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OPPD
Omaha Public Power District

444 South 16th Street Mall
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July 3, 2006
LIC-06-0073

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk,
Director, Spent Fuel Project Office, Office of Nuclear Material Safety and Safeguards,
Washington, D.C. 20555

References:
1. Docket Nos. 50-285 and 72-054
2. Letter from OPPD (S.K. Gambhir) to NRC (Document Control Desk & Director, Spent Fuel Project Office) dated June 9, 2006, "Fort Calhoun Station-Request for Exemption from NUHOMS® Certificate of Compliance No. 1004, Amendment No. 8" (TAC No. L23984) (LIC-06-0056)
3. Letter from NRC (J. M. Sebrosky) to OPPD (R. T. Ridenoure) dated June 27, 2006, "Request for Additional Information Regarding the Fort Calhoun Independent Spent Fuel Storage Installation (ISFSI) (TAC. No. L23984)" (NRC-006-078)

SUBJECT: Response to Request for Additional Information Regarding the Fort Calhoun Independent Spent Fuel Storage Installation (TAC. No. L23984)

Reference 2 provided the Omaha Public Power District (OPPD) request for exemption to support use of the standardized NUHOMS®-32PT storage system and the OS197L Transfer Cask. Attachment 1 of this letter provides the OPPD Response to the Nuclear Regulatory Commission (NRC) Request for Additional Information contained in Reference 3.

One commitment, to incorporate a description of OS197L Transfer Cask (TC) Accidental Cask Drop through a specific 72.212 evaluation prior to fuel handling, is made in this letter.

If you require additional information, please contact Thomas C. Matthews at (402) 533-6938.

Sincerely,

Jeffrey A. Reinhart
Site Director
Fort Calhoun Station

NMSS01

JAR/rlj

Attachment: Response to Request for Additional Information Regarding the Fort Calhoun Independent Spent Fuel Storage Installation

cc: Director of Consumer Health Services, Department of Regulation and Licensure, Nebraska Health and Human Services, State of Nebraska

Omaha Public Power District
Fort Calhoun Station
Response to Request for Additional Information
Regarding the
Fort Calhoun Independent Spent Fuel Storage Installation

RAI-1

State the minimum cooling time of the assemblies that will be loaded under this exemption request.

The summary of the key parameters for Fort Calhoun Station's CE 14x14 fuel, provided in Table 1 of Attachment 1 of the exemption request, lists a number of fuel parameters, excepting the minimum cooling time of the assemblies.

This information is necessary to ensure that the dose rates in Technical Specifications (TS) 1.2.11 are not exceeded and to satisfy the requirements of 10 CFR 72.44(c)(1), 72.106, and 72.126.

OPPD Response:

The dose rates calculated as alternatives to the TS 1.2.11 dose rates are included in the exemption request. The minimum cooling time of the assemblies that will be loaded under this exemption request is 16.2 years.

RAI-2

Clarify whether the OS197L transfer cask (TC) surface dose rate, 13 rem/hr, given on Page 12 of Attachment 1 of the exemption request is the maximum or average surface dose rate.

*Transnuclear, Inc. Calculation No. 1121-0505, which determines the radiation dose rates around the OS197L TC in support of the exemption request, states in Section 6.2 that 13 rem/hr is the **maximum** TC surface dose rate. However, Page 12 of Attachment 1 states that 13 rem/hr is the **average** TC surface dose rate.*

This information is necessary to satisfy the requirements of 10 CFR 72.11 and 72.106.

OPPD Response:

The values of 13 Rem/Hr and 53 Rem/Hr are the peak calculated dose rates. The wording of page 12 in Section 6.2 of Attachment 1 to the exemption request was incorrectly stated. The word "average" should be revised to "peak" as follows.

> ". . .To assist in ALARA planning, Transnuclear (TN) has calculated the bare cask surface dose rates in calculation 1121-0505 Rev.0 [Reference 7]. The OS197L TC peak surface dose rate for the Fort Calhoun specific fuel being loaded under this exemption (11.0 kW DSC heat load) was calculated to be 13 Rem/Hr. This is significantly lower than the 53 Rem/Hr peak dose rate calculated with design basis fuel. This calculation is available onsite for NRC review."

