ArevaEPRDCPEm Resource

From: Tesfaye, Getachew
Sent: Thursday, October 13, 2011 3:53 PM
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Subject: Draft - U.S. EPR Design Certification Application RAI No. 518 (6122, 6125), FSAR Ch. 9
Attachments: Draft RAI_518_SBPA_6122_6125.doc

Attached please find draft RAI No. 518 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. 518(6122, 6125), Revision 0

10/13/2011

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 09.02.05 - Ultimate Heat Sink
Application Section: 9.2.5

QUESTIONS for Balance of Plant Branch 1 (AP1000/EPR Projects) (SBPA)

09.02.05-38

OPEN ITEM

NRC regulations 10 CFR 50.36(c)(2)(ii) states that a technical specification limiting condition for operation of a nuclear reactor must be established for each item meeting one or more of the following criteria … (C) Criterion 3. A structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

The US EPR standard plant uses a mechanical draft cooling tower (MDCT) for its ultimate heat sink (UHS). Regulatory Position 4 from Regulatory Guide (RG) 1.27 (1976), “Ultimate Heat Sink for Nuclear Power Plants,” states, in part, that the technical specifications for the plant should include provisions for actions to be taken in the event that conditions threaten partial loss of the capability of the UHS. Thus, the staff needs assurance that the assumptions used to calculate the UHS cooling capability bound actual conditions.

There are already surveillance requirements in TS 3.7.19 for the UHS cooling tower basin water temperature and level. For a MDCT, wet bulb (WB) temperature dictates the cooling tower’s heat removal capacity. The higher the ambient WB temperature the worse the cooling performance of the tower. A higher WB temperature than previously analyzed would threaten the cooling capability of the MDCT UHS. Thus, if RG 1.27 is followed, plants that use MDCTs for their UHS should incorporate an ambient WB temperature surveillance requirement in their TS.

For the US EPR FSAR – Revision 3, the variable “wet bulb” is found in several locations as shown below:

- Tier 2 FSAR Table 9.2.5-2, “Ultimate Heat Sink Design Parameters,” states that the design inlet wet bulb temperature is 81° F (non-coincident, 0% exceedance value).
- Tier 2 FSAR Table 9.2.5-3, “Design Valves for Maximum Evaporation and Drift Loss of Water from the UHS,” shows a wetbulb value of 78.72°F at hour 42.
- Tier 2 FSAR Table 9.2.5-4, “Design Values for Minimum Water Cooling in the UHS,” shows a maximum wet bulb temperature of 85.3° F with a concurrent dry bulb temperature of 99° F (hour 8 & 9).

For the US EPR FSAR – Revision 3, references to RG 1.27 is found in several locations as shown below:

- Tier 2 FSAR, Section 9.2.5, “Ultimate Heat Sink,” states that the UHS for the US EPR is sized to provide adequate cooling capacity as required by RG 1.27.
- Tier 2 FSAR, Table 1.9-2, “US EPR Conformance with Regulatory Guides,” states that the US EPR assessment is “yes” for RG 1.27; that is; there is no exception to RG 1.27.

Other related FSAR section influenced by WB:

- Tier 2 FSAR Technical Specification (TS) SR 3.7.19.2 states that the water temperature of each UHS cooling tower basin is $\leq$ 90° F.

Since the ambient WB temperature greatly influences the heat removal capacity and efficiency of the MDCT and may simultaneously affects all four trains of the UHS, which is used to protect fission product barriers:

a. Describe in the US EPR FSAR the condition of the UHS that would exist if the ambient WB temperature exceeds the UHS design basis 81° F WB temperature.

b. Describe in the RAI response the UHS WB temperature margins.

c. Describe if the existing US EPR basin water temperature TS surveillance requirements (SR) of <90° F is bounding and if the limited conditions of operations (LCO), would be entered if the ambient WB temperature exceeds 81° F (Table 9.2.5-2), exceeds 78.72° F (Table 9.2.5-3), or exceeds 85.3° F (Table 9.2.5-4).

d. Describe the US EPR TS surveillance (and TS Bases) for ambient WB temperature as it relates to cooling tower performance. Also describe in the US EPR TS how ambient WB is to be measured and on what frequency.

e. Describe applicable combined license (COL) information items that are required to address ambient WB temperature.

09.05.01-87

OPEN ITEM

FSAR Section 9.5.1 states that "The FPP, including administrative controls and the fire brigade, are implemented prior to receiving fuel on site for fuel storage areas and for the entire station prior to reactor startup." SRP 9.5.1 states that the Fire Protection Program should be fully implemented prior to fuel receipt at the plant site. The applicant should change the above to be acceptable to the staff and to be consistent with CCNPP3 as follows: "The FPP elements necessary to support receipt and storage of fuel onsite should be implemented prior to initial fuel receipt. The FPP elements necessary to support fuel load and plant operation should be implemented prior to initial fuel load."