KHNPDCDRAIsPEm Resource

From: Ciocco, Jeff
Sent: Tuesday, December 15, 2015 10:57 AM
To: apr1400rai@khnp.co.kr; KHNPDCDRAIsPEm Resource; Harry (Hyun Seung) Chang; Andy Jiyong Oh; James Ross
Cc: Sastre, Eduardo; Mitchell, Matthew; Ward, William; Lee, Samuel
Subject: APR1400 Design Certification Application RAI 336-8367 (05.02.03 - Reactor Coolant Pressure Boundary Materials)
Attachments: APR1400 DC RAI 336 MCB 8367.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 336-8367

Issue Date: 12/15/2015
Application Title: APR1400 Design Certification Review – 52-046
Operating Company: Korea Hydro & Nuclear Power Co. Ltd.
Docket No. 52-046
Review Section: 05.02.03 - Reactor Coolant Pressure Boundary Materials
Application Section: 05.02.03

QUESTIONS

05.02.03-15

APR-1400 FSAR Section 5.2.7, "References," mentions two different versions of the EPRI PWR Primary Water Chemistry Guidelines. However the applicant does not mention which version will be used by COL applicants to produce their site specific water chemistry program.

The staff requests that the applicant provide an explanation of which EPRI Guidelines revision was used to write the chemical parameters mentioned in the FSAR and which version will be used by the COL applicants.

05.02.03-16

APR-1400 FSAR section 5.2.3.2.1, "Reactor Coolant Chemistry," provides a limited explanation of the reactor coolant chemistry. Although some information, like limits, is provided in FSAR section 9.3.4, "Chemical and Volume Control System," the applicant does not discuss the chemical control parameters as mentioned in the EPRI PWR Primary Water Chemistry Guidelines.

The staff requests that the applicant provides a detailed discussion of the following chemical control parameters: dissolved oxygen, ammonia, lithium, dissolved hydrogen, fluoride and sulfate.

05.02.03-17

APR-1400 FSAR section 5.2.3.2.1, "Reactor Coolant Chemistry," does not provide any detail on the diagnostic parameters as mentioned in the EPRI PWR Primary Water Chemistry Guidelines. Although the EPRI PWR Primary Water Chemistry Guidelines do not mandate any limits, the diagnostic parameters should be monitored as they provide an additional level of protection from corrosion, radiation protection and other failures.

The staff requests that the applicant provide a description of the diagnostic parameters to be monitored this includes; boron, silica, conductivity and suspended solids.

05.02.03-18

APR1400 FSAR Table 9.3.4-1B states that the standard value for pH at 25°C (77°F) is between 4.6 and 7.3. In Section 9.3.4, the applicant also states that LiOH will be regulated to control the pH in the RCS.

However, the FSAR does not provide detail on how they come up with the pH range, what pH control program it will use or how the pH program will meet the EPRI PWR Primary Water Chemistry Guidelines.

The Staff requests that the applicant provides additional details for the APR1400 pH control program. The applicant is also requested to check pH range specified in Table 5.2-5, "4.2 ~ 10.7 ppm."

05.02.03-19

In APR1400 FSAR Section 5.2.3.2.1 the applicant states that a soluble zinc compound may be added to the reactor coolant for the purpose of radiation field reduction and mitigation of the PWSCC [primary water stress corrosion cracking] initiation. The Staff is aware that this is done because operating experience has proven that zinc addition in PWRs leads to thinner, more evenly distributed crud fuel. However the applicant doesn't provide an explanation on how this addition will take place nor the quantities to be added.

The staff requests that the applicant provide additional details on the zinc addition program for APR14000.


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