

---

---

## 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:** 9.1.2  
**Date of RAI Issue:** 02/01/2015

---

### **Question No. 09.01.02-48**

Title 10 of the Code of Federal Regulations (10 CFR) Part 50, Appendix A, General Design Criteria 1 and 30; and 10 CFR Part 50.55a contain provisions regarding quality standards for material specifications that are met by compliance with the applicable provisions of the ASME Boiler and Pressure Vessel Code (ASME Code) and by acceptable application of materials Code Cases as described in Regulatory Guide (RG) 1.84, "Design, Fabrication, and Materials Code Case Acceptability, ASME Section III." Specifications for permitted materials are identified in the ASME Code, Section III, Appendix I, or described in detail in the ASME Code, Section II.

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.

On November 13th 2015 the applicant provided docketed responses to eight of the ten items of concern that were sent as part of a request for a July 29th, 2015 public meeting on DCD Tier 2, FSAR Section 9.1.1 (ML15317A525).

In Issue #3 (AI 9.24.3) the staff asked the applicant:

"Provide material specifications for all materials wetted by the water in the spent fuel pool and material specifications for the new fuel rack."

The response to Issue #3, the applicant provided the staff with the following:

Material for piping wetted by the water in the spent fuel pool is Type 304 stainless steel; ASME SA-312 and ASTM A-312 are applied for the safety-related piping and the non-safety-related piping, respectively.

Material for the spent fuel pool liner is Type 304 stainless steel (ASTM A-240).

There are two follow up items:

- 1) This information has not been added to the DCD. Add this information to the SAR.
- 2) No welding material is listed for the spent fuel pool liner or the piping. Provide this information and update the SAR.

### **Response**

Material for piping in the spent fuel pool and its welding material will be described in DCD Tier 2 Subsection 9.1.3.2.1.9.

Material for the spent fuel pool liner is provided already in DCD Tier 2 Subsection 3.8.4.6.1.4 and the description about the welding material will be added in the same subsection.

---

### **Impact on DCD**

DCD Tier 2 subsection 3.8.4.6.1.4 and 9.1.3.2.1.9 will be revised as indicated in the attached markup.

### **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.

**APR1400 DCD TIER 2**

Fabrication and erection of structural steel in seismic Category I structures are in accordance with the requirements of AISC N690.

Welding materials conform with the requirements of the Structural Welding Code (AWS-D1.1). AWS D1.1 Table 3.1 shows the compatibility of filler metal with base metal. AISC N690 provides supplemental information on weld materials for stainless steel.

Bolted connections conform with one of the following specifications:

- a. ASTM A325, “Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength”
- b. ASTM A490, “Standard Specification for Heat-Treated Steel Structural Bolts, 150 ksi Minimum Tensile Strength”
- c. ASTM A307, “Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength”

Bolts listed in AISC N690 may also be used.

#### 3.8.4.6.1.4 Stainless Steel

Stainless steel pool liners are fabricated from ASTM A240 Type 304 material, hot rolled, annealed and pickled and further processed by cold rolling. Further requirements for stainless steel pool liners and other stainless steel are described in Subsections 3.8.3.6.3 and 3.8.3.6.4.

#### 3.8.4.6.2 Quality Control

Welding material for the stainless steel pool liners is used in accordance with ASME Sec.III CC-2600 and ASME Sec.IX.

The quality of materials is controlled by requiring the suppliers to furnish appropriate mill test reports as required under relevant ASTM specifications as described in Subsection 3.8.4.6.1. The mill test reports are reviewed and approved in accordance with the general provisions of the overall quality assurance program outlined in Chapter 17 and supplemented by the special provisions of the appropriate codes and specifications for design listed in Subsection 3.8.4.2.

**APR1400 DCD TIER 2**9.1.3.2.1.7 Spent Fuel Pool Cleanup Demineralizers

Two vertical, cylindrical-type SFP demineralizers are designed to provide adequate clarity of the SFP, IRWST or refueling pool water, and reduce the radiation level at the fuel handling working area. Each demineralizer is designed for a flow rate of approximately 1,324.89 L/min (350 gpm) and contains a flow distributor on the influent to prevent channeling of the resin bed and a resin retention element on the effluent to preclude discharge of resin with the effluent process fluid. Connections are provided to sluice spent resin to the SWMS. The vessel material is austenitic stainless steel.

9.1.3.2.1.8 Valves

Manual stop valves are for component isolation, and manual throttle valves are provided for flow control. Valves in contact with SFP water are made of austenitic stainless steel.

9.1.3.2.1.9 Piping

All piping in contact with pool water is made of austenitic stainless steel. The piping is welded except for flanged connections for the pumps and heat exchangers being used to facilitate maintenance.

9.1.3.2.2 System Operation

Material for piping wetted by the water in the spent fuel pool is ASME SA-312 Type 304 and ASTM A-312 Type 304 stainless steel for the safety-related piping and the non-safety-related piping, respectively. Welding materials for these pipings are used in accordance with ASME Section III ND and ASME B31.1 respectively.

The SFPCCS is not directly associated with plant startup, normal operation, or shutdown but is operated when there is a need to lower the SFP water temperature or when there is a need to clean or purify the water in the SFP, refueling pool, fuel transfer canal, or the in-containment refueling water storage tank (IRWST). All situations are dependent upon the fuel loading and refueling cycle. Components for each cooling and cleanup division are interchangeable while in service using interconnection lines between divisions.

9.1.3.2.2.1 Spent Fuel Pool Cooling Operation

The SFP cooling pumps and cleanup pumps are started manually in the MCR. The SFP heat exchangers are provided with temperature indicators to indicate a cooling water loss.