Direct Testimony and Schedule
Allen D. Krug

Before the Minnesota Public Utilities Commission
State of Minnesota

In the Matter of the Application of Northern States Power Company d/b/a Xcel Energy for a Certificate of Need for Additional Dry Cask Storage at the Monticello Nuclear Generating Plant Independent Spent Fuel Storage Installation in Wright County

Docket No. E002/CN-21-668
Exhibit___(ADK-1)

Policy

March 1, 2023

Table of Contents

Schedule

I. INTRODUCTION AND QUALIFICATIONS

Q. PLEASE STATE YOUR NAME AND TITLE.

A. My name is Allen D. Krug. I am Associate Vice President, State Regulatory Policy for Northern States Power Company, d/b/a Xcel Energy (Xcel Energy or the Company).

Q. PLEASE SUMMARIZE YOUR QUALIFICATIONS AND EXPERIENCE.

A. I have worked for Xcel Energy since 1998, initially as a Manager of Renewable Energy and Energy Contract Coordinator. I then served as a Regulatory Consultant for a number of years before becoming Regional Vice President, Regulatory Administration in 2008. I began my current position in 2013. Prior to joining the Company, I worked for over a decade at the Minnesota Department of Commerce, first as a Statistical Analyst and later as a Supervisor in the Electric Regulatory Unit. My statement of qualifications is provided as Exhibit___(ADK-1), Schedule 1.

Q. WHAT ARE YOUR CURRENT RESPONSIBILITIES?

A. In my current role, I develop regulatory strategy for Xcel Energy across North Dakota, South Dakota, and Minnesota.

Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY IN THIS PROCEEDING?

A. I am the Company's policy witness in this proceeding, and in that role I present the Company's overall case to the Minnesota Public Utilities Commission (Commission) in support of our Certificate of Need Application (Application), requesting additional dry cask storage at the Monticello Nuclear Generating Plant (Monticello Plant or the Plant) Independent Spent Fuel

Storage Installation (ISFSI). To support our request and inform the Commission's decision, I provide a general overview of the Company's proposal, briefly introduce the Company's other witnesses in this proceeding, and explain why the Monticello Plant remains a vital generation resource for the Company. To extend the life of the Plant, the Company will need to expand the existing ISFSI site and apply for a 20-year Subsequent License Renewal (SLR) with the Nuclear Regulatory Commission (NRC). My testimony supports the conclusion that expansion of the ISFSI, allowing the Plant to continue playing a critical role in the Company's long-term carbon-free generation resource mix, will benefit Xcel Energy customers and meets the Commission's criteria for granting a Certificate of Need.

Q. DO YOU ALSO SPONSOR ANY SECTIONS OF THE COMPANY'S APPLICATION?

A. Yes. I am sponsoring:

- The Executive Summary
- Section 1.1, Overview
- Chapter 2, General Information
- Chapter 3, Schedule of Other Filings and Section 3.1, Certificate of Need
- Section 4.1, Adequacy, Reliability, Safety and Efficiency of Energy Supply, portions of which will also be addressed by other witnesses
- Section 4.3.1, discussing the Monticello Plant's role in meeting Minnesota's energy needs, also addressed by Company witnesses Ms. Pamela Prochaska and Ms. Farah Mandich
- Section 5.1, Socially Beneficial Uses of the Output of the Facility.

Q. HOW IS THE REMAINDER OF YOUR TESTIMONY STRUCTURED?

A. My testimony covers the following topics:

- *Section II*: I provide background information on the Monticello Plant.
- *Section III*: I address the resource planning implications of extending the operation of the Monticello Plant.
- *Section IV*: I discuss the ISFSI Expansion and the Relicensing of the Monticello Plant.
- *Section V*: I discuss how our application meets the Certificate of Need Criteria.
- *Section VI*: I introduce the Company's other witnesses.

II. BACKGROUND

Q. WHAT IS THE PURPOSE OF THIS SECTION OF YOUR TESTIMONY?

A. In this section, I provide a brief background of the Company's Monticello Plant and the Plant's recent operating history.

