

**Enclosure 4 Contains Proprietary Information**



**MAY 04 2010**

L-PI-10-021  
10 CFR 72.56

U S Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Director, Spent Fuel Project Office  
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 Amendment Request (LAR) to Modify TN-40 Cask Design  
(Designated as TN-40HT) (TAC No. L24203)

- References:
1. Nuclear Management Company, LLC (NMC) letter to US Nuclear Regulatory Commission (NRC), L-PI-08-020, "License Amendment Request (LAR) to Modify TN-40 Cask Design (Designated as TN-40HT)", dated March 28, 2008 (ML081190039).
  2. NMC letter to NRC, L-PI-08-059, "License Amendment Request (LAR) to Modify TN-40 Cask Design (Designated as TN-40HT) (TAC No. L24203)", dated June 26, 2008.
  3. NMC letter to NRC, L-PI-08-073, "Supplement to License Amendment Request (LAR) to Modify TN-40 Cask Design (Designated as TN-40HT) (TAC No. L24203)", dated August 29, 2008.
  4. Northern States Power Company, a Minnesota corporation (NSPM), letter to NRC, L-PI-09-071, "Supplement to License Amendment Request (LAR) to Modify TN-40 Cask Design (Designated as TN-40HT) (TAC No. L24203)", dated June 26, 2009.
  5. NRC letter to NMC, "Second Request For Additional Information TN-40HT License Amendment Request (LAR) To Modify The TN-40 Cask Design for Use At The Prairie Island Independent Spent Fuel Storage Installation (ISFSI)", dated November 25, 2009 (ML093310293).
  6. NSPM Letter to NRC, L-PI-09-121, "Supplement to License Amendment Request (LAR) to Modify TN-40 Cask Design (Designated as TN-40HT) (TAC No. L24203)", dated January 18, 2010, (ML100210197)

1145501

7. Conversation Record, "Northern States Power Company, Discussion of RAI Responses to SNM-2506 LAR, Conversation Held January 27, 2010", dated January 27, 2010 (ML100290300)
8. 2/2/2010 Conversation Record with G. Adams (Northern States Power Company), Re: "Suspension of the TN-40HT Licensing Amendment Request (LAR) Review, Docket No. 72-10 SNM-2506" (ML100361194)
9. Conversation Record, "Northern States Power Company, Clarification of RAI Responses for SNM-2506 LAR", dated April 1, 2010 (ML100920077)

In Reference 1, the NMC\* submitted an LAR to revise the Special Nuclear Materials (SNM) license and Technical Specifications (TS) for the Prairie Island ISFSI (License No. SNM-2506), to modify the TN-40 cask for storage of fuel with higher enrichment and higher burnup. References 2, 3, and 4 provided supplemental information for the LAR. In Reference 5, the NRC Staff requested additional information to support their review of Reference 1. In Reference 6, NSPM provided supplemental information to respond to the request for additional information in Reference 5.

In telephone conferences on January 27, 2010 (Reference 7), February 1, 2010 (note that the document date in ADAMS is listed as 02/02/2010, Reference 8), and April 1, 2010 (Reference 9), the NRC Staff requested further clarification to the supplement provided in Reference 6, and posed an additional question related to the use of foreign, i.e., non-United States, material standards.

This letter and its enclosures provide further clarification to the NRC Staff request for additional information. NSPM submits this supplement in accordance with the provisions of 10 CFR 72.56.

This letter contains the following enclosures:

Enclosure 1 to this letter contains the oath or affirmation statement for this supplement required pursuant to 10 CFR 72.16(b).

Enclosure 2 to this letter contains the NSPM responses to the additional information requested by the NRC Staff.

Enclosure 3 to this letter contains the instructions for the page updates to the Safety Analysis Report and Technical Specifications.

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\* On September 22, 2008, the NMC transferred its operating authority to Northern States Power Company, a Minnesota corporation (NSPM), doing business as Xcel Energy. By letter dated September 3, 2008, NSPM assumed responsibility for actions and commitments previously submitted by NMC.

