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**EXECUTIVE SUMMARY**

Xcel Energy has pioneered the clean energy transition for decades, with industry-leading energy efficiency and renewable energy efforts. Over two years ago, the Company took its leadership to a new level, announcing a goal of reducing carbon emissions by 80% from 2005 levels by 2030 and becoming the first utility in the nation to state its intention to serve customers with 100% carbon-free electricity by 2050. As we work toward these goals and move toward a portfolio that is predominantly renewable and intermittent, the Company must maintain a significant amount of firm dispatchable generation in order to protect the adequacy and reliability of energy supply for our customers. A significant amount of that firm dispatchable generation is currently provided by the Company's nuclear fleet, including the Monticello Nuclear Generating Plant (Monticello Plant or Plant), which provides carbon-free baseload generation to our system. In 2030, the Monticello Plant will exhaust its storage capacity for spent nuclear fuel within the Plant and at the existing Independent Spent Fuel Storage Installation (ISFSI) located on site. Without additional storage capability, the Monticello Plant would need to be shut down.

The Company therefore submits this application for a Certificate of Need (CN) to the Minnesota Public Utilities Commission (MPUC or Commission) for authority to add additional storage at the existing ISFSI which would allow for the continued operation of the Plant from 2030 until 2040. This Executive Summary provides an overview of the main points of the CN Application, a description of the Project, and highlights the critical role of this Project in our energy future, including:

- ***Enables Significant Carbon Reduction:*** Nuclear power is a key component of the Company's vision to be 100% carbon-free by 2050 and currently provides 30% of the electricity used by Xcel Energy's Upper Midwest customers. The Company simply cannot achieve the aggressive levels of carbon reduction desired by both Xcel Energy and the State of Minnesota at an affordable price without nuclear generation on our system. Our resource plan modeling shows that when the nuclear units are removed, the model chooses incremental combustion turbine (CT) resources in its place.
- ***Maintains Reliability:*** Our nuclear fleet provides around-the clock grid stability, voltage support, and overall reliability – some of the positive grid-supporting attributes that are currently provided by our coal units and would also be provided by the Sherco Combined Cycle unit. Nuclear plants have up to 24 months of fuel on site and thus are not subject to fuel supply disruptions. They also are not subject to pipeline limitations during the winter season, and they have a very



strong operating history during cold and hot weather events. Monticello, in particular, is at the core of the NSP bulk power system. The grid has grown around this core near Becker and depends on ongoing power injection at this point. Continued reliable carbon free power injection at this site helps ensure a stable resource transition given the evolution of resources around it.

- ***Economical for Customers:*** Our resource modeling shows that extending operation of the Monticello Plant is beneficial and least-cost when compared to other alternatives. Specifically, the Monticello extension yields \$60 to \$80 million of benefits on a present value societal costs (PVSC) basis in comparison to alternatives. Were operation of the Plant not extended, we would need to build many incremental new gas units or (setting aside the capacity needs provided by the nuclear plant entirely) we would replace the carbon free energy from the Plant with renewable resources which would require over 1,000 MW of wind or nearly 3,000 MW of solar resources along with \$400 million in additional transmission investments based on our Resource Plan assumptions.
- ***Provides Jobs and Supports Energy Workforce Transition:*** As we move away from our coal-fired generation facilities and look to support our workforce, our nuclear fleet is critical to supporting that transition. Our nuclear facilities directly employ approximately 1,400 people in and around the Monticello and Red Wing communities. The Monticello Plant specifically employs 600 workers. An additional 1,000 workers, primarily from local union halls, are employed to complete the refueling outages which occur approximately one month every two years.
- ***Supports Fuel and Resource Diversity:*** Our nuclear fleet adds important diversity to our generation portfolio and provides a hedge against not only gas price volatility but also the uncertainty of technological development, future renewable pricing, and the future of solar capacity values. The importance of a diverse portfolio of resources to an affordable and reliable clean energy transition cannot be overstated. In addition to fuel diversity, operational and resource diversity attributes provide important benefits. We need a mix of large and small plants with their different operational attributes in order to maximize production and reduce risk.
- ***Delivers Community Contributions:*** Our nuclear plants are an important source of tax base for their host communities, resulting in a combined total of approximately \$42 million in state and local taxes annually. In total, Xcel Energy's nuclear operations contribute approximately \$1 billion in annual economic benefits throughout the state. The Monticello Plant accounts for roughly 50% of the tax base for the City of Monticello.