Q. PLEASE PROVIDE A GENERAL OVERVIEW OF THE MONTICELLO PLANT.

A. The Monticello Plant is a single-unit, 671 MW, nuclear-powered, boiling water reactor, electric generating station located in Monticello, Minnesota. Since it began operations in 1971, the Plant has played a critical role in the fleet of resources Xcel Energy uses to serve our customers, generating over 200 million megawatt-hours (MWh) of electricity over the past 50-plus years. The Plant provides baseload service, operating 24 hours a day, seven days a week for extended periods of time to meet steady demand for electric power. The Company's Prairie Island Plant and Monticello Plant are the only generating

stations in Xcel Energy's system that provide this level of consistent, reliable, carbon-free energy and capacity.

Q. WHAT IS THE CURRENT LICENSURE STATUS OF THE MONTICELLO PLANT?

A. The NRC regulates the operation of nuclear power plants. It granted the Monticello Plant its initial 40-year license in 1970, which allowed the Plant to operate until September 8, 2010. In 2006, the NRC approved a 20-year license extension, which expires on September 8, 2030. As detailed further in Ms. Prochaska's and Ms. Mandich's testimony, the Company has determined that it can continue to operate the Plant safely, reliably, and economically beyond 2030. Accordingly, Xcel Energy filed an application with the NRC on January 9, 2023 to renew the operating license for the Monticello Plant for an additional 20 years. With such an extension, the Plant would be licensed until September 8, 2050.

Q. HOW DOES THE MONTICELLO PLANT OPERATE?

A. Company witness Ms. Pamela Prochaska provides details on the technical operations of the Plant in her Direct Testimony. But in general terms, the Monticello Plant operates using a boiling water reactor, which boils water to produce steam inside the reactor vessel, which is then directed to turbine generators to produce electrical power. The steam is cooled in a condenser and returned to the reactor vessel to be boiled again.

The reactor core, which provides the heat used to boil water, is made up of nuclear fuel assemblies. Each assembly contains fuel rods, consisting of high-density ceramic uranium dioxide fuel pellets, each about the size of a thimble, stacked in a tube made of a special steel alloy called Zircaloy. A fission

reaction between two particles in the fuel rods creates heat, powering the reactor core. The Company's nuclear engineers carefully monitor and control the reaction within the core to provide the steady baseload power the Company's customers rely on.

Q. HOW LONG DOES THE FUEL LAST?

A. Each nuclear fuel assembly provides heat over about a six-year period before its output declines to the point that it becomes ineffective. Approximately every two years, Xcel Energy shuts down the Plant to refuel one-third of the fuel in the reactor.

Q. HOW DOES THE MONTICELLO PLANT PROVIDE VALUE TO MINNESOTA CUSTOMERS?

A. The Monticello Plant offers customers cost-effective and carbon-free generating capacity that powers hundreds of thousands of homes in the Company's service territory nearly every day of the year. The value proposition for the Plant has several components.

Reliable Energy—The Monticello Plant is among the most reliable generation resources in the Company's fleet. The Plant has achieved an average capacity factor of 95 percent over the past three years. No other generation source in the Company's fleet can be depended on like its nuclear reactors, because plants like Monticello are designed to run at nearly full capacity year-round, while other baseload generation resources cannot because of higher marginal costs. The Monticello Plant and the Prairie Island Plant provide the constant baseload output that remains an important and necessary part of the Company's overall generation portfolio. Ms. Prochaska and Ms. Mandich

further discuss the reliability benefits of the Monticello Plant in their Direct Testimonies.

