ArevaEPRDCPEm Resource

From: Tesfaye, Getachew
Sent: Monday, March 05, 2012 9:35 AM
To: 'usepr@areva.com'
Cc: Peng, Shie-Jeng; Grady, Anne-Marie; McKirgan, John; Gleaves, Bill; Segala, John; ArevaEPRDCPEm Resource
Subject: Draft - U.S. EPR Design Certification Application RAI No. 540 (6300, 6308, 6329), FSAR Ch. 6
Attachments: Draft RAI_540_SPCV_6300_6308_6329 (2).doc

Attached please find draft RAI No. 540 regarding your application for standard design certification of the U.S. EPR. If you have any question or need clarifications regarding this RAI, please let me know as soon as possible, I will have our technical Staff available to discuss them with you.

Please also review the RAI to ensure that we have not inadvertently included proprietary information. If there are any proprietary information, please let me know within the next ten days. If I do not hear from you within the next ten days, I will assume there are none and will make the draft RAI publicly available.

Thanks,
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Hearing Identifier: AREVA_EPR_DC_RAIs
Email Number: 3812

Mail Envelope Properties (0A64B42AAA8FD4418CE1EB5240A6FED160DF19C87D)

Subject: Draft - U.S. EPR Design Certification Application RAI No. 540 (6300, 6308, 6329), FSAR Ch. 6
Sent Date: 3/5/2012 9:35:20 AM
Received Date: 3/5/2012 9:35:20 AM
From: Tesfaye, Getachew

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Files	**Size**	**Date & Time**
MESSAGE	897	3/5/2012 9:35:20 AM
Draft RAI_540_SPCV_6300_6308_6329 (2).doc	44026	

Options
Priority: Standard
Return Notification: No
Reply Requested: No
Sensitivity: Normal
Expiration Date:
Recipients Received:

Draft

Request for Additional Information No. 540(6300, 6308, 6329), Revision 0

3/5/2012

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 06.02.01.01.A - PWR Dry Containments, Including Subatmospheric Containments
SRP Section: 06.02.01.05 - Minimum Containment Pressure Analysis for Emergency Core Cooling System Performance Capability Studies
SRP Section: 06.02.05 - Combustible Gas Control in Containment

Application Section: 6.2

QUESTIONS for Containment and Ventilation Branch 1 (AP1000/EPR Projects) (SPCV)

06.02.01.01.A-2

OPEN ITEM

Follow-up to RAI 221, Question 06.02.01-38(b) and RAI 212, Question 06.03-11

Based on GDC 4, 13 and 50, the purpose of this RAI is to ensure that the components important to safety be designed to accommodate the effects of postulated accidents.

The applicant's response to RAI No. 221, Question 06.02.01-38(b), dated on June 17, 2009 stated that Technical Specification surveillance and ITAAC requirements for conformance with minimum hot leg injection acceptance criteria would be developed. The response to RAI No. 212 Supplement 2, Question 06.03-11 did provide the ITAAC. But it is not known if the Technical Specification surveillance has been developed. The applicant is requested to provide the technical specification surveillance requirement for conformance with minimum hot leg injection acceptance criteria.

06.02.01.01.A-3

OPEN ITEM

Follow-up to RAI 437, Question 06.02.01-98

Based on GDC 4, 13 and 50, the purpose of this RAI is to ensure that the components important to safety be designed to accommodate the effects of postulated accidents.

Part "b" of Question RAI 437, Question 06.02.01-98 requested demonstration that the containment temperatures resulting from main steam line break calculations using the FSAR Chapter 15 assumptions to compute the liquid entrainment from the break, will fall within the limits of the Environmental Qualification Temperature Profile. The applicant's response to RAI No. 437, Question 06.02.01-98, dated June 15, 2011did not provide the required information.

Provide the containment temperature results of the MSLB cases presented in the Response to RAI No. 266, Question 06.02.01.04-4 (in Supplement 7). These cases used the Chapter 15 methodology (S-RELAP5) for mass and energy release into the

containment. Compare the calculated maximum temperature histories against the FSAR Environmental Qualification Temperature Profile. Demonstrate that the Environmental Profile bounds all containment temperature results obtained with the Chapter 15 mass and energy release methodology.

