ArevaEPRDCPEm Resource

From: Tesfaye, Getachew
Sent: Tuesday, May 25, 2010 8:34 AM
To: 'usepr@areva.com'
Cc: Grady, Anne-Marie; Jackson, Christopher; McKirgan, John; Carneal, Jason; Colaccino, Joseph; ArevaEPRDCPEm Resource
Subject: Draft - U.S. EPR Design Certification Application RAI No. 410(4719_4720), FSAR Ch. 6
Attachments: Draft RAI_410_SPCV_4719_4720.doc

Attached please find draft RAI No. 410 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,
Getachew Tesfaye
Sr. Project Manager
NRO/DNRL/NARP
(301) 415-3361

Hearing Identifier: AREVA_EPR_DC_RAIs
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Created By: Getachew.Tesfaye@nrc.gov

Recipients:
"Grady, Anne-Marie" <Anne-Marie.Grady@nrc.gov>
Tracking Status: None
"Jackson, Christopher" <Christopher.Jackson@nrc.gov>
Tracking Status: None
"McKirgan, John" <John.McKirgan@nrc.gov>
Tracking Status: None
"Carneal, Jason" <Jason.Carneal@nrc.gov>
Tracking Status: None
"Colaccino, Joseph" <Joseph.Colaccino@nrc.gov>
Tracking Status: None
"ArevaEPRDCPEm Resource" <ArevaEPRDCPEm.Resource@nrc.gov>
Tracking Status: None
"'usepr@areva.com'" <usepr@areva.com>
Tracking Status: None

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Request for Additional Information No. 410(4720), Revision 1

5/25/2010

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 06.02.04 - Containment Isolation System
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)

06.02.04-10

Follow-up to RAI 12, Question 06.02.04-2:

General Design Criteria 55, 56 and 57 require that isolation valves outside containment shall be located as close to the containment as practical. FSAR Tier 2, Section 6.2.4.2.1, General System Design, states that isolation valves outside containment are located as close as practical to the containment or shield building walls. The DCA, while committing to this, does not provide any design criteria associated with this requirement, not does it provide any design information about the distances from the outside containment isolation valves (CIV) and the containment.

The ITAAC in FSAR Tier 1, Table 3.5-3 specify that the CIVs identified in FSAR Tier 1, Table 3.5-1 will be located according to Table 3.5-1 and Figure 3.5-1. The location of the CIVs identified in FSAR Tier 1, Table 3.5-1 identifies whether or not the valve is located inside or outside the containment and in which building the valve is located. The distances from the containment to the outboard CIVs are not provided.

In order for the staff to be able to evaluate the US EPR compliance with the requirements of GDCs 55, 56, and 57, provide the distance from each CIV outside containment and the containment. Add this information to the FSAR Tier 2, Table 6.2.4-1, Containment Isolation Valve and Actuator. Provide an ITAAC for each outboard CIV for this distance in their respective sections in Tier 1.

06.02.05-16

Follow-up to RAI 323, Question 06.02.05-8:

In response to RAI # 323, supplement 1, question 06.02.05-8, AREVA noted that the KALI H2 tests examined PAR performance for a broad range of conditions consistent with those anticipated following a design-basis loss-of-coolant-accident, but did not address PAR performance impacts from fission product poisons.

The PAR performance database credited by AREVA NP for the U.S. EPR design is derived from several tests listed in the response. AREVA considers the Integrated Core-Melt-Simulation-Test (1996) program in the aerosol tests of the IPSN/EDF H2 PAR-Test program in Cadarache to be the most important test program concerning poisoning,

deposition on and contamination of catalyst in a PAR in the post accident atmosphere. During this program, an AREVA NP designed PAR was subjected to a realistic aerosol exposure generated by a molten core, including poisons such as iodide, tellurium, cesium and antimony.

Provide the test report(s) AREVA used in concluding that PAR performance would meet the US EPR design criteria for functional performance when exposed to aerosols generated by a molten core, including fission product poisons, both for design basis accidents and significant beyond design basis accidents.

06.02.05-17

Follow-up to RAI 323, Question 6.02.05-1:

a. The test report EPRI TR-107517, vol. 3 documented the results of tests showing that FR90/1-150 PARs, when subjected to simulated containment spray, did not begin recombination for ~4.5 hours and when subjected to direct spray did not begin recombination for ~ 14.5 hours. AREVA's response to the question of the impact of the PAR performance under spraying conditions is that there is no or minimal impact. Provide the test reports which refute the conclusions stated in EPRI TR-107517, vol. 3.

b. AREVA's response to the question of whether the PARs in the US EPR design have a hydrophobic coating was that the hydrophobic coating would be unnecessary. Confirm whether or not the PARs will have the hydrophobic coating. If the hydrophobic coating is part of the PAR design, revise the FSAR, section 6.2.5.2.1, and Table 6.2.5-1—CGCS Design and Performance Parameters, and section 19.2.3.3.2 to clarify the status of the hydrophobic coating.

06.02.05-18

Follow-up to RAI 323, Question 6.2.5-12:

Functionality of the PARs after H2 ignition and deflagration.

EPRI TR-107517, vol. 3 documented the results of tests showing that all the FR90/1-150 PARs when subjected to concentrations of H2 greater than 7% ignited and burned. The EPRI report, section 10, Table 4, description of ignitions occurring inside the KALI Vessel with Siemens PARs, indicates that all 5 tests where ignition occurred for H_2 concentrations greater that 7%, the PARs were no longer functioning. These test results indicate that a deflagration at or within a PAR could disable that PAR.

AREVA's response to question 6.2.5-12 indicates that PAR tests were performed with the German inspection agency (TÜV) under an AREVA NP test program. Provide the test report that supports the PAR functional behavior performance was unaffected by the H_2 ignition.

06.02.05-19

Follow-up to RAI 323, Question 06.02.05-13:

The effects of the operating environment in containment on the performance of the PARs, in particular the effects of radiation, operational vibrations, welding fumes and solvent fumes.

a. Provide test reports which demonstrate the radiation effects on the PAR catalytic coatings, platinum and palladium.

b. Provide the test reports for the developmental tests performed at the AREVA NP laboratories partnered with the German inspection agency (TÜV), which demonstrate PAR performance when subject to welding and solvent fumes, no functional impairment was observed.

c. While the PARs are enclosed by a housing, they are open both at the bottom and at the top, to encourage convective flow. Discuss how the PARs will be protected from these fumes both during normal operation and maintenance activities.