LeeRAIsPEm Resource

From: Hughes, Brian
Sent: Wednesday, April 13, 2011 3:27 PM
To: LeeRAIsPEm Resource
Subject: LEE-RAI-LTR-096.doc
Attachments: LEE-RAI-LTR-096.doc

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Sent Date: 4/13/2011 3:26:46 PM
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From: Hughes, Brian

Created By: Brian.Hughes@nrc.gov

Recipients:
"LeeRAIsPEm Resource" <LeeRAIsPEm.Resource@nrc.gov>
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Peter Hastings

April 14, 2011

Mr. Peter S. Hastings, P.E.
Licensing Manager, Nuclear Plant Development
Duke Energy
526 South Church Street
Charlotte, NC 28201-1006

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 096 RELATED TO SRP SECTION: 02.04.12 - GROUNDWATER FOR THE WILLIAM STATES LEE III UNITS 1 AND 2 COMBINED LICENSE APPLICATION

Dear Mr. Hastings:

By letter dated December 12, 2007, as supplemented by letters dated January 28, 2008, February 6, 2008 and February 8, 2008, Duke Energy submitted its application to the U. S. Nuclear Regulatory Commission (NRC) for a combined license (COL) for two AP1000 advanced passive pressurized water reactors pursuant to 10 CFR Part 52. The NRC staff is performing a detailed review of this application to enable the staff to reach a conclusion on the safety of the proposed application.

The NRC staff has identified that additional information is needed to continue portions of the review. The staff's request for additional information (RAI) is contained in the enclosure to this letter.

To support the review schedule, you are requested to respond within 30 days of the date of this letter. If changes are needed to the final safety analysis report, the staff requests that the RAI response include the proposed wording changes.

Peter Hastings

If you have any questions or comments concerning this matter, you may contact me at 301-415-6582.

Sincerely,

/**RA**/

Brian Hughes, Senior Project Manager
AP1000 Projects Branch 1
Division of New Reactor Licensing
Office of New Reactors

Docket Nos. 52-018
52-019

Enclosure:
Request for Additional Information

CC: see next page

Peter Hastings

If you have any questions or comments concerning this matter, you may contact me at 301-415-6582.

Sincerely,

/**RA**/

Brian Hughes, Senior Project Manager
AP1000 Projects Branch 1
Division of New Reactor Licensing
Office of New Reactors

Docket Nos. 52-018
52-019

eRAI Tracking No. 5507

Enclosure:
Request for Additional Information

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DATE	02/9/10	02/15/11	N/A	04/13/11

*Approval captured electronically in the electronic RAI system.

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Request for Additional Information No. 5507

4/14/2011

William States Lee III, Units 1 and 2
Duke Energy Carolinas, LLC
Docket No. 52-018 and 52-019
SRP Section: 02.04.12 - Groundwater
Application Section: FSAR Section 2.4.12

QUESTIONS for Hydrologic Engineering Branch (RHEB)

02.04.12-20
Additional information regarding maximum post-construction groundwater elevations at the Lee Nuclear Site is required to meet the requirements of 10 CFR 52.79(a)(1)(iii), 10 CFR 100.20(c), 10 CFR 100.21(d), and GDC 2. The applicant's past estimates based on observed water levels in the Cherokee excavation and generalizations based on LeGrand (2004) are insufficient, since they do not sufficiently take into account the actual conditions that are anticipated to exist after construction. Staff needs an estimate of the maximum post-construction groundwater level that is based on anticipated post-construction surface conditions, and also on a plausible conceptual model of the post-construction subsurface conditions. The estimate must be based on recharge rates associated with each of the main surface features, including semi-impervious surfaces, grass-covered surfaces, drainage ditches, and the cooling tower mounds. The estimate must address groundwater response to the maximum plausible recharge rates and to potential groundwater mounds that might form, e.g., beneath the cooling towers and drainage ditches. The groundwater response must account for the post-construction subsurface conditions, including engineered fill and backfill. The area of interest is bounded approximately by the 588-ft contour just north and south of Units 1 and 2, as shown in COLA Rev. 2, FSAR Fig. 2.4.2 202, and bounded east and west by the cooling towers.

