KHNPDCDRAIsPEm Resource

From: Ciocco, Jeff
Sent: Wednesday, November 04, 2015 3:23 PM
To: apr1400rai@khnp.co.kr; KHNPDCDRAIsPEm Resource; Harry (Hyun Seung) Chang; Andy Jiyong Oh; James Ross
Cc: Makar, Gregory; Mitchell, Matthew; Ward, William; Lee, Samuel; Umana, Jessica
Subject: APR1400 Design Certification Application RAI 292-8306 (05.04.02.01 - Steam Generator Materials)
Attachments: APR1400 DC RAI 292 MCB 8306.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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Hearing Identifier: KHNP_APR1400_DCD_RAI_Public
Email Number: 341

Mail Envelope Properties (db7d55ea5b7e4f15b0daa6637577ce4b)

Subject: APR1400 Design Certification Application RAI 292-8306 (05.04.02.01 - Steam Generator Materials)
Sent Date: 11/4/2015 3:22:48 PM
Received Date: 11/4/2015 3:22:51 PM
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APR1400 DC RAI 292 MCB 8306.pdf	91222	
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Options
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REQUEST FOR ADDITIONAL INFORMATION 292-8306

Issue Date: 11/04/2015
Application Title: APR1400 Design Certification Review – 52-046
Operating Company: Korea Hydro & Nuclear Power Co. Ltd.
Docket No. 52-046
Review Section: 05.04.02.01 - Steam Generator Materials
Application Section: SRP 5.4.2.1

QUESTIONS

05.04.02.01-1

General Design Criterion 4 of Appendix A to 10 CFR 50 Part 50 requires, in part, that structures, systems, and components, important to safety should be designed to accommodate the effects of, and to be compatible with, the environmental conditions associated with normal operation, maintenance, testing, and postulated accidents. The staff requests that the applicant identify the materials used for the feedwater rings, spray nozzles, thermal sleeves, and the economizer, and the potential forms of degradation considered for these components (e.g., flow accelerated corrosion). This information is needed as part of the staff's evaluation of how the potential degradation of SG components are designed to address compatibility with the coolant and the potential for loose parts.

05.04.02.01-2

The August 4, 2015, response (ML15216A447) to MCB Issue 5.4.2.1-16 (KHNP issue AI 5-6.16) includes a proposed revision to FSAR Subsection 5.4.2.1.5 that states, "The primary water chemistry is controlled at a level comparable to the guidelines in the EPRI …." This seems to be inconsistent with FSAR Subsections 5.4.2.2.2.7 and 5.4.2.2.2.8, which state the water chemistry will be controlled "in accordance with" the EPRI guidelines. If the APR1400 design is going to follow the EPRI guidelines, please revise the FSAR where appropriate to make that clear.. This information is needed for consistency within FSAR Subsection 5.4.2 and with other parts of the FSAR. The staff's review of the adequacy of the primary water chemistry requirements is in other FSAR Subsections (5.2.3 and 9.3.4).

05.04.02.01-3

In the August 4, 2015, response (ML15216A447) to MCB Issue 5.4.2.1-11 (KHNP issue AI 5-6.11), Table 1 provides corrosion rate measurements in units of "mdm" and "mpy." The original source of the data identified "mdm" as milligrams per square decimeter per month. The response stated that the "mpy" values (mils per year) are based on a conversion factor of 1 mdm = $5x10^{-4}$ mpy. The staff confirmed the mdm values in the original paper but could not reproduce the conversion factor of 1 mdm = $5x10^{-4}$ mpy. (The staff calculated a value of 5.8 $x10^{-3}$ as shown below, using a density of 8.2 grams per cubic centimeter for Alloy 690.) The staff requests that the applicant show how the conversion to mpy of $5x10^{-4}$ was derived, or provide a corrected response to AI 5-6.11 if appropriate. The purpose of the original question was compliance with ASME Code Section III, which requires an appropriate allowance for corrosion and other forms of degradation. The additional information is needed for clarification or correction of the August 4, 2015 response.

1 (mg/dm^2-month) x (12 month/year) x (g/1000 mg) x (dm^2/100 cm^2) x (inch/2.54 cm) x (cm^3/8.2 g) x (1000 mils/inch) = 5.8 x 10^{-3} mils/year


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