Direct Testimony and Schedules
Steve W. Wishart

Before the North Dakota Public Service Commission
State of North Dakota

In the Matter of the Application of Northern States Power Company
for an Advance Determination of Prudence for Three Natural Gas Combustion
Turbine Generators

Case No. PU-13-_____
Exhibit___(SWW-1)

Resource Need and Alternatives Testimony

April 26, 2013

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I. INTRODUCTION

Q. PLEASE STATE YOUR NAME AND TITLE.

A. My name is Steven W. Wishart. I am Director of Resource Planning and Bidding for Xcel Energy.

Q. PLEASE DESCRIBE YOUR QUALIFICATIONS AND EXPERIENCE.

A. I have worked for Xcel Energy since 2005 in the areas of demand-side management and resource planning. In my current role, I am responsible for the direction and oversight of electric Resource Planning for the five-state integrated Northern States Power Company system (NSP System), which provides electric service to customers in North Dakota, South Dakota, Minnesota, Wisconsin, and Michigan.

My responsibilities include assisting the Company in making reasonable and prudent acquisition decisions for electric generation resources. I maintain our resource planning model, Strategist, and conduct economic evaluations of resource additions and bid processes for new resource acquisitions. My resume is provided as Exhibit___(SWW-1), Schedule 1.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. I discuss the Company's need to add approximately 150 to 500 MW of system capacity during the 2017-19 time period, as well as the factors and analysis that goes into determining resource need. I also discuss the Company's analysis of the different types of resources to meet the identified need.

Q. PLEASE SUMMARIZE YOUR TESTIMONY.

A. The Company performs a rigorous analysis to estimate its resource needs many years into the future, using econometric and other assumptions and variables to base its determinations. While there are inherent challenges and difficulties in accurately assessing future generation capacity requirements, our outcomes rely on a rigorous regulatory process in which many perspectives are represented, as well as a probability range that represents the best available information at the time the need is determined.

The modular generation proposal we make in this case meets the identified resource need and provides flexibility to adjust deployment to changing econometric and other factors that may affect our future generation capacity requirements. Before coming to our conclusion, we assessed many alternatives, including intermediate resources, uprating existing facilities, additional Demand Side Management (DSM), and use of Power Purchase Agreements (PPA). In the end, we believe our modular proposal for three 215 MW simple-cycle natural gas-fired generators will best meet the probable range of our customers' capacity needs in the foreseeable future – while also providing essential flexibility to minimize the potential for excess capacity on our system.

II. RESOURCE NEED

Q. HOW WAS THE COMPANY'S RESOURCE NEED DETERMINED?

A. The Company's assessment of resource need is based on three primary factors: (1) peak demand forecast; (2) required reserve margins; and (3) the maximum generation capability of existing resources. The peak demand

forecast is based on an econometric model using a combination of variables, including weather-normalized native energy requirements and peak producing weather by month. The reserve margins are based on the reserve margin calculations used by the Midwest Independent System Operator (MISO), the regional transmission organization to which the Company belongs. Finally, the maximum generation capability of existing resources is based on NSP System operational data. We include the outcome of this analysis in our Midwest Resource Plan, and the Company's ultimate resource need is determined through a regulatory process, as discussed by Company Witness Ms. Laura McCarten.

Q. WHAT IS THE COMPANY'S NEED?

A. As reported in our Advance Determination of Prudence (ADP) Application, the Company's need is based on our Fall 2011 forecast update, and a reserve generation margin based on MISO's new unforced capacity (UCAP) methodology. Our forecasted need, adjusted for aggressive DSM programs and a planning reserve margin of 3.8 percent, identified potential generating capacity deficits of approximately 150 MW in 2017, growing to approximately 500 MW by 2019.

Q. HOW WOULD YOU CHARACTERIZE THE COMPANY'S ASSESSMENT OF ITS NEED?

A. Our resource need is based on a rigorous review of the factors outlined above. We are confident it is a sound projection based on the best information available. However, there is inherent uncertainty in the estimation of future generation capacity requirements. Peak demand forecasts vary as econometric measurements upon which they are based prove over time to have been more or less accurate. There is also some uncertainty stemming from the June 2013

MISO reserve margin requirement change to the UCAP methodology.

Q. PLEASE DISCUSS THE VARIABILITY IN DEMAND FORECASTING.

A. Resource need projections depend heavily on underlying forecasts of peak power demand. Demand forecasts in turn depend heavily on forecasts of economic activity, such as customer usage. The uncertainty has been amplified in recent years due to ongoing economic instability, making it more challenging to predict several years into the future. This difficulty is illustrated in the variability of in our demand forecasts in recent years. While the range of forecasts falls within an error band, or probability range, of only two to three percent, estimates of peak demand have varied up and down by approximately 250 MW in the 2016-2020 timeframe – stemming from relatively small changes in estimated customer demand growth.

