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March 3, 2022

—Via Electronic Filing—

Ray Kirsch
Minnesota Department of Commerce
85 7th Place East, Suite 280
St. Paul, MN 55101-2198

RE: COMMENTS – DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT
PRAIRIE ISLAND FUEL STORAGE
DOCKET NO. E002/CN-08-510

Dear Mr. Kirsch:

Northern States Power Company, doing business as Xcel Energy, offers these comments to the Minnesota Public Utilities Commission (Commission) regarding the draft Supplemental Environmental Impact Statement (draft SEIS) prepared by the Minnesota Department of Commerce, Energy Environmental Review and Analysis (EERA) regarding the Company's planned change to the Certificate of Need authorizing spent fuel storage at the Prairie Island Nuclear Generating Plant at the Independent Spent Fuel Storage Installation.

We appreciate EERA's work on this draft SEIS, and we support its conclusions that the impacts of a change in storage technology are anticipated to be minimal. We offer these comments on supporting information to further support the basis for the conclusions offered in the SEIS.

Our comments are organized by section in the draft SEIS. For each, we include in *italics* the excerpt to which our comment applies; a contextual comment if needed; and a suggested revision, with edits ~~struck out~~ or underlined.

COMMENTS

Summary

Page S-1: *The NRC is currently reviewing applications for private, interim storage facilities in Texas and New Mexico.*

Page S-2: *The SEIS notes that consolidated interim storage facilities (CISF) proposed in Texas and New Mexico are being reviewed by the NRC.*

> **Comment:** As the SEIS notes in Chapter 7.2, page 53, the facility in Texas was issued a license by the NRC in September 2021. The facility in New Mexico expects an NRC license in the first half of 2022.
>
> **Suggested revision, page S-1:** *The NRC ~~is currently reviewing applications for private, interim storage facilities in Texas and New Mexico~~ has issued a license for a private, interim storage facility in Texas, and it is currently reviewing the application for a facility in New Mexico.*
>
> **Suggested revision, page S-2:** *The SEIS notes that ~~consolidated interim storage facilities (CISF) proposed in Texas and New Mexico are being reviewed by the NRC~~ the NRC has issued a license for a consolidated interim storage facility (CISF) in Texas, and it is currently reviewing the application for a CISF in New Mexico.*

Page S-2: *The SEIS does note that if Xcel Energy selects a canister-based system for use in the PINGP ISFSI, health impacts to workers would likely be incrementally greater due to relatively higher radiation dose levels associated with canister systems. This incremental increase in dose levels would be within NRC standards and health impacts to workers would remain minimal.*

> **Comment:** Exposure to workers during cask loading with a canister system may be incrementally higher, but could also be incrementally lower. Operating experience with various cask systems shows worker dose rates are similar and consistent with the principle of maintaining doses As Low As Reasonably Achievable (ALARA). It is expected that any relative differences in worker exposure during loading would be minimal.
>
> **Suggested revision:** *The SEIS does note that if Xcel Energy selects a canister-based system for use in the PINGP ISFSI, health impacts to workers ~~would likely~~ could be incrementally greater due to difference in loading operations associated with canister systems. ~~This~~ Any potential incremental increase in dose levels would be within NRC standards and health impacts to workers would remain minimal.*

1.1 Background

Page 1: *Spent nuclear fuel from the plant is stored on-site in an independent spent fuel storage installation (ISFSI).*

> **Comment:** Spent fuel is stored in the spent fuel pool as well as in dry casks in the ISFSI. We suggest more specific phrasing.
>
> **Suggested revision:** *Spent nuclear fuel from the plant is stored on-site <u>in the spent fuel pool and in dry casks</u> in an independent spent fuel storage installation (ISFSI).*

1.3 Project Need

Page 2: *The NRC is currently reviewing applications for private, interim storage facilities in Texas and New Mexico.*

> **Comment and suggested revision:** See comment above regarding Summary, page S-1. We suggest the same revision.