Cost-Effective Resource—The Company's nuclear fleet can deliver carbon-free energy at a competitive cost. In fact, the Monticello Plant's marginal cost per MWh is at its lowest point in over a decade. Over this same time period, Xcel Energy has achieved all-time-high capacity factors at the Plant, further reducing the cost per MWh. Ms. Mandich discusses the Company's resource planning and economic analysis and the recent Commission action approving the Company's Alternate Plan in the most recent integrated resource plan (IRP) docket, Docket No. E002/RP-19-368 (2019 IRP Docket), which shows that extending the life of the Monticello Plant provides important benefits for customers.

Fuel Diversity—The Company's nuclear facilities also provide the Company and its customers a hedge against changes in resource availability and fossil fuel prices. As demonstrated by recent price increases for other fuels due to geopolitical events and weather disruptions, Xcel Energy's nuclear fuel prices remain less volatile and provide a consistent cost per MWh. Ms. Mandich also discusses the importance of fuel diversity from a resource planning and reliability perspective, respectively.

Clean Energy—As discussed further by Ms. Mandich, the Monticello Plant is critical to achieving the Company's carbon reduction initiatives and to achieving Minnesota's recently-established standard requiring 100 percent "carbon-free" electricity in the State by 2040. On February 7, 2023, Governor Tim Walz signed into law 2023 Minnesota Laws, Chapter 7, requiring that, by

2040, each electric utility generate or procure 100 percent of the electricity for its Minnesota retail customers from a "carbon-free energy technology." The reliable baseload energy provided by the Plant will be critical to Xcel Energy's ability to meet this standard.

Q. HAS THE PLANT OPERATED RELIABLY AND EFFICIENTLY?

A. Yes. As Ms. Prochaska discusses in more detail, Xcel Energy has achieved industry leading results in the performance of the Plant and in managing the costs it invests to achieve that performance. The Company's nuclear fleet has never operated on a more consistent, efficient, and safe basis, and the Plant is one of the system's most dependable generation resources, with a capacity factor in the last six months of 2022 of nearly 100 percent. In addition, the Company achieved these operational results without increasing its production costs. In fact, both Operations and Maintenance and production costs have decreased in recent years.

Q. HAS THE PLANT BEEN RECOGNIZED FOR ITS PERFORMANCE RECORD?

A. Yes. The Monticello Plant has been rated among the top nuclear plants in the country by the Institute of Nuclear Power Operations (INPO). In fact, the plant has received a "1" ranking for exceptional performance for over ten years, including in its most recent INPO evaluation.

Q. HOW IS SAFETY REGULATED AND MAINTAINED AT THE MONTICELLO PLANT?

A. As noted above, the NRC regulates nuclear power production in the United States, including implementing regulations and conducting oversight to ensure the safety of operations at the Plant. With respect to spent fuel storage, the NRC oversees the design, manufacturing, and use of dry casks to ensure

licensees and designers follow safety and security requirements, meet the terms of their licenses, and implement quality assurance programs. The NRC also enforces strict security requirements to protect stored fuel, including the ability to detect, assess, and respond to an intrusion.

The NRC and plant processes require continuous evaluation of plant and human performance and correction of issues as they are identified. Every two years, the NRC performs an inspection at all commercial nuclear facilities in the United States. The inspections include evaluating station processes and corrective actions for use of industry and NRC operating experience as well as the effectiveness of the stations' audits and self-assessments. In the last inspections at both the Monticello Plant and the Prairie Island Plant, the NRC determined that there was no evidence of challenges to the organization's safety-conscious work environment.

Q. HAS THE MONTICELLO PLANT RECEIVED POSITIVE EVALUATIONS FOR ITS SAFETY STANDARDS?

A. Yes. After completing the modifications required by the NRC in the wake of the Fukushima incident and other safety investments, the Company achieved Column 1 (best) status from the NRC Reactor Oversight Process. This exemplary safety rating underscores the tireless work Xcel Energy has done and continues to do to make the Monticello Plant one of the safest, most efficient, and reliable nuclear facilities in the country.

