February 9, 2012

Mr. Don Shaw
Licensing Manager
Transnuclear, Inc.
7135 Minstrel Way - Suite 300
Columbia, MD 21045

SUBJECT: APPLICATION FOR AMENDMENT NO. 3 TO THE STANDARDIZED ADVANCED NUHOMS® CERTIFICATE OF COMPLIANCE NO. 1029 - SUPPLEMENTAL INFORMATION NEEDED

Dear Mr. Shaw:

By letter dated December 15, 2011, Transnuclear, Inc. submitted an application to the U.S. Nuclear Regulatory Commission (NRC) for Amendment No. 3 to Certificate of Compliance (CoC) No.1029 for the Standardized Advanced NUHOMS® System. The application proposes to add the NUHOMS® 32PTH2 system, which consists of a new transportable Dry Shielded Canister (DSC) designated the 32PTH2, stored in a modified version of the currently licensed Advanced NUHOMS® AHSM horizontal storage module, designated the AHSM-HS.

This letter is to advise you that NRC staff have performed an acceptance review of your application to determine if the application contains sufficient technical information in scope and depth to allow the staff to complete the detailed technical review. The information needed to continue our review is described in Enclosure 1 to this letter as Request for Supplemental Information (RSI). Staff included observations in Enclosure 2 to allow you to start earlier on issues that have the potential to be asked at a later date. Responses to observations are not required for staff to begin a detailed technical review. Observations are not the result of a detailed technical review and may be resolved once staff begins a detailed review. In order to schedule our technical review, the response to this RSI should be provided by February 24, 2012. If the information requested is not received by this date, the application will be delayed.

This letter confirms our telephone call on February 8, 2012, with respect to the supplemental information needed and the date for your submittal. If you have any questions regarding this matter, please feel free to contact me at (301) 492-3219 or by email at steve.ruffin@nrc.gov.

Sincerely,

/RA/

Steve Ruffin
Project Manager
Division of Spent Fuel Storage and Transportation
Office of Nuclear Material Safety
and Safeguards

Docket No.: 72-1029
TAC No.: L24607

Enclosures: As stated

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REQUEST FOR SUPPLEMENTAL INFORMATION

CONTAINMENT

RSI-1
Provide a general description of the fabrication helium leak rate test for the entire confinement boundary of the new and modified DSCs.

Consistent with the guidance in ANSI 14.5-1997, and as provided for in the recent amendment to 72-1004, leak testing of the confinement boundary should encompass welds, joints, and surfaces of the confinement boundary including the base material. The staff does not have sufficient data to generically grant an exception of helium leak testing of base material that may be procured, fabricated, and operated under various conditions for multiple types of canisters, although the likelihood of helium leakage through thick, forged base material for any given canister confinement boundary may be very low. In addition, there is not sufficient evidence to correlate the minimum flaw sizes that are detectable during other fabrication examinations (e.g. UT) with the minimum flaw sizes in any orientation that may cumulatively result in leak rates greater than 1.0 x 10-7 ref cm^3/sec. The applicant should list the operating procedures for helium leak testing of the confinement boundary in the SAR and TS, for helium leakage rate test to the entire confinement boundary of the Advanced NUHOMS® DSCs.

Alternatively, the applicant should provide a basis for demonstrating that the materials, forging, fabrication, and testing of the entire confinement boundary construction provides reasonable assurance that leakage through the canister during its entire service life is not credible, without confirmation by helium leak test. The basis should describe the physical properties of the confinement boundary after fabrication, potential types of flaws (e.g., stringers), and other mechanisms that could potentially result in leakage. In addition, the industry leak test data for canister bodies, or the applicable data for similar types of nuclear components, should be provided to validate the assumed integrity of the base metal and fabrication welds.

This information is needed to determine compliance with 10 CFR 72.236(j) and 72.236(l).

OBSERVATIONS

STRUCTURAL

Provide a benchmark for the use of LS-DYNA, or an ANSYS analysis for the 32PTH2 basket assembly during the 80-inch accidental side drop.

Amendment No. 3 SAR section B.3.6.1.2.6 evaluates the 32PTH2 basket assembly side drop (accident) by a LS-DYNA transient dynamic finite element analysis.

The 32PTH2 basket assembly analysis methodology using LS-DYNA to determine stress values (no direct stress intensities output) is inconsistent with that of the current ANSYS analysis technique for the 80-inch, 75g side drop. LS-DYNA capability for basket assembly analysis must be properly benchmarked for intended use. Specifically, the applicant must demonstrate that LS-DYNA analysis results can be properly post-processed for section-cut internal stress quantities (i.e. the ability to extract validated stress intensities consistent with ASME code criteria) relevant for a comprehensive structural integrity evaluation of the 32PTH2 fuel basket assembly.

This information is needed to demonstrate compliance with 10 CFR 72.236(c).

THERMAL

Obtain the analysis discretization error for the bounding case by calculating the grid convergence index (GCI) following the procedure described in American Society of Mechanical Engineers Verification and Validation 20-2009 (ASME V&V 20-2009), "Standard for Verification and Validation in Computational Fluid Dynamics and Heat Transfer."

Per ASME V&V 20-2009, when using the GCI method to estimate the discretization error, the following criteria should be met:

- The solution from the different grids used display monotonic convergence.
- The solution from the different grids used should be in the asymptotic range.

To test for:

- A minimum of four grids is required to demonstrate that the observed order of accuracy p is constant for a simulation series. In fact, it may require more than four grids to convincingly demonstrate asymptotic response in difficult problems, possibly five or six grid resolutions in cases where the convergence is noisy (ASME V&V 20-2009).
- The observed order of accuracy p has to be comparable to the expected order of accuracy of the method.
- If order of accuracy p is not consistent, then the factor of safety (F_s) should be equal to 3.

Provide all analysis files generated as a result of the GCI calculation.

This information is necessary to verify the requirements of 10 CFR 72.11 and 72.236.

OBSERVATIONS

MATERIALS

Justify the 40-year strength of the HSM concrete that will operate above 350°F, as stated in Table B.4.1-3. The footnote to Table B.4.1-3 states:

"The maximum concrete temperature for accident conditions is above the 350ºF limit given in ACI-349 [B4.28]. Testing will be performed to demonstrate that the concrete compressive strength is greater than that assumed in structural analyses of Chapter B.2." It is not clear how mechanical testing will accurately predict the strength of concrete operating outside the bound of the code specifications.

This information is required for compliance with 10 CFR 72.120(d).