ArevaEPRDCPEm Resource

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Sent: Tuesday, January 26, 2010 11:09 AM
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Subject: Draft - U.S. EPR Design Certification Application RAI No. 363 (4136), FSAR Ch. 6
Attachments: Draft RAI_363_SPCV_4136.doc

Attached please find draft RAI No. 363 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. 363(4136), Revision 1

1/26/2010

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 and 6.3

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

06.02.02-43

This request for additional information is based primarily on an audit conducted on AREVA document 51-9125267-000, Revision 0, "US EPR STRAINER TEST PROTOCOL", dated October 26, 2009.

Describe how testing of the US EPR containment sump debris interceptors (weirs, trash racks, retaining basket (RB), and strainer) is prototypical or conservative (bounding) in comparison to the plant. The following list provides examples where additional information is requested:

1. Describe the scaling methodology and explain how it ensures prototypical or bounding test data.
    a. What similarities between test and plant conditions are preserved?
    b. Identify any assumptions in the scaling analysis and evaluate the impact on debris interceptor performance, particularly suction strainer head loss.
2. Identify important control parameters which must be considered in the design and operation of the test facility and explain the effects of the test facility design and operation on these important parameters.
3. Discuss how AREVA's approach to the number of tests conducted will provide results that are bounding.
4. Provide the basis for the water fall height in the test and how this height is prototypical or conservative in comparison to the plant.
5. Describe the potential for the cross brace support located at the entrance to the plants RB and extending above the basket wall to cause debris laden water to splash outside the basket (bypassing basket filtering) and how this bypass potential is accounted for in the test protocol.
6. Describe how delivering water flow to the RB during the test (pipe nozzles) is prototypical or conservative with respect to the plant arrangement (trapezoidal opening). Explain how the manner in which flow is delivered to the RB impacts the ability of the debris bed to form prototypically or conservatively inside the RB.
7. What is the basis for placing the RB bottom at the same elevation as the strainer bottom and how is this prototypical or conservative?

8. Describe the RB scaling approach. Explain how the tested RB surface area and tested RB volume are prototypical or conservative when compared to the plant.
    a. What is the basis for selecting the RB screened area on one side only (facing strainer) and having the other normally screened surfaces tested as solid surfaces? How is this arrangement prototypical or conservative?
9. How do the hydraulic conditions internal to the tested RB compare with the plant design RB hydraulic conditions?
10. What measurements are planned specific to the RB?
11. How is the RB small compartment (only receives flow from the annular floor wall opening) and its postulated debris source term bounded by the testing for the large compartment?
12. Describe how the flow rate to the retaining basket is determined.
13. How are drains that introduce debris between RB and strainer (example: refueling pool) accounted for in the test protocol?
14. The strainer flow rate listed in the test protocol and selected for scaling analysis is a certain value per strainer. ANP-10293 lists strainer flow at a different value. What is the correct flow rate through the plant strainer and what is the basis for this flow rate? In addition describe how all scaled flow values selected for testing are prototypical or conservative.
15. Describe how the flow conditions (velocities and turbulence levels) in the test flume region between the RB and strainer are prototypical or conservative in comparison to the plant.
16. What is the basis for the visual observation criteria that may be used to decide if a thin bed test will be conducted?
17. Justify chemical introduction location and why it is representative or conservative.
18. How is the tested strainers slope/angle for the nearly vertical face representative or conservative with respect to the plant design?
19. Describe how the selected test termination criteria are realistic or conservative.
20. Provide a simplified drawing (single line) depicting the debris interceptors test set-up.
21. Provide the following test and plant parameters, and scaling justification for each, as applicable.
    a) Screen mesh size for RB and strainer
    b) Distance between strainer and RB
    c) Debris source term amounts for testing
    d) Test termination – number of flume turnovers

06.02.02-44

1. The retaining basket and strainer have screen area adjacent to the outer walls of the in-containment refueling water storage tank (IRWST). RG 1.82 provides guidance on how far screens should be from obstructions. Describe the proximity of screen surfaces to nearby obstructions (walls). Explain how the proximity to these obstructions impacts the basket and strainer performance. How is the closeness to these obstructions (walls) and associated hydraulic impact accounted for during testing?

2. Explain how the surrogate debris characteristics (debris used for testing), are representative or conservative when compared to the debris characteristics for the plant?