
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.: 495-8627
SRP Section: 09.01.02 – New and Spent Fuel Storage
Application Section:
Date of RAI Issue: 06/10/2016

Question No. 09.01.02-56

The applicant credits the spent fuel pool liner as performing an important to safety function in FSAR Section 9.1.3.3.2: “The leakage probability is very low because the SFP stainless steel liner is a seismic Category I structure” (GDC 62, requiring maintenance of SFP inventory).

The staff has examined FSAR Chapter 3, 9, and 17 and Topical Report APR 1400-K-Q-TR-11005 “KHNP Quality Assurance Program Description (QAPD) for the APR1400 Design Certification” Rev 5 and cannot determine the specific Quality Assurance (QA) requirements for the spent fuel pool liner. QA requirements for the spent fuel pool system and the spent fuel pool liner are vaguely discussed in two sections of the FSAR:

1. As is described in FSAR Section 3.2 and Table 3.2-1 the spent fuel cavity (which is protected by the spent fuel pool liner) is part of the Auxiliary Building. The Auxiliary Building is constructed to ACI 397 and requires a 10 CFR 50 Appendix B qualified QA program. However, ACI 397 does not have requirements for liners. It is unclear whether the spent fuel pool liner would be considered a supplemental system to the spent fuel cavity or a component of the spent fuel cavity requiring an Appendix B QA program. Several SSCs in the spent fuel pool cleanup and makeup system are described in FSAR Table 3.2-1 with different codes of construction and quality assurance requirements than the Auxiliary Building; however, the spent fuel pool liner is not listed in Table 3.2-1.
2. FSAR Section 3.8.4.6.1.4 states that the spent fuel pool liner will meet the QA requirements described in FSAR Section 3.8.4.6.1. FSAR Section 3.8.4.6.1 states that the components should meet the general QA program requirements of FSAR Chapter 17. The QA requirements in Chapter 17 include safety-related (Appendix B) SSCs, non-safety related SSCs (Part III, Section 1), and augmented quality non-safety related SSCs (Part III, Section 2).

FSAR Chapter 3 does not provide clear QA requirements.

The staff is concerned that a COL applicant referencing the APR1400 design might use the QA requirements specified in the QAPD Part III, Section 1 (non-Appendix B and non-augmented QA program). QAPD Part III, Section 1.7 “Control of Purchased Items and Services” and Section 1.18 “Audits” would not be sufficient to preclude the use of sensitized stainless steel in the spent fuel pool liner. Part III, Section 1 would not require material verification by testing or verification of the trustworthiness of a supplier. The use of sensitized material could result in unanticipated leakage (in both location and size of leakage) which is not consistent with the assumptions in Section 9.1 of FSAR.

The applicant should provide the staff with the QA requirements for the spent fuel pool liner. Additionally the applicant should revise the FSAR or QAPD to provide clear guidance for a COL applicant related the QA requirements for spent fuel pool liner.”

Response

The spent fuel pool (SFP) liner is part of Auxiliary Building (AB). The codes and standards for the SFP liner design are described in DCD Subsection 3.8.4.6.1.4. Table 3.2-1 (1 of 86) shows only the representative codes and standards for AB design.

According to Subsection 3.8.4.6.2, the quality of materials is controlled by requiring the suppliers to furnish appropriate mill test reports as required under relevant ASTM specifications which are 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.

Spent fuel liner material ASTM A240 Type 304 shall be solution annealed in accordance with the requirement of ASTM standard. For spent fuel liner material following requirements are required/specified in design/procurement specification.

- Cutting, forming and bending for stainless steel liner plates shall conform to the requirements of ASME Code, Section III, Div.2, Subsection CC-4521.
- If heat is needed for forming stainless steel members, solution annealing shall be performed after fabrication.
- Welding shall conform to ASME Code, Section III, Div.2, Subsection CC-4500
- Maximum interpass temperature and maximum heat input is limited to 350 °F and 60kJ/inch respectively for austenitic stainless steel welding.

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.