ArevaEPRDCPEm Resource

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Sent: Friday, May 15, 2009 7:45 PM
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Cc: Sara Bernal; Timothy Frye; Jason Jennings; Joseph Colaccino; ArevaEPRDCPEm Resource
Subject: Draft - U.S. EPR Design Certification Application RAI No. 228 (2755), FSAR Ch. 12
Attachments: Draft RAI_228_CHPB_2755.doc

Attached please find draft RAI No. 228 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. 228 (2755), Revision 0

5/15/2009

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 12.03-12.04 - Radiation Protection Design Features
Application Section: 12.03-12.04, Radiation Protection Design Features

QUESTIONS for Health Physics Branch (CHPB)

12.03-12.04-9

The applicant's response to RAI 23 Question 12.03-12.04-1 (reference 1) did not fully address the need for FSAR changes to address compliance with 10 CFR 20.1406. Due to the cross-cutting nature of 10 CFR 20.1406 and its applicability to all radioactive and potentially contaminated systems, revise section 12 of the FSAR as follows:

1. Incorporate into Section 12.3 of the FSAR the applicant's response to Question 12.03-12.04-1 (Reference 1) with regard to the Coolant Storage and Transfer System (specifically the 1st, 2nd and last paragraphs under "(i) Facility Contamination") as well as the applicant's response provided with regard to the Nuclear Island Drain and Vent System (specifically the 5th paragraph under "(i) Facility Contamination" and the 2nd and 3rd paragraph under "(ii) Environmental Contamination").

2. RAI 23 Question 12.03-12.04-1 (reference 1) states that "the compartment where the coolant storage tanks are installed is designed with a leak retention capability equivalent to the complete drainage of one tank." Provide more detail as to how this leak retention capability will be achieved. For example, will the compartment be lined with stainless steel?

3. Incorporate into Section 12.3 of the FSAR 10 CFR 20.1406 design features that were provided in response to 20.1406 Questions issued under other FSAR sections (for example, for the Seal Water Supply System, the Component Cooling Water System, Essential Service Water System, Compressed Air System, and the spent fuel pool leakage detection system). Alternatively, provide pointers in section 12.3 of the FSAR to the specific section under which the Question was issued and which, as a result of the RAI, contains some discussion on that system's compliance with 20.1406.

4. For each system who's 20.1406 design features are addressed in Section 12.3 of the FSAR, provide a pointer in the system-specific FSAR Section referencing the reader to Section 12.3 for a description of that system's design features which demonstrate compliance with the requirements of 10 CFR 20.1406 (for example, in Section 9.3.3, Equipment and Floor Drainage System).

References

1. Response to Request for Additional Information No. 23, Supplement 1, Revision 0, 06/24/2008 U.S. EPR Standard Design Certification AREVA NP Inc. Docket No. 52-020 SRP Section : 12.03-12.04 – Radiation Protection Design Features Application Section: 12 CHPB Branch (ADAMS Accession No. ML083091032)

12.03-12.04-10

Background:

10 CFR 20.1406, “Minimization of Contamination,” requires design certification applicants to provide design features for minimizing contamination of the facility and the environment and for minimizing radioactive waste generation and facilitating decommissioning. RG 4.21, "Minimization of Contamination and Radioactive Waste Generation: Life-Cycle Planning," provides guidance on an acceptable method of complying with the requirements of 10 CFR 20.1406 based on nuclear industry experience, such as that provided in NRC Bulletin 80-10, “Contamination of Nonradioactive Systems and Resulting Potential for Unmonitored, Uncontrolled Release to the Environment.”

NRC Bulletin 80-10, “Contamination of Nonradioactive Systems and Resulting Potential for Unmonitored, Uncontrolled Release to the Environment” discusses operational experience concerning the contamination of nonradioactive systems (such as the demineralized water system, the auxiliary boiler system, the isolation condenser system, secondary water clean-up system, the instrument air system and the sanitary waste system) through leakage, valving errors, or other operating conditions in radioactive systems. As described in Bulletin 80-10, in the past this type of cross-contamination has resulted in unmonitored, uncontrolled releases of radioactivity to the environment with significant environmental impact. One approach to addressing this operating experience is provided in Appendix A to RG 4.21 item (a) under A-1, "Minimizing Facility Contamination," which states that applicants should provide a minimum of two barriers between radioactive and nonradioactive systems, including one that can be a pressure differential, and/or instrumentation to detect and control cross-contamination.

Question:

The applicant’s response to RAI 23 Question 12.3-12.4-1 (reference 1) states that the Demineralized Water Distribution System (DWDS) is isolated from the Coolant Storage and Transfer System by manual isolation valves. However, PWR nuclear industry operating experience has shown that the coolant storage and transfer systems (and to a lesser degree the condensate storage and transfer system) over time becomes significantly contaminated with tritium, particularly if tritiated water is recycled, as is the case with the EPR design (see FSAR Section 9.3.4, "Chemical and Volume Control System (including Boron Recovery System)). This tritiated water can contaminate interfacing clean systems, such as the DWDS, through diffusion, valve leakage, valving errors or other operating conditions, resulting in possible unmonitored releases of radioactivity to the environment. Therefore provide the following information to address the DWDS’s compliance with 10 CFR 20.1406:

i. Discribe any contaminated systems which the DWDS interfaces with in addition to the Coolant Supply and Storage System.

ii. In accordance with the RG 4.21 guidance discussed above, provide information on the location, type and number of barriers (check valves, isolation valves, etc) that prevent back flow and isolate the DWDS from the Coolant Supply and Storage System and any other contaminated system provided in response to (i).

iii. Discribe where the demineralized water storage tanks will be located, and whether there will be any buried piping connecting this system to a contaminated system like CSSS. If there is buried piping, discuss how this piping will be monitored for leakage.

iv. Update Section 12 of the FSAR to include the information provided for parts (i), (ii) and (iii).

References

1. Response to Request for Additional Information No. 23, Supplement 1, Revision 0, 06/24/2008 U.S. EPR Standard Design Certification AREVA NP Inc. Docket No. 52-020 SRP Section : 12.03-12.04 – Radiation Protection Design Features Application Section: 12 CHPB Branch (ADAMS Accession No. ML083091032)