Second Request for Additional Information (RAI)
Nuclear Management Company, LLC
Docket No. 72-10
Related to Special Nuclear Material License No. 2506 (SNM-2506),
License Amendment Request to Modify the TN-40 Cask Design for use at the Prairie Island Independent Spent Fuel Storage Installation (ISFSI)
TN-40HT Storage System

By letter dated March 28, 2008 (ML081400652), supplemented August 29, 2008 (ML081190038), Nuclear Management Company, LLC (NMC[1]) submitted an application to amend SNM-2506 and the license Technical Specifications (TS) for the Prairie Island ISFSI in accordance with 10 CFR Part 72. This amendment proposes to modify the TN-40 storage cask to accommodate higher initial enriched fuel with a corresponding higher burnup and to reformat the TS.

This second RAI identifies additional information needed by the U.S. Nuclear Regulatory Commission (NRC) staff in connection with its review of the amendment request. Each RAI describes information needed by the staff to complete its review of the application and the Safety Analysis Report (SAR) to determine whether the applicant has demonstrated compliance with the regulatory requirements. Requested information is listed by chapter number, and where appropriate, the title is in accord with the applicant's SAR. The staff, in their review of the amendment request application, used NUREG-1567, "Standard Review Plan for Spent Fuel Dry Storage Facilities."

Editorial
Reference to "10 CFR 100" appears in the response to RAI A4-6. Clarify the exact citation.

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).

RAI A1-2

Modify the SAR and licensing drawings to change the quality category of the lid, vent, and drain port seals to Category A as defined in NUREG/CR-6407. Also, see RAI A1-1.

[1] On September 22, 2008, 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.

Regarding the response to RAI A4-6, NUREG/CR-6407 “Classification of Transportation Packaging and Dry Spent Fuel Storage System Components According to Importance to Safety” states that all containment boundary seals should be Category A or critical to safe operations (see Table 6 of NUREG/CR-6407). Category A items include structures, components, and systems 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 unsafe geometry compromising criticality control (see Table 2 of NUREG/CR-6407). Section 6 of NUREG/CR-6407 states that vendor assignment of classification that is different from those in the table is acceptable but must be justified as discussed in Section 3. The applicant stated in the response to RAI A4-6 that the failure of one of the seals in addition to the failure of the pressure monitoring system showed that the calculated dose is less than the limits in 10 CFR 72.106 as well as less than the 10 CFR 100 limits. The applicant did not address the fact that the confinement barrier seals are the primary barrier against radionuclide release, are required for maintaining confinement under normal and accident conditions, and therefore should be Category A as defined in NUREG/CR-6407.

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

RAI A4-1

Clarify how the corrected Stefan-Boltzmann constant is applied in determining the transverse effective thermal conductivity in UO_2 and discuss the potential effect on the peak cladding temperatures for the TN-40HT design for normal, off normal, and accident conditions.

During a public meeting held on October 7, 2009, Transnuclear indicated that an incorrect effective thermal conductivity might have been used with the TN-40HT analyses performed for Prairie Island. The applicant should analyze the peak cladding temperatures for normal, off normal, and accident conditions with the correct Stefan-Boltzmann constant in order to determine its effect.

This information is needed to confirm compliance with 10 CFR 72.24(c)(3).

RAI A5-1

Table 5.1-1, Step C.9 of the application states, “Perform helium leak test of lid seals.” Clarify if leakage testing is being performed on all confinement boundary seals, including the lid seals as well as the vent and drain port seals.

The staff would like clarification that leakage rate testing is being performed on all confinement boundary seals.

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

RAI A5-2

Clarify how ANSI N14.5 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).

RAI A7.1
Provide the neutron source spectra for Cm-244 used in the analyses.

The information found in Section A7.2.5 only provides the total neutron source for Cm-244. The Cm-244 energy spectrum is used in the MCNP analyses. Table A7.2-8 provides the total neutron source for Cm-244. However, it does not provide the detailed neutron energy distribution used.

This information is needed to determine compliance with 10 CFR 72.24 and 10 CFR 72.104(a).

RAI A7.2
Provide a copy of the evaluation used to identify the design basis fuel assembly used in the shielding analyses.

The response to RAI A7.1 in the first request for additional information discussed the methodology used to identify the design basis assembly. The discussion stated, in part, that “based on the results of this evaluation, the design basis source terms for shielding are obtained from the Westinghouse 14x14 standard fuel assembly….” The evaluation referred to in the response to RAI A7.1 in the first request for additional information was not identified in the supporting documents.

This information is needed to determine compliance with 10 CFR 72.24 and 10 CFR 72.104(a).