

## Accession No. ML070050071

**From:** Peter Tam  
**To:** Loeffler, Rick; Salamon, Gabor  
**Date:** 01/04/2007 3:25:01 PM  
**Subject:** Request for Conference Call re. Structural Issues for Temporary Spent Fuel Rack (TAC MD0302)

Rick;

The NRC staff's main structural safety concerns regarding the installation of an 8x8 fuel storage rack, were:

- (1) The response spectrum used in the 1977 seismic analysis did not envelope the proposed Monticello Nuclear Generating Plant (MNGP) site floor response spectrum; and
- (2) There was no information on natural frequencies of the PaR 8x8 fuel storage rack to show that the seismic response of the 8x8 rack will be bounded by the responses of other racks being analyzed.

Based on the new information submitted in your 1/02/07 letter, the NRC staff agrees that if the artificial time history response spectrum from the fundamental frequencies of the PaR 8x8 fuel storage rack to zero period bounds the MNGP response spectrum by a wide margin, the seismic loading used in the 1977 PaR Systems Report will bound loads from a seismic evaluation using the MNGP response spectrum. The remaining issue is the determination of fundamental frequencies of the 8x8 rack.

In Enclosure 2 to response, you presented calculation results for the 8x11 rack using SAP 2000 based on "A simplified ANSYS model (see Fig. 2 of [1]), consisting of a cantilever beam extending the height of the racks, attached to a horizontal beam at the base bottom casting elevation with leg beams connecting the ends of this member to the floor" (sheet 5 of 12). The calculated "1st and 2nd horizontal natural frequencies are given at 8.2 Hz and 33.7 Hz, respectively. The "Casting Bottom" vertical mode is approximately 17.2 Hz" (sheet 7 of 12).

Notice that PaR report "Section 5.3 Model Description, Formulation and Assumptions for the Seismic Analysis of BWR Spent Fuel Racks" (July 1977), page 5.3-4, stated: Dynamic analysis of a detailed SAP IV model have determined the first two natural frequencies to be orthogonal and simple cantilever modes at 8 Hz; and subsequent horizontal frequencies are greater than 28 Hz. A vertical diaphragming frequency of the bottom casting exists at 14 Hz.

Our reviewer Weijun Wang has some remaining questions that he would like to discuss with you in a conference call:

1. The PaR report indicated that the natural frequencies of the rack was determined by "a detailed SAP IV model" as illustrated in Figure 1 of the PaR report (page 5.3-13), while the new calculation used a "simplified ANSYS model."
2. It is not clear which rack configuration was used in the SPA IV model analysis. Although the new calculation presented similar 1st mode frequency, the 2nd horizontal frequency is 28 Hz, the "casting bottom" (vertical) is 14 Hz in PaR's report; the new calculation yielded 33.7 Hz and 17.2 Hz, respectively (for the 8x11 rack).
3. Since it is not convincing that using a simplified model by SAP 2000 can obtain similar results as that using a detailed SAP IV model for the 8x11 rack, the same method used to determine the natural frequencies for the 8x8 rack may be questionable.
4. The conclusion that 8 Hz is the lower bound natural frequency of the rack configurations cannot be drawn until we are certain that the natural frequency of the 8x8 rack is higher than 8

Hz.

The sole purpose of this e-mail is to prepare you and others for the requested conference call. **It does not convey a formal NRC staff position, and it does not formally request for additional information.**

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**CC:** Weijun Wang

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**From:** Peter Tam

**Created By:** PST@nrc.gov

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