

NRR-PMDAPEm Resource

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Sent: Thursday, October 01, 2015 2:07 PM
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Subject: NRC Staff Comments on EPRI Seismic Spent Fuel Pool Evaluation
Attachments: NRC Staff - Spent Fuel Pool Comments.docx

Andrew,

Attached are NRC comments associated with the review of the *Seismic Review of Spent Fuel Pool* industry white paper.

Please let me know if you have any questions.

Regards,

Nick

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NRC staff comments on EPRI Seismic Spent Fuel Pool (SFP) Evaluation Report

SFP Structural Evaluation Approach

- 1) Additional information should be provided to support use of the screening criteria in EPRI report NP-6041 (Table 2-3):
 - a) The EPRI SFP report or licensee submittal should confirm on a plant-specific basis that SFPs do not have physical degradation, and
 - b) Confirm that plant design features and conditions does not preclude applicability of Table 2-3.
 - c) Include a discussion demonstrating that potential effects of out-of-plane response for SFP walls and floor are not significant.
- 2) The screening report should identify the BWRs with Mark III components as a separate design group and discuss these plants with the PWRs.

SFP Non-Structural Evaluation Approach

- 1) Minor clarifications are needed to the text in the Section 3.3.1.1:
 - a) The first paragraph of Section 3.3.1.1 indicates gates may be constructed of concrete blocks. Gates typically aren't constructed from this material, and that material is inconsistent with the statement in the following paragraph that the gate designs have high ductility.
 - b) The fourth paragraph of Section 3.3.1.1 states that catastrophic failure of inflatable seals would result in only limited water loss due to limited volume of the adjacent cavity. This is generally true for PWRs, which use inflatable seals to separate fuel transfer and cask handling areas from the spent fuel pool using gates with inflatable seals. However, for the EPRI non-structural considerations of a SFP adjacent to a refueling cavity, the example provided is applicable to BWRs with Mark I and II containment designs. For these plants, the refueling cavity is neither a small volume nor separated from the pool by gates with inflatable seals. Instead, BWR refueling cavities are separated from the pool by redundant gates with elastomeric seals. BWRs with Mark III containment designs and PWRs use an inclined or horizontal fuel transfer tubes with isolation valves to transfer fuel between the refueling area in the reactor building and the fuel storage area in another building.
- 2) The spent fuel pool study (SFPS) assessed the capacity of the SFP gates. This assessment was primarily based on examination of the structural details of metallic gates, ductility of their materials, their support system and seals, and the redundancy in the gate system. Consequently, this assessment is applicable for SFP gates and gate systems with structural characteristics, steel, seals, support system and redundancy similar to those in the studied SFP. The screening report should be enhanced with a description of existing gate systems for comparisons with those in the SFPS and the types addressed in the screening report. If needed, a confirmatory approach involving a more detailed analysis or examination should be done for gate types that would not have obvious strength and ductility characteristic like those in the SFPS, for plants with >0.8 g Peak Spectral Accelerations.

- 3) The use of a median value approach for evaluating SFP water loss due to sloshing (SPID section 7.3.2) does not acceptably represent the plant-specific potential for water loss from the reevaluated seismic hazard.
 - a) Each plant should calculate the potential for water loss from the SFP due to sloshing using the plant-specific GMRS and SFP configuration, and use this calculated water loss value in subsequent plant-specific evaporation calculations (see item #4).
 - b) The plant-specific calculations could be reported in either the EPRI screening report, or in the individual plant submittals for the SFP evaluation response.
 - c) The EPRI report should be enhanced by a discussion of the distribution of calculated sloshing losses, in lieu of a focus on median results.
- 4) Regarding boil off losses, SPID section 7.3.1 references Severe Accident Management Guidance, Appendix EE. Please provide rationale for using NUREG-1738 confirming that the proposed methodology would not underestimate the amount of post-sloshing evaporative SFP water loss. Additionally, please expand on the basis for assumed spent fuel pool heat loads.