MONTANA-DAKOTA UTILITIES CO.
A Division of MDU Resources Group, Inc.

Before the Public Service Commission of North Dakota

Case Nos. PU-11-395 and PU-11-396

Direct Testimony
of
Darcy J. Neigum

Q. Please state your name and business address.

A. My name is Darcy J. Neigum and my business address is 400 North Fourth Street, Bismarck, North Dakota 58501.

Q. By whom are you employed and in what capacity?

A. I am the System Operations and Planning Manager of Montana-Dakota Utilities Co. (Montana-Dakota), a Division of MDU Resources Group, Inc.

Q. Please describe your duties and responsibilities with Montana-Dakota.

A. I have manager responsibility for the day-to-day operations of the Company's electric control center and system operations planning department. The system operations planning department is responsible for performing the Company's electric resource planning and expansion studies.

Q. Please outline your educational and professional background.

A. I hold a Bachelor's Degree in Electrical and Electronics Engineering from North Dakota State University as well as a Masters of

Business Administration from the University of Mary. My work experience includes four years as a nuclear plant engineer, three years of experience as a plant engineer at a coal-fired power plant in North Dakota, and thirteen years of generation development and operational responsibilities which include coal-fired, gas-fired, and renewable generation.

Q. What is the purpose of your testimony in this proceeding?

A. The purpose of my testimony is to describe the analysis process used to identify the 88 MW combustion turbine project as part of the Company's least cost generation expansion plan and to describe how the unit will be used to service the needs of Montana-Dakota's customers.

Q. Please describe Montana-Dakota's customer needs for future capacity and energy resources?

A. Montana-Dakota is a net buyer of capacity and energy from others to meet customer demand and energy requirements. In 2010, 15 percent of the energy to serve customer requirements came from the MISO energy market and 20 percent of the capacity to service customer requirements came from third party purchases.

As indicated in Table 4-1 of the Main Report in Montana-Dakota's 2011 Integrated Resource Plan (2011 IRP), when Montana-Dakota's current capacity purchase agreement expires in 2015, Montana-Dakota is forecasted to be deficit 149.5 MW of capacity to meet customer demand requirements. This capacity deficit is forecasted to continue to grow until a new third party contract purchase agreement is secured or a new capacity

resource is constructed. The 149.5 MW represents 25 percent of the capacity requirements that Montana-Dakota will need to serve peak customer demand.

Q. What was the purpose of the modeling runs included in Montana-Dakota's 2011 IRP?

A. The Electric Generation Expansion Analysis System (EGEAS) modeling runs were used to determine the least cost expansion plan available to Montana-Dakota to meet future customer demand and energy requirements under various scenarios.

The EGEAS modeling runs in the 2011 IRP included Montana-Dakota's existing generation resources, current purchased capacity and energy agreements, and current demand and energy forecast data. The only unit retirement in the study timeframe was the Williston Combustion turbines which are to be retired by the end of 2011.

Future supply resource options in the EGEAS model included results from a 2010 Request for Proposals (2010 RFP); self-built generating resources including coal, gas, and wind; new demand side-management programs; and a Big Stone resource which included the costs of the plant's required air quality control system (AQCS) upgrade equipment.

Q. What was the scope of Montana-Dakota's 2010 RFP?

A. The 2010 RFP was issued on June 1, 2010 and requested proposals for all capacity and energy resources totaling 25 MW to 225

MW for a period of at least five years, with five year extension options available, beginning June 1, 2015. The 2010 RFP considered all potential resources including new and existing thermal generation, renewable generation, and demand-side management programs.

Q. What was the response the Company received to the 2010 RFP?

A. Montana-Dakota received responses from eight separate entities regarding the 2010 RFP. Three of the proposals were for wind generation projects. One of the proposals was for a wind and wind plus nuclear combination. Two of the proposals were for simple cycle and combined cycle gas turbines. One proposal was from a regional utility offering wholesale tariff rates. And one proposal was for a commercial and industrial demand response program to be offered to Montana-Dakota's customers.

