72-1029

TRANSNUCLEAR WEST

July 20, 2001
DCS-TNW0107-12

Mr. Timothy Kobetz
Project Manager, Spent Fuel Project Office
U.S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852

Subject: Additional Supplemental Response to Request for Additional Information and Submittal of Revision 3 of the Advanced NUHOMS® Storage System Application (TAC No. L23203)

References:
1. R. Grenier Letter to T. Kobetz dated June 25, 2001; "Double Sided Pages of Attachments 3 and 4 of Advanced NUHOMS® Storage System Application, Revision 2 (TAC No. L23203)".
2. R. Grenier Letter to T. Kobetz dated June 22, 2001; "Supplemental Response to Request for Additional Information and Submittal of Revision 2 of the Advanced NUHOMS® Storage System Application (TAC No. L23203)".
3. R. Grenier Letter to T. Kobetz dated May 18, 2001; "Response to Request for Additional Information (RAI) and Submittal of Revision 1 of Advanced NUHOMS® Storage System Application (TAC No. L23203)".
4. T. Kobetz Letter to R. Grenier dated November 8, 2000; "Schedule for Review of the Advanced NUHOMS System".

Dear Mr. Kobetz:

Transnuclear West (TN West) provides an additional supplemental response to specific RAI responses submitted previously in References 1, 2 and 3. This additional supplemental response supercedes the corresponding information related to these specific RAI issues submitted previously. In addition, the affected pages of the Advanced NUHOMS® SAR have been updated and replacement pages are included in this submittal.

Per our previous discussions with you, TN West understands that a review of this additional submittal was not provided for in the original NRC review schedule (Reference 4). Accordingly, we acknowledge that the impact of this additional review is expected to result in an extension in the date for NRC issue of the preliminary SER and C of C from 8/13/01 to 9/3/01.

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Ten copies of the proprietary SAR changed pages are provided along with 4 copies of the associated non-proprietary SAR changed pages. Revision 3 pages to be incorporated and Revision 2 pages to be deleted are identified in the List of Effective Pages.

Please contact me at 510-744-6053 or Mr. Rob Grenier at 510-744-6020 if you have any questions regarding this submittal.

Sincerely,

U. B. Chopra
Licensing Manager

Docket 72-1029

Attachments:

1. Additional Supplemental Response to the RAI (14 copies)
2. Revision 3 replacement pages for the proprietary version of the Advanced NUHOMS® Storage System Application (10 copies)
3. Revision 3 replacement pages for the non-proprietary version of the Advanced NUHOMS® Storage System Application (4 copies)

cc: File: SCE-01-0007.01

ADDITONAL SUPPLEMENTAL RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION TRANSNUCLEAR WEST INC., TAC NO. L23203

Note: The responses below include only questions for which a supplemental response was required. These responses update the initial RAI response (TNW letter DCS-TNW0105-12, dated 5/18/01) and the initial supplemental response (TNW letter DCS-TNW0106-13, dated 6/22/01). The changes associated with this additional supplemental response are identified by revision bars.

Question 6-7

Describe in greater detail in Section 6 how the Upper Subcritical Limit (USL) was determined.

The SAR does not discuss any bias and uncertainty associated with the USL determination, nor does it discuss any uncertainty due to modeling approximations. Note that only biases that increase keff should be applied. This is required for the staff to assess compliance with 10 CFR 72.124.

Response to Question 6-7

SAR Section 6.5.1 has been revised to incorporate additional discussion of the method used for calculation of the Upper Subcritical Limit (USL). The methodology used is based on NUREG/CR-6361, USL method 1.

To evaluate the effect of fuel parameter tolerances on reactivity, the fuel parameters used in the criticality analyses are reviewed to identify sensitivity studies needed to evaluate these effects. A review of fuel parameters identified in Tables 6.2-1 and 6.2-2 of the SAR indicates that all parameters listed with the exception of pellet diameter, clad outer diameter (OD) and clad thickness are enveloped by the criticality analyses performed. To evaluate the effect of tolerances in clad OD, clad thickness and fuel pellet diameter on reactivity, sensitivity analyses are performed to evaluate system reactivity as a function of these parameters. The evaluations performed are discussed in SAR section 6.4.5 and the results of these evaluations are presented in Tables 6.4-5, 6.4-6 and 6.4-7 of the SAR. The results demonstrate that the calculated changes in reactivity between the various cladding and pellet dimensions are not significant.

A discussion of the effect of the two empty slots and/or multiple dummy assemblies on structural, thermal, and shielding analyses has been added in SAR Section 2.1.1. Requirements for the dummy fuel assemblies are included in SAR Section 12.2.1.d.

Question 6-13

Revise Section 12.4.0 to include the basket B-10 loading and the flux trap size.

The B-10 loading and flux trap size are design parameters important to criticality safety. This is required by the staff to assess compliance with 10 CFR 72.24(g), 72.26, and 72.44(c).