2.1 State Regulation

Page 7: *Storage of spent nuclear fuel at Prairie Island is regulated by the Commission, whose decisions must be affirmed by the Minnesota Legislature.*

> **Comment:** Minn. Stat. § 116C.83, Subd. 3 provides the legislature the opportunity to review the Commission decision to grant a Certificate of Need, but does not require the legislature to affirm the decision. So long as the legislature does not modify or reject the decision, it becomes effective on the expiration of the stay.
>
> **Suggested revision:** *Storage of spent nuclear fuel at Prairie Island is regulated by the Commission, whose ~~decisions must be affirmed~~ <u>CN decisions may be reviewed</u> by the Minnesota Legislature.*

2.2 Federal Regulation

Page 11: *Using this process, Xcel Energy will need to file documentation with the NRC demonstrating that the cask selected can be properly used in the PINGP ISFSI, i.e., that its use in the ISFSI will be consistent with the conditions in the cask's certificate of compliance.*

Comment: Xcel Energy must notify the NRC at least 90 days before its first storage of spent fuel under a general license. The Company must also register the use of each cask with the NRC no later than 30 days after the use of that cask. The documentation prepared by Xcel Energy in advance of using a certified cask must be made available for inspection by the NRC, but it is not required to be filed with the NRC.

Suggested revision: *Using this process, Xcel Energy will ~~need to file documentation~~ make documentation available to the NRC demonstrating that the cask selected can be properly used in the PINGP ISFSI, i.e., that its use in the ISFSI will be consistent with the conditions in the cask's certificate of compliance.*

3.7 Summary of Spent Fuel Storage Technology

Page 26, Table 2

Comment: The TN-40 shielding is provided by steel, and a borated polyester resin.

Suggested revision:

Characteristic	Cask (e.g., TN-40)	Canister System
Fuel Confinement	Steel	Steel
Loading of Fuel	In spent fuel pool; dried; backfilled with helium	In spent fuel pool; dried; backfilled with helium
Seal	Bolted, with O-ring seal	Welded, with two lids
Shielding	Steel and a borated polyester resin	Concrete overpack for storage; metal overpack (transfer cask) for handling
Cost	Relatively more expensive; approximately $4.1 million per cask	Relatively less expensive; estimated to be 40 to 50 percent less expensive than TN-40 casks

4.3 Potential Impacts to the Human Environment

Page 30: *Horizontal concrete modules can be pre-fabricated or constructed on-site. Either method would require construction activities within the ISFSI. These activities could involve, among others, building concrete forms, placing rebar, and pouring concrete. These activities would introduce additional traffic to the site, e.g., construction workers, materials, supplies. They would also introduce additional noise sources, e.g., trucks, construction equipment. Potential impacts to nearby residents due to additional traffic and additional noise are anticipated to be minimal. The 2009 Prairie Island EIS concluded that traffic and noise impacts related to expanding the Prairie Island ISFSI would not be significant.[8] That conclusion holds for the construction of any horizontal concrete storage modules at the ISFSI.*

> **Comment:** Vertical overpacks, like horizontal concrete modules, can be pre-fabricated or constructed on-site.
>
> **Suggested revision:** *Horizontal concrete modules <u>and vertical concrete overpacks</u> can be pre-fabricated or constructed on-site. Either method would require construction activities within the ISFSI. These activities could involve, among others, building concrete forms, placing rebar, and pouring concrete. These activities would introduce additional traffic to the site, e.g., construction workers, materials, supplies. They would also introduce additional noise sources, e.g., trucks, construction equipment. Potential impacts to nearby residents due to additional traffic and additional noise are anticipated to be minimal. The 2009 Prairie Island EIS concluded that traffic and noise impacts related to expanding the Prairie Island ISFSI would not be significant.[8] That conclusion holds for the construction of any horizontal concrete storage modules <u>and vertical storage overpacks</u> at the ISFSI.*

Page 31: *There are 55 TN-40 and TN-40HT casks currently in the PINGP ISFSI.[10]*

> **Comment:** There are 47 TN-40 and TN-40HT casks loaded, with eight on order to be loaded between 2022 and 2025, bringing the total to 55 casks in 2025.
>
> **Suggested revision:** *There are ~~55~~<u>47</u> TN-40 and TN-40HT casks currently in the PINGP ISFSI,[10] <u>with eight additional casks on order to be loaded between 2022 and 2025.</u>*

5.2 Radiation Monitoring at Prairie Island

Page 34: *Xcel Energy must operate the PINGP such that the dose to individual members of the public from operations does not exceed 100 mrem per year.*