Importantly, in our currently pending Integrated Resource Plan (IRP) many intervenors have recognized these critical contributions from the Monticello Plant and we have received support for the extension of the Plant from numerous parties including: the Deputy Commissioner of the Division of Energy Resources at the Minnesota Department of Commerce, Aditya Ranade, the Clean Energy Organizations (“CEOs” comprised of Fresh Energy, Clean Grid Alliance, Union of Concerned Scientists, and Minnesota Center for Environmental Advocacy), the Citizens Utility Board (CUB), the Monticello Labor Coalition (comprised of the Minnesota Building & Construction Trades Council, Pipefitters Local 539, and Construction & General Laborers Local 563), the City of Monticello, the City of Becker, Xcel Large Industrials (XLI), Becker Township, the Coalition of Utility Cities, and the City of Monticello Industrial Economic Development Committee.

Because we believe the expansion of spent fuel storage capacity at the ISFSI is needed and the least cost and best alternative for our customers, the state, the environment, and the communities we serve, we ask that the Commission approve our CN Application.

### **I. THE PROJECT AND MINNESOTA’S CARBON FREE ENERGY FUTURE**

To achieve our carbon free energy vision, in our pending IRP, Xcel Energy announced our plan to retire all of our coal plants in the Upper Midwest by 2030. Together, our coal units provide a combined capacity of 2400 MW, and therefore, their retirements will create a significant shortage in our energy capacity needs. Approval of this CN, which would extend the useful life of the Monticello Plant, is critical to our ability to retire our coal plants in the near future, and allows the Company to reduce carbon emissions while at the same time meeting our customers’ electricity needs using a dispatchable resource that offers reliability and affordability. We also recently brought forward an Alternative Plan in our IRP that does not include the approximately 800 MW natural gas Sherco CC previously included in our Preferred Plan. These kinds of bold, carbon-reducing moves cannot happen without the continued availability of affordable and reliable generation from the Monticello Plant.

The Monticello Plant provides our system with 671 megawatts (MW) of capacity and produces energy 24 hours a day, seven days a week for extended periods of time. Since it began operating in 1970, the Plant has generated over 200 million megawatt hours (MWh) of zero carbon electricity, which translates to over 200 million tons of avoided carbon dioxide emissions. In fact, the Monticello Plant and the Prairie Island nuclear

plant together avoid 13 million tons of carbon emissions annually – the equivalent of removing two million cars from the roads. Moreover, the Plant contributes to the balance and diversity of resources the Company has available and provides important grid-supporting attributes such as stability, voltage support and overall reliability as the Company retires its other baseload power plants. In short, the Project (and the continued operation of the Monticello Plant it enables) is a critical component of achieving Xcel Energy’s and Minnesota’s carbon reduction goals, while still meeting the ongoing demand for electrical power affordably, reliably and efficiently.

## II. THE MONTICELLO PLANT

In the Company’s pending IRP, we modeled a number of scenarios testing different retirement dates for the baseload resources (coal and nuclear) currently in our generation portfolio. Through the course of the three filings made in the IRP, we determined that a scenario in which our remaining coal units would be retired by 2030, and Monticello would be extended to 2040, would be the most prudent path forward to achieving our clean energy goals while also maintaining affordability and reliability.

The Company’s preferred resource mix is presented in its Alternate Plan, filed in the IRP docket in June 2021. The Alternate Plan was developed after significant feedback regarding the inclusion of the Sherco CC in earlier iterations of the Company’s preferred plan. The Alternate Plan maintains the proposed early coal retirements and Monticello Plant life extension; however, it also removes the Sherco CC and reutilizes the generator interconnection rights that will become available at the coal sites and used for adding renewable generation, alongside limited combustion turbine capacity and future firm dispatchable resources to provide integration support. The Alternate Plan therefore balances the Company’s goals of achieving its decarbonization objectives with providing affordable and reliable energy to our customers. Without the continued operation of the Monticello Plant, the right balance of these factors cannot be achieved in a scenario where the Company retires its coal plants and foregoes construction of the Sherco CC.