Q. PLEASE DESCRIBE THE UNCERTAINTY RELATING TO CHANGES IN HOW MISO CALCULATES RESERVE MARGINS.

A. The way MISO calculates the generation reserve margins necessary to ensure system reliability has been subject to on-going change. Starting in 2013, MISO's reserve margin calculation for individual utility systems will change to reflect the utility's peak demand *at the time of the region's peak*, rather than the utility's own peak. The Company's demand at the MISO peak has varied substantially, and has not been coincident with MISO's in five of the last eight summer seasons – averaging approximately five percent lower than our own peak.

Because our peak has not been coincident with MISO's, this methodology change reduces our reserve obligation. For 2013, the Company's reserve margin is approximately 200-300 MW lower than what we used in our

Midwest Resource Plan analysis. This suggests that our reserve requirements may remain lower in the future. Relatively small changes in coincidence factors, combined with adjustments in MISO's UCAP capacity calculations and adjustments in MISO's annual loss of load expectation calculations, can swing reserve requirements on our system measurably. However, it is not clear at this time how reserve calculations might change between now and the 2017-2019 time period for which we currently have identified resource needs. Therefore, we must take thoughtful action to ensure we meet our customers' identified capacity needs.

Q. PLEASE SUMMARIZE THE COMPANY'S POSITION ON THE IDENTIFIED NEED OF 150 MW TO 500 MW FOR THE 2017-2019 TIME PERIOD.

A. In summary, we believe it is prudent to consider a range of forecasts when planning for our capacity needs at the end of this decade. Based on that range, the generating capacity assessment from our resource planning process presents reasonable targets for generation additions in the 2017 to 2019 timeframe. The new generation is warranted to ensure adequate generating capacity under all reasonably plausible outcomes. New generation on our system is also beneficial, as it insulates our customers from overreliance on the MISO market. Further, small surpluses in generating capacity can result in excess energy available to sell into the market, which serves to reduce costs for our customers.

III. ALTERNATIVE RESOURCE ANALYSIS

Q. DID THE COMPANY ANALYZE ALTERNATIVES TO ITS PROPOSAL?

A. Yes. The Company assessed an intermediate natural-gas-fired combined cycle

plant as an alternative, as well as additional DSM, uprating of existing facilities, certain renewable generation options, and PPAs.

Q. PLEASE DESCRIBE THE COMPANY'S ASSESSMENT OF THE INTERMEDIATE COMBINED RESOURCE ALTERNATIVE.

A. As discussed in our ADP Application, our modeling of peaking generation results in a lower cost of energy over the long-term than the alternative of building a single, combined-cycle plant to meet the resource need through 2019. In short, our peaking alternative has a lower net system cost of $217 million compared to the generic intermediate unit, using base case assumptions.

The lower cost of the Company's proposal is due in great part to the fact that peaking resources fit well with our existing mix of generating resources. We are able to more fully-utilize coal-fired generation at our Sherco and King plants, as well as existing combined-cycle units at our Riverside and High Bridge plants, before making much larger capital commitments necessary for a new combined-cycle plant. The lower capital commitment also keeps customer rates lower in the short-term. Company Witness Mr. Gregory L. Ford discusses the Company's proposed generating facilities and ability to convert the proposed simple-cycle units to combined-cycle in the future, if that is determined to be appropriate.

Q. HAS AN INTERMEDIATE COMBINED-CYCLE PROPOSAL BEEN SUBMITTED IN THE MINNESOTA PUBLIC UTILITY COMMISSION'S (MPUC) COMPETITIVE RESOURCE ACQUISITION DOCKET?

A. Yes. A proposal submitted in the MPUC competitive resource acquisition

proceeding (Docket No. E002/CN-12-1240) would add combined-cycle generating capacity to an existing plant, rather than committing to an entirely new combined cycle plant.

Q. WHAT IS THE PROCESS TO EVALUATE THE VARIOUS PROPOSALS?

A. Ms. McCarten discusses the regulatory process in her Direct Testimony. In summary, we and other stakeholders will analyze and assess the various proposals, and share our insights and input as part of state regulatory proceedings.