RAI-3

Clarify whether the reference to Chapter 11 of the updated final safety analysis report (UFSAR) in the "Accident Analysis" section on page 18 of Attachment 1 of the exemption request is actually a reference to Chapter M.11 of the UFSAR.

The discussion in this section pertains to prior accident analyses performed for the OS197 and OS197L TCs. Chapter 11 of the UFSAR pertains to quality assurance. Chapter M.11 of the UFSAR contains the accident analysis of the OS197.

This information is necessary to satisfy the requirements of 10 CFR 72.11.

OPPD Response:

The text on page 18 of Attachment 1 to the exemption request is a reference to Chapter M.11 of the UFSAR, including W.11 of the FSAR Change Notice (FCN). The "Accident Analysis" section should read:

> "Accident analyses for the system are presented in Chapter M.11 and W.11 of the UFSAR (includes FCN 321). As addressed in the discussion for the Structural Evaluation, Thermal Evaluation, Shielding Evaluation, and Criticality Evaluation above, this section of the UFSAR is not adversely affected by the transfer cask dose rates or the start time/time limits for vacuum drying. Therefore, the accident analysis results presented in the UFSAR remain bounding."

RAI-4

OPPD should justify why the trailer shielding's impact on the structural response of the TC is not considered as creating the possibility for an accident of a different type than any previously evaluated in the UFSAR (10 CFR 72.48(c)(2)(v)).

OPPD's exemption request Attachment 2 page 95 section W.11.1.4 discusses the loss of neutron shield. This section evaluates, from a radiological perspective, the loss of the neutron shield and also postulates the loss of the trailer shielding. This evaluation does not include an evaluation of the structural impact the trailer shielding may have on the TC. For example, it is the staff's understanding that the 3 inch top shield is placed using a crane that is not single failure proof. OPPD does not evaluate the results dropping this shielding would have on the TC. In addition, TN does not evaluate the impact the additional transfer trailer shielding would have on the 80 inch accidental drop analysis discussed in Section W.11.1.3 of Attachment 2.

This information is necessary to satisfy the requirements of 10 CFR 72.48(c)(2)(v).

OPPD Response:

As stated in NEI 96-07, Appendix B, "Guidelines for 10 CFR 72.48 Evaluations," Section B4.3.5 (paragraph 2), certain accidents are not discussed in the UFSAR because their effects are bounded by other related events that are analyzed. In this case, an explicit evaluation of a mechanistic TC drop, considering the influence of the trailer, skid, or any other trailer structure (ram, skid positioning system) was not performed and documented in the UFSAR. This is because the accident was bounded by the analysis of the unrestricted TC drop, which maximizes g-levels on the dry shielded canister (DSC).

The conservatively postulated cask drop scenarios evaluated within the UFSAR, including Appendix W, provide the appropriate bounding accident definition and evaluation consistent with 10CFR72.48 (c)(2)(v). This information provides the bases for the conclusion by OPPD that the possibility of a new or different accident was not created. There are two specific concerns that are identified in the RAI.

The first concern raised in the RAI question is that *"OPPD does not evaluate the results of dropping the outer shield on the TC."* The lift of the transfer trailer shielding, similar to all of the other lifts required as part of the dry fuel storage operations, was evaluated by TN and OPPD. The response to the specific case of the top trailer shielding is provided below:

1. As proposed for use of the OS197L TC at FCS, the lift of the inner top shielding will be performed inside the Auxiliary Building using the single-failure-proof crane. (Reference the figure on Page 8 of TN FCN 721004-321, Revision 1, included as Attachment 2 of the exemption request.)
2. The lift of the 3-inch thick outer top shielding onto the inner top shielding will be performed outside of the Auxiliary Building using a non-single-failure-proof crane. The trailer jacks will be engaged prior to this evolution. (Reference the figure on Page 9 of TN FCN 721004-321, Revision 1.)

