agency serving 60 member communities in Iowa, Minnesota, North Dakota and 11 member communities in South Dakota. MRES is a consumer-owned utility and all of our municipal utility members are also owned by the consumers they serve. The MRES board of directors is composed of 13 board members; four of those board members represent four of the South Dakota cities that MRES serves. All of these board members live in the respective communities that they represent and all of these individuals work for the municipal utility of their community.

The governing bodies of each of the municipal utilities involved in this matter are elected from the ranks of its municipal utility membership, are responsible for making resource decisions and investments that will ultimately be recovered from their consumer-owners – i.e. the municipal utility members themselves.

The nature of consumer-owned utilities like MRES and the other municipal Applicants is that there is no separation between ratepayer and shareholder; the people who pay the bills are

the people who own the utility. It is that local control over the decision-making that distinguishes not-for-profit public power utilities from others in the industry.

Q: Does this conclude your testimony?

A: Yes, it does.