Plant: SONGS 2 and 3
Docket No.: 50-361, 50-362
TAC No.: MD1405, MD1406
Subject: RAI to SCE from SPWB, Round 3
From: N. Kalyanam (NRC)
To: L. Conklin (SCE)

>>> N. Kaly Kalyanam 05/14/2007 10:26 AM >>>
Summer Sun has reworded his last two questions and added a thied one.

I will just docket this email. You can quote the questions in your response.

Thanks

Kaly

>>> Gregory Cranston 05/14/2007 9:56 AM >>>
Looks OK.

Gregory Cranston, Branch Chief
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>>> Summer Sun 05/14/2007 9:22 AM >>>
Greg, I have made some editorial changes to the RAI sent to you last Thursday. Please disregard the previous one, and review this revised RAI. After your concurrence, I would send it to the PM for him to convey it to the licensee for response. Thanks.

Followup RAI

1. The licensee considered in its criticality analyses the following storage patterns and GT-Inserts: (1) unrestricted storage; (2) SFP peripheral storage; (3) 2x2 storage patterns; (4) 3x3 storage patterns; (5) credit for inserted CEAs; (6) credit for Erbium rods; (7) credit for Pu241 decay; (8) credit for GT-Inserts; and (9) credit of burnup effects to compensate for no Boraflex poison credit. Based on its results of the criticality analyses, the licensee proposed the allowable storage patterns and the associated enrichment-burnup limits at discrete numbers of cooling years in Tables 4-3 through 4-34, and Figures 4-1 through 4-32 of the criticality analysis report (CAR) for the NRC staff to review. The Tables and Figures include 23 individual storage patterns and various combined patterns with associated enrichment ranging from 0.94 to 5.0 w/o, the burnup of up to 55.68 GWD/MTU, and the cooling times of up to 20 years).

Discuss the conditions in terms of the storage pattern, enrichment, burnup, cooling time, and boron concentration used to determine the values of <u>each</u> (underlined for emphasis) of the following parameters, and demonstrate that these values are the bounding values and applicable to the proposed allowable storage patterns for the assemblies in the SFP.

(a) the parameters included in Appendix D to the CAR. These parameters include: kENO-V.a method bias, KENO-V.a method bias 95/95 uncertainty, k-nominal and its associated sigma, normal pool temperature bias, CEA insertion bias, eccentric loadings, and manufacturing tolerances including tolerances of rack storage cell wall thickness, rack storage cell ID, rack storage cell pitch and U235 enrichment.

(b) the axial burnup bias discussed in the draft RAI 11 response.

(c) the reactivity equivalencing uncertainty and discharge burnup uncertainties discussed in the draft RAI 14, and RAI 15 response, respectively.

(d) the boron concentration of 370 ppm to maintain k-eff less than 0.95 discussed in Section 5.1 of the CAR.

2. As indicated in the CAR, the licensee determined the allowable storage patterns and the associated enrichment limits based on calculations of following sets of conditions:

I. For cases with unborated water in the SFP, the k-eff is maintained to be less than 1.0 at a 95/95 level, and
II. For Cases with borated water in the SFP, the k-eff is maintained to be less than or equal to 0.95 at a 95/95 level.

Provide information to demonstrate that the available margins in the results of the criticality analyses for all the allowable storage patterns are sufficient to bound the uncertainties for the following parameters that are not included in the criticality analyses. If the available margins are not sufficient, the licensee should perform the criticality analyses including all uncertainties, and present the results of analyses and the allowable storage patterns and the associated enrichment-burnup limits for the NRC staff to review.

(a) the reactivity equivalencing uncertainty and discharge burnup uncertainty (discussed in RAI 1(c)) that are not included in the criticality analyses for cases with unborated water (discussed in RAI 2.I), and

(b) the biases and uncertainties for the parameters included in Appendix D to the CAR (discussed in RAI 1(a)), and the axial burnup bias discussed in RAI 1(b) that are not included in the criticality analyses for cases with borated water (discussed in RAI 2.II).

3. SR 3.8.18.1 references LCS 4.0.100. The LCS should be added with the revision number and the date to be consistent with TS.4.3.1 and the note on page 4.0.100-1 discussed in the draft RAI 3 response.

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Creation Date 05/14/2007 10:26:34 AM
From: N. Kaly Kalyanam

Created By: NXK@nrc.gov

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conklilt (Linda Conklin)

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