Q. Did Montana-Dakota receive any feedback from neighboring utilities or historical capacity suppliers regarding the 2010 RFP?

A. One of the entities who has supplied capacity to Montana-Dakota in the past did provide a notice of intent to bid but did not submit a proposal over concerns of future environmental regulation and the uncertainty of availability and need for excess capacity resources in the future.

Another entity which has supplied capacity to Montana-Dakota was only able to offer wholesale tariff rates whereas a year earlier they were able to offer a firm price for a peaking capacity type resource. Uncertainty

of regulation and future resource availability was a major concern over the type of resource offer provided.

Q. What were the results of the analysis of the 2010 RFP?

A. Using the EGEAS model, three proposals from the 2010 RFP were identified as potential resources for Montana-Dakota's least cost resource expansion plan.

Of the identified proposals, one was a new combustion turbine project to be located in Illinois. This proposal was not considered viable as it contained a 20 year term and the resource would be located three states away from Montana-Dakota's service territory. In MISO's recently filed capacity auction and resource adequacy construct, this resource would be located two capacity zones away from Montana-Dakota service territory and the capacity credits may have delivery issues and additional costs in order to meet Montana-Dakota's customer demand requirements.

Another proposal was from a new 150 MW wind project to be located in North Dakota which had potentially large unaccounted network upgrade costs required to interconnect to Montana-Dakota's transmission system. Receipt of energy at the offered price was not considered a viable opportunity.

The third proposal was for a 25 MW demand response program for Montana-Dakota's commercial and industrial customers. An agreement for implementation of a demand response program was entered into with

Constellation New Energy on September 29, 2011 as a result of the proposal.

Q. What resource alternatives did Montana-Dakota include in its supply side analysis contained in the 2011 IRP?

A. Montana-Dakota's supply side resources in the 2011 IRP included the following self-built and third-party resources:

Self-built resources

- 43 MW simple cycle combustion turbine;
- 88 MW simple cycle combustion turbine;
- 140 MW combined cycle combustion turbine;
- 30 MW blocks of coal-fired generation;
- 30 MW blocks of wind generation (with and without federal production tax credits); and
- Big Stone AQCS project.

Third-party resources

- 10 MW blocks of purchased capacity through 2014;
- 25 MW blocks of purchased wind generation proposal;
- 25 MW Demand Response program proposal;
- 155 MW simple cycle combustion turbine proposal; and
- 345 MW combined cycle combustion turbine proposal.

Q. Why were these supply-side resources included in the modeling for the 2011 IRP?

A. These resources were selected as a representative selection of self-built resources likely available to the Company and third-party resources that were offered to the Company through the 2010 RFP.

Q. What were the results of the modeling studies that Montana-Dakota conducted as part of the 2011 IRP?

A. Based on the base case modeling assumptions, the least-cost plan of future resources requirements to serve Montana-Dakota's customer requirements for the 2011 – 2015 period included:

- Purchase of 10 MW of capacity in 2013 and 20 MW of capacity in 2014;
- Installation of two 88 MW combustion turbines in 2015;
- Contract for a 25 MW commercial demand response;
- Installation of the Big Stone AQCS project in 2015; and
- Implementation or continuance of demand side management programs contained in Chapter 3 of the 2011 IRP.

Q. What sensitivity studies did Montana-Dakota conduct as part of the 2011 IRP modeling activities?

A. Montana-Dakota conducted ten sensitivity studies as part of the modeling for the 2011 IRP which included:

- Base with new demand side management programs;
- Low natural gas (minus $1 per Dkt from the base case);
- High natural gas (plus $3 per Dkt from the base case);
- $30 per ton carbon tax on all thermal generation;

- $50 per ton carbon tax on all thermal generation;
- High environmental case ($30 carbon tax, plus $3 per Dkt increase in natural gas cost, $1.25 per MW adder to coal generation for mercury, and $3.00 per MW adder to coal generation for coal ash disposal);
- High capital cost for combustion turbines;
- High capital cost for Big Stone AQCS;
- Low customer growth; and
- High customer growth.