Response to Question 6-13

SAR Section 12.4 has been revised to include the basket Boron loading and the flux trap size as requested.

Supplemental Clarifications Resulting from Additional NRC Questions per Various Telecons Since June 25, 2001

Question No. 1: *Explain the basis for the difference in fuel clad and guidesleeve/ oversleeve/Boral temperatures in SAR Table 4.1-3.*

Response to Question No. 1: SAR Tables 4.1-3, 4.1-4 and 4.1-5 are revised to clarify the applicability of the data provided with respect to the storage/transfer modes.

Question No. 2: *Why is technical specification 12.4.3.5 not incorporated into Technical specification 12.3.1.3? The requirements of Technical Specification 12.4.3.5 are applicable during the operations defined in Technical Specification 12.3.1.3.*

Response to Question No. 2: Technical Specification, SAR Section 12.4.3.5, is deleted and its requirements are shown in Technical Specification 12.3.1.3.

Question No. 3: *Credit is taken for the placement of fuel spacers in the DSC to maintain fuel and poison location. This should be incorporated into the technical specifications.*

Response to Question No. 3: An additional Design Feature is added to Technical Specification, SAR Section 12.4.2 (Section 12.4.2.5). This section specifies the requirements for placement of fuel spacers in the 24PT1-DSC. A revision to Chapter 8 of the SAR is provided to specifically identify the placement of fuel spacers in the DSC.

Question No. 4: *The inclusion of proprietary information (Figure 12.4-1) in technical specification 12.4.2.4 is not appropriate. Delete this proprietary figure and also delete references to other SAR sections in the Technical Specifications.*

Response to Question No. 4: SAR Sections 12.4.2.3, 12.4.2.4 and 12.4.4.1 are revised as requested. Figure 12.4-1 is deleted.

Question No. 5: *Clarify the ASME code exception tables in SAR Section 12.4.3.4 with respect to the NB-8000 and NG/NF-8000 exception referencing QA data package*

requirements. Also clarify the conditions under which authorization of exceptions is to be sought from the Director of the Office of Nuclear Material Safety and Safeguards.

Response to Question 5: The requirements of SAR Section 12.4.3.4 are clarified to indicate that the exception cited is mitigated by the application of the referenced requirements to the QA data package. The text of SAR Section 12.4.3.4 is revised.

Question No. 6: *Clarify SAR Section 12.4.4.2 to specify that the concrete pad cited is the concrete storage pad.*

Response to Question No. 6: SAR Section 12.4.4.2 is revised to provide the requested clarification.

Question No. 7: *Provide additional details to support the derivation of the solar insolation heat flux value used for normal operating conditions (specified in Table 4.1-1).*

Response to Question No. 7: The basis for the solar insolation heat flux value used for the normal operating condition is clarified by a revision to SAR Section 4.4.2.2. The original thermal insolation value used was obtained by an incorrect use of data from the ASHRAE Handbook, SAR Reference [4.3]. The solar heat load was recalculated based on data from SAR Reference [4.3] for the average heat flux transmitted through horizontal DSA glass. This heat flux (74.8 Btu/ft^2-h) is adjusted to account for the solar heat gain of the DSA glass by dividing the heat flux obtained from SAR Reference [4.3] by the heat gain factor for the glass, which is 0.87, per SAR Reference [4.3]. To account for the reflective properties of the concrete surface this adjusted heat flux is multiplied by the absorptivity of concrete, which ranges from 0.65 to 0.80 (SAR Reference [4.3], Table 3, p. 2.8). Therefore the solar heat flux absorbed by the AHSM concrete roof surface with the maximum absorptivity value of 0.80 (which is conservative) is:

$$74.8 \times 0.80 / 0.87 = 68.8 \text{ Btu/ft}^2\text{-h}.$$

The data obtained from Reference [4.3] was also reviewed against data available from the National Solar Radiation Database maintained by DOE and was found to be conservative relative to this independent source. The solar insolation value used in the thermal analysis for normal conditions is 72.6 Btu/ft^2-h which provides an additional 5% conservatism above the value calculated above.

In addition, the AHSM thermal analysis was rerun to assess the sensitivity of the AHSM maximum concrete and fuel cladding temperatures to the value of solar insolation used. This run used a solar insolation value of 123 Btu/ft^2-h. The results indicate that the effect of this change is an increase in the maximum concrete temperature of less than 2° F and an imperceptible effect on the fuel clad temperature. Therefore, the maximum concrete temperatures and fuel cladding temperatures are relatively insensitive to the solar insolation value used.

Editorial Corrections to the SAR

1. Page 4.4-1 was revised to correct a cross-reference error.
2. SAR Table 4.4-3 was revised to correct a typographical error.
3. The table numbers on page 6.4-14 of the SAR were corrected.
4. Figure 6.4-1 was revised to correct an error in its legend.