



Prairie Island Nuclear Generating Plant  
1717 Wakonade Drive East  
Welch, MN 55089

July 26, 2013

L-PI-13-073  
10 CFR 72.42

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Director, Division of Spent Fuel Storage and Transportation  
Office of Nuclear Material Safety and Safeguards  
Washington, DC 20555-0001

Prairie Island Independent Spent Fuel Storage Installation  
Docket No. 72-10  
Materials License No. SNM-2506

Supplement to License Renewal Application – Response to Request for Additional Information (TAC No. L24592)

- References:
1. Letter from M.A. Schimmel (NSPM) to Document Control Desk (NRC), "Prairie Island Independent Spent Fuel Storage Installation (ISFSI) License Renewal Application," L-PI-11-074, dated October 20, 2011 (ADAMS Accession No. ML11304A068).
  2. Letter from S. Ruffin (NRC) to M.A. Schimmel (NSPM), "Request for Additional Information for Review of the License Renewal Application for the Prairie Island Independent Spent Fuel Storage Installation – SNM-2506 (TAC No. L24592)," dated January 31, 2013 (ADAMS Accession No. ML13035A083).
  3. E-mail from S. Ruffin (NRC) to B.R. Zelenak (NSPM), "Revision of high burnup fuel RAI No. 3-2," dated June 5, 2013 (ADAMS Accession No. ML13163A291).

Pursuant to 10 CFR 72.42, Northern States Power Company, a Minnesota corporation doing business as Xcel Energy (hereafter "NSPM"), submitted in Reference 1 an application to renew the site-specific license for the Prairie Island Independent Spent Fuel Storage Installation (ISFSI) Materials License SNM-2506. The Reference 1 License Renewal Application (LRA) requested that SNM-2506 be extended an additional 40 years beyond the current expiration date of October 31, 2013.

In Reference 2, the Nuclear Regulatory Commission (NRC) provided a request for additional information (RAI) to support the staff's technical review of the LRA. A conference call was held with the NRC technical staff on March 18, 2013 to provide

NM5526

Document Control Desk  
Page 2

clarification of the staff's questions, and a revision to RAI 3-2 was provided in Reference 3. This letter provides NSPM's response to the RAIs in References 2 and 3.

Enclosure 1 to this letter contains the oath or affirmation statement required pursuant to 10 CFR 72.16.

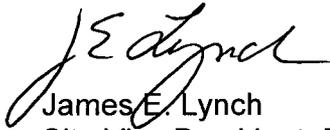
Enclosure 2 to this letter provides the responses to the subject RAIs. NSPM submits this supplemental information in accordance with 10 CFR 72.42.

NSPM has determined that the supplemental information provided in this letter does not affect the conclusions of the License Renewal Application, and the proposed changes do not require any changes to the PI ISFSI Environmental Report.

If there are any questions or if additional information is needed, please contact Gene Eckholt, Projects Licensing Manager, at 651-388-1121 x4137.

Summary of Commitments

This letter contains no new commitments and no revisions to existing commitments.



James E. Lynch  
Site Vice President, Prairie Island Nuclear Generating Plant  
Northern States Power Company - Minnesota

Enclosures (2)

- cc: Administrator, Region III, USNRC (letter only)  
SFST Project Manager, PI ISFSI, USNRC (8 copies with Enclosures)  
NRR Project Manager, Prairie Island Nuclear Generating Plant, USNRC (letter only)  
Resident Inspector, Prairie Island Nuclear Generating Plant, USNRC (letter only)  
State of Minnesota (letter only)

L-PI-13-073  
Enclosure 2

NSPM

**NRC RAI 3-2:**

*Provide justification for the acceptability of the storage of high burnup (HBU) fuel by providing a strategy that includes an aging management program (AMP) to demonstrate that HBU fuel is protected against possible degradation that may lead to gross ruptures for storage periods beyond 20 years and potential operational safety issues during removal from storage.*

