

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.: 173-8213

SRP Section: 15.00.03 - Design Basis Accidents Radiological Consequence Analyses for Advanced Light Water Reactors

Application Section: Chapter 15 including 15A

Date of RAI Issue: 08/26/2015

Question No. 15.00.03-29

10 CFR 52.47(a)(2)(iv) requires that an application for a design certification include a final safety analysis report that provides a description and safety assessment of the facility. The safety assessment analyses are done, in part, to show compliance with the radiological consequence evaluation factors in 52.47(a)(2)(iv)(A) and 52.47(a)(2)(iv)(B) for offsite doses, 10 CFR 50, Appendix A, GDC 19 for control room radiological habitability, and the requirements related to the technical support center in 10 CFR 52.47(b)(8) and (b)(11) and Paragraph IV.E.8 of Appendix E to 10 CFR Part 50. The radiological consequences of design basis accidents are evaluated against these regulatory requirements and the dose acceptance criteria given in SRP 15.0.3.

In DCD Section 15.6.5.5.1.2, the assumptions on the analysis of engineered safety feature (ESF) system leakage for the loss-of-coolant accident (LOCA) dose analysis are discussed. On DCD page 15.6-49, the last sentence of the first full paragraph states that the assumed design ESF leakage rate is doubled to 37.8 liters per hour (L/hr) [10 gal/hr] to calculate the dose consequences. However, DCD Table 15.6.5-13, on sheet 2 of 3 lists the ESF leakage rate as 8.08 L/hr (2.13 gal/hr). Please resolve this discrepancy.

Response

The value of 8.08 L/hr (= 2.13 gal/hr) in Table 15.6.5-13 (2 of 3) will be updated to be consistent with the description in DCD Subsection 15.6.5.5.1.2.

Impact on DCD

DCD Table 15.6.5-13 (2 of 3) will be updated as indicated in the Attachment.

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 Reports.

APR1400 DCD TIER 2

Table 15.6.5-13 (2 of 3)

| Parameter | Value |
|--|--|
| Activity Transport Parameters in Primary Containment | |
| Containment Net Free Volume | $8.86 \times 10^4 \text{ m}^3$ ($3.13 \times 10^6 \text{ ft}^3$) |
| Sprayed Volume | $6.64 \times 10^4 \text{ m}^3$ ($2.35 \times 10^6 \text{ ft}^3$) |
| Unsprayed Volume | $2.21 \times 10^4 \text{ m}^3$ ($7.82 \times 10^5 \text{ ft}^3$) |
| Primary Containment Leak Rate | 0.1 v/o/day (0 ~ 24 hr) 0.05 v/o/day (24 ~ 270 hr) |
| Flow Rate Between Sprayed and Unsprayed Regions | 736 m ³ /min (26,000 cfm) (Mixing Flow) 2 turnovers of unsprayed volume/hr |
| Spray Initiation Time | 110 sec (Delay time) |
| Spray Recirculation Phase Initiation Time | Spray water is circulated from IRWST for entire duration of accident (IRWST→CS→HVT→IRWST) |
| Containment Spray Removal Coefficients | 20 hr ⁻¹ (0 ~ 2.25 hr until DF is 200) |
| Elemental (λ_E) | 6.25 hr ⁻¹ (0 ~ 2.40 hr until DF is 50) |
| Particulate (λ_P) | 0.625 hr ⁻¹ (2.40 ~ 4 hr) |
| ESF Leakage Parameters | |
| Minimum IRWST Water Volume | $2.44 \times 10^3 \text{ m}^3$ ($8.61 \times 10^4 \text{ ft}^3$) |
| ESF Leakage Rate | 8.08 L/hr (2.13 gal/hr) |
| ESF Leakage Initiation Time | 0.0 min |
| Long-term Minimum IRWST Water pH | > 7 |
| ESF Leakage Flashing Factor | 10 % (0 ~ 3 hr) 2 % (3 ~ 16.67 hr) 10 % (> 16.67 hr) |
| Post-LOCA Sump Water Temperature | |
| 3.0 hr | 107 °C (225 °F) |
| 7.64 hr | 113 °C (235.5 °F) |
| 16.67 hr | 107 °C (225 °F) |

37.8 L/hr (10 gal/hr)