### A. Carbon-Free Generation

In our IRP modeling, no baseload scenario that retired our nuclear units (both Monticello and Prairie Island) at their currently licensed dates achieved our goals to reduce carbon 80% from 2005 level by 2030 (our “80x30” goal). Xcel Energy has been on the path toward significant carbon reduction for more than a decade and, since 2005, we have reduced carbon emissions 51% companywide. In order to achieve our goal of an 80% reduction of carbon emissions by 2030, we need to retire our coal-fired generation by that date, replace those assets with low-or no-carbon resources,

and preserve the carbon-free generation that is already part of our system. The Plant is a critical part of our carbon-free generation portfolio, providing 671 MW of capacity and over 5 GWh of energy each year.

Furthermore, we have a goal to provide 100% carbon-free electricity by 2050. Reducing the remaining 20% of carbon emissions to deliver 100% carbon-free electricity by 2050 will require technologies not yet commercially available. We are working with policy makers and other innovative tech industries to explore new technologies but do know that our nuclear units could be a place to pilot potential technologies that could help with further carbon reduction, like hydrogen production. In that way, our nuclear units could play an even bigger part in reducing our carbon emissions.

### **B. Reliability, Diversity, and Stability**

In addition to generating carbon-free electricity, due to its round-the-clock operations, the Plant is one of our system's most reliable generation resources. The Monticello Plant operates 24 hours a day, seven days a week for extended periods of time. In fact, the Plant recently completed a record 704 days of continuous operation prior to its most recent scheduled refueling outage in April 2021. Additionally, our nuclear fleet, including Monticello, adds important diversity to our generation portfolio and provides a hedge against not only gas price volatility but also the uncertainty of technological development, future renewable pricing, and the future of solar capacity values.

Monticello has operated at an average capacity factor of 93.5% over the past four years, including a record-setting 98.7% in 2020, a non-refueling year. Combined with the Prairie Island nuclear plant, the Monticello Plant represents nearly 30% of the total electric energy (and 48% of the carbon-free energy) our customers required in 2020, making it a critical component of our overall generation fleet. No other carbon-free resource in our generation fleet can replicate this kind of reliable performance.

As Xcel starts to retire its coal units, the Monticello Plant serves an increasingly important role in providing stability, voltage support, and overall reliability – some of the positive grid-supporting attributes of central station power that we will lose when the coal units retire and that the Sherco Combined Cycle would have provided.

The reliability of nuclear generation, and its continued inclusion in our diverse resource mix, is especially important during extreme weather. For example, our three nuclear units performed extremely well throughout both the 2019 polar vortex and the February 2021 cold spell. There are a number of reasons for nuclear generators' resiliency – at any given time, nuclear plants have up to 24 months of fuel supply, and

they can run when other energy resources are interrupted by extreme weather or other circumstances. Nuclear plants are also built to withstand extreme weather and have demonstrated their ability to continue operations during hurricanes and severe weather, as well as freezing temperatures, which are common during Minnesota winters. With severe weather events on the rise and reasonably expected to occur again, maintaining a diverse generation mix that ensures we can meet our obligation to provide reliable electric service in all conditions, including extended durations of extreme weather, is critical.

The continued operation of the Monticello Plant helps us to maintain a healthy ratio of firm capacity to peak demand during the 2030 through 2040 time period, whereas scenarios that do not include an extension of the Monticello Plant either rely on incremental gas resources to provide firm capacity or rely more heavily on variable or use-limited resources. In either case, however, we would be decreasing the diversity of generation on our system and, ultimately, making it notably less resilient. On the other hand, maintaining a mix of large and small generating units, with their different operational attributes allows us to maximize production and reduce risk, just like with a stock portfolio. Especially as we consider moving forward without a combined cycle plant at Sherco, the Monticello Plant provides an important part of that diversity for the Xcel Energy system.

While renewable resources are an essential component of the Company's energy transition plan, the inherent variability of renewable resources creates a need for sufficient stable energy resources, such as the Plant, to assure our ability to meet our customers' needs. To that end, as part of moving towards a carbon-free generation fleet by 2050, we have improved our operational flexibility so that we can ramp down our nuclear plants during periods of high transmission congestion and low prices, such as times when abundant renewable resources are available on our system. We have demonstrated our units' ability to participate in the MISO Day Ahead market by flexing a number of times in 2020, and have moved beyond the pilot stage, with all three units in the market. This helps with the Company's efforts to integrate its continuing renewable additions.