Enclosure 4 to this letter contains the updates to the Safety Analysis Report sections. This enclosure contains trade secret information that is proprietary to Transnuclear, Inc.

Enclosure 5 to this letter contains the updates to the Technical Specification pages.

Enclosure 6 to this letter contains the affidavit and withholding request, pursuant to the requirements in 10 CFR 2.390(b)(1)(iii), of trade secret information contained in Enclosure 4.

Enclosure 7 to this letter contains the non-proprietary updates to the Safety Analysis Report sections that are required in support of the NSPM response to the request for additional information by NRC Staff.

The supplemental information provided in this letter does not impact the conclusions presented in the March 28, 2008 submittal as supplemented on June 26, 2008, August 29, 2008, June 26, 2009, and January 18, 2010.

If there are any questions or if additional information is needed, please contact Mr. Glenn Adams at (612) 330-6777.

#### Summary of Commitments

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



Mark A. Schimmel  
Site Vice President, Prairie Island Nuclear Generating Plant  
Northern States Power Company - Minnesota

Enclosures (7)

cc: Administrator, Region III, USNRC (letter only)  
NMSS Project Manager, TN-40HT LAR, USNRC (8 copies)  
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)

## **ENCLOSURE 1**

### **Oath or Affirmation Pursuant to 10 CFR 72.16**

UNITED STATES NUCLEAR REGULATORY COMMISSION

NORTHERN STATES POWER COMPANY - MINNESOTA

PRAIRIE ISLAND INDEPENDENT SPENT FUEL STORAGE INSTALLATION  
DOCKET NO. 72-10

REQUEST FOR AMENDMENT TO  
MATERIALS LICENSE No. SNM-2506

SUPPLEMENT TO LICENSE AMENDMENT REQUEST (LAR)  
TO MODIFY TN-40 CASK DESIGN (DESIGNATED AS TN-40HT)

Northern States Power Company - Minnesota, provides additional information that supports the request for changes to the Prairie Island Independent Spent Fuel Storage Installation Material License.

This letter contains no restricted or other defense information.

NORTHERN STATES POWER COMPANY - MINNESOTA

By 

Mark A. Schimmel

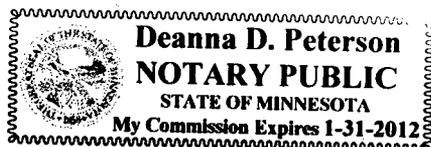
Site Vice President, Prairie Island Nuclear Generating Plant  
Northern States Power Company - Minnesota

State of Minnesota

County of Goodhue

On this 4 day of May 2010 before me a notary public acting in said County, personally appeared Mark A. Schimmel, Site Vice President, Prairie Island Nuclear Generating Plant, and being first duly sworn acknowledged that he is authorized to execute this document on behalf of Northern States Power Company - Minnesota, that he knows the contents thereof, and that to the best of his knowledge, information, and belief the statements made in it are true.





## **ENCLOSURE 2**

# **REQUEST FOR ADDITIONAL INFORMATION (RAI) RESPONSES**

**RAI: A1-1**

Modify the quality category for all components on the licensing drawings, Table A4.5-1, and the SAR as appropriate to follow the guidance in NUREG/CR-6407. Also, see RAI A1-2.

The quality categories provided in the licensing drawings (SR, AQ, and NQR) are not in agreement with the quality category definitions in NUREG/CR-6407 "Classification of Transportation Packaging and Dry Spent Fuel Storage System Components According to Importance to Safety."

This information is required to determine compliance with 10 CFR 72.24(n) and 144(c).

**Response: A1-1**

The following information is provided as a supplement to the response provided in Northern States Power Company – Minnesota (NSPM) letter L-PI-09-121.

Following the conference calls with the NRC, and a review of the NSPM Quality Assurance Topical Report, NSPM has determined that it would be able to classify the TN-40HT components using the guidance contained in NUREG/CR-6407.