Q. How did the various sensitivities affect the least cost plan available to the Company?

A. While the total net present value of costs of the generation portfolio changed with each scenario, the addition of the 88 MW combustion turbine, the Big Stone AQCS project, and the new commercial and industrial demand response program were selected as part of the least cost resource mix in each of the scenarios studied.

Q. How will the new 88 MW combustion turbine be used to serve customer needs?

A. The 88 MW combustion turbine will be used to serve customer peak demand requirements and reduce the dependency on third party capacity purchases as well as supplying energy when the marginal cost of the 88 MW combustion turbine is less than the next marginal cost unit

available to the market. The 88 MW combustion turbine is forecasted to have a 10 to 20 percent capacity factor in 2015.

Q. Why doesn't Montana-Dakota rely entirely on the market to supply future capacity and energy resources?

A. Market prices fluctuate up and down but over time the general trend is that market prices increase with inflation and changes to the cost of supply and demand. In 2015, without the addition of the 88 MW combustion turbine, Montana-Dakota would be purchasing 25 percent of its capacity resources from others to serve customer peak demand requirements.

The value of capacity resources is tied to an actual resource cost, which includes specific net book and fixed operations and maintenance costs. For markets, the value of capacity is tied to competition in supply resources and the cost of new entry (CONE) resources. MISO annually calculates the value of CONE, which is a revenue requirement of a new simple cycle combustion turbine, and establishes a penalty to those entities who are short capacity resource requirements based on the current value of CONE. As the amount of excess capacity in the current market decreases, either through load growth or unit retirements, the market value of capacity will approach the value of CONE. The cost of new entry resources or CONE increases over time with inflation and the cost of material increases due to demand and scarcity. Long-term price stability is maintained either through self- construction of new resources or

entry into long-term capacity agreements with specific resources owned by others.

Market purchases may be appealing in the short-term but over time they will correct themselves due to changes in supply and demand. Montana-Dakota has not added a large capacity resource to its generation portfolio since the Glendive Unit II combustion turbine was built in 2003. A power purchase agreement with Basin Electric Power Cooperative for 66 MW of baseload capacity from the Antelope Valley Station Unit II expired in November 2006, which left Montana-Dakota dependent on capacity purchase agreements and market energy prices. Montana-Dakota was unable to acquire additional coal-fired baseload resources when the Big Stone II project was abandoned. Continued reliance on market purchases subjects customers to unknown future prices of capacity and energy. At the expiration of purchased power agreements, there are no remaining assets for continued customer benefit and customers are subjected to the cost impacts of replacement agreements with future market resources.

A long term goal should be to have no more than 10 percent of capacity and energy requirements exposed to markets. This allows some benefits to customers when prices are low and limits the volatility customers experience when prices are high.

Q. What is the recommendation derived from the results of the 2011 IRP?

A. Based on the analysis of the resource expansion models and the consideration of customer impacts, market availability of capacity and energy, and other factors such as environmental regulations; Montana-Dakota's recommended resource plan is to pursue the following resources to meet its customers requirements for the 2011-2015 time period:

- Purchase 10 MW of capacity in 2013 and 20 MW in 2014 through the MISO capacity auction or bilateral agreements;
- Contract for the 25 MW demand response program offered by Constellation New Energy with 5 MW of dispatchable commercial or industrial demand response the summer of 2012; a total of 15 MW the summer of 2013; and the full 25 MW the summer of 2014;
- Implement the portfolio of demand side management programs identified in chapter 3 Table 3-3 of the 2011 IRP that are expected to provide an additional peak demand reduction of 24.5 MW and an annual energy savings of 7.3 MWh equivalent by 2015;
- Install the AQCS equipment required to continue operating the Big Stone Plant beyond 2015; and
- Construct one 88 MW simple-cycle combustion turbine to be operational by March 1, 2015.

The recommended resource plan is considered to be the best plan to economically and reliably meet customers' requirements. Montana-

Dakota also plans to issue a new request for proposal for capacity and energy resources in 2012 to start the next planning process.

Q. Does this conclude your direct testimony?

A. Yes, it does.