ArevaEPRDCPEm Resource

From: Tesfaye, Getachew
Sent: Tuesday, January 19, 2010 9:39 AM
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Cc: Budzynski, John; VanWert, Christopher; Donoghue, Joseph; Carneal, Jason; Colaccino, Joseph; ArevaEPRDCPEm Resource
Subject: U.S. EPR Design Certification Application RAI No. 342 (3933), FSAR Ch. 5 OPEN ITEM
Attachments: RAI_342_SRSB_3933.doc

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on December 7, 2009, and on January 18, 2010, you informed us that the RAI is clear and no further clarification is needed. As a result, no change is made to the draft RAI. The question in this RAI is an OPEN ITEM in the safety evaluation report for Chapter 5 for Phases 2 and 3 reviews. As such, the schedule we have established for your application assumes technically correct and complete responses prior to the start of Phase 4 review. For any RAI that cannot be answered prior to the start of Phase 4 review, it is expected that a date for receipt of this information will be provided so that the staff can assess how this information will impact the published schedule.

Thanks,
Getachew Tesfaye
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Hearing Identifier: AREVA_EPR_DC_RAIs
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Request for Additional Information No. 342 (3933), Revision 0

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U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 05.04.12 - Reactor Coolant System High Point Vents
Application Section: FSAR Chapter 5

QUESTIONS for Reactor System, Nuclear Performance and Code Review (SRSB)

05.04.12-5

OPEN ITEM

The applicant's response to RAI 5.4.12-1 stated that "In the event that the vent flow path does not close, flow is restricted by an orifice such that the normally operating chemical and volume control system (CVCS) can make up the loss of coolant mass with the assumption that only one high pressure charging pump is available. The makeup flow is based on flow from one charging pump at system pressure and temperature minus the flow diverted to the reactor coolant pump (RCP) seals. Additionally, the redundancy of the vent design (i.e., two valves in series for each vent line powered from separate electrical divisions) precludes the possibility of a stuck open flow path. Breaks upstream of the flow-restricting orifice are bounded by the small break loss of coolant accident (SBLOCA) analysis in FSAR Tier 2, Section 15.6.5.2."

The staff finds the response to be inadequate. In addition, the staff is concerned with this response because FSAR Tier 2 Revision 1 Section 9.3.4, "Chemical and Volume Control System (Including Boron Recovery System)," page 9.3-62 states: "The CVCS is not a safety system and is not required to supply reactor coolant makeup to the RCS in the event of small breaks or leaks in the RCPB. Also, the CVCS is not designed to perform the safety function of the ECCS during a DBA. Therefore, GDC 33 and GDC 35 are not applicable to the CVCS." However, in Section 5.2 "Integrity of the Reactor Coolant Pressure Boundary," on page 5.2-23 the applicant states: "Components that are connected to the RCS and are part of the RCPB, and that are of such a size and shape so that upon postulated rupture the resulting flow of coolant from the RCS under normal plant operating conditions is within the capacity of makeup systems that are operable from on-site emergency power. The emergency core cooling systems are excluded from the calculation of makeup capacity." The applicant does not identify the makeup systems but infers that the CVCS is capable of performing this task without supporting data to substantiate their claim. Therefore, the staff believes there are inconsistencies with respect to the RAI response and the FSAR sections noted above.

Since the applicant does not describe the makeup systems required to perform this function, additional information is needed to identify the makeup systems and confirm that the makeup systems or CVCS can provide adequate makeup in the event the high point vent system fails open and to confirm that this failure would not be classified as a LOCA. In addition, the staff was unable to determine, in FSAR Tier 1 Section 2.2.1, that the ITAAC includes verification of the "as-built" high point vent system conformance to the assumptions used to conclude, in the event that the

system fails open, that the CVCS is capable of providing adequate makeup to the reactor coolant system.

Therefore, provide a reference or a discussion to address the following:

a. The RCS mass discharge flow rate downstream on the flow restricting orifice, including a description of the piping, valve and orifice pressure losses assumed in the flow rate determination,

b. The pressure and temperature (and other thermodynamics variables) used in the flow rate determination (and as applicable the critical flow model used),

c. The CVCS flow (the total flow rate, the flow rate to the RCP seals, and flow rate to the RCS), at the pressure and temperature used to determine the discharge flow rate,

d. Identify the “makeup systems” and provide the data requested in (3), and

e. If no other makeup system is identified, explain the applicant’s position that GDC 33 is not applicable to the CVCS system.

f. Identify the ITAAC that includes verification of the “as-built” high point vent system conformance to the assumptions used to conclude that the CVCS is capable of providing adequate makeup to the reactor coolant system in the event that the system fails open.