In sum, as we make future resource planning decisions, it is important to consider overall system, fuel, and resource diversity and the important benefits offered by nuclear power. Currently, nuclear power is the source of most of the country's emissions-free energy and has long been a reliable, efficient, and job-creating energy source. Because of their comprehensive safety procedures and stringent federal regulations, nuclear plants are among the most robust elements of critical energy infrastructures. The Company needs to carefully manage the transformation of its generation portfolio in order to preserve the reliability and stability of the system



while moving towards a carbon-free generation portfolio, and maintaining Monticello as a resource on our system is a key piece of that plan.

### C. Low Production Costs

In 2020, our fleet achieved its third year in a row of production costs below \$30/MWh, which represents a 32% decline from 2013. We have reduced our annual O&M costs relative to 2016 by over \$20 million, which represents an 8% percent improvement compared to 2016 results.

The Company's nuclear power plants provide the Company and its customers a hedge against changes in resource availability, fossil fuel prices, and future emissions regulations. Our nuclear units use a steadily available fuel at a consistent cost per MWh,<sup>1</sup> which benefits our customers.

As discussed in our currently pending Resource Plan, we have worked with external consultants and the Institute of Nuclear Power Operations (INPO) to effectively improve upon a number of processes and personnel behaviors that has enabled our nuclear fleet to achieve better results with fewer resources. Accordingly, we have seen decreases in our O&M and capital costs, and also reflected these in our long-term forecasts.<sup>2</sup>

The Department's consultant, Global Energy & Water Consulting, LLC (Global) has confirmed our budgets for both O&M and capital costs at Monticello.<sup>3</sup> Specifically, Global's report concluded at page 3, that "The Monticello forecast budget for O&M spending through 2040 is aggressive but attainable with Xcel's attention to cost controls."

The report also concluded, at page 3:

The Monticello forecast budget for capital spending is well within reason considering the age and the need to prepare the unit for relicensing. The forecast capital spending for the next 20 years is well below capital spending during the last 10+ years. The outlier that is still not very well

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<sup>1</sup> The fuel assemblies in each nuclear unit's reactor contain the equivalent energy of approximately six million tons of coal used to produce electricity.

<sup>2</sup> See the July 1, 2019 filing in Integrated Resource Plan docket (19-368) Appendix K: Xcel Energy Resources: Nuclear.

<sup>3</sup> See the December 23, 2020 filing in the Integrated Resource Plan docket (19-368), *Independent Investigation of Cost Overruns and Cost Estimates for Xcel Energy's Monticello and Prairie Island Nuclear Power Plants* prepared by Global Energy & Water Consulting, LLC (Global).

documented is the capital necessary to accomplish the Subsequent License Application/Review (SLA/SLR) and it will not be until Xcel completes its license review and application to the NRC.

#### **D. Safety and NRC Oversight**

The Monticello Plant has maintained high levels of safety performance, achieving top marks on the industry's rigorous safety evaluations. In fact, our nuclear fleet was recognized as one of the highest performing fleets in the country according to our nuclear industry peer group, and, based on that strong operational performance, Xcel Energy was recently chosen by NuScale SMR Technologies to enter a memorandum of understanding (MOU) to explore the feasibility of Xcel Energy serving as a plant operator at NuScale Plants. Additionally, our nuclear fleet has received the State of Minnesota Governor's Safety award for industrial safety every year since the program began in 2000. The Monticello Plant is in Exemplary Status at INPO, in NRC Column 1 Status with all green performance indicators, and has no NRC Safety Culture Concerns.

The Monticello Plant, like all nuclear plants, is subject to rigorous oversight by the Nuclear Regulatory Commission (NRC), both under its license requirements and all new NRC rules and regulations. In addition to these ongoing requirements, the NRC will evaluate the Company's Monticello SLR, including by supplementing the Generic Environmental Impact Statement prepared for SLRs. This level of regulatory attention will help to ensure that the Monticello Plant is operated safely and in compliance with applicable regulation through 2040.

