

NorthAnnaRAIsPEm Resource

From: Patel, Chandu
Sent: Tuesday, February 28, 2012 4:42 PM
To: 'na3raidommailbox@dom.com'
Cc: NorthAnnaRAIsPEm Resource; Weisman, Robert; Kallan, Paul; Wheeler, Larry
Subject: RAI Letter 96 RAI 6198, Section 9.2.5, North Anna 3 COLA
Attachments: RAI Letter No. 96 RAI 6198.doc

By letter dated November 26, 2007, Dominion Virginia Power (Dominion) submitted a Combined License Application for North Anna, Unit 3, pursuant to Title 10 of the *Code of Regulations*, Part 52. The U.S. Nuclear Regulatory Commission (NRC) staff is performing a detailed review of this COLA.

The NRC staff has identified that additional information is needed to continue portions of the review and a Request for Additional Information (RAI), is enclosed. To support the review schedule, Dominion is requested to respond within 30 days of the date of this request. If the RAI response involves changes to the application documentation, Dominion is requested to include the associated revised documentation with the response.

Sincerely,
Chandu Patel
Lead Project Manager for NA3 COLA

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2/28/2012
RAI Letter No. 96
North Anna, Unit 3
Dominion
Docket No. 52-017
SRP Section: 09.02.05 - Ultimate Heat Sink
Application Section: 9.2.5

QUESTIONS for Balance of Plant Branch 1 (AP1000/EPR Projects) (SBPA)
Request for Additional Information No. 6198

09.02.05-2

10 CFR 50.36(c)(2)(ii) states that a technical specification (TS) limiting condition for operation (LCO) of a nuclear reactor must be established for each item meeting one or more of four listed criteria. The third criterion provides that a TS LCO is required for “[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 UHS is the sink for heat removed from the reactor core following all accidents and anticipated operational occurrences in which the unit is cooled down and placed on residual heat removal (RHR) operation. The operating limits are based on conservative heat transfer analyses for the worst case Loss-of-Coolant-Accident (LOCA). The UHS satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

The North Anna 3 uses mechanical draft cooling towers (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. There are already surveillance requirements in TS 3.7.9 for the UHS cooling tower basin water temperature (SR 3.7.9.2) and level (SR 3.7.9.1). 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.

Section 2.3.1.3.8, “Meteorological Data for Evaluating the Ultimate Heat Sink,” in the North Anna Early Site Permit (ESP) Site Safety Analysis Report (SSAR), which is incorporated by reference into Section 2.3.1 of the North Anna Final Safet Analysis Report (FSAR), establishes the design basis wet bulb temperature as 78.3° F.

The ambient WB temperature greatly influences the heat removal capacity and efficiency of the MDCT and may simultaneously affect all four trains of the UHS, which is used to protect fission product barriers. Thus, the staff needs assurance that the assumptions used to calculate the UHS cooling capability bound actual conditions.

a. Describe how the 1-day and 5-day worst time periods discussed in SSAR Section 2.3.1.3.8 were used in the design of the UHS.

b. Describe in the North Anna 3 FSAR the condition of the UHS that would exist if the ambient WB temperature exceeds the UHS design basis 78.3° F.

- c. Describe in the North Anna 3 TS bases the UHS WB temperature margins.
- d. Provide justification for why the TS surveillance requirements for UHS water temperature and level provide assurance, in accordance with RG 1.27, that if the ambient WB is exceeded, the UHS is still able to perform its intended heat removal function. If the UHS is determined to be unable to perform its intended heat removal function if the ambient WB is exceeded, then create a North Anna 3 TS surveillance (and associated TS Bases) for ambient WB temperature as it relates to cooling tower performance. Also, describe in the North Anna 3 TS Bases how ambient WB is to be measured and on what frequency.