

## **KHNPDCDRAIsPEm Resource**

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**From:** Ciocco, Jeff  
**Sent:** Wednesday, March 16, 2016 7:46 AM  
**To:** apr1400rai@khnp.co.kr; KHNPDCDRAIsPEm Resource; Junggho Kim (jhokim082@gmail.com); Andy Jiyong Oh; Young H. In (yhin@enercon.com); Steckel, James  
**Cc:** Nakanishi, Tony; Phan, Hanh; Mrowca, Lynn; Steckel, James; Williams, Donna  
**Subject:** APR1400 Design Certification Application RAI 445-8537 (19 - Probabilistic Risk Assessment and Severe Accident Evaluation)  
**Attachments:** APR1400 DC RAI 445 SPRA 8537.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, the following RAI question response times. We may adjust the schedule accordingly.

19-96: 120 days  
19-97: 30 days

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

Thank you,

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**Received Date:** 3/16/2016 7:46:04 AM  
**From:** Ciocco, Jeff

**Created By:** Jeff.Ciocco@nrc.gov

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**Options**

**Priority:** Standard  
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**Sensitivity:** Normal  
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## REQUEST FOR ADDITIONAL INFORMATION 445-8537

Issue Date: 03/16/2016

Application Title: APR1400 Design Certification Review – 52-046

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

Docket No. 52-046

Review Section: 19 - Probabilistic Risk Assessment and Severe Accident Evaluation

Application Section:

### QUESTIONS

19-96

(Follow up to RAI 8348, Question 28564)

10 CFR 52.47(a)(27) requires that a standard design certification applicant provide a description of the design specific PRA.

SRP Chapter 19.0, Revision 3, Section “II. Acceptance Criteria,” states that the staff determines whether, “...the applicant has performed risk importance studies at the system, train, and component level that adequately provide insights about (1) the systems that contribute the most in achieving the low risk level assessed in the PRA, (2) events (e.g., component failures or human errors) that contribute the most to decreases in the built-in plant safety level, and (3) events that contribute the most to the assessed risk. ”

To allow the staff to reach a reasonable assurance finding on APR1400 PRA technical adequacy and ensure that the APR1400 risk insights are adequately identified, please provide the following:

- a) the initiating event importance measures for the at-power and low power and shutdown (LPSD) internal fire and flood scenarios in the DCD, and
- b) for at-power and LPSD internal fires and floods, please evaluate the risk-significant scenarios with consideration of equipment damaged by the initiating fire or flood and confirm that no additional SSC failures or human failure events need to be considered risk significant beyond what has been identified in Tables 19.1-51 through 19.1-62 and Tables 19.1-68 through 19.1-79. Otherwise, please make any necessary update to the risk-significant SSCs and operator actions in the DCD.

19-97

(Follow up to RAI 8348, Question 28637)

10 CFR 52.47(a)(27) requires that a standard design certification applicant provide a description of the design specific PRA.

SRP Chapter 19.0, Revision 3, Section II, "Acceptance Criteria," states that the staff determines whether, “...the technical adequacy of the PRA is sufficient to justify the specific results and risk insights that are used to support the DC or COL application. Toward this end, the applicant’s PRA submittal should be consistent with prevailing PRA standards, guidance, and good

## REQUEST FOR ADDITIONAL INFORMATION 445-8537

practices as needed to support its uses and applications and as endorsed by the NRC (e.g., RG 1.200).”

To allow the staff to reach a reasonable assurance finding on APR1400 PRA technical adequacy and to confirm the assumptions used in the LPSD internal flooding PRA, please clarify the following potential inconsistency and revise the DCD and/or the underlying PRA documentation as necessary.

During the audit of the LPSD flooding analysis, the staff reviewed information in the underlying PRA documentation and found that the assumed volume of water required to submerge both divisions of SC pumps may be different from that provided in the DCD. The DCD Page 19.1-167 states, “The lowest flood areas in each quadrant of the auxiliary building are designed to contain over 2,271 m<sup>3</sup> (600,000 gal) of water without impacting equipment in adjoining quadrants.” Please clarify this potential inconsistency.



**U.S.NRC**

United States Nuclear Regulatory Commission

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