



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

February 14, 2012

Mr. Mark A. Schimmel  
Site Vice President  
Prairie Island Nuclear Generating Plant  
1717 Wakonade Drive East  
Welch, Minnesota 55089

SUBJECT: ACCEPTANCE REVIEW OF RENEWAL APPLICATION TO MATERIALS  
LICENSE NO. SNM-2506 FOR PRAIRIE ISLAND INDEPENDENT SPENT FUEL  
STORAGE INSTALLATION – SUPPLEMENTAL INFORMATION NEEDED  
(TAC NO. L24592)

Dear Mr. Schimmel:

By letter dated October 20, 2011, Northern States Power Company, a Minnesota corporation, d/b/a Xcel Energy (hereafter "NSPM") submitted an application to the U.S. Nuclear Regulatory Commission (NRC) for renewal of the Prairie Island Nuclear Generating Plant independent spent fuel storage installation (ISFSI) license, Material License No. SNM-2506. In the application, NSPM requested to extend the license for an additional 40 years. NRC staff performed an acceptance review of the application to determine if the application contains sufficient technical information in scope and depth to allow the staff to complete the detailed technical review. The staff used the following regulatory documents to perform its acceptance review:

- Spent Fuel Storage and Transportation (SFST) Office Instruction SFST – 14, "Acceptance Review Process" (ML110450435), and
- NUREG-1927, "Standard Review Plan for Renewal of Spent Fuel Dry Storage System Licenses and Certificates of Compliance – Final Report," March 2011.

This letter is to advise NSPM that based on the NRC's acceptance review the application does not contain sufficient technical information. The information needed to continue the NRC's review is described below in the form of requests for supplemental information (RSIs); observations are also provided. As defined in SFST – 14, "observations" include questions (identified by the NRC staff during the acceptance review), which do not rise to the level of a RSI that needs to be resolved before the requested licensing action could be accepted for review, but may require NRC staff to issue a request for additional information (RAI) during the detailed technical review. NSPM may respond to the observation(s) in response to the RSIs to avoid the need for a RAI on the question(s) during the staff's detailed technical review.

**Request for Supplemental Information**

**MATERIALS**

R-1. Provide the inspection results of the casks to the staff for independent review.

The license renewal application provides a summary of inspection results, but the supporting data (e.g., images and reports) were not provided to the staff for review. As noted in NUREG-1927, Aging Effects should be considered for compliance with 10 CFR 72.24(d); 72.122(a), (b), (c), (h)(1), (h)(5), and (i); 72.124; and 72.162.

This information is required to demonstrate compliance with required 10 CFR 72.24(d); 72.122(a), (b), (c), (h)(1), (h)(5), and (i); 72.124; and 72.162.

- R-2. Provide a copy of the ISFSI Inspection and Monitoring Program to the staff.

The ISFSI Inspection and Monitoring Program, which describes the specifics of the aging management activities, should be provided to the staff for review. As noted in NUREG-1927, Aging Management, Maintenance or Surveillance Programs should be considered for compliance with 10 CFR 72.82(d); 72.122(f), (h)(4), and (i); 72.128(a); 72.162; 72.168(a); 72.170; and 72.172.

This information is required to demonstrate compliance with required 10 CFR 72.82(d); 72.122(f), (h)(4), and (i); 72.128(a); 72.162; 72.168(a); 72.170; and 72.172.

- R-3. Specify what industrial codes are used to describe the acceptance criteria for visual examinations of systems, structures and components (SSCs).

The license application makes frequent references to visual inspections of SSCs but does not mention what acceptance criteria is used. As noted in NUREG-1927, Aging Management, Maintenance or Surveillance Programs should be considered for compliance with 10 CFR 72.82(d); 10 CFR 72.122(f), (h)(4), and (i); 72.128(a); 72.162; 72.168(a); 72.170; and 72.172.

This information is required to demonstrate compliance with required 10 CFR 72.82(d); 10 CFR 72.122(f), (h)(4), and (i); 72.128(a); 72.162; 72.168(a); 72.170; and 72.172.

## CONFINEMENT

- R-4. Provide confinement/dose analyses for the casks located at the ISFSI during the license renewal period.

