

# REQUEST FOR ADDITIONAL INFORMATION 387-2931 REVISION 1

6/11/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

SRP Section: 09.01.02 - New and Spent Fuel Storage  
Application Section: Section 9.1.2

## QUESTIONS for Balance of Plant Branch 1 (AP1000/EPR Projects) (SBPA)

### 09.01.02-21

In RAI No. 132-1538, Question No.: 09.01.02-06, the staff requested the applicant to include in the DCD a description of the inspection program (including testing interval) for the spent fuel storage racks and spent fuel pool liner.

In its response to this RAI dated 1/29/09, the applicant stated that:

Inspections of the integrity of the liner and SFP storage racks, verifying their presence, absence of significant corrosion, etc., will be conducted upon completion of construction/installation, and informally upon every visit of plant personnel to the operating floor in the vicinity of the SFP. Formal inspections will be conducted before every fuel move interfacing with the SFP, and especially for the SFP racks prior to their utilization. Any build-up of crud or debris that may interfere with inspection of the SFP floor areas or, in a worst-case scenario, have the potential to obstruct coolant flow for the spent fuel storage racks, will be cleared as necessary by underwater vacuum systems with underwater viewing capabilities whenever necessary prior to significant build-up.

The applicant has not discussed the procedure or created a COL information item requiring the COL applicant to create a procedure that will instruct the operator to perform the above mention formal inspection of the integrity of the spent fuel racks.

The staff requests the applicant to discuss in the DCD the key elements of the procedure that will instruct the operator to perform the above mention formal inspection of the integrity of the spent fuel racks, or to create a COL information item in the DCD that will direct the COL applicant to create such procedure.

### 09.01.02-22

In RAI No. 132-1538, Question No.: 09.01.02-012, the staff requested the applicant to discuss in the DCD the SFP liner capacity to withstand all design basis loads.

In its response to this RAI dated January 29, 2009, the applicant stated that the key feature of the liner, its leak-tightness, will be established by the pit's maintaining of the water used to fill it upon completion of construction and construction inspections, and by the absence of water in the liner leakage collection system which is provided with a leak detection capability, so no liner ITAAC is considered necessary.

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The staff agrees with the applicant statement that no ITAAC is need to verify the leak-tightness of the spent fuel pool liner, but the staff did not find the available preoperational tests appropriate to test the leak-tightness of the liner. The staff evaluated DCD Section 14.2.12.1.85, "Spent Fuel Pit Cooling and Purification System (SFPCS) Preoperational Test," an found that this preoperational test will fill the spent fuel pool in order to test the SFPCS, but evaluating the leak-tightness of the liner is not one of the test objectives. The staff considers that evaluating the leak-tightness of the liner should be one of the test objectives.

The staff requests the applicant to include in the DCD the evaluating the leak-tightness of the spent fuel pool liner as one of the objectives of Preoperational Test 85.

09.01.02-23

In RAI No. 132-1538, Question No.: 09.01.02-013, the staff requested the applicant to include in the DCD a detailed description of the SFP liner leakage collection system monitoring schedule, system capacity, how is the system operability evaluated, and what are the testing intervals. The staff also requests the applicant to justify why there is no need for an ITAAC to test the proper operation of the SFP leakage collection system.

In its response to this RAI dated January 29, 2009, the applicant stated that:

A leakage collection monitoring schedule is not necessary, as such unexpected leakage would be alarmed upon its occurrence. The capacity of the collection system has not yet been set, but the insignificance of such leakage eliminates concerns about collection system overflows or alarms for such potential overflows - any significant unexpected leakage would be indicated by the SFP level detectors that alarm both locally and in the main control room. During construction, the operability of the leakage collection system will be confirmed to assure no blockages, system leakages, etc. The simplicity of the system eliminates the need for subsequent testing, or for an ITAAC to further confirm the proper operation of the SFP leakage collection system.

The staff finds the answer to RAI No. 132-1538, Question No.: 09.01.02-013 inadequate. Operational experience has shown that SFP liner leakage collection systems are susceptible to be obstructed by slow buildup of boric acid residue and/or minerals.

NRC Information Notice 2004-05, "Spent Fuel Pool Leakage to Onsite Groundwater," March 3, 2004, discusses the case of Salem Nuclear Generating Station Unit 1. Salem's SFP includes an integral liner leakage detection and collection system. On September 18, 2002, the licensee identified evidence of radioactive water leakage. The licensee's reviews discovered that over the years since initial facility startup, materials such as boric acid residue and minerals accumulated within the SFP liner leak collection and detection system and restricted the normal drainage of liquid. The leakage itself was not accompanied by large fluctuations in SFP water levels and was likely masked by approximately equal volumes of evaporation from the SFP.

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Regulatory Guide (RG) 4.21, "Minimization of Contamination and Radioactive Waste Generation: Life-Cycle Planning," Appendix A 1.i states that during design and/or process selection, where applicable, processes should be selected that eliminate streams that have the potential for the encrustation of precipitates or crystallization at ambient temperatures that could result in line blockages. RG 4.21, Appendix A.1.j states that pipes should be adequately sized to minimize the potential for blockage by the encrustation of precipitates and to facilitate the removal of such blockage from the pipes.

The applicant has not demonstrated that the spent fuel pool leakage collection system is in compliance with 10 CFR 20.1406. The staff requests the applicant to justify how the spent fuel pool leakage collection system meets the requirements of 10 CFR 20.1406 if the system is not periodically inspected to identify blockages. Additionally, the staff requests the applicant to clarify in the DCD that the spent fuel pool leakage collection system is sized to allow cleaning of blockages as specified in RG 4.21.