#### **E. Community Impact**

Xcel Energy currently has 600 employees working in or directly supporting the Monticello Plant, which increases by an additional 1,000 workers during refueling, but the economic impact of the Plant goes well beyond just these employees. In a recent NEI report, "*The Impact of Xcel Energy's Nuclear Fleet on the Minnesota Economy*," NEI states that, in 2016, "Xcel Energy's nuclear facilities were estimated to contribute \$595 million to Minnesota's gross state product (GSP)." In addition, the report finds that "...for every dollar of output from Xcel Energy's nuclear operations, the state economy produces \$1.98." That same study noted that the fleet supports an estimated 6,100 additional jobs across Minnesota and generates \$1 billion in economic activity each year. The Company's nuclear fleet also generates substantial tax revenue for the state, contributing an estimated \$41 million in state and local taxes annually with approximately \$18 million generated by the Monticello plant. Further, given the retirement of the Company's coal plants and alternative resource plan that does not

include developing the Sherco CC, a significant number of existing and potential energy-related jobs will be lost within the next decade. Retiring the Monticello Plant on top of these other changes in 2030, as would be required absent a CN for the Project, would exacerbate the difficulty of this overall job transition.

## F. Modeling Results

To assess the alternatives to certifying the need for additional spent-fuel storage altogether, we examined two cases in which we retire the Monticello Plant at its currently scheduled date and allow the resource planning model to optimize replacements needed to fill the energy and capacity needs created by the retirement. In the first case (Replacement Scenario 1) we allow the model to freely optimize the most cost-effective resources to replace Monticello. In the second case (Replacement Scenario 2), the model was prohibited from choosing any incremental CTs (over and above the firm dispatchable generation included in our IRP Alternate Plan) to backfill capacity needs left open by Monticello's retirement.

In comparison to these two cases, the IRP Alternate Plan, which includes the Project and the continued operation of the Plant, proposes the acceleration and expansion of many renewable resources as well as the retirement of all of our coal units in the upper Midwest, thereby achieving the highest level of carbon reduction among the three options. It is also the lowest cost basis on a Present Value Societal Cost (PVSC) basis and is lower cost than Replacement Scenario 2 on a Present Value Revenue Requirements (PVRR) basis. While Replacement Scenario 1 comes out as slightly lower cost than the Alternate Plan and Replacement Scenario 2 on a PVRR basis, it is the *worst* choice in terms of carbon reduction because of the addition of gas units, emitting nearly 1 million tons of additional carbon in the year after Monticello would retire and staying consistently higher than the Alternate Plan through the 2030s. What is not reflected in the modeling results, but incredibly important to the Company and our customers, is the inherent stability and reliability the Plant provides for the Company's system. Put simply, the Company's system would be significantly destabilized, and lack critical resource diversity, were the Company to retire its coal resources and Monticello before 2030, particularly if we also were to forego development of the Sherco CC facility.

## III. THE PROJECT

To allow for continued operation of the Plant after 2030, Xcel Energy must obtain two approvals – approval of this CN for additional storage capacity for spent nuclear fuel, and a SLR from the NRC.<sup>4</sup> Both are crucial to the continued operation of the

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<sup>4</sup> Xcel plans to apply for an SLR in 2023 to extend the operation of the Monticello Plant to 2050.



Monticello Plant, which is essential for the continued provision of adequate, reliable, safe and carbon-free electricity to Xcel Energy's customers in Minnesota and neighboring states.

The current ISFSI consists of a lighted area, approximately 460 feet long and 200 feet wide, roughly 3-1/2 acres in size, located adjacent to the reactor and turbine building. The site and storage vaults are monitored with cameras, other security devices, and temperature sensors. Within the storage area, spent fuel is currently stored in 30 canisters in modular concrete vaults, placed on a reinforced concrete support pad. Concrete approach pads surround the support pad to accommodate vault placement and spent fuel canister transfer traffic.

Xcel Energy proposes to increase the capacity of the existing ISFSI by loading additional welded canister modules and placing them on a second concrete support pad that would be constructed within the existing facility. The existing facility was constructed with sufficient space to add the necessary additional storage modules with minimal environmental or other impacts.

#### **A. Construction of Additional Pad**

The Project involves construction of a second pad and modular concrete storage system (hereinafter referred to as expansion facilities) within the existing ISFSI to support additional storage casks, which will store sufficient spent fuel to allow the Monticello Plant to continue operating until 2040. The exact number of casks needed will be determined by the specific amount of nuclear fuel required to run an additional ten years, from 2030 to 2040, how much fuel is loaded each cycle, and the capacity of the cask eventually selected. Although we estimate that we will need approximately fourteen additional storage casks, the storage facility and second support pad will be able to accommodate another thirty-six vaults of the existing design without having to change the security perimeter. The extra space can be used for the existing technology or a different welded canister system, depending on which is selected.