III. THE MONTICELLO PLANT AND THE COMPANY'S INTEGRATED RESOURCE PLAN

Q. WHAT IS THE PURPOSE OF THIS SECTION OF YOUR TESTIMONY?

A. In this section, I discuss the importance of the Monticello Plant to the Xcel Energy system from a resource planning perspective, as well as the economic analysis that the Company performed on the potential Monticello Plant extension in the 2019 IRP Docket. I also discuss the reliability benefits of the Monticello Plant to the Company and our customers.

Q. PLEASE DESCRIBE THE MONTICELLO PLANT'S CONTRIBUTION TO THE XCEL ENERGY SYSTEM.

A. The Monticello Plant is a key part of the baseload backbone of the Company's system, operating just outside of the Company's largest load center. The Plant provides 671 MW of capacity at a very high capacity factor year-round, and is among the most reliable generators in the Company's fleet. I discuss the reliability impacts of the Monticello Plant in the next section.

Q. HOW DID THE COMPANY ANALYZE THE POTENTIAL EXTENSION OF THE MONTICELLO PLANT?

A. As discussed in detail by Ms. Mandich, the Company analyzed the potential extension of the Monticello Plant as part of its broader analysis of various resource portfolios in the 2019 IRP Docket. The Company performed additional modeling specific to the extension of the Monticello Plant.

Q. AT A HIGH LEVEL, WHAT WERE THE RESULTS OF THE COMPANY'S ECONOMIC ANALYSIS?

A. The Company's resource planning analyses generally found that extending the life of the Monticello Plant (1) is cost effective from Present Value of Revenue Requirements (PVRR) perspective; (2) generates considerable savings from a present value of societal cost (PVSC) perspective when environmental externalities are considered; (3) is critical to achieving our carbon reduction goals; and (4) ensures that we maintain a robust share of firm and dispatchable generation relative to peak load across seasons. Specifically, the Company's resource plan that the Commission ultimately approved (Alternate Plan), which includes an extension of the Monticello Plant through 2040, results in $46 million in PVRR savings relative to a "business as usual" reference case based on the prior 2016-2030 Resource Plan.

Q. DID THE COMPANY DRAW ANY HIGH-LEVEL CONCLUSIONS ABOUT THE CONTINUED OPERATION OF THE MONTICELLO PLANT FROM ITS ANALYSES IN THE 2019 IRP DOCKET?

A. Yes. In general, the resource plan scenarios analyzed in which the Monticello Plant continued operation past 2030 resulted in expected savings for Company customers.

Q. HOW WOULD THE COMPANY REPLACE THE MONTICELLO PLANT IF IT WAS REQUIRED TO SHUT DOWN IN 2030?

A. If Xcel Energy could not run the Plant beyond 2030, the Company would need to make up the substantial levels of capacity and energy provided by the Monticello Plant to the system. As Ms. Mandich discusses in more detail, this would mean increased market purchases, resulting in higher emissions and

leaving customers more exposed to wholesale energy markets, fuel prices, and supply volatility.

Q. PLEASE ELABORATE ON HOW EARLY RETIREMENT OF THE MONTICELLO PLANT WOULD EXPOSE CUSTOMERS TO WHOLESALE MARKETS AND VOLATILITY.

A. The Company's analysis found that in the case where the Monticello Plant is retired in 2030, the Company would be more reliant on the MISO wholesale power market to supply enough power to serve hour-to-hour customer load. Unlike a nuclear unit that provides near-constant baseload power, the gas combustion turbines that the model selected as replacement resources are intended to be utilized as peaking capacity. These resources have higher marginal costs, and would leave the Company more reliant on market purchases to serve customer needs. Additionally, replacing the Monticello Plant with gas combustion turbines would leave the Company more exposed to fuel price volatility and supply chain disturbances. Even though Xcel Energy employs appropriate hedging and fuel storage practices to mitigate volatility, gas combustion turbines do not normally have firm fuel delivery contracts and may need to rely on other types of fuel security such as on-site storage of liquid fuels. While these resources are an important part of the Company's resource mix, they do not represent a one-for-one replacement strategy for nuclear capacity in terms of the risk mitigation value they provide to the system.