> **Comment:** While dose to any individual member of the public must not exceed 100 mrem/year, dose to the nearest resident from both the power plant and ISFSI combined is limited to 25 mrem/year by EPA regulations contained in 49CFR Part 190, as required by 10CFR Part 20.1301 (e).
>
> **Suggested Revision:** *Xcel Energy must operate the PINGP such that the dose to individual members of the public from operations does not exceed 100 mrem per year. Dose to the nearest resident from both the power plant and ISFSI combined is limited to 25 mrem/year.*

Page 34: *Xcel Energy samples air and water near and around the PINGP and samples milk from local farms.*

> **Comment:** Xcel Energy samples and monitors air, water, milk, and much more.[1] We suggest revising the sentence to include all items regularly sampled by Xcel Energy.
>
> **Suggested revision:** *Xcel Energy ~~samples air and water near and around the PINGP and samples milk from local farms~~ regularly samples river water; well water and ground water from five locations near the PINGP; drinking water from the City of Red Wing; agricultural products including corn from fields irrigated with river water, cabbage, and milk; and upstream and downstream fish, periphyton or invertebrates, bottom sediments, and shoreline sediment from the Mississippi River.*

[1] *See* Prairie Island Nuclear Generating Plant 2020 Annual Radiological Environmental Monitoring Program Report, May 14, 2021, NRC Docket Nos. 50-282, 50-306, and 72-10. https://www.nrc.gov/docs/ML2113/ML21134A012.pdf.

5.4 Potential Radiological Impacts to Workers

Page 37: *If Xcel Energy selects different spent fuel technology for the PINGP ISFSI, this technology could have an impact on radiation doses for workers. Data from Xcel Energy indicates that radiation doses to workers for spent fuel handling could increase or decrease (Table 4).[43] Data collected by Xcel Energy for the PINGP and its Monticello nuclear generating plant indicates that radiation doses will increase for workers during fuel loading if the PINGP ISFSI uses a canister system with a horizontal overpack (Table 4). Data collected by Holtec, a canister system vendor, indicates that radiation doses may decrease for workers if the PINGP ISFSI uses a canister system with a vertical overpack (Table 4).*

Comment: The Monticello data should not be inferred to conclude that a horizontal system would result in increased worker exposure, nor that worker dose would decrease for a horizontal system. The primary driver of worker exposure is the radiation source term resulting from the fuel loaded in each cask. The 61 Boiling Water Reactor fuel assemblies loaded into the Monticello casks have a different radiation source term from the 37-40 Pressurized Water Reactor (PWR) fuel assemblies from Prairie Island. The Monticello data simply shows that radiation exposure from loading is comparable for all systems, and well below estimated values provided in NRC licensing documents. Additional data from two vendors, although limited, shows worker exposure from loading PWR fuel assemblies in their canister-based system is also very comparable to the TN-40 experience.

Vendors also provide a conservative estimate of worker exposure during loading to the NRC in the cask Safety Analysis Report (SAR) for use by the NRC in their review and approval of the design. In all cases, actual worker exposure is significantly lower than these estimates provided in the SAR. An additional column would be useful to identify the estimate used in the NRC review and approval of each design. It is important to note that the various vendor estimates are based on different assumptions regarding the fuel loaded (largest variable in dose rates) and therefore **should not** be used by a reader to compare one design versus another. What the comparison **does** demonstrate is that in all cases the actual worker exposure is well below the estimates used to obtain NRC approval.

Suggested revision:

If Xcel Energy selects different spent fuel technology for the PINGP ISFSI, this technology could have an impact on radiation doses for workers. Data from Xcel Energy for Monticello as well as other nuclear sites, while limited, indicates that radiation doses to workers for spent fuel handling could increase or decrease (Table 4).[43] ~~*Data collected by Xcel Energy for the PINGP and its Monticello nuclear generating plant indicates that radiation doses will increase for workers during fuel loading if the PINGP ISFSI uses a canister system with a horizontal overpack (Table 4). Data collected by Holtec, a canister system vendor, indicates that radiation doses may decrease for workers if the PINGP ISFSI uses a canister system with a vertical overpack (Table 4).*~~ *In all cases, the actual dose to workers is far below the conservative estimate provided to the NRC in the cask licensing process. Table 4 provides experience in actual cask loading dose compared to values provided in licensing documents submitted to the NRC. The table* **should not** *be used to infer that one design is better than the other from this perspective, as the fuel parameters (largest impact on dose rates) for each design (both actual loading and calculated estimates) are different. The table* **does** *show from experience with actual loading that worker exposure is far below the estimates used in the NRC licensing process. The change in radiation received during loading is expected to be minor and the data does not suggest any particular design is preferrable from this standpoint.*

