

KHNPDCDRAIsPEm Resource

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Sent: Wednesday, August 16, 2017 4:49 PM
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Subject: APR1400 Design Certification Application RAI 552-9083 [5.2.5 - Reactor Coolant Pressure Boundary Leakage Detection]
Attachments: APR1400 DC RAI 552 SPSB 9083.pdf

KHNP,

The attachment contains the subject request for additional information (RAI). This RAI was sent to you in draft form. Your licensing review schedule assumes technically correct and complete responses within 30 days of receipt of RAIs.

Please submit your RAI response to the NRC Document Control Desk.

Thank you,

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REQUEST FOR ADDITIONAL INFORMATION 552-9083

Issue Date: 08/16/2017

Application Title: APR1400 Design Certification Review – 52-046

Operating Company: Korea Hydro & Nuclear Power Co. Ltd.

Docket No. 52-046

Review Section: 05.02.05 - Reactor Coolant Pressure Boundary Leakage Detection

Application Section: DCD Tier 2, Section 5.2.5.4

QUESTIONS

05.02.05-4

Regulatory Basis

Title 10 of the Code of Federal Regulations (10 CFR), Section 52.47(a)(8) requires an applicant for a design certification to provide a final safety analysis report (FSAR) that must include the information necessary to demonstrate compliance with any technically relevant portions of the Three Mile Island requirements set forth in 10 CFR 50.34(f), except paragraphs (f)(1)(xii), (f)(2)(ix), and (f)(3)(v). Specifically, Three Mile Island requirements in 10 CFR 50.34(f)(2)(xxvi) require an applicant to “provide for leakage control and detection in the design of systems outside containment that contain (or might contain) accident source term radioactive materials following an accident.” NUREG-0800 “Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition,” Section 5.2.5, “Reactor Coolant Pressure Boundary Leakage Detection,” Revision 2; and NUREG-0711, “Human Factors Engineering Program Review Model,” Revision 3; identify criteria the staff uses to evaluate whether an applicant meets this requirement.

Acceptance Criteria

- NUREG-0800, Section 5.2.5, Subsection III, “Review Procedures,” states, “The reviewer determines whether the applicant identifies all potential inter-system leakage paths and whether the instrumentation for each path is appropriate and adequate for positive indication of inter-system leakage in the affected system and provides adequate monitoring capability so that the limits assumed in the accident analyses are not exceeded... Table I shows some of the systems that need inter-system leakage monitoring.”
- NUREG-0711, Criterion 8.4.4.2(10), says, “The applicant should describe how the HSI [human-system interface] provides for leakage control and detection in the design of systems outside containment that contain (or might contain) accident-source-term radioactive materials after an accident.”

REQUEST FOR ADDITIONAL INFORMATION 552-9083

Application

APR1400-E-I-NR-14007-P, "HSI Design Implementation Plan" (HD IP), Revision1, explains how the HSI design will include the inter-system leakage instrumentation identified in DCD Tier 2, Section 5.2.5.4, "Intersystem Leakage." However, DCD Tier 2, Section 5.2.5.4, does not address inter-system leakage monitoring for the secondary side of the letdown heat exchangers in the Chemical and Volume Control System (CVCS), which is listed in Item 8 in Table I of NUREG-0800, Section 5.2.5. DCD Tier 2, Section 5.2.5.1.1.1, "Inventory Methods," indicates the CVCS is connected to the reactor coolant system (RCS), and therefore, it is possible that there could be leakage between the RCS and CVCS.

Question

Revise DCD Tier 2, Section 5.2.5.4 to identify (1) the CVCS as a potential intersystem leakage path and (2) the instrumentation provided to monitor intersystem leakage between the RCS and the CVCS.