ArevaEPRDCPEm Resource

From: Tesfaye, Getachew
Sent: Monday, May 16, 2011 5:10 PM
To: 'usepr@areva.com'
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Subject: Draft - U.S. EPR Design Certification Application RAI No. 490 (5788), FSAR Ch. 6
Attachments: Draft RAI_490_CIB1_5808.doc

Attached please find draft RAI No. 490 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
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Request for Additional Information No. 490(5808), Revision 0

5/16/2011

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 06.02.02 - Containment Heat Removal Systems
Application Section: 6.2.2

QUESTIONS for Component Integrity, Performance, and Testing Branch 1 (AP1000/EPR Projects) (CIB1)

06.02.02-100

The staff requests that AREVA modify Appendix D of ANP-10293P to address directly and completely the change in IRWST peak temperature from 230°F to 250°F. For example, there is a statement on page D-5 that, "The temperature during the test was controlled to simulate the IRWST response to a large-break LOCA as closely as practicable." The autoclave testing was conducted at a lower temperature than the IRWST peak, and this needs to be acknowledged and justified. Another example is on page D-11, which has a statement about Nukon binder stability relative to 230°F (rather than 250°F).

06.02.02-101

The staff requests that AREVA either justify the linear extrapolation of the calcium release rate shown in Figure D.3-1 or propose an alternative. It does not appear to the staff that the linear extrapolation from 230°F to 250°F is justified and conservative. Rather, it appears that an exponential form would fit the data better and at 250°F would predict a significantly higher release rate than the proposed linear extrapolation.

06.02.02-102

The staff requests that AREVA explain why Table D.2-3 does not identify carbon as a constituent of pulverized concrete, even though the sample presumably contained carbonate. If the analysis was normalized in some way based on the measurement technique, the staff requests that this be explained in the text or the table.

06.02.02-103

With respect to Figure D.2-10, the staff requests that AREVA discuss, or identify on the graph, the relationship between the measured concentrations and the amount of material added to the autoclave, since a measured value less than the theoretical added suggests precipitation was occurring.

06.02.02-104

The staff requests that AREVA identify in Figure D.2-10 and D.2-11 whether the elemental concentrations are based on filtered or unfiltered samples, and the timing of the key steps in the analysis (e.g., filtration before or after cooling, filter pore size).

06.02.02-105

Page D-60 discusses the corrosion rate of the fiberglass and states that the data suggest the corrosion rate becomes negligible after about 100 hours. The staff requests that AREVA clarify that the analysis assumed there was negligible fiberglass corrosion after 80 hours and, hence, the corrosion rate was set to zero in the release calculation after 80 hours. The staff also requests that AREVA discuss the possible role of silicon precipitation after 80 hours, since precipitation would seem to result in more corrosion to maintain equilibrium.

06.02.02-106

Figure D.3-5 compares calculated steady-state aluminum corrosion rates to measured values from NUREG/CR-6915 and WCAP-16530-NP. Since the measured values correspond to more than one pH, the staff requests that AREVA annotate the figure accordingly. (The staff also notes that the figure appears to have a typographical error: "WCAP-16539").

06.02.02-107

Beginning on page D-66, there is a discussion of how, for “the U.S. EPR LOCA calculations,” the corrosion rate of aluminum was assumed to be made up of two parts (up to 20 hours and after 20 hours). It is the staff’s understanding that these two different corrosion rate relationships were used together to subsequently calculate the aluminum releases listed in Tables D.3-6, D.3-7, D.3-9, and D.3-10 (158 hours or 720 hours). The staff requests that AREVA clarify this in the discussion on page D-66 (i.e., define “the U.S. EPR LOCA calculations”). The staff also notes that the reference to Figure D.3-4 on page D-66 probably intends to reference Figure D.3-5.

06.02.02-108

The staff requests that AREVA confirm that the chemical effects analysis included insulation (other than RMI) or other materials that will not necessarily be destroyed (i.e., outside the zone of influence) but will be wetted and potentially add to the chemical debris and ionic content of the sump liquid. The mass of those other materials and the amount of ionic materials that may be leached should be included in the calculation.

06.02.02-109

The chemical precipitate quantities ("Total Solids") identified in Table D.3-10 and in the text on page D-80 are different than the chemical precipitate quantities listed in Table E.5-2 (debris head-loss tests). The staff requests that AREVA modify ANP-10293P to include an explanation of how the quantities calculated in Appendix D relate to the quantities used in head-loss testing.