3. The inner top shielding completely shrouds the TC, and there is total clearance of approximately 2 inches between the inner top shield and the TC at both ends. The inner top shielding is supported completely by the skid end and side walls and does not bear on the TC. In addition, the inner top shielding is mechanically registered to the permanent lower shielding of the skid, thus preventing any lateral shifting of the inner top shielding on the skid.

4. The lift height of the outer top shielding above the inner top shield will be administratively limited by procedure. This maximum lift height was determined by the load drop analysis which assumed the most geometrically adverse lift orientation and demonstrated that worst case deflections of the inner top shield would not result in contact with the TC. The dropped outer top shielding would contact the 2.5-inch thick inner top shielding and the load would be transferred directly into the skid/trailer, and then into the four 75-ton trailer jacks (600,000 pounds total capacity).

OPPD has concluded that the unlikely drop of the outer top shielding upon the inner top shielding is bounded by the UFSAR evaluation of an 80-inch unrestricted drop of the TC. Therefore, an accident of a different type than any previously evaluated in the UFSAR is not postulated.

The second specific concern raised in the RAI question was that "*TN does not evaluate the impact the transfer trailer shielding would have on the 80 inch accidental drop analysis discussed in Section W.11.1.3 of Attachment 2.*" The response to this specific concern is discussed below.

The conservatively postulated cask drop scenarios evaluated within the UFSAR, including Appendix W, provide the appropriate bounding accident definition and evaluation consistent with 10CFR72.48 (c)(2)(v). To clarify and add a description of OS197L Transfer Cask (TC) Accidental Cask Drop, the following additions to Section W.11.1.3 will be made through a FCS-specific 72.212 evaluation prior to fuel handling. TN has agreed to incorporate these changes into the UFSAR.

W.11.1.3 OS197L TC Accidental Cask Drop

This event is described in Sections 8.2.5.2.B, D and E.

The cask drop accident scenarios are considered incredible as stated in UFSAR Section 8.2.5.1. The postulated drop scenarios of an unrestricted 80-inch drop onto an unyielding surface were conservatively selected to provide bounding conditions for any credible accident assumed under the licensing basis. It is noted that the primary concern for the drop evaluations is the g-levels imposed on the DSC and basket. In the assumption of a non-mechanistic 80-inch unrestricted drop, the g-levels imposed on the DSC are maximized, thus providing a bounding load case. Any inclusion of additional structure, such as the skid, trailer, or shielding will only

reduce the drop distance and will provide additional energy absorption, thus reducing the DSC g-levels.

The center of gravity (CG) of the OS197L transfer system is essentially the same as the CG of the original OS197 unshielded transfer system since shielding is added below the CG of the cask and above the CG of the cask. In addition, the total weight of the OS197L transfer system and the height of the DSC above grade is essentially the same as the OS197.

The load path for support of the TC is the same for both the OS197L and the OS197. The TC is supported by the trunnions, which rest on the skid, which is supported by the trailer deck, which is supported by the tires or the jacks. The additional trailer shielding is supported from the skid, and does not load the TC.

Both the inner and the outer top shielding are fully welded structures that are robust and are fully captured on the skid. The outer top shielding is fit over the permanently welded side skid shielding, and is bolted to this shielding with eight 1.25-inch bolts. In this manner, the outer and inner top shielding are prevented from becoming a missile that could impact the TC.

In the very unlikely event that the trailer should tip over, the additional trailer shielding will also act as an impact limiter, and would further reduce the total height of the TC drop (already less than 80 inches). As stated above, in all cases the maximum unrestricted drop height of the cask is less than 80 inches (even assuming rotation of the entire trailer/skid/shielding at the trailer jacks, followed by instantaneous disappearance of the skid, trailer, and shielding). Given the well-connected and interlocking design of the skid shielding, there is no malfunction of the skid shielding that would invalidate the unrestricted 80-inch drop of the OS197L TC as the bounding event. The actual fall distance of the TC on the trailer is approximately 70 inches.

See Section W.3.7 for a discussion of the OS197L TC drop accident as it affects the TC. This drop accident is bounded by the results for the OS197 TC drop accident discussed in Section 8.2.