Therefore, NSPM is modifying the SAR as follows:

SAR Section A4.5 is changed to:

**A4.5 CLASSIFICATION OF STRUCTURES, SYSTEMS AND COMPONENTS**

The structures, components, and systems of the TN-40HT Dry Storage Casks are classified as "important to safety" or "not important to safety" in accordance with the criteria of 10 CFR 72.3. A tabulation of the major systems and components for a TN-40HT cask is shown in Table A4.5-1. Structures, components, and systems are classified as "important to safety" whose function is:

- to maintain the conditions required to store spent fuel safely,
- to prevent damage to the spent fuel cask during handling and storage, or
- to provide reasonable assurance that spent fuel can be received, handled, packaged, stored, and retrieved without undue risk to the health and safety of the public.

Items that are "important to safety" are further categorized using a graded quality approach based on the following definitions:

**Category A Item**

Category A items are critical to safe operations. These items include systems and components whose failure could directly result in a condition adversely affecting public health and safety. The failure of a single item could cause loss of primary containment leading to release of radioactive material, loss of shielding, or an unsafe geometry compromising criticality control.

**Category B Item**

Category B items have a major impact on safety. These items include systems and components whose failure or malfunction could indirectly result in a condition adversely affecting public health and safety. The failure of a Category B item, in conjunction with the failure of an additional item, could result in an unsafe condition.

**Category C Item**

Category C items have a minor impact on safety. These items include systems and components whose failure or malfunction would not significantly reduce the packaging effectiveness and would not be likely to create a situation adversely affecting public health and safety.

The drawings contained in Section A1.5 show the category classification for each part of a TN-40HT cask.

**A4.5.1 CONTAINMENT VESSEL**

The containment vessel components are classified as important to safety Category A since they serve as the primary confinement structure for the fuel assemblies. Failure of any of these components could lead to a release of radioactive material.

**A4.5.2 PENETRATION GASKETS**

The metallic seals on the lid, vent port cover, and drain port cover are classified as important to safety Category A since the inner seal is part of the confinement boundary and a failure of a seal could lead to a release of radioactive material.

**A4.5.3 SHIELDING**

The gamma and neutron shielding are classified as important to safety Category B. During normal operations there is no credible failure mode for the gamma shield that would prevent it from fulfilling its design shielding function. Under accident conditions the analyses show that the gamma

shield remains in place and thus still performs its shielding function. While the neutron shielding may be lost during a fire accident, the analyses show that the resultant dose rates still meet the applicable accident dose limits. The failure of an additional item is necessary for there to be an unsafe condition. Therefore, these components are classified as Category B.

#### **A4.5.4 PROTECTIVE COVER AND OVERPRESSURE SYSTEM**

The weather cover and overpressure system serve no safety function and are thus classified as not important to safety.

#### **A4.5.5 CONCRETE STORAGE PADS**

The information in Section 4.5.5 remains applicable with the use of the TN-40HT casks except that the accidents are described and analyzed in Section A8.

SAR Table A4.5-1 is changed to show those major components that meet the above definition of important to safety and those that do not meet the definition.

The drawings contained in SAR Section A1.5 are revised to show the QA category classification for each part based on the above definitions.

SAR Section A11.1 is changed to:

#### **A11.1 QUALITY ASSURANCE PROGRAM DESCRIPTION**

10 CFR 72.140 requires that a quality assurance (QA) program be established and implemented. The previously approved QA program described in Section 11 will be applied to activities, systems and components of the TN-40HT cask commensurate with their importance to safety. This is the same previously approved NSPM QA Program which satisfies applicable criteria of 10 CFR 50, Appendix B.

