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## RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

### APR1400 Design Certification

Korea Electric Power Corporation / Korea Hydro & Nuclear Power Co., LTD

Docket No. 52-046

**RAI No.:** 380-8443  
**SRP Section:** 09.01.02 – New and Spent Fuel Storage  
**Application Section:**  
**Date of RAI Issue:** 02/01/2016

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### **Question No. 09.01.02-49**

Title 10 of the Code of Federal Regulations (10 CFR) Part 50, Appendix A, General Design Criteria 4 requires SSCs to be designed and fabricated to accommodate the effects of environmental conditions during normal, off normal, and accident conditions.

NRC Report NUREG/CR-7111 (ML12047A184) documents operating experience associated with spent fuel pool and reactor cavity leakage. The report contains 11 spent fuel pool leakage events that are of interest to the APR-1400 design. While there is limited information on the root cause of the events the nature of the leaks suggests that the degradation is a localized phenomenon.

The most probable cause of localized failure of this system would be 1) construction flaws or 2) intergranular failure due to sensitization.

As such, the staff requests information on any special process controls that will be utilized for the Type 304 stainless steel liner and piping connected to the spent fuel pool. These controls should address flaws during welding, cleanliness, and sensitization.

Controls may include:

- 1) Minimum delta ferrite requirements
- 2) Prior to welding, requiring the wetted side of the stainless steel to meet a cleanliness class specified in NQA-1 Subpart 2.1 "Quality Assurance Requirements for cleaning of Fluid Systems and Associated Components for Nuclear Power Plants".
- 3) Minimizing grinding except when necessary to meet weld profiles and/or prevent radiological accumulation on the steel surface.
- 4) Limiting heat input during welding. This may include:

- a. Using relatively low heat welding processes
- b. Specifying a maximum heat input
- c. Limiting interpass temperature
- d. Use of the stringer bead technique

If no special processes will be used for the spent fuel pool liner and connected piping: provide the staff with a justification of how

### **Response**

- 1) Minimum delta ferrite of welding filler metal shall be 5FN in accordance with ASME BPVC Section III, Div.2 CC-2613.3.2 for liner and NX-2433.2 for piping.
- 2) The wetted side of the stainless steel of SFP shall be cleaned to meet the requirements of cleanliness class specified in NQA-1 Subpart 2.1 "Quality Assurance Requirements for cleaning of Fluid Systems and Associated Components for Nuclear Power Plant" of Reference Plant(SKN3&4 plant) in Korea.
- 3) Grinding may be performed when required to meet the requirements for finished surface of welds and thickness of weld reinforcement in ASME Sec.III Code CC-4542.8.1.
- 4) For austenitic stainless welding, maximum heat input shall be 60 kJ/inch and maximum interpass temperature shall be 350 F (177 C).

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### **Impact on DCD**

There is no impact on the DCD.

### **Impact on PRA**

There is no impact on the PRA.

### **Impact on Technical Specifications**

There is no impact on the Technical Specifications.

### **Impact on Technical/Topical/Environmental Reports**

There is no impact on any Technical, Topical, or Environmental Report.