Page 37, Table 4

Comment: The Monticello data could be misconstrued to imply expected dose levels if a similar design were used at Prairie Island. As noted previously, the Monticello fuel is considerably different than Prairie Island. The table should be revised as discussed in the previous comment.

Suggested revision: Revise and expand the table to include additional data as shown below:

Type of Cask/Canister	*Average cumulative Worker Exposure During Fuel Loading (person-mrem)*	*Estimate Provided in Safety Analysis Report (person-mrem)*
TN-40 Cask (PWR fuel)	*343*[1]	*2,315*
Canister – Monticello (BWR fuel)	*608*[2]	*2,370*
Canister – Site 1 (PWR fuel)	*220*[3]	*1,651*
Canister – Site 2 (PWR fuel)	*160*[4]	*3,361*

[1] *PINGP data from 47 casks*
[2] *Monticello data from 30 canisters*
[3] *Holtec data from 15 canisters*
[4] *TN Americas data from 4 canisters*

Page 38: *As discussed in Chapter 3, there are differences in how casks and canisters are loaded and handled. These differences suggest that radiation doses to workers will likely be higher for canister systems as compared with casks.*[44] *For example,*

- *Canister lids are welded into place outside of the spent fuel pool, while cask lids are put into place while the cask is still in the spent fuel pool. Additionally, welds must be inspected to ensure proper sealing of the canister.*
- *Canisters must use an overpack (concrete or metal) each time the canister is handled. Placing the canister in the overpack requires handling by workers. Casks do not require an overpack.*

Thus, if Xcel Energy selects a canister system for use in the PINGP ISFSI, health impacts to workers would likely be incrementally greater due to relatively higher radiation dose levels associated with canister systems.

Comment: We do not have sufficient information to draw a specific conclusion on the relative worker radiation exposure when loading Prairie Island fuel into any specific canister system vs the TN-40. Based on the data available from the vendors, we expect it would be similar to what we experience in loading TN-40 casks.

Suggested revision:

As discussed in Chapter 3, there are differences in how casks and canisters are loaded and handled. These differences ~~suggest that radiation doses to workers will likely be higher for canister systems as compared with casks~~ may result in slightly different worker exposures than would be incurred loading TN-40 cask.[44] For example,

- *Canister lids ~~are welded into place outside of the spent fuel pool, while cask lids are put into place while the cask is still in the spent fuel pool. Additionally, welds must be inspected to ensure proper sealing of the canister.~~ require multiple welding and non-destructive examination evolutions. Automation of the welding process reduces the worker exposure considerably.*
- *Canisters must use an overpack (concrete or metal) each time the canister is handled. Placing the canister in the overpack requires handling by workers. Casks do not require an overpack.*

Thus, if Xcel Energy selects a canister system for use in the PINGP ISFSI, health impacts to workers ~~would likely~~ could be incrementally greater due to ~~relatively higher radiation dose levels~~ the loading operating uniquely associated with canister systems.

We have electronically filed this document with the Minnesota Public Utilities Commission, and copies have been served on the parties on the attached service list. Please contact me at bria.e.shea@xcelenergy.com or (612) 330-6064 if you have any questions regarding this filing.

Sincerely,

/s/

BRIA E. SHEA
DIRECTOR, REGULATORY AND STRATEGIC ANALYSIS

c: Service List

CERTIFICATE OF SERVICE

I, Crystal Syvertsen, hereby certify that I have this day served copies of the foregoing document on the attached list of persons.

xx by depositing a true and correct copy thereof, properly enveloped with postage paid in the United States mail at Minneapolis, Minnesota

or

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DOCKET NO. E002/CN-08-510

Dated this 3rd day of March 2022

/s/

_____

Crystal Syvertsen
Regulatory Administrator

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