KHNPDCDRAIsPEm Resource

From:	Ciocco, Jeff
Sent:	Tuesday, March 08, 2016 10:52 AM
To:	apr1400rai@khnp.co.kr; KHNPDCDRAIsPEm Resource; Andy Jiyong Oh; James Ross
Cc:	Honcharik, John; Mitchell, Matthew; Vera, John; Lee, Samuel; Williams, Donna
Subject:	APR1400 Design Certification Application RAI 436-8538 (04.05.01 - Control Rod Drive Structural Materials)
Attachments:	APR1400 DC RAI 436 MCB 8538.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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United States Nuclear Regulatory Commission
Protecting People and the Environment

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Options
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REQUEST FOR ADDITIONAL INFORMATION 436-8538

Issue Date: 03/08/2016
Application Title: APR1400 Design Certification Review – 52-046
Operating Company: Korea Hydro & Nuclear Power Co. Ltd.
Docket No. 52-046
Review Section: 04.05.01 - Control Rod Drive Structural Materials
Application Section: 4.5.1

QUESTIONS

04.05.01-11

REGULATORY BASIS: GDC 14 and 26

ISSUE:

This RAI is a follow-up to RAI 303-8391, Question 04.05.01-02.

In the response to RAI 303-8391, Question 04.05.01-02, dated December 22, 2015 (ADAMS Accesion No. ML15356A554), the applicant proposed a revision to APR1400 FSAR Tier 2, Section 4.5.1.2 based on the following information:

> "...Meanwhile, there has been no SCC problem in the magnetic drive CEDMs of other CE plants with venting devices according to EPRI MRP-236[note 1] and MRP-352[note 2].
>
> It should be noted that the magnetic drive CEDM design of CE plants is almost the same as that of the OPR1000 and APR 1400, and therefore, venting is performed for the APR1400 CEDMs through the vent stem to eliminate the air trapped in the top of the CEDMs, compared with US and France plants which have adopted no venting practice in general and experienced SCC in CRD canopy seal welds. In addition, for the OPR1000 plants, the Versa Vent™ and its operating tools have been used for venting the CEDMs, which are the CEDM servicing equipment to facilitate venting activities. This servicing equipment will be applied to APR1400 plants. [...]
>
> ...As shown in Figure 1, the Versa Vent™ is substituted for the CEDM housing nut and installed into the top of the CEDM upper pressure housing assembly (UPHA) with its venting device.
>
> The CEDM housing nut is only installed into the top of the CEDM UPHA instead of the Versa Vent™ and omega seal will be welded with CEDM housing nut when excessive leakage occurs during normal operation and normal operation should be resumed immediately. The CEDM venting is impossible when the omega seal weld is applied. However, the omega seal weld is just made as a temporary repair to block the unacceptable leakage and it has never been made for the OPR1000 CEDMs so far.
>
> Under normal operating condition, the pressure retaining boundary is composed of the CEDM UPHA and the vent stem (the ball seal is a sealing material.). Therefore, the Versa Vent™ and its operating tools are not composed of the pressure retaining boundary. When the CEDM housing nut is installed and omega seal welded, the pressure retaining boundary is composed of the CEDM UPHA, vent stem, housing nut and an omega seal weld. The Versa Vent's housing nut is made of non-code and non-nuclear safety related material and no welding is allowed, while the CEDM's housing nut is made of code and safety class material."

REQUEST FOR ADDITIONAL INFORMATION 436-8538

The staff needs the following information to determine the pressure boundary components of the CEDM and the applicable operating experience:

a. Discuss the difference between the CE designed magnetic drive CEDM and the APR1400 magnetic drive CEDM, so that the staff can determine the applicability of the CE CEDM operating experience.
b. Explain when the Versa Vent™ is installed, and how it is used during normal operation.
c. Since the Versa Vent™ is substituted for the CEDM housing nut (which is pressure boundary), then the Versa Vent™ should also be pressure boundary. Therefore, since the Versa Vent™ is part of the pressure boundary, include the material specification and type in Section 4.5.1.1 of APR1400 FSAR.

d. Since the omega seal is not welded, and provides a vent between the housing nut and the upper pressure housing, discuss why the use of the Versa Vent™ is necessary.

Include the appropriate DCD markups with the response.

04.05.01-12
REGULATORY BASIS: GDC 14 and 26

ISSUE:

This RAI is a follow-up to RAI 303-8391, Question 04.05.01-05.

In the response to RAI 303-8391, Question 04.05.01-05, dated December 22, 2015 (ADAMS Accesion No. ML15356A554), the applicant proposed to revise Section 4.5.1.3 to include the material specifications AMS 5894 for Stellite 6B, and material specification AMS 5979 for Haynes alloy No. 25 and Haynes alloy No. 36. The staff requests the following information to ensure that the material properties of these components will be appropriate for these applications:

a. There is no material specification AMS 5979 for Haynes alloy Nos. 25 and 36. Provide the appropriate material specifications and include them in Section 4.5.1.3.

b. Include in APR1400 FSAR Tier 2, Section 4.5.1.3 the heat treatment (to include temperature, time and cooling, if applicable) to be applied to the Stellite No. 6B, Haynes alloy No. 25 and Haynes No. 36 materials, as previously requested.

Include the appropriate DCD markups with the response.

04.05.01-13

REGULATORY BASIS: GDC 14 and 26

ISSUE:

This RAI is a follow-up to RAI 303-8391, Question 04.05.01-06.

In the response to RAI 303-8391, Question 04.05.01-06, dated December 22, 2015 (ADAMS Accesion No. ML15356A554), the applicant provided Table 4.5-1 which included the weld filler metal types used for the reactor coolant pressure boundary of the CEDMs. However, RAI 303-8391, Question 04.05.01-06 requested the filler metal specification as well as type. Therefore, include the applicable filler metal specification for each filler metal type in Table 4.5-1.

Include the appropriate DCD markups with the response.

04.05.01-14

REGULATORY BASIS: GDC 14 and 26

ISSUE:

This RAI is a follow-up to RAI 303-8391, Question 04.05.01-09.

In the response to RAI 303-8391, Question 04.05.01-09, dated December 22, 2015 (ADAMS Accesion No. ML15356A554), the applicant proposed to revise Section 4.5.1.1.b, to include the heat treatment condition of the ASTM A 276, Type 410 material. The response also specified that the tempering temperature will be higher than 565°C (1050°F), but did not include it in the proposed revision to Section 4.5.1.1.b.response also specified that the tempering temperature will be higher than 565°C (1050°F), but did not include it in the proposed revision to Section 4.5.1.1.b. Therefore, include in FSAR Section 4.5.1.1.b that the tempering temperature will be above 565°C (1050°F).

Include the appropriate DCD markups with the response.

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