

KHNPDCDRAIsPEm Resource

From: Ciocco, Jeff
Sent: Wednesday, November 25, 2015 10:23 AM
To: apr1400rai@khnp.co.kr; KHNPDCDRAIsPEm Resource; Harry (Hyun Seung) Chang; Andy Jiyong Oh; Christopher Tyree
Cc: Stutzcage, Edward; McCoppin, Michael; Olson, Bruce; Vera, John; Lee, Samuel
Subject: APR1400 Design Certification Application RAI 321-8353 (12.02 - Radiation Sources)
Attachments: APR1400 DC RAI 321 RPAC 8353.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. However, KHNP requests, and we grant, 45 days to respond to this RAI. We may adjust the schedule accordingly.

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

Thank you,

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REQUEST FOR ADDITIONAL INFORMATION 321-8353

Issue Date: 11/25/2015
Application Title: APR1400 Design Certification Review – 52-046
Operating Company: Korea Hydro & Nuclear Power Co. Ltd.
Docket No. 52-046
Review Section: 12.02 - Radiation Sources
Application Section: 12.2

QUESTIONS

12.02-20

This is a follow-up to the response to RAI 7929, Question 12.02-7, Revision 1.

The staff noted inconsistencies, apparent inaccurate assumptions, and assumptions provided without justification or a basis in this response. Therefore, the staff has the following questions related to the response to Question 12.02-7.

1. In Part 1 of the response, the applicant compares the partition factors assumed for calculating airborne iodine concentrations in the plant as a result of piping leaks to guidance which provides iodine partition factors during steam generator tube rupture accidents. However, it is still unclear why the values chosen for the partition factors for iodine are appropriate for equipment leaks to the plant atmosphere during operation. The guidance of RG 1.183, Appendix A, Paragraph 5.5, provides guidance for iodine release fractions from ESF piping leaks with a temperature less than 212 degrees Fahrenheit. This guidance appears more relevant than the guidance for steam generator tube ruptures for leaks of liquid less than 212 degrees Fahrenheit. In addition, the applicant uses the criteria from RG 1.183, to determine airborne tritium partition factors, so it is unclear why it would not be used for iodine partition factors. Therefore, please provide additional justification for why the values used for airborne iodine partition factors are appropriate, or revise the partition factors, calculations, and associated information in the FSAR, as appropriate.
2. In Part 1 of the response, the applicant indicates that the partition factor is 0.0 for all radionuclides not specifically mentioned in the response. However, for the airborne activity concentrations in containment (FSAR Table 12.2-23 (1 of 4) and Table 12.2-23 (2 of 4)) other radionuclides than those mentioned are considered to be airborne in the containment atmosphere. Please indicate how those airborne activity concentrations were calculated and what partition factors were used and the basis for those values.
3. In Part 1 of the response, the applicant indicates that the partition factor is 0.0 for all radionuclides not specifically mentioned in the response. Please provide data to justify using a value of 0.0 for all other radionuclides or provide data supporting that the airborne activity from all other isotopes would be negligible compared to halogens, noble gasses, and tritium.
4. In reviewing the cubicle designations provided in FSAR Tables 12.2-23 and 12.2-26, it is unclear which rooms some of the designations are referring to. For example, there are several "Filter and Demin. Valve Areas" in the Auxiliary Building (rooms 068-A10A, 068-A11A, and 068-A12A) therefore, it is unclear which one of these areas Tables 12.2-23 and 12.2-26 is referring to when it states "Filter and Demin. Valve Area." Therefore, please include the room designations of rooms in Tables 12.2-23 or 12.2-26, or otherwise make it clear which rooms are being referred to in the FSAR and ensure that all relevant rooms that could be expected to contain airborne radioactivity contain an appropriate airborne radiation source term.
5. In Part 3.b of the response the applicant indicates that there are six flanges in the charging pump room, however, FSAR Table 12.2-26 indicates that there are three flanges. Please correct this discrepancy.
6. The applicant did not fully describe how the tritium levels in the fuel handling area were calculated in Part 7 of the response. Specifically, neither the response nor the FSAR indicate what the ventilation flow rate is for the fuel handling area. Please update the FSAR to provide this information.
7. 10 CFR 20.1701 requires that the licensee use to the extent practical, process or other engineering controls to control the concentration of radioactive material in air and 10 CFR 20.1702 requires that when it is not practical to apply process or other engineering controls to control airborne radioactivity within those that define an airborne radioactivity area, the licensee shall increase monitoring and limit intakes by other methods.

The airborne radioactivity concentrations calculated in FSAR Table 12.2-23 for certain rooms outside containment would be within the definition of airborne radioactivity areas.

REQUEST FOR ADDITIONAL INFORMATION 321-8353

Please describe why it is acceptable for the ventilation flow rates provided for these rooms to not limit the estimated airborne activity levels to below that of an airborne radioactivity area or update the minimum ventilation flow rates in these areas, as appropriate. If the minimum ventilation flow rates for these rooms are not updated, update the FSAR to describe how the requirements of 10 CFR 20.1701 and 10 CFR 20.1702 will be met for these areas.

8. SRP 12.2 specifies that the applicant should specify the methods, models, and assumptions used in developing source terms. Therefore, when the above issues regarding the partition factor have been resolved, please update the FSAR to provide the assumed partition factor values for all radionuclides.

12.02-21

This is a follow-up to RAI 7998, Question 12.02-12 (27043)

In the response to Question 12.02-12, the applicant indicates that since all of the components for the boric acid concentrator (BAC) package are within the same room (room 078-A04B), the source term for all of the components for the BAC package are conservatively added together and considered to be within the BAC flash tank for radiation shielding and zoning purposes. SRP 12.2 indicates that the FSAR should describe how the source terms are used in the shielding analysis. Therefore, please update the FSAR to provide this information, so that it is clear how the source terms in FSAR Table 12.2-14 are used in the shielding analysis and how the shielding for room 078-A04B was determined.



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