ArevaEPRDCPEm Resource

From: Tesfaye, Getachew
Sent: Friday, June 12, 2009 11:13 AM
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Subject: U.S. EPR Design Certification Application RAI No. 235 (2851, 2850), FSAR Ch. 12
Attachments: RAI_235_CHPB_2851_2850.doc

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on May 19, 2009, and discussed with your staff on June 3, 2009. Draft RAI Question 12.03-12.04-11 was modified as a result of that discussion. The schedule we have established for review of your application assumes technically correct and complete responses within 30 days of receipt of RAIs. For any RAIs that cannot be answered within 30 days, it is expected that a date for receipt of this information will be provided to the staff within the 30 day period so that the staff can assess how this information will impact the published schedule.

Thanks,
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Request for Additional Information No. 235 (2851, 2850), Revision 0

6/12/2009

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 12.02 - Radiation Sources
SRP Section: 12.03-12.04 - Radiation Protection Design Features
Application Section: FSAR Ch. 12

QUESTIONS for Health Physics Branch (CHPB)

12.02-4

According to RG 1.206, Section C.I.12.2.2, Airborne Radioactive Material Sources, the applicant should provide a description of airborne radioactive material sources in the plant considered in the design of the ventilation systems and used for the design of personnel protective measures as well as for dose assessment.

In the EPR FSAR Section12.2, Table 12.2-19, “Parameters and Assumptions for Calculating Airborne Radioactive Concentrations” a reactor coolant tritium concentration of 1 uCi/g for calculating airborne radionuclide concentrations is listed, presumably based on the guidance provided by ANSI/ANS-18.1-1999, “Radioactive source term for normal operation of light water reactors.” However, ANSI/ANS-18.1 - 1999 is based on reactor coolant tritium data for a PWR reference plant with a 12 month refueling cycle, making it non-conservative for all currently operating plants which follow a 24 month refueling cycle, and making it particularly non-conservative for those plants which are designed to recover boron and recycle tritiated water, as is the case with the US EPR (See section 9.3.4, “Chemical and Volume Control System (Boron Recovery System).” SRP Section 12.2 states that for PWRs designed to recycle tritiated water, tritium concentrations in contained sources as well as tritium airborne concentrations should be based on a primary coolant concentration of 3.5 uCi/g. Provide revised airborne tritium concentrations for the Nuclear Island based on a primary coolant tritium source term of 3.5 uCi/g or higher, or justify the use of the 1 uCi/g concentration.

12.03-12.04-11

EPR FSAR Tier 2, Section 12.3.5.2, “Post accident Access to Radiological Vital Areas,” lists the following radiological vital areas:

1. MCR, technical support center, and adjoining rooms
2. Safeguard Building containment heat removal system pump rooms
3. Safeguard Building residual heat removal system pump rooms,
4. Post-LOCA sampling room in the Fuel Building

5. Post-LOCA ventilation air sampling room in the Fuel Building

6. Radiological analysis laboratory in the Nuclear Auxiliary Building

7. Diesel fuel oil delivery area.

Section 12.3.5.2 states that for the above listed radiological vital areas, mission doses were calculated to be less than 5 rem total effective dose equivalent (TEDE), in accordance with 10 CFR 50.34(f)(2)(vii) and GDC 19, and in accordance with NUREG-0737 II.B.2. The FSAR also notes that for missions (2), (3), (4), (5), (6) and (7) listed above, "the operator wears full protective clothing and respiratory protection, therefore only direct dose is considered."

In response to RAI 136 Question 12.03-12.04-2 part (3) the applicant stated that the COL holder's radiation protection program would ensure that doses remained ALARA during post-accident radiological vital area access, including ensuring the appropriate use of respiratory protection and temporary shielding, as necessary.

However, while the use of respiratory protection can limit intakes significantly, its ability to reduce intake doses to negligible levels will be dependent on the post-accident airborne concentrations present in the vital areas at the time that access is required.

Therefore, demonstrate the U.S. EPR design’s compliance with GDC 19 and 10 CFR 50.34(f)(2)(vii) by providing airborne concentrations for all vital areas or by providing information (such as additional mission description detail and/or additional design detail) that would support the conclusion that post-LOCA doses due to airborne radioactivity (from sources such as ESF system leakage or stack releases) would be negligible for missions (2) through (7). Update the FSAR to include this information.