*The requirements in 10 CFR 72.122(h) state that the spent fuel cladding must be protected during storage against degradation that leads to gross ruptures or the fuel must be otherwise confined such that degradation of the fuel during storage will not pose operational safety problems with respect to removal from storage. The strategy should address reasonable and known physical or degradation phenomena associated with storage periods from 20 to 60 years, such as embrittlement of cladding from the ductile to brittle transition from hydride reorientation in the radial direction in HBU fuel.*

*The AMP should define specific inspection or monitoring of storage of the HBU fuel to address potentially conflicting information, uncertainties, or indications of the presence of specific potential aging effects of the fuel. The program may specify activities including inspection or monitoring of HBU fuel within the cask system after 20 years of storage at periodic intervals (e.g., every 10-20 years) during the renewal period; and may define an alternative, optional program to periodically review and use surrogate information from other confirmatory programs in the U.S. with similar type of HBU fuel. The applicant may also consider proposing licensing conditions to limit the scope or storage time of HBU fuel during the renewal period to address uncertainties and lack of confirmatory data.*

*In order to comply with the requirements of 10 CFR 72.122(h)(1), the AMP should address how the fuel will otherwise be confined if, at any time during the renewal period, the applicant obtains information that indicates the stored HBU fuel may be subject to gross cladding ruptures.*

*This information is needed to evaluate compliance with 10 CFR 72.122(h).*

**NSPM Response to RAI 3-2:**

NSPM intends to rely on the option to use surrogate information from other confirmatory programs in the U.S. with similar type of HBU fuel as provided in RAI 3-2. The Department of Energy (DOE) has recently initiated procurement activities (DOE Solicitation #DE-SOL-00056019 – High Burnup Fuel Cask Research and Development) in support of a high burnup fuel (HBF) Dry Cask Storage Demonstration Project which can be used as a surrogate program for the industry. As described in a letter from the Nuclear Energy Institute (NEI) dated March 22, 2013 (Reference 6), it is anticipated that

L-PI-13-073  
Enclosure 2

NSPM

the HBF demonstration project will be similar to the previous Dry Storage Characterization project for low burnup fuel discussed in EPRI Report 1002882 (Reference 7), except that the demonstration cask used in the DOE Demonstration Project will be specially instrumented in advance to allow data collection to begin as soon as the cask is loaded. After a period of storage, plans call for opening the demonstration cask and examining the HBF. The proposed project is expected to consist of the following elements:

- Develop a detailed program plan/design and obtain necessary NRC approvals,
- Load well-characterized used HBF of multiple cladding types into an existing bolted storage cask at a reactor site,
- Use a specially instrumented lid, to begin collecting data on temperature, moisture content, and internal gas composition immediately,
- Perform hot cell examinations of “sister” rods, taken from the same HBF but not placed in dry storage, for baseline comparison, and
- After ten years or longer in storage, open the cask to perform visual and physical tests on the stored HBF.

On April 16, 2013 DOE awarded this contract to an Electric Power Research Institute (EPRI) team. NSPM directly supports EPRI through our financial support of that organization and is an active participant on the Industry Review Team (IRT) overseeing the demonstration project. This participation will ensure NSPM has input on the direction of the project and will be able to apply information learned from this project to the aging management of HBF stored in the PI ISFSI.

The first Prairie Island ISFSI HBF was placed into dry storage in 2013, and the DOE Demonstration Project is anticipated to yield significant relevant data prior to the point at which this HBF exceeds 20 years of dry storage.

When information from the demonstration program becomes available, NSPM will evaluate the information via NSPM's Operating Experience Program and / or the Corrective Action Program to determine what actions should be taken, if any. Similarly, if NSPM receives information / data from any other source that indicates that stored HBF may be subject to gross cladding ruptures, NSPM will utilize its Operating Experience Program and / or Corrective Action Program to determine what actions should be taken.