Since NSPM is currently licensed under 10 CFR 50 to operate nuclear power facilities, a quality assurance program meeting the requirements of 10 CFR 50, Appendix B, is already in place. The governing document for this program is "Northern States Power Company-Minnesota, Quality Assurance Topical Report," (QATR) (Reference 1 in Section 11.3) which has been reviewed and approved by the NRC. The QATR is applied to the "important to safety" activities associated with the TN-40HT cask, as allowed by 10 CFR 72.140.d. This program is implemented through directives, instructions, and procedures. The objective of the company QATR is to comply with the criteria as expressed in 10 CFR 50, Appendix B, as amended, and with the quality assurance program requirements for nuclear power plants as referenced in the Regulatory Guides and industry

standards. This program will be applied to those activities associated with the TN-40HT cask.

Those major components of the TN-40HT cask which are important to safety are listed in Table A4.5-1. As such, the QATR delineates the requirements for engineering, procurement, fabrication, and inspection of this equipment.

The procurement documents (specifications, requisitions, etc.) of the TN-40HT casks will be technically reviewed prior to use to ensure that the proper criteria have been specified. Vendor information (drawings, specifications, procedures, etc.) will be reviewed to ensure compliance with technical requirements during the cask design phase. NSPM representatives will visit the vendor's shop to ensure compliance with requirements and to witness parts of the cask fabrication and testing. The vendor may not ship the cask until NSPM is satisfied that the cask meets the technical requirements.

Each of the 18 criteria of 10 CFR 50, Appendix B and their applicability to the TN-40HT storage casks and associated activities are described in Sections A11.1.1 through A11.1.18.

SAR Section A11.2.2 is changed to:

#### **A11.2.2 CASK SUPPLIER**

As described in the QATR, NSPM has the ultimate responsibility for ensuring that the manufacture of important to safety components is done in accordance with the plan. In accordance with the plan, the cask manufacturer must do work under the approved NSPM QA Program.

The following SAR and Technical Specification pages are changed to reflect the important to safety classification defined in Section A4.5.

#### SAR Pages

A3.2-1

A3.3-36

A3.3-50

A4.2-9

#### SAR Pages

A4.2-12

A4.2-13

A4.2-29

A8.2-8 (Note that an editorial change resulted in the removal of the affected sentence.)

#### TS Page

4.0-1

**RAI: A5-2**

Clarify how ANSI N 14.5 will be used to perform fabrication leakage rate tests and the confinement boundary components on which fabrication leakage tests have been performed, or where the staff can find this information in the application.

The application should specify fabrication leakage rate tests will be performed on the entire confinement boundary in accordance with applicable ANSI N14.5 standards, including confinement welds and subcomponents.

This information is required to determine compliance with 10 CFR 72.122(h)(4) and 128(a)(1).

**Response: A5-2**

The response to RAI A5-2 in NSPM letter L-PI-09-121 is hereby replaced with the following:

The confinement shell, lid, covers, welds, and seals will be leak tested in accordance with ANSI N14.5 during fabrication.

The following section will be added to the SAR.

**A9.7.8 FABRICATION LEAK TEST REQUIREMENTS****A9.7.8.1 LID, VENT PORT COVER, AND DRAIN PORT COVER**

The lid, vent port cover, and drain port cover shall be helium leak tested at the fabricator in accordance with ANSI N14.5-1997, with an acceptance criterion of 1E-7 ref cc/s.

**A9.7.8.2 CONFINEMENT SHELL**

The confinement shell, bottom plate, flange, and associated welds, shall be helium leak tested at the fabricator in accordance with ANSI N14.5-1997, with an acceptance criterion of 1E-7 ref cc/s.

**A9.7.8.2 LID, VENT, AND DRAIN PORT SEALS**

The main lid seal along with the vent and drain port seals shall be helium leak tested at the fabricator in accordance with ANSI N14.5-1997. The combined leak rate of all seals including inner and outer seals shall be less than 1E-5 ref cc/s.

**Additional Question**

During telephone calls discussing the second RAI responses, the Staff asked for a definition of “equivalency” when evaluating materials that meet Japanese Industrial Standards (JIS) Code or Equivalent National Standard and which may be used in lieu of American Society for Testing and Materials (ASTM) Materials.