Q. WHAT IS THE COMPANY'S ASSESSMENT OF DSM?

A. While there may be additional conservation and demand response opportunities on our system, they do not represent a reasonable alternative to the addition of generation in the 2017 to 2019 timeframe. We already have a substantial amount of DSM on our system. The amount of new conservation and interruptible load that can be arranged is uncertain, as is the cost of obtaining additional conservation and demand response. Therefore, there is high risk that efforts to add DSM might end-up falling short of projections.

Rather than relying solely on DSM to meet the identified need, we believe a better course is to pursue additional DSM over the next several years in parallel with the development of new generation. When new demand response is added to our system, it will be incorporated into subsequent resource need assessments and may eliminate or reduce the need for future generation. Again, our incremental proposal is well-suited to adjust to potential changes in circumstances.

Q. WHAT DID THE COMPANY CONCLUDE ABOUT THE OPTION OF INCREASING THE EFFICIENCY OF EXISTING RESOURCES?

A. As noted in our ADP Application, the type of efficiency project that would be appropriate to fill the identified 500 MW capacity need must increase the maximum output from a facility without substantially increasing the fuel inputs. This substantially limits available options.

We have completed such a project at the Monticello nuclear facility that added 77 MW of capacity in 2013 – and, we have already increased output at our Prairie Island nuclear facility by 18 MW. Also, when the Sherco Unit 3 returns to service later this year, it will have an additional 10 MW of generation capacity. We will continue to pursue projects like these to the extent that they are cost-effective for our customers. However, we have not been able to identify any additional cost-effective efficiency opportunities within our generation fleet that would meet the identified capacity need.

Q. WHAT WERE THE RENEWABLE GENERATION ALTERNATIVES THE COMPANY ASSESSED?

A. The Company investigated biomass, hydro power, wind, and solar generation as alternatives to its proposal.

Q. CAN THESE RENEWABLE ALTERNATIVES MEET THE COMPANY'S IDENTIFIED CAPACITY NEED?

A. Biomass and hydro are the only renewable-based resources that can provide dispatchable generating capacity. The opportunities for additional hydro power on our system are minimal, and therefore could not address the potential 150-500 MW need the Company faces. Further, assuming that new

biomass generation could be added to our system in the available timeframe, our modeling of that alternative showed it to be much more expensive than our proposal, and it is questionable whether the fuel supply is reliable.

Wind and solar generation are not peaking or intermediate resources, since production is intermittent or varies substantially and cannot be effectively dispatched. However, MISO rules allow 13 percent of installed wind generation to be counted toward resource requirements, and approximately 50 percent of solar generation. In theory, over 3,000 MW of new wind power (nearly twice what is on our system today) or 1,000 MW of solar would be required to replace the accreditable capacity of a dispatchable resource like our proposal. Regardless of the cost assumed, the amount of new wind or solar generation required to meet a 500 MW resource need is much more expensive than our proposal, and raises concerns about whether the system could operate reliably.

Q. PLEASE DESCRIBE THE COMPANY'S ASSESSMENT OF PPAS AS AN ALTERNATIVE TO ITS PROPOSAL.

A. While PPAs can be an appropriate choice under the circumstances, utility-owned generation provides long-term benefits to our customers that may not be available from PPAs. PPAs are typically 10-25 years in duration, while utility-owned resources will generally last 35-40 years or more – if their life is extended, as it often is. With all things being equal, the unit will remain available to ratepayers for a much longer life than a PPA, reducing customer costs over the long-term.

Short-term PPAs (less than five years) are also a viable alternative, if they are

shown to be a cost-effective 'bridge' to extending the time period before investment in new generating capacity becomes necessary. In this case, we believe that a portfolio consisting of only short-term purchased power would not be appropriate to fill the entire 500 MW of capacity in 2019 and beyond.

The other proposals submitted for consideration in the MPUC's competitive resource acquisition proceeding will be thoroughly assessed. We will provide the Commission information on their cost-effectiveness as it becomes available.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes, it does.

Steven W. Wishart Jr.

(612) 508-0869
Steve@Wishart.com

1814 Kohinoor Pl.
Golden CO, 80401

EXPERIENCE

Xcel Energy, Minneapolis MN, Denver CO — 5/12-Current
Director – Resource Planning & Bidding

Xcel Energy, Minneapolis MN, Denver CO — 4/06-05/12
Manager / Sr. Analyst / Analyst – Strategic Analytics

Responsibilities:

- Oversee economic evaluation of large power supply projects for Xcel Energy.
- Prepare analysis for senior leadership that reports on expected value and value at risk for new generation assets, power purchases, conservation programs, wholesale sales, and other projects.
- Maintain complex model of the three Xcel Energy power systems for use in, project evaluation, rate forecasting, and policy analysis.
- Manage a group of quantitative analysts that evaluate various supply and demand side alternatives for all three Xcel Energy service territories.
- Serve as quantitative expert for resource planning and purchased power related dockets.