#### **B. Cask Technology**

Our application does not identify a specific cask vendor or technology to be used, as we propose to use a competitive bidding process to select the technology and vendor. Regardless of the specific vendor selected, the technology will be licensed by the NRC and will consist of welded, sealed canisters for confinement, stored in an overpack (typically concrete construction) that will provide additional radiation shielding and protect the sealed canister from external hazards. For transportation offsite, the

canisters will be transferred to a shipping overpack licensed by the NRC without the need to move the fuel to a new container.

We are, therefore, requesting that the Commission approve the additional storage necessary to support an additional 10 years of plant operation using a welded canister system, independent of the specific vendor selected. Regardless of the technology selected, the Company will not use the expanded ISFSI to accommodate the storage of waste generated after the end-date specified in the CN absent additional Commission approval.

### **C. Radiological Impacts**

Assuming the additional casks are loaded to provide the needed storage to allow the Monticello Plant to operate until 2040, and based on fuel characteristics representative of the actual fuel in the Monticello Plant spent fuel pool, the dose rate to the nearest resident would be 0.4 mrem/year when the additional modules are first loaded. This level is indistinguishable from normal background levels. Further, once the spent fuel is located at the site, the dose rate will constantly decrease due to the radioactive decay of the spent fuel. Because all NRC certified cask designs must meet the same NRC standards for radiation shielding, it is expected that that calculation would be representative of other cask designs certified by the NRC.

### **D. Environmental Impacts**

Because the Project is an expansion of an existing facility in an already-disturbed area, the environmental impacts of the construction will be minimal. Additionally, because the Monticello Plant has been in operation for over 50 years, there is little negative environmental impact associated with the continued operation of the plant for another ten years.

As noted above, there is a significant environmental benefit associated with the continued operation of the Monticello Plant, as it will significantly assist Xcel Energy in meeting its goals to reduce carbon emissions by 80% from 2005 levels by 2030 and chart a path toward achieving carbon-free generation by 2050.

## **IV. Alternatives Analysis**

In assessing the need for additional spent fuel storage at the Monticello Plant, the Company considered both generation alternatives, in which the Plant is assumed to be shut down in 2030, and storage alternatives, in which the Plant is assumed to run through 2040, but additional spent fuel is not stored at the ISFSI. Based on this analysis,

we conclude that expanding the ISFSI for additional spent-fuel storage is the best solution for the Company and our customers.

### **A. Alternatives to Generation**

The Company considered alternatives to facilitating the extension of the life of the Plant altogether because a denial of the CN for expanded ISFSI would mean that the Monticello Plant will shut down in 2030. If that occurs, the capacity and generation of Monticello Plant will need to be replaced. Xcel Energy modeled various scenarios and that modeling demonstrated that the Project and extending the life of the Plant provides cost benefits, compared to replacement scenarios. In addition, the lowest cost replacement scenario adds significant gas-fired resources to our system. Finally, while sophisticated modeling can examine and compare various combinations of resources that could replace the capacity and energy of the Plant, modeling alone cannot paint a complete picture. Factors to be considered in determining whether and how to replace a large baseload central station facility such as the Monticello Plant should also include: the impact on the Company's ability to reach its goal of carbon-free generation by 2050 and the impact on the State's ability to meet its own carbon reduction goals; the reliability of the electricity provided to the Company's customers; diversity of resources; affordability of power; and other societal issues, such as economic benefits generated by the provision of hundreds of high paying jobs and substantial tax revenues and other benefits to the community. All of these aspects of replacing the Monticello Plant with alternative generation resources must be considered and such a full consideration supports approval of the Project and continued operation of the Monticello Plant beyond 2030.

### **B. Storage Alternatives to ISFSI Expansion**

In considering alternatives to storing fuel in an expanded ISFSI, we looked at a variety of options including off-site storage, reprocessing the spent fuel, and storing the fuel in locations on-site other than the ISFSI. At the present time, there are no viable alternatives to continuing to store spent fuel at the Plant itself. And, of the options for storing spent fuel at the Plant, expanding the ISFSI makes the most sense.

#### *1. Off-Site Storage Alternatives*

There are currently no off-site licensed storage facilities accepting spent nuclear fuel from other reactors. While the federal government retains the obligation to provide a permanent repository for spent nuclear fuel, efforts to establish such a repository at Yucca Mountain in Nevada have been stalled for an extended period of time, and it is not expected to move forward during the next few years.