02.04.12-21
Additional information regarding the site characteristics of the proposed Lee Nuclear Site is required to meet the requirements of 10 CFR 52.79(a)(1)(iii), 10 CFR 100.20(c), 10 CFR 100.21(d), and GDC 2. FSAR Revision 2, Appendix 2AA, provides the results of 11 packer tests conducted in 2006. Enercon Project Report DUK010-FSAR-2.4-Calc-16, Rev. 5, provides the results of 16 slug tests conducted in 2006. Calc-16 also shows the calculation of hydraulic conductivity summary statistics (based on all conductivity tests) that support Table 2.4.12-204. In reviewing the FSAR and this information, staff identified the need for clarification of data and methods related to these results. The following questions and requests for documents address this need:

1. Calc-16 identifies eight Partially Weathered Rock (PWR) "pump & recovery tests" and 23 Undifferentiated Material "aquifer pump tests" that are not identified in Section 2.4.12.2.4 of the FSAR. It appears the hydraulic conductivity values from these tests were included in the summary statistics that support Table 2.4.12-204. Please provide the following:
    a. Information or references describing the eight PWR pumping tests
    b. Information or references describing the 23 Undifferentiated Material pumping tests
    c. Clarification about whether and how these K values were included in the summary statistics
    d. If Calc-16 does contain new information about the basis of Table 2.4.12-204 that is not included in FSAR Revision 2, a revised description of the basis of the table.
2. "Undifferentiated Material" refers to a combination of soil, saprolite, PWR, and/or bedrock. Aquifer tests were conducted in Undifferentiated Material in the 1970s. Calc-16 shows that the average hydraulic conductivity of this material is 1.58E-3 cm/s, which is slightly higher than the FSAR

estimate of a “conservative” hydraulic conductivity of 1.4E-3 cm/s for the PWR. Please explain whether the value of 1.4E-3 cm/s should be retained as a conservative estimate of hydraulic conductivity, or whether a higher value (e.g., something greater than the average conductivity of undifferentiated material) should be used instead.

3. Figure 2.4.12-207 shows hydraulic conductivity values as a function of depth. Many hydraulic conductivity values in the PWR exceed the “conservative” estimate of 1.4E-3 cm/s. Please describe how many of those values are associated with the primary transport pathway defined as Pathway 1 in Section 2.4.12.3 and FSAR_FIG02_04_12_208.pdf and provide the values.
4. Figure 2.4.12-207 shows hydraulic conductivity values as a function of depth. According to the legend, it appears that there are at least seven values associated with 2006 pumping tests. The FSAR indicated there was only one pumping test in 2006. Please clarify how many pumping tests were conducted in 2006, and, if more than one, what boreholes were used for pumping and water level observation. If more than one pumping test were performed in 2006, please provide the results.
5. Please clarify whether the statistics that support Table 2.4.12-207 are based on unique hydraulic conductivity measurements, or whether they include multiple tests conducted in the same borehole. For example, if a slug test was repeated in the same borehole, were both values included in the calculations? If repeated measurements in the same borehole were included, even if using different techniques, explain whether this approach would bias the statistics.
6. Please provide a copy of the calculation package or report that describes the multi-borehole aquifer test and the calculations that yielded the value of 1.4E-3 cm/s as the conservative estimate of hydraulic conductivity for PWR, as shown in Table 2.4.12-204.
7. Please provide a copy of Enercon Project Report, DUK010-PR-036, Rev. 0, “Review of Cherokee Gradient and Drainage Plans to Evaluate Potential for Preferential Pathways.”
8. Please provide the complete MACTEC Engineering, Inc., report for the packer tests conducted in 2006
9. Please provide the complete contractor report for the slug-out tests conducted in 2006