ArevaEPRDCPEm Resource

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Sent: Monday, August 22, 2011 1:18 PM
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Subject: Draft - U.S. EPR Design Certification Application RAI No. 507 (5964), FSAR Ch. 6
Attachments: Draft RAI_507_SPCV_5964.doc

Attached please find draft RAI No. 507 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. 507(5964) Revision 0

8/22/2011

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 06.02.02 - Containment Heat Removal Systems
Application Section: 6.3

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

06.02.02-120

Since the submission of technical report ANP-10293 Revision 3, NRC staff have been informed by AREVA personnel that one side of the retaining basket is mounted flush against the IRWST wall facing the annular space and this side will not contain a debris screen/filtering surface. The retaining basket provides debris screen/filtering surfaces on the three remaining sides and the bottom of the basket (top of the basket is open). The two sides and bottom of the retaining basket that terminate at the IRWST wall are attached to the IRWST wall with a “tightening device.”

Per ANP-10293 Section 2.2, the retaining basket screen mesh size is designed to catch small debris that is carried through the trash rack and minimize fine debris that may bypass the screen and impact downstream component performance. The staff seeks assurance that the retaining basket tightening device, under design basis accident conditions and/or a seismic event, is not breached or gaps/openings are developed that will enhance debris bypass and impair the functionality of the basket.

The staff requests AREVA describe the design basis and performance requirements of the tightening device in the DCD-FSAR or FSAR incorporated references. As part of this information, the staff request AREVA describe/provide the tightening device materials of construction and provide an evaluation of the designs performance relative to GSI-191 debris transport and debris accumulation. Include in the discussion performance requirements at attachment points to the retaining basket, IRWST wall, and within the device itself; and debris filtering capability of the device (if applicable). In addition, describe the qualification of this device, to include testing, if applicable.

06.02.02-121

Follow-up to RAI 434, Question 06.02.02-72 (specific to 'upstream effects' evaluation)

NEI 04-07 GR section 7.2 discusses upstream effects. This review [upstream effects] should look for locations where debris might collect and either retard or block the flow to the sump. The concern to be addressed for upstream effects is the hold-up of inventory away from the containment sump.

The NEI 04-07 GR states that certain holdup or choke points may exist which could reduce flow to and possibly cause blockage upstream of the sump. Such areas within containment are: (1) narrowing of hallways or passages - pieces of debris may gather on the floor in these areas and form a debris “mound”, (2) gates or screens that restrict

access to areas of containment, such as behind the bioshield or crane wall - debris may form behind the screen or grate, restricting flow to the containment sump and (3) the refueling canal drain - the collection of debris on the floor drain should be evaluated to determine if this path to the containment sump may be blocked.

The items listed above are typical areas of concern that are generally applicable to all containments. However, each containment design has unique geometric features, as well as a plant-specific insulation installation. An upstream effects evaluation should include and address these plant-specific features.

In section 3.2.5 of ANP-10293, AREVA describes the US EPR water holdup analysis and discusses water holdup due to steam, condensate on walls, and water retained on floors due to weirs or curbs. The staff did not find a discussion on whether debris might collect and either retard or block flow to the sump. The staff request that AREVA assess upstream effects using industry and regulatory guidance contained in NEI-04-07 and document the upstream effects evaluation in ANP-10293.

06.02.02-122

In RAI 416, Question 06.02.01-94, the staff requested demonstration testing of the CONVECT system. In a November 2010 response the applicant indicated that vendor-specific testing was not possible because the vendor had not been selected. In RAI 468, Question 06.02.02-83 the staff again requested demonstration testing of the CONVECT system. The staff noted that vendor-specific testing was not necessary but proof-of-concept testing was necessary for the first-of-a-kind application. In July of 2011 the applicant responded and did not include proof of concept testing in the response. The response provided a general description of “behaviors that are based on simple physics.” The response is not sufficient for the staff to make a finding that the foils and dampers used in CONVECT system are capable of accomplishing the safety function as described in FSAR. Since the staff is unaware of any testing or operating experiences associated with the foils and dampers as described in FSAR, proof of concept testing is needed for the foils and dampers in this first-of-a-kind application. Specifically, the staff requests testing to demonstrate the capability of the foils and dampers.

06.02.02-123

Tier 1, Table 2.1.1-8 “Reactor Building ITAAC,” commitment item 2.8 has provisions to inspect the reactor compartment for water flow to the IRWST, as shown in Figure 2.1.1-4 “Reactor Building Plan Elevation -8ft” and Figure 2.1.1-5 “Reactor Building Plan Elevation +5 ft.” Figure 2.1.1-4 shows two wall openings. Response to RAI 434 Question 06.02.02-71 and associated DCD Section 6.3.2.2.2 Rev 3 – interim markup indicate there are more than two openings for water flow to the IRWST (related to a change that now has all 4 retaining baskets receiving water flow from annular space whereas previously only 2 retaining baskets received water flow from the annular space). ANP-10293 Revision 3, Figure 3-2 also details four additional openings provided to direct break water to the IRWST that are not shown on Figure 2.1.1-5. Therefore, the staff request that AREVA document these additional wall openings and inspect all wall openings that are provided for water flow to the IRWST, pertaining to commitment 2.8 and Figures 2.1.1-4 and 2.1.1-5.