



South Texas Project Units 3&4 Spent Fuel Rack Technical Report

Initial Review Comments by
NRC Staff

September 18, 2013

Enclosure 2

South Texas Project Units 3&4 Spent Fuel Rack Technical Report

Purpose

- Present to the applicant the observations made by the NRC staff based on initial review of the STP Spent Fuel Rack technical report prepared by Holtec International (Report No. HI-2135462).
- Highlight the potential for issuing more RAIs than the staff had expected.

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Major Observations by the Staff

- The staff identified several areas where technical issues raised during review of the previous technical report by Westinghouse are not adequately addressed.
- The staff also noted that the design information provided in several parts of the report does not satisfy the general guidance in SRP 3.8.4, Appendix D in the level of details needed for staff review.
- The staff anticipates that the number of RAIs needed for completing review of the report would be more than expected.

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Examples of Issues Identified in Previous RAIs:

- Figures 2.1 through 2.16 provide details of the Spent Fuel Rack (SFR) components. Tie bar width and various weld sizes are not included in the report. (RAI 09.01.02-2, Item 'a')
- The report does not include any information about the gap considered in design between the fuel and cell wall. (RAI 09.01.02-2, Item 'b')
- The report did not include discussion of any evaluation or results for stuck fuel assembly loading. (RAI 09.01.02-3, Item 'c')
- The report did not include consideration of out-of-phase movement of fuel assemblies for determining maximum impact loads on fuel assembly. (RAI 09.01.02-10, Item 'a')

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Examples of Issues Identified in Previous RAIs (Cont.):

- Evaluation of cell-to-cell welds in the report does not include any discussion of how shear is transferred from one cell to the next through the tie bars, including stresses in the tie bars. (RAI 09.01.02-5, Item 'i'; RAI 09.01.02-31)
- Information included in the report for design check of the cell wall for rattling of fuel assembly and rack-to-rack impact do not describe how the evaluations were done in order for the staff to determine adequacy of the evaluations. Also, the report does not include any information about how the base plate and the bearing plate stresses are evaluated, or the acceptance criteria used for these evaluations. (RAI 09.01.02-6)
- The report does not include a comprehensive description of how the stiffness for the various impact springs is determined, and their values. (RAI 09.01.02-5, Item 'c')

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Examples of Insufficient Analysis and Design Information:

- The accidental fuel drop analysis presented in Chapter 7 of the report does not clearly describe all the drop locations used in the evaluation. Fuel drop locations must be known to determine adequacy of fuel drop evaluation.
- In Chapter 7 of the report, it states that energy balance method is used to carry out the accidental fuel drop analysis using the computer program Mathcad. The report needs to include a description of the energy balance method used, including how it was benchmarked, in order for the staff to evaluate its adequacy.

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Examples of Insufficient Analysis and Design Information (Cont.):

- The dynamic analysis of the racks assumes that sliding occurs at the interface of the rack pedestal and the bearing pads. There is no discussion of why sliding at the interface of the bearing pads and the pool liner need not be considered.
- Reported maximum rack displacement relative to the floor is 4.7 inches, which is close to the minimum distance to the edge of the bearing pad, and occurs for analysis run number 2. However, there is no sensitivity study performed for this loading case to confirm that the rack displacements will be within limits of the bearing pads for partial loading, empty rack, or reduced integration time steps.

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Observations Summary

- The staff had anticipated a comprehensive submittal that addressed the RAI issues identified during review of the original WEC design/analysis and the discussions during the March 20, 2013 meeting at NRC Headquarters.
- The staff finds that the submitted technical report falls far short of the staff's expectations.
- The staff also notes that the LS-DYNA accidental fuel drop analysis methodology presented to the staff at the March 20, 2013 meeting has been changed to a simplified energy balance method, without any explanation or technical basis for implementing the energy balance method in its place.

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Schedule Impacts

- Staff developed its review schedule based upon similar completed NRC evaluations assuming a high quality submittal, timely response to RAIs, effective use of audits and sufficient time to complete staff findings and conclusions.
- Based upon the above staff observations and comments, it is extremely difficult to estimate the time needed to resolve staff questions or concerns.
- Therefore, it would be speculative at this time to estimate the review finish date. Staff will continue to monitor the progress of this review and reassess any impacts on the overall STP COL Schedule in 2014.

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Discussions/Questions