

KHNPDCRAIsPEm Resource

From: Ciocco, Jeff
Sent: Monday, August 10, 2015 12:59 PM
To: apr1400rai@khnp.co.kr; KHNPDCRAIsPEm Resource; Harry (Hyun Seung) Chang; Yunho Kim; Christopher Tyree
Cc: Stutzcage, Edward; McCoppin, Michael; Olson, Bruce; Betancourt, Luis; Lee, Samuel
Subject: APR1400 Design Certification Application RAI 146-8152 (12.02 - Radiation Sources)
Attachments: APR1400 DC RAI 146 RPAC 8152.pdf; image001.jpg

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, 60 days to respond to the RAI question. We may adjust the schedule accordingly.

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

Thank you,

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Subject: APR1400 Design Certification Application RAI 146-8152 (12.02 - Radiation Sources)
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Options

Priority: Standard
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REQUEST FOR ADDITIONAL INFORMATION 146-8152

Issue Date: 08/10/2015
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 and 12.3

QUESTIONS

12.02-14

This is a follow-up to RAI 7855, Question 12.02-1 and RAI 7930, Question 12.3-6.

10 CFR 50, Appendix A, Criterion 61, requires, in part, that the fuel storage and handling, radioactive waste, and other systems which may contain radioactivity be designed to assure adequate safety under normal and postulated accident conditions and with suitable shielding for radiation protection.

SRP 12.2 states that, "The reviewer will consider whether source strengths, concentrations of airborne radioactivity, and quantitative source descriptions are consistent with the assumptions made and the methods used by the applicant."

SRP 12.3-12.4 indicates that, "The applicant's shielding design is acceptable if the methods are comparable to commonly accepted shielding calculations and if assumptions regarding source terms, cross sections, shield and source geometries, and transport methods are realistic, and specified radiation zones are consistent with the assumed source term and shielding specified in the design."

In the response to the above RAIs, the applicant provided source term and shielding information for spent fuel, including for being transferred from the refueling pool to the spent fuel pool. All of the information is based on fuel being transferred 100 hours post operation. The applicant indicates that the 100 hour time frame is based on data from currently operating plants in Korea. However, a review of FSAR Chapter 15 indicates that the fuel handling accident is based on a fuel assembly being transferred 72 hours post operation. In addition, the basis for technical specifications 3.9.3, "Containment Penetrations" and 3.9.6, "Refueling Pool Water Level" indicate that they are based on core alterations being performed 72 hours after shutdown.

Differences in the decay time of spent fuel can significantly impact the source term and plant shielding and zoning. Therefore, staff cannot accept that shielding and zoning is based on an assumed 100 hours decay when plant technical specifications allow movement with only 72 hours decay.

Please provide a 72 hour spent fuel source term and revise all shielding and dose calculations to account for fuel being transferred 72 hours post-operation. In doing so, the applicant should ensure that all radiation shielding and radiation zones are appropriate for the peak fuel element(s) being transferred at 72 hours post-operation (including that the estimated dose to an operator on the refueling platform remains below 2.5 mrem/hour in accordance with ANSI/ANS 57.1-1992).