Major Projects:

- Colorado Clean Air Clean Jobs Act – Retire/repower 900MW of existing coal units in PSCo service territory for compliance with regional NOx legislation.
- 2010 Minnesota Resource Plan – 10 year projection of new resource acquisitions, retirements, renewable energy standard compliance, and enhanced conservation programs.
- Jones Station Repowering – Convert existing 240MW gas steam unit to 650MW combined cycle in SPS service territory.
- 2009 PSCo All-Source Solicitation – Modeling/evaluation of bids totaling 20,000MW. Including Gas, wind, solar PV, solar thermal with storage, compressed air storage, pumped hydro, wind/battery combo, and solar augmented combined cycle.
- Manitoba Hydro CON – Economic valuation of 10yr $1.6B purchase from MH.
- Nuclear Uprate Projects – Economic evaluation and expert witness for Prairie Island and Monticello nuclear uprate proceeding in NSP service territory.
- CO2 Regulation - Forecasted rate impacts of American Clean Energy and Security Act (ACES) on the Xcel Energy operating companies.
- Other - Bottom up redesign of Xcel's long-range planning models, focusing on consistency across jurisdictional operating companies and integration of best practices including Monte-Carlo simulation for risk evaluation. Represented Xcel Energy at MISO board of directors/stakeholder meetings on the topic of wind integration. Long range rate forecasts for management and stakeholders. Financial and economic analysis for Excelsior IGCC project. Analysis of long term power purchase from Manitoba Hydro. EEI regulatory accounting seminar.

Software:

- Strategist, Matlab, Prosym, Excel, Access.

Xcel Energy, Minneapolis MN
Demand Side Management (DSM) Technical Analyst — 2/05-4/06

Responsibilities:

- Managed cost/benefit analysis of NSP's $45 million annual conservation and load management activities, including forecasting of financial incentives, and strategic planning.

Projects:

- Evaluation and contract negotiations of DSM bids in Colorado service territory.
- Conservation rulemaking in New Mexico, including design of financial incentive mechanism.
- Cost benefit analysis of NSP's three-year conservation and load management strategic plan.

Software:

- Strategist, DSManager, Matlab, Excel.

The Solar Store, Tucson AZ 10/98-8/00
Accountant

- AR/AP, payroll, inventory management, sales, solar energy system design & installation.
- Member of Concerned Arizonans for Renewable Energy (CARE) lobbied in support of solar tax credits in Arizona.

EDUCATION

PhD (all but dissertation) **Applied Economics, University of Minnesota, 3.7GPA** 8/02-1/05

Course Work:

- Emphasis - environmental and natural resource economics. Other course work - Financial economics, econometrics, dynamic programming, production economics, non-parametric frontier analysis, managerial economics, international trade, macro- and microeconomics.

Software:

- SAS, Matlab, Gauss, Stata, Mathematica.

MS Economics, University of Arizona, 3.8GPA 8/00-5/02

Course Work:

- Environmental economics, environmental law, econometrics, linear and quadratic programming, production economics, consumer economics.

Software:

- SAS, Stata, LimDep, Gams, Lindo, Gauss.

BS Finance, University of Arizona 8/92-12/96

Course Work:

- Financial markets and instruments, corporate finance, accounting, statistics, economics, marketing, Russian, French.

STATE OF NORTH DAKOTA
BEFORE THE
NORTH DAKOTA PUBLIC SERVICE COMMISSION

IN THE MATTER OF THE APPLICATION OF
NORTHERN STATES POWER COMPANY
FOR AN ADVANCE DETERMINATION OF
PRUDENCE FOR THREE NATURAL GAS
COMBUSTION TURBINE GENERATORS

CASE NO. PU-13-_____

VERIFICATION

STATE OF MINNESOTA)
) ss.
COUNTY OF HENNEPIN)

Steven W. Wishart, being first duly sworn on oath, deposes and says that he is Director of Resource Planning and Bidding for Xcel Energy Services Inc. on behalf of Applicant Northern States Power Company, in the above captioned matter, that the testimony and schedules submitted in the above captioned matter under his name were prepared under his direction, that he knows the contents thereof, and that the same is true and correct to the best of his knowledge and belief.

Steven W. Wishart

Subscribed and sworn to before me this 24th day of April, 2013.

Notary Public
My Commission Expires: 1-31-2015

CYNTHIA D. HARRINGTON
NOTARY PUBLIC
MINNESOTA
My Commission Expires Jan. 31, 2015