Considering this is a 40-year license renewal request, a confinement/dose analysis should be provided that includes the presence of the TN-40 and TN-40HT casks at the ISFSI. The confinement/dose analysis should include normal, off-normal, and accident conditions and take into account the dose associated with gases, volatiles, fines, and crud for both the TN-40 and TN-40HT casks. The response should include a step-by-step calculation methodology. For example, the equation and factors (release fractions to the environment, etc.) for determining the amount of material released (defined by Q on page A7A.8-9 of the SAR) should be included. Guidance for the analysis can be found in NUREG-1567, "Standard Review Plan for Spent Fuel Dry Storage Facilities" (and NUREG-1536, "Standard Review Plan for Dry Cask Storage Systems"). As noted in NUREG-1927, radioactivity/radiation monitoring (e.g., confinement and dose analysis) can be used to evaluate aging effects and should be considered for compliance with 10 CFR 72.104 and 72.106.



This information is required to evaluate compliance with 10 CFR 72.104 and 72.106.

- R-5. Clarify the use of airborne radioactivity monitoring for verifying site dose.

Page E-48 of the "Application for Renewed ISFSI Site-Specific License" states: "There is no need for airborne radioactivity monitoring since no airborne radioactivity is anticipated." It appears that this statement indicates that there is no ISFSI-specific airborne radioactivity monitoring. However, there should be a plant airborne radioactivity monitoring system that has monitors located at the site perimeter. Provide the historic data (~1990 – 2011) of the airborne radioactivity monitoring system for the plant site. As noted in NUREG-1927, radioactivity/radiation monitoring (e.g., confinement and dose analysis) can be used to evaluate aging effects and should be considered for compliance with 10 CFR 72.104 and 72.106.

This information is required to evaluate compliance with 10 CFR 72.104 and 72.106.

- R-6. Provide historical smear sample data for the casks located at the ISFSI.

Page A-21 of the "Application for Renewed ISFSI Site-Specific License" provides some historical cask gamma and neutron dose rates. Smear samples of casks are often taken as part of a radiation/health physics program. The historical smear sample data for casks should be provided, if available. As noted in NUREG-1927, radioactivity/radiation monitoring (e.g., confinement and dose analysis) can be used to evaluate aging effects and should be considered for compliance with 10 CFR 72.104 and 72.106.

This information is required to evaluate compliance with 10 CFR 72.104 and 72.106.

## FINANCIAL ASSURANCE

In order to demonstrate financial qualifications and in order to be issued a license extension, 10 CFR 72.22(e) provides that the applicant must submit information that shows that the applicant either possesses the necessary funds, or has reasonable assurance of obtaining the necessary funds to cover (construction), operating, and decommissioning costs.

The provisions of 10 CFR 72.30 require the licensee to provide financial assurance for decommissioning an ISFSI. Based on information provided within the application, the NRC needs the following additional information in order to complete its review.

- R-7. NSPM's March 28, 2011, decommissioning funding status report for Prairie Island is referenced in the application as providing the estimated decommissioning costs and status of decommissioning funding for the ISFSI. However, the March 28, 2011, report does not delineate the costs for ISFSI decommissioning.

For the ISFSI, provide the current estimated decommissioning costs, and the latest and updated version of the decommissioning funding plan used to provide reasonable assurance that funds for decommissioning the ISFSI will be available when needed.

- R-8. Explain the procedure that will be used to add financial assurance adequate to cover the cost of decommissioning the ISFSI.
- R-9. Explain the procedure that will be used to separately identify the amounts of financial assurance provided for each reactor and the ISFSI.
- R-10. Provide the estimated operating costs for the requested ISFSI license renewal period, including costs related to activities associated with managing aging effects.

## **OBSERVATIONS**

### **MATERIALS**

- O-1. Demonstrate the condition of the high burnup fuel in dry cask storage for the length of time the high burnup fuel will be in storage in the proposed Prairie Island renewal period of 20 to 60 years.

