ArevaEPRDCPEm Resource

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Sent: Friday, November 30, 2012 10:09 AM
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Subject: DRAFT- U.S. EPR Design Certification Application RAI No. 566 (6955), FSAR Ch. 6
Attachments: DRAFT RAI_566_SCVB_6955.doc

Attached please find draft RAI No. 566 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.

Amy

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Hearing Identifier: AREVA_EPR_DC_RAIs
Email Number: 4118

Mail Envelope Properties (AF843158D8D87443918BD3AA953ABF78B482A1ED9B)

Subject: DRAFT- U.S. EPR Design Certification Application RAI No. 566 (6955), FSAR Ch. 6
Sent Date: 11/30/2012 10:08:49 AM
Received Date: 11/30/2012 10:08:51 AM
From: Snyder, Amy

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Post Office: HQCLSTR02.nrc.gov

Files	**Size**	**Date & Time**
MESSAGE	989	11/30/2012 10:08:51 AM
DRAFT RAI_566_SCVB_6955.doc	34298	

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

DRAFT
Request for Additional Information 566

Issue Date: 11/30/2012
Application Title: U. S. EPR Standard Design Certification - Docket Number 52-020
Operating Company: AREVA NP Inc.
Docket No. 52-020
Review Section: 06.02.05 - Combustible Gas Control in Containment
Application Section: 6.2.5

QUESTION

06.02.05-32

The confirmatory evaluation of U.S. EPR™ CGCS performance under design basis accident conditions was carried out using the MELCOR code, with input based on the recent EPR™ MAAP model. The comparison of MELCOR and MAAP results showed that the MELCOR predicted containment hydrogen concentration is approximately 45% to 73% higher than the MAAP prediction for the design basis scenario in which PARs are not credited, and exceeds 4 %.

This discrepancy may be due to the differences in boundary conditions (break mass and energy and hydrogen sources from core oxidation, radiolysis, and corrosion of zinc and aluminum) between the MELCOR and MAAP calculations, and to a lesser degree due to the MELCOR and MAAP thermal-hydraulic model differences.

In order to resolve these differences, the following clarifications regarding the boundary conditions used in the MAAP calculations are requested.

1. Hydrogen Source Rate and Location

The following hydrogen sources are considered in the design basis MAAP calculations documented in the FSAR:

1% Core Oxidation

Radiolysis of reactor coolant system (RCS) and In-Containment Refueling Water Storage Tank (IRWST) water plus the radiolysis of Hypalon and PVC jacketed cable in the containment.

Corrosion of zinc and aluminum in containment

Volumetric rates of these sources are provided in the FSAR, where adequate information on the pressures and temperatures at which these sources are calculated is not. Furthermore, the locations or distribution of these sources in the MAAP calculations are not known. For example, it is not clear whether the 1% core oxidation source was added to the RCS or directly into the containment volumes. Therefore, please provide, for each hydrogen source, the following:

Mass rate of injection

Location or distribution of source in MAAP model computational nodes

2. Break Mass and Energy Release Rate to the Containment

Section 6.2.5.3 of the FSAR indicates that the design basis analysis was performed for a LOCA scenario. Please confirm the break mass and energy release rates used in the MAAP calculations, by providing:

Break mass and energy release rates to the containment

MAAP model node for which break mass and energy release are applied as boundary condition

Please elaborate any additional assumptions used for the specification of break flow boundary condition such as composition of break flow (steam, liquid, droplets) or flashing