Q. WHAT OTHER FACTORS SHOULD THE COMMISSION CONSIDER ASIDE FROM THE MODELED COSTS OF THE PROPOSED EXTENSION?

A. The Monticello Plant provides important resource diversity benefits that are

crucial to maintaining reliability on the Xcel Energy system. Combined with Prairie Island, the Monticello Plant represents nearly 30 percent of the total electric energy our customers require, making it a critical component of the Company's overall generation fleet. As discussed above, the Monticello Plant also operates nearly every day of the year at a very high capacity factor, and is less vulnerable to fuel supply issues, price volatility, and severe weather. For example, the Plant, along with the two Prairie Island units, performed at a high level throughout the 2019 polar vortex and the February 2021 cold spell—operating at a 100 percent capacity factor. Even among other traditional baseload resources, the high capacity factor achieved by the Company's nuclear fleet is unique. This combination of high output and inherent reliability makes the Monticello Plant a critical daily resource for maintaining reliability on the Company's system.

Q. BEYOND ITS INHERENT RELIABILITY, DOES THE MONTICELLO PLANT PROVIDE OTHER RELIABILITY BENEFITS TO THE COMPANY'S SYSTEM?

A. Yes. As a large, "always-on" baseload resource, the Monticello Plant provides a range of essential reliability services that support system strength and system stability. In general, this means that the Monticello Plant supports the grid's ability to maintain stable voltages and respond to disturbances on the grid that can affect balance, frequency, or other conditions. Additionally, the location of the Plant near the Twin Cities provides important system balancing benefits by ensuring a consistent injection of power at the Company's historic generation core near Sherburne County.

Q. IF THE MONTICELLO PLANT WERE RETIRED AND REPLACED WITH COMBUSTION TURBINES, WOULD THOSE RESOURCES PROVIDE THE SAME RELIABILITY BENEFITS?

A. Not entirely. While combustion turbines can provide some of the same essential reliability services as synchronous generators, these essential reliability services are only provided when the generator is operating. Because any combustion turbine that replaces the Monticello Plant would have a much lower capacity factor than the Monticello Plant, the replacement resource would be less likely to provide the same essential reliability services as the Plant. The same is true for the existing Sherco coal-fired generating units. Because those units only run during certain periods of the year or during peak periods due to economic forces, they would not be able to provide the same year-round essential reliability services as the Monticello Plant.

Q. HOW DOES MAINTAINING NUCLEAR AS PART OF A DIVERSE MIX OF GENERATING RESOURCES SUPPORT OVERALL RELIABILITY?

A. As discussed further by Ms. Mandich, the Company considers the attributes of different resources in its planning processes, as it is important to maintain a mix of large and small generating resources that have different operational attributes. By maintaining a diverse mix of resources including nuclear, the Company can hedge not only against fuel price volatility but also the uncertainty of technological development, future renewable pricing, and the future of renewable capacity values.

IV. THE ISFSI EXPANSION PROJECT AND RELICENSING

Q. WHAT IS THE PURPOSE OF THIS SECTION OF YOUR TESTIMONY?

A. This section of my testimony introduces both the ISFSI expansion, which is the subject of this Certificate of Need, and the NRC relicensing process that, together with the ISFSI expansion, will allow the Plant to continue providing safe, reliable, efficient carbon-free energy for our customers.

A. The ISFSI Expansion

Q. WHAT IS THE ISFSI?

A. The ISFSI is an area at the Plant site adjacent to the reactor and turbine building where the Company stores spent fuel in canisters within modular concrete vaults. The modular concrete vaults containing the spent fuel assemblies sit on a reinforced concrete support pad. Concrete approach pads surround the support pad to allow for the placement of vaults and spent fuel canister transfer traffic. Ms. Prochaska discusses spent fuel storage at the Monticello Plant and the proposed IFSFI expansion in more detail.