**Response to Equivalency for ASTM Material**

During the phone calls discussing the second RAI responses, the staff indicated that their position on what is required to demonstrate “equivalent material” may still be evolving, and previously accepted approaches do not constitute precedence. After considering the need for timely approval of the LAR, and the risk of potential delays associated establishing acceptable requirements for demonstrating equivalent material, NSPM has elected to not allow JIS Code or Equivalent National Standard to be used in lieu of ASTM materials.

SAR changes:

General note number 27 on SAR Drawing TN40HT-72-1 and general note 17 on SAR Drawing TN40HT-72-22 have been removed.

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## **ENCLOSURE 3**

# **SAFETY ANALYSIS REPORT (SAR) UPDATING INSTRUCTIONS**

## SAR Updating Instructions

### SAR Section A1 Pages

Remove Page	Insert Page
TN40HT-72-1 Revision 1	TN40HT-72-1 Revision 4*
TN40HT-72-21 Sheet 1 of 7 Revision 2	TN40HT-72-21 Sheet 1 of 7 Revision 3**
TN40HT-72-21 Sheet 2 of 7 Revision 2	TN40HT-72-21 Sheet 2 of 7 Revision 3**
TN40HT-72-21 Sheet 3 of 7 Revision 2	TN40HT-72-21 Sheet 3 of 7 Revision 3**
TN40HT-72-21 Sheet 4 of 7 Revision 2	TN40HT-72-21 Sheet 4 of 7 Revision 3**
TN40HT-72-21 Sheet 5 of 7 Revision 2	TN40HT-72-21 Sheet 5 of 7 Revision 3**
TN40HT-72-21 Sheet 6 of 7 Revision 2	TN40HT-72-21 Sheet 6 of 7 Revision 3**
TN40HT-72-21 Sheet 7 of 7 Revision 2	TN40HT-72-21 Sheet 7 of 7 Revision 3**
TN40HT-72-22 Sheet 1 of 2 Revision 0	TN40HT-72-22 Sheet 1 of 2 Revision 3***
TN40HT-72-22 Sheet 2 of 2 Revision 0	TN40HT-72-22 Sheet 2 of 2 Revision 3***

### SAR Section A3 Pages

Remove Page	Insert Page
A3.2-1 Revision TBD	A3.2-1 Revision D
A3.3-36 Revision B	A3.3-36 Revision D
A3.3-50 Revision B	A3.3-50 Revision D

### SAR Section A4 Pages

Remove Page	Insert Page
A4.2-9 Revision TBD	A4.2-9 Revision D
A4.2-12 Revision B	A4.2-12 Revision D
A4.2-13 Revision TBD	A4.2-13 Revision D
A4.2-29 Revision B	A4.2-29 Revision D
A4.5-1 Revision TBD	A4.5-1 Revision D
-----	A4.5-2 Revision D

Table A4.5-1 Revision C	Table A4.5-1 Revision D
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**SAR Section A8 Pages**

Remove Page	Insert Page
A8.2-8 Revision B	A8.2-8 Revision D

**SAR Section A9 Pages**

Remove Page	Insert Page
A9.7-12 Revision C	A9.7-12 Revision D

**SAR Section A11 Pages**

Remove Page	Insert Page
A11.1-1 Revision TBD	A11.1-1 Revision D
A11.1-2 Revision TBD	A11.1-2 Revision D
-----	A11.1-3 Revision D
A11.2-1 Revision TBD	A11.2-1 Revision D

**Technical Specification Pages**

Remove Page	Insert Page
4.0-1 Amendment #A	4.0-1 Amendment #C

**Non-Proprietary Drawings Numbers**

- \* TN40HT-72NP-1 Revision 3
- \*\* TN40HT-72NP-21 Revision 3
- \*\*\* TN40HT-72NP-22 Revision 3