06.02.01.05-2

OPEN ITEM

Based on 10 CFR 50.46, the purpose of this RAI is to ensure the validity of the analysis (Sec. 6.2.1.5) that will produce the minimum possible containment pressure as applied to the ECCS performance evaluation.

a. Additional Information for the Outside Atmospheric Temperature.

   In Rev.0 DCD FSAR Sec. 6.2.1.5, it described that the outside atmospheric temperature used in the analysis was 20ºF. In Rev.3 DCD FSAR Sec. 6.2.1.5, such a data is not presented. Justify why the data is not shown in Rev.3 DCD FSAR Sec. 6.2.1.5. Provide the data for outside atmospheric temperature that is assumed in the analysis for Sec. 6.2.1.5. Furthermore, justify the use of the data to reflect the minimum temperature as specified in the Rev.3 DCD FSAR Table 2.1-1-U.S. EPR Site Design Envelope.

b. Consideration of Containment Purge

   It is not described in the FSAR Sec. 6.2.1.5 that the containment purge has been considered in the analysis of minimum containment pressure. Since the containment purge system can be used during plant normal operation, an inclusion of containment purge in the analysis should be considered according to SRP Branch Technical Position 6-2. If the containment purge has been modeled in the analysis, provide modeling information and its impact on the analysis results in the FSAR. Otherwise, provide justification if it is not assumed or modeled in the analysis.

06.02.05-27

OPEN ITEM

In RAI 410, Question 06.02.05-17, the following AREVA document was requested, and was reviewed by NRC staff in a Feb. 2012 audit:

AREVA document # 38-9175074-000

The original CEA document number is NT-SECA-LECC-96/003.

Study of Siemens FR 90/1/150 H_2 Recombiner Performance Under Spray Conditions.

This document summarizes performance tests conducted in the KALI vertical containment and referred to as “KALI H2”. The test spray water contained boric acid and sodium hydroxide, to be representative of actual containment sprays. However, in the U. S. EPR, the spray water from the IRWST will contain boric acid and trisodium phosphate (TSP). Explain or demonstrate how this test spray water is equivalent to the water to be used in the U. S. EPR IRWST. Discuss how these test results are applicable to the U. S. EPR PAR performance.

06.02.05-28

OPEN ITEM

38-9175080-000: Test Report for the Phase 3 EDF recombiner - Siemens recombiner Influence of combustion products of French electric cables on the Siemens hydrogen recombiner evaluated the PAR performance post exposure to the combustion products of an electric cable insulation fire.

The French cables tested were NC type, with PVC insulation and sheathing, and ADR K1 type insulation and Hypalon sheathing. Both types were tested. In the U. S. EPR design the cable insulation and sheathing is Hypalon. Please explain how these test results represent the effect of contamination by combustion products from the cable insulation in the U. S. EPR.

06.02.05-29

OPEN ITEM

RAI 474, Question 06.02.05-25 requested test reports documenting PAR functional behavior following exposure to HNO_3, produced from the radiolysis of water, and HCl, produced from the radiolysis of the cable insulation materials Hypalon and PVC. Provide the test reports that demonstrate acceptable PAR performance following exposure to these chemicals.

06.02.05-30

OPEN ITEM

The NRC staff reviewed the following document in a Feb. 2012 audit.

AREVA doc # ETK 50/91/PB02, 1992; Siemens AG Power Generation Group KWU; Seligenstadter Str.; 8757 Karlstein (Main)

In the above report which summarized the results of several tests, the following detailed test reports addressing Siemens PAR functional performance were identified.

a. Siemens Working Report No. E 443/90/008

b. Test Report KSA 10/PB01/88

These tests investigated PAR capability under loads such as mechanical vibration, thermal and radiological loading, and chemical impurities in the containment atmosphere, and, of PAR integrity during operational vibrations and loads occurring during earthquakes.

Additional tests included:

- Functional test after prior loading through H_2 deflagration
- Long-term recombination tests after the catalyst had been subjected to severe fouling by residues from oil and cable fires.

Provide the two detailed tests reports identified above, so that Siemens PAR performance under these various conditions can be evaluated.