Q. HOW MUCH FUEL IS CONTAINED IN THE ISFSI NOW?

A. As of January 9, 2023 the ISFSI contains 1,830 spent fuel assemblies. Additionally, the Company stores 1,052 spent fuel assemblies in its spent fuel pool for a total of 2,882 spent fuel assemblies stored at the Monticello Plant.

Q. IF THE PLANT CONTINUES TO OPERATE PAST 2030, WOULD THERE BE SUFFICIENT SPACE AT THE CURRENT ISFSI FOR ADDITIONAL SPENT FUEL RODS?

A. No. Additional dry storage for spent fuel rods is needed for the Plant to

continue operations past 2030. However, the Company will need to plan for additional on-site storage even if the Plant begins decommissioning in 2030. As part of the decommissioning process, Xcel Energy will remove all fuel currently in the spent fuel pool inside the Plant to dry storage at the ISFSI. This process would require the Company to either expand its existing ISFSI facility during decommissioning to accommodate the fuel rods already being stored in the spent fuel pool or move fuel to an off-site facility.

Q. HAS THE COMPANY BEEN ABLE TO IDENTIFY ANY OFF-SITE FACILITIES THAT COULD ECONOMICALLY AND RELIABLY STORE OR REPROCESS ADDITIONAL SPENT FUEL?

A. No. The Company has determined that expanding the ISFSI facility is the most economical and reliable method for storing additional spent fuel rods. The Company analyzed four other potential options for disposal of the additional fuel rods: (1) reprocessing spent nuclear fuel, (2) contracting for additional spent fuel storage capacity at an existing offsite spent fuel storage facility, (3) contracting for additional spent fuel storage capacity at an offsite interim spent fuel storage facility in the future, and (4) the availability of a federally-sponsored permanent repository for spent fuel at Yucca Mountain. Ultimately, the Company has concluded that none of the four alternatives represent a viable strategy to support continued operation of the Monticello Plant after it exhausts its current storage capacity. Ms. Prochaska's testimony further details the Company's analysis on each of these alternative options and why ISFSI expansion is the least-cost solution for additional spent fuel storage.

Q. PLEASE PROVIDE A HIGH LEVEL OVERVIEW OF THE PROPOSED ISFSI EXPANSION PROJECT.

A. The Company's proposal involves the construction of a second concrete pad and modular concrete storage system within the existing ISFSI to support additional storage casks, which will store sufficient spent fuel to allow the Monticello Plant to continue operating past 2030. The largest part of the project would be the construction of a second concrete pad at the site. The Company would also purchase additional dry storage casks to hold the spent fuel rods.

Q. HOW DOES THE ISFSI EXPANSION PROJECT BENEFIT XCEL ENERGY'S MINNESOTA CUSTOMERS?

A. With additional spent fuel storage capacity, the Plant can continue providing reliable, baseload and carbon-free electricity, without exposing customers to the same fuel price or availability concerns as other resource types. Expanding the storage capacity of the ISFSI is necessary to keep this important resource on the system. Once the expansion is complete, the Company will have the ability to run the Plant economically and reliably at least until 2040, representing a long-term hedge against volatile fuel prices and helping the Company and the State of Minnesota meet its carbon reduction goals.

B. The SLR Application

Q. WHY DOES THE MONTICELLO PLANT REQUIRE A LICENSE RENEWAL?

A. The Plant's license will expire on September 8, 2030. Therefore, to operate the plant past this date, along with the Certificate of Need to allow for additional dry cask storage, the Company will need to obtain a license renewal. The proposed SLR would be the Plant's second license renewal and would

extend the Plant's life from 60 to 80 years, with a new expiration date of September 8, 2050.

Q. APART FROM THE LAST MONTICELLO SLR, HAS THE COMPANY SUBMITTED SLRS FOR OTHER NUCLEAR FACILITIES?

A. Yes. The Company also completed an SLR process for its Prairie Island Plant in 2014. Because the Company has already completed the SLR process for the Monticello Plant and the two units at Prairie Island, we expect that the Company's institutional expertise in the relicensing process will help expedite the process for the Monticello Plant's second SLR. Furthermore, the Company plans to study other operators as they undergo the second SLR process to help learn what issues could arise for the Monticello Plant during the relicensing.

