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Subject: RAI on Changes to Spent Fuel Pool Loading Restrictions
Creation Date: 4/8/03 8:17AM
From: Michelle Honcharik

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MESSAGE	814	04/08/03 08:17AM

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From: Michelle Honcharik
To: DMILLAR@entergy.com
Date: 4/8/03 8:17AM
Subject: RAI on Changes to Spent Fuel Pool Loading Restrictions

Dana,
Please see the attached RAI from the Mechanical and Civil Engineering Branch. Other branches are reviewing the amendment, so there may be additional RAI submittals at a later date.
Thank you,
Michelle

CC: Thomas Alexion

REQUEST FOR ADDITIONAL INFORMATION
MECHANICAL AND CIVIL ENGINEERING BRANCH
REQUEST TO CHANGE THE SPENT FUEL POOL LOADING RESTRICTIONS
ARKANSAS NUCLEAR ONE, UNIT 2 (ANO-2)

1. The first paragraph on page 6-3 of the Holtec Report (Attachment 4) states that Three-dimensional (3-D) Whole Pool Multi-Rack (WPMR) analyses carried out on several previous plants demonstrate that single rack simulations may under predict rack displacement during seismic response. Is the nature of the above mentioned under-prediction in rack displacement with respect to a set of closed form solutions or responses obtained via pertinent tests? If yes, briefly describe the applicable closed form solutions or tests conducted; otherwise, explain the basis of your statement.
2. Regarding the last paragraph on page 6-3 of Attachment 4, discuss the laboratory experiments that were conducted to validate the multi-rack fluid coupling theory and the basis for specific coupling parameters used in the ANO-2 WPMR analyses.
3. The first paragraph on page 6-4 of Attachment 4 states that the WPMR analyses have corroborated the accuracy of the single rack 3-D solutions in predicting the maximum structural stresses, and served also to improve predictions of rack kinematics. Explain the basis of this statement including to what specific accurate 3-D solution the statement is meant to apply. Also, indicate if ANO-2 has a set of known or true rack kinematic data to serve as a reference solution for the statement.
4. Referring to the last paragraph on page 6-4 of Attachment 4, it is not clear as to whether both the single rack and the WPMR analyses were used by ANO-2 for the license amendment request (LAR). Discuss how the results of these analyses were utilized in providing an adequate seismic/structural analysis basis for the ANO-2 spent fuel rack related LAR.
5. With respect to Item d on page 6-8 of Attachment 4 addressing fluid coupling effect, discuss any pertinent experimental work performed after 1982 which supports the adequacy and reasonableness of the methods reported in References 6.5.2 and 6.5.3. Also, the last paragraph on page 6-11 of Attachment 4 states that the derivation of fluid coupling matrix has been extensively verified by an extensive set of shake table experiments (Reference 6.5.5, proprietary). Briefly summarize the experimental results that are relevant to ANO-2 WPMR analyses.
6. Regarding Section 6.8.4.3, Fuel to Cell Wall Impact Loads, on page 6-24, discuss briefly how the evaluation of cell wall integrity under the instantaneous impact of fuel assembly load was performed to conclude that cell walls will remain intact with no permanent damage. Additionally, referring to the last paragraph on page 6-26 of Attachment 4, discuss briefly the basis for obtaining the limiting impact load of 3438 lb/ft for rack cell wall.

7. Figure 6.11.1 of Attachment 4 shows maximum instantaneous hydrodynamic pressures for both the operating basis earthquake and the safe shutdown earthquake that are indicated to be applicable to spent fuel pool walls adjacent to a rack. Are these data ever corroborated by applicable tests and are the negative wall pressures shown in the figure realistic? Briefly discuss how this figure is applied specifically to the integrity evaluation of ANO-2 spent fuel pool structures.
8. Referring to page 6-13 of Attachment 4 discussing Rabinowicz's data and fixing the randomly selected coefficient of friction for each simulation, briefly summarize Rabinowicz's experiments and elaborate on the meaning of a statement that the coefficient of friction between the pedestal supports and the pool floor is indeterminate. Also indicate the minimum number of simulations for the friction coefficient performed (refer to the footnote of the page) in a given WPMR analysis to ensure that the results obtained are meaningful and discuss the basis for selecting the minimum number.
9. For the plants listed in Table 6.2.1 of Attachment 4, discuss briefly, as applicable, the actual operating experience of plants whose spent fuel racks/spent fuel pools have been subjected to real earthquakes of some significance and displayed seismic responses appreciably different from those obtained from Dynarack analyses.
10. With respect to Attachment 5, Evaluation of Spent Fuel Pool Structural Integrity for Increased Loads from Spent Fuel Racks, discuss past operating, inspection and maintenance experience of the ANO-2 spent fuel racks and spent fuel pool structures. As applicable, discuss any pool wall/bottom slab cracking, settlement and/or pool water leakages observed to date and repair measures taken to remedy them.