Low burnup fuel was used in the DOE/Surry cask demonstration program (cited by the applicant). This demonstration program is not applicable to the storage of high burnup fuel for periods beyond 20 years of storage. To staff's knowledge, DOE and other entities have not yet engaged in additional demonstration programs for storage of high burnup fuel to acquire additional performance data that is commensurate with the previous DOE program that examined low burnup fuel that had been stored for 15 years. High burnup cladding may experience a ductile to brittle transition as it cools and result in larger uncertainties in its long-term physical state and fragility.

The applicant should consider potential approaches for adequate demonstration under the principles of Aging Management, to include (1) obtaining further data regarding the properties and behavior of high burnup cladding in storage beyond 20 years; or (2) commitments to limit the actual storage time of high burnup fuel during the renewal period; or (3) commitments to monitor and inspect the behavior of high burnup cladding integrity while in storage; and/or (4) strategies to detect and mitigate unexpected degradation during longer storage periods.

This information may be required to demonstrate compliance with required the cladding protection and ready-retrieval standards of 10 CFR 72.122(h)(5) and the criticality safety design requirements of 10 CFR 72.124(a) that are inherent in the current licensing basis for Prairie Island license, as well as clarifying the potential technical basis for the applicant's Environmental Report for the entire renewal period.

- O-2. Justify why the Pressure Monitoring System is not included with Systems, Structures and Components (SSCs) that are within the scope of the licensing renewal.

The operation of the ISFSI Pressure Monitoring System is necessary to detect any leakage from the cask lid assembly.

This information may be required to demonstrate compliance with required 10 CFR 72.122(h)(4).



- O-3. Justify seven-year inspection intervals under the ISFSI Inspection and Monitoring Activities Program.

Concrete damage to the ISFSI is monitored on a seven-year interval using ACI 349.3R acceptance criteria, but ACI 349.3R recommends a 5-year inspection interval for concrete.

This information may be required to demonstrate compliance with required 10 CFR 72.24(c)(4).

- O-4. Provide a plan for servicing and responding to events from the ISFSI when the reactor site support is no longer available.

The additional 40-year life extension request for the dry storage system is beyond the renewed reactor license period. To what extent does the dry storage system rely on the reactor site support? What is the plan for maintaining and event recovery for the dry storage system at the decommissioned site?

NSPM's action items from the public meeting held on November 18, 2011 (ML113540581) are also included as observations.

- O-5. Evaluate whether or not the top nozzle anchors should be considered in the aging management review.
- O-6. Explain why NSPM identified no aging effects/mechanisms for subcomponents in air/gas environments.
- O-7. Equate the alarm setpoint for the interseal pressure monitoring system to leakage of helium through the metallic seals.
- O-8. Describe the vent path for the buildup of gases in the radial neutron shield. Reference the applicable SAR sections.
- O-9. Provide a summary of the Operations procedure for the daily alarm surveillance of the interseal pressure monitoring system. Also, provide details of any preventative maintenance of the equipment in the interseal pressure monitoring system.
- O-10. Ensure the results from the lead cask inspection performed in June 2011 at the Prairie Island ISFSI are available to the NRC technical reviewers.

In order to schedule our technical review, this information should be provided by March 1, 2012. If the information described is not received by this date, the application will not be accepted for review. This letter confirms our phone call on December 22, 2011, January 24, 2012 and the follow-up call on February 14, 2012, with respect to the supplemental information needed and the date for your submittal.

M. Schimmel

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If you have any questions regarding this matter, please contact me at (301) 492 - 3562.

Sincerely,

A handwritten signature in cursive script, reading "Pamela Longmire". The signature is written in dark ink and is positioned above the printed name and title.

Pamela Longmire, Ph.D., Project Manager  
Division of Spent Fuel Storage and Transportation  
Office of Nuclear Material Safety  
and Safeguards

Docket No.: 72-10  
TAC No.: L24592

cc: PINGP Service List

If you have any questions regarding this matter, please contact me at (301) 492 – 3562.

Sincerely,

/RA/

Pamela Longmire, Ph.D., Project Manager  
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Office of Nuclear Material Safety  
and Safeguards

Docket No.: 72-10

TAC No.: L24592

cc: PINGP Service List

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