Q. HAS THE COMPANY FILED THE SLR APPLICATION?

A. Yes. The Company filed an application with the NRC on January 9, 2023 to renew the operating license for the Monticello Plant for an additional 20 years. NRC rules required the SLR application to be filed no later than September 8, 2025, but by submitting the SLR application earlier, the Company has minimized the potential for changing regulatory expectations to impact the project.

Q. PLEASE DESCRIBE THE RELICENSING PROCESS AT A HIGH LEVEL.

A. Ms. Prochaska explains the relicensing process in more detail, but in brief, the SLR process includes all of the requirements imposed on an initial 40-year license plus new equipment evaluations and equipment replacement frequencies to mitigate the effects of aging. The Company expects that its

previous relicensing efforts will help with many of the relicensing requirements for the Monticello Plant for the second SLR.

V. CERTIFICATE OF NEED CRITERIA

Q. HOW DOES THE COMPANY'S PROPOSAL FOR ADDITIONAL DRY CASK STORAGE CONFORM WITH THE COMMISSION'S CRITERIA FOR GRANTING A CERTIFICATE OF NEED?

A. Xcel Energy's proposal satisfies all four of the Commission criteria set forth in Minnesota Rules 7855.0120, as outlined in our application at Chapter 4. Those criteria are as follows:

A. the probable direct or indirect result of denial would be an adverse effect upon the future adequacy, reliability, safety, or efficiency of energy supply to the applicant, to the applicant's customers, or to the people of Minnesota and neighboring states;

B. a more reasonable and prudent alternative to the proposed facility has not been demonstrated by a preponderance of the evidence on the record by parties or persons other than the applicant;

C. it has been demonstrated by a preponderance of the evidence on the record that the consequences of granting the certificate of need for the proposed facility, or a suitable modification thereof, are more favorable to society than the consequences of denying the certificate; and

D. that it has not been demonstrated on the record that the design, construction, operation, or retirement of the proposed facility will fail to comply with those relevant policies, rules, and regulations of other state and federal agencies and local governments.

With regard to Criterion A, denial of our application for a Certificate of Need would result in an adverse impact on the future adequacy, reliability and efficiency of energy supply, as demonstrated by the Commission's approval of the Company's Alternate Plan in the 2019 IRP Docket and as further discussed by Ms. Mandich. And as Ms. Prochaska discusses, the Plant is one of the most reliable plants on the Xcel Energy system. In order for the Company to continue providing an adequate and reliable supply of electricity to our customers, we need the electricity provided by the Plant. Without the Plant available, its output would have to be replaced by other sources, adding costs, carbon emissions, or both.

Regarding Criterion B, the Company examined available alternatives to provide the capacity and energy of the Monticello Plant in the 2019 IRP Docket and, as demonstrated by the Commission approval of the Alternate Plan and discussed by Ms. Mandich and Company witness Ms. Jessica Peterson, those alternatives, including the alternative of increased conservation efforts, are either insufficient to replace the capacity and energy supplied by the Monticello Plant or are not superior to continued operation of the Plant. In addition, Xcel Energy examined storage alternatives that may be possible, in lieu of adding dry cask storage capacity at the ISFSI. None of those alternatives provide a more reasonable option to additional dry cask storage at the ISFSI, as discussed by Ms. Prochaska and Company witness Mr. Daniel Flo.

With respect to Criterion C, the consequences of providing additional dry cask storage that allows the plant to continue operating are more favorable to society than the consequences of denying the Certificate of Need and closing the Plant in 2030. The reliability and efficiency advantages associated with granting the

Certificate of Need help foster a strong regional economy, as Ms. Prochaska and Ms. Mandich discuss, while any radiological impacts are minimal, as discussed by Company witness Mr. Glenn Mathiasen. In addition, as I discussed above, the carbon-free energy provided by the Plant helps the Company and the State achieve the ambitious carbon reduction goals that have been set.