There are currently two private centralized interim facilities seeking NRC licensure, the Holtec HI-STORE Consolidated Interim Storage Facility (Holtec), proposed to be located in southeastern New Mexico, and the Interim Storage Partners (ISP) Storage Facility proposed to be located in Andrews County, Texas.<sup>5</sup> Environmental and safety reviews are ongoing at the NRC and the NRC expects to issue the licenses for the two facilities by early 2022. That said, there are a number of additional requirements that will need to be met before either of these facilities are able to accept spent fuel. After receiving the NRC license, each facility will need to work with their respective states on permitting issues and will develop a business model for operations prior to construction. In addition, the Department of Energy will begin its own process to find a consent-based interim storage location over the next few months, and it is unclear how this will impact the two private facilities currently in licensing.

While we believe the centralized storage facilities proposed by ISP and Holtec meet all NRC regulatory requirements and would be a positive development in the management of spent nuclear fuel, we do not consider either of them to be a viable alternative to granting additional storage capacity at the Monticello Plant ISFSI at this time, as we will need to load the next dry cask storage containers in the 2028 timeframe.

### 2. *Reprocessing Spent Fuel*

Reprocessing is not a viable alternative to establishing onsite dry storage at the Monticello Plant. Reprocessing by private companies was banned by President Jimmy Carter in 1977. While this ban was eventually lifted, because of the economics of reprocessing compared to fabrication of new fuel and the political uncertainty surrounding reprocessing, no private companies have invested in constructing and operating reprocessing facilities in United States.

### 3. *On-Site Storage Alternatives*

Xcel could theoretically achieve increased storage capacity by increasing the capacity of its pool storage on site through one of three means: consolidation, re-racking or a new storage pool. None of these provide a more reasonable and prudent alternative than additional dry cask storage.

For example, NSP conducted a fuel rod consolidation demonstration project at the Prairie Island Nuclear Generating Plant in 1987. The demonstration project was not

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<sup>5</sup> In addition, the Private Fuel Storage, LLC (PFS) facility proposed for the West Central Utah reservation of the Skull Valley Band of Goshute Indians remains licensed by the NRC. That said, no additional work has been conducted with respect to the PFS facility for many years, and because of the substantial obstacles to reviving this project at this point, it is not a viable alternative to expanding fuel storage at Monticello.

successful – as the Department of Energy noted in a 2001 report to Congress, “these demonstrations encountered numerous and varied difficulties, which were not easily resolvable.”<sup>6</sup> Xcel is not aware of any recent industry initiatives or design advances that would lead to consolidation being a viable spent fuel handling option.

Re-racking the existing spent fuel storage pool, meaning installing different racks to create additional space for spent fuel, would require NRC approval, and would potentially create enough space to handle spent fuel from less than six years of operation. Therefore, re-racking is not a viable alternative.

Creating a new spent fuel pool and building would take approximately five years for approval and construction. In addition, it would lead to an approximate three-fold increase in the time fuel assemblies would need to be handled because fuel would need to be removed from the transfer cask to be placed into the new pool, while spent fuel that is transferred to the ISFSI need not be removed from the cask once it is loaded – it can be shipped offsite in the cask. Additionally, the cost of a new pool and building would be prohibitively expensive.

Xcel could also consider a new ISFSI at a different location at the Monticello Plant. However, the Company previously rejected this as an alternative in 2005 after conducting a study to identify whether there were suitable locations at the Plant. Xcel identified five preliminary locations for the ISFSI, two of which were identified as the most suitable. These two locations were referred to as the preferred site (which was approved and constructed) and the alternative site. Ultimately, the preferred site was chosen because it was closer to the reactor building. In addition, the alternative site would have required additional support infrastructure such as diesel generators as a back-up power supply for lighting and monitoring. Because there is sufficient room within the footprint of the existing ISFSI to provide the needed storage, there is no reason to consider constructing an entirely new ISFSI at the Monticello Plant rather than adding additional storage to the existing ISFSI.

## V. CONCLUSION

Because the Project, which is required to allow the Monticello Plant to operate through 2040, satisfies the CN requirements set forth in Minn. R. 7855.0120, the Company respectfully requests that the Commission grant the CN requested here.

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<sup>6</sup> *Spent Fuel Management Alternatives Available to Northern States Power Company Inc. and the Federal Government for the Prairie Island Nuclear Plant Units 1 & 2* (DOE, 2001).