Finally, regarding Criterion D, the Company will comply with all applicable laws and regulations, including the rigorous federal framework in place to ensure safe operation of nuclear power plants and ISFSIs, as discussed by Ms. Prochaska.

Given that each of the Commission's Certificate of Need criteria has been demonstrated, the Certificate of Need should be granted.

VI. INTRODUCTION OF WITNESSES

Q. PLEASE INTRODUCE THE WITNESSES PROVIDING TESTIMONY FOR THE COMPANY IN THIS PROCEEDING.

A. In addition to my Policy Testimony, the Company sponsors the following witnesses:

- *Pamela Prochaska,* who sponsors testimony on nuclear operations and nuclear policy.
- *Farah L. Mandich*, who sponsors testimony on resource planning and the role of the Monticello Plant in the Xcel Energy System.
- *Daniel S. Flo,* of Merjent, Inc., who sponsors testimony on environmental impacts.
- *Glenn D. Mathiasen,* who sponsors testimony on radiological impacts.

- *Jessica K. Peterson*, who sponsors testimony on the Company's conservation programs and the impacts of those programs on the Company's capacity and energy needs.

Together, these witnesses provide the information needed to evaluate and approve our Application.

VII. CONCLUSION

Q. PLEASE SUMMARIZE YOUR CONCLUSIONS.

A. The Company's proposal for additional dry cask storage at the Monticello Plant is necessary to allow the Plant to continue providing Company customers with efficient, reliable and carbon-free baseload power as the system continues to shift to more variable, non-dispatchable resources. This benefit will help the Company maintain reliability during winter storms and seasonal peaking events, with less reliance on market purchases or high marginal cost dispatchable generators. By maintaining the Monticello Plant as a baseload generator beyond 2030, the Company and our customers will benefit from the Plant's ability to provide low marginal cost power as it continues to develop new low-cost generation sources to replace the Plant when it eventually retires.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, it does.

Al Krug

414 Nicollet Mall, 401-7th Floor
Minneapolis, MN 55401
allen.krug@xcelenergy.com
612-330-6270 (W)

EDUCATION

1980	University of California, Los Angeles MA, Economics
1978	Queens College, City University of New York BA, Economics

WORK EXPERIENCE

2013-Present

Xcel Energy Services, Inc., Minneapolis MN
Associate Vice President, State Regulatory Policy
- Develop regulatory strategy for NSPM.

2008-2013

Xcel Energy Services, Inc., Minneapolis MN
Regional Vice President, Regulatory Administration
- Coordinate regulatory compliance and strategy for NSPM.

2003-2008

Xcel Energy Services, Inc., Denver, Colorado
Regulatory Consultant
- Develop regulatory strategy for Commercial Operations.
- Coordinate compliance activity.
- Coordinate internal and external audits of trading activity.

1998-2003

Xcel Energy Services, Inc., Minneapolis, MN
Manager Renewable Energy/Regulatory Contract Coordinator
- Develop corporate strategies for renewable energy development.
- Represent Company at state regulatory and legislative proceedings regarding renewable energy issues.
- Negotiate purchased power contracts for renewable energy.
- Manage Energy Market's regulatory interactions with internal and external stakeholders.

1994-1998 **Minnesota Department of Commerce, St. Paul, MN**
Supervisor, Electric Regulatory Unit

- Manage regulatory staff to participate in state regulatory proceedings before the Minnesota Public Utilities Commission.
- Submit expert testimony in regulatory proceedings.
- Represent the Department of Commerce before the Minnesota legislature.

1982-1994 **Minnesota Department of Commerce, St. Paul, MN**
Principal Statistical Analyst

- Submit expert testimony in regulatory proceedings.
- Perform economic and statistical analysis